



Guru Amar Das Block, Guru Nanak College (Autonomous), Chennai

# GURU NANAK JOURNAL OF MULTIDISCIPLINARY RESEARCH (GNJMDR)

*(Refereed, Peer-reviewed, Bi-annual Journal from Guru Nanak College (Autonomous), Chennai)*  
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## GURU NANAK COLLEGE (AUTONOMOUS)

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Guru Nanak Salai, Velachery, Chennai - 600 042.



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## *Message from the Editor's Desk!*

*“Research and education are the cornerstones of progress.  
Through rigorous inquiry and scholarly collaboration, we not only advance  
knowledge but also shape a better future for generations to come”*

It is with immense pleasure that I present Volume 14, Issue 1 (January–June 2025) of the *Guru Nanak Journal of Multidisciplinary Research*, a refereed, peer-reviewed, and biannual publication of Guru Nanak College (Autonomous), Chennai. This issue continues our commitment to academic excellence, featuring diverse and insightful research across multiple disciplines, ranging from linguistics, literature, education, economics, technology, and environmental studies to international relations and emerging innovations. As an academic platform dedicated to knowledge dissemination, our journal fosters interdisciplinary dialogue that connects researchers, academicians, and professionals from varied domains. Each article in this edition reflects rigorous research, critical analysis, and contemporary relevance, aligning with the journal's objective of promoting intellectual growth and innovation.

The editorial team expresses profound gratitude to the contributors, reviewers, and advisory board members for their dedication and scholarly contributions. Their collective efforts uphold the integrity and quality of our publication. We are also thankful to our readers, for their continuous feedback and encouragement which enables us to move towards the continuous pursuit of Excellence. As research continues to evolve in response to technological advancements, socio-economic transformations, and global challenges, we remain steadfast in our mission to serve as a reliable academic resource. We encourage scholars to contribute their research work and look forward to fostering a robust academic ecosystems through future editions.

Warm regards,

**T. K. Avvai Kothai**

Principal

Editor-in-Chief

Guru Nanak Journal of Multidisciplinary Research

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## நற்றிணை குறுந்தொகையில் வெளியீட்டு உத்திகள்

ந. கார்த்தி

உதவிப் பேராசிரியர் (ம) தலைவர்,

முதுகலைத் தமிழ்த்துறை,

ஜெய்ராம்ஸ் கலை மற்றும் அறிவியல் கல்லூரி, கரூர்-03.

### முன்னுரை

இலக்கியம் என்பது ஒரு கருத்தைக் கடத்தும் ஊடகமாகச் செயல்படுகிறது. இலக்கிய வடிவத்தின் தன்மைக்கு ஏற்ப கருத்தைப் படைப்பாளி கையாளுகின்றான். கவிதை, சிறுகதை, நாவல், நாடகம் என்னும் வடிவங்களுக்கு ஏற்ப கருத்தை ஒரு சிறு கூறாகவோ அல்லது விரிவான நிலையிலோ எடுத்துரைக்கிறான். படைப்பாளன் தனது கருத்தை எடுத்துரைக்க இலக்கிய வடிவத்திற்கு ஏற்ப வெளியீட்டு முறையை அமைத்துக் கொள்கிறான். இவ்வெளியீட்டு முறையைப் படைப்பாக்க உத்தி எனவும் குறிப்பிடலாம். அவ்வகையில் அகக் கருத்துக்களை முன்வைக்கும் குறுந்தொகை, நற்றிணை ஆகிய இலக்கியங்களில் இடம்பெற்றுள்ள வெளியீட்டு உத்திகளை வெளிக்கொணரும் வகையில் இவ்வாய்வு அமைகிறது.

### உத்தி விளக்கம்

இலக்கியப் படைப்புகளில் வெளியீட்டு உத்தி என்பது தவிர்க்க இயலாத ஒன்றாக அமைகிறது. இலக்கியத்தை வெளிப்படுத்த சில உத்தி முறைகளைப் படைப்பாளி தெரிந்தோ தெரியாமலோ பயன்படுத்துகிறான். இவ்வெளியீட்டு உத்திப் படைப்பாக்கத்திற்குப் பெரிதும் பயன்படுகிறது.

உத்தி என்பதற்கு “இலக்கியத்தில் உள்ளடக்கத்திற்கு ஏற்ற வடிவத்தைப் பயன்படுத்தும் முறை” எனக் க்ரியாவின் தற்காலத் தமிழ் அகராதி பொருள் தருகிறது. (க்ரியாவின் தற்காலத் தமிழ் அகராதி, ப.190) “இலக்கியத்தில் பொருள் புலப்படுத்தும் முறை பல உத்திகளை உள்ளடக்கியது. உயிர் தாங்கிய எலும்பு கூட்டிற்குப் புற அழகு தருகிற பல்வேறு உறுப்புகளைப் போன்றது” உத்திகள் என்று இரா.பாலசுப்பிரமணியன் கூறுகிறார். (பாலசுப்பிரமணியன். இரா, நாவல் கலையியல், ப.22). படைப்பாளி தான் பெற்ற உணர்வுகளைப் பிறரும் பெறுவதற்குப் பல உத்திகளைப் பயன்படுத்துவான். ‘கற்பனை, சொல்நயம், ஒலிநயம், யாப்பு, அணி, அழகுகள், குறிப்பு, சுவைப் பொருள்கள் போன்றன அத்தகைய உத்திகள் என சுந்தரமூர்த்தி குறிப்பிடுகிறார். (சுந்தரமூர்த்தி. இ.ப., நடைபயிலும் இலக்கியமும்- ப.1). இத்தகு வெளியீட்டு உத்திகள் படைப்பாளியையும் வாசகனையும் நெருக்கம்

கொள்ள வைக்கின்றன. வெளியீட்டு உத்திகள் இலக்கியங்களில் இடம்பெறும்போது வாசிப்புத் திறனும் படைப்பின் மீதான ஆர்வமும் மேம்படுகின்றன. மேலும், படைப்பை ஆர்வம் மிகுந்ததாகவும் இவ்வுத்தி முறைகள் மாற்றுகின்றன.

### குறுந்தொகை, நற்றிணையில் வெளியீட்டு உத்திகள்

சங்க அக இலக்கியங்களான நற்றிணை, குறுந்தொகை ஆகியவற்றை ஆய்வுக்கு உட்படுத்தும்போது சில வெளியீட்டு உத்தி முறைகளைச் சங்கப் புலவர்கள் பயன்படுத்தியுள்ளதைக் காணலாம். இவ்வுத்தி முறைகள் இத்தொகுப்புகளில் இடம் பெற்றுள்ள பாடல்களுக்கு ரசிக்கும் தன்மையை நல்குகின்றன. தற்கால தலைமுறையினர் இக்கவிதைகளை ரசிப்பதற்கும் அனுபவிப்பதற்கும் இவ்வுத்தி முறைகள் துணை நிற்கின்றன.

நற்றிணை, குறுந்தொகையில் காணப்பெறும் வெளியீட்டு உத்திகளைப் பின்வருமாறு பகுத்து ஆராயலாம். அவை,

- ❖ உவமை
- ❖ உள்ளுறை
- ❖ இறைச்சி
- ❖ நெஞ்சோடு உரையாடல்
- ❖ சொல்நிலை உத்திகள்

ஆகியனவாகும்.

### உவமை

இலக்கியத்திற்கு அழகு ஊட்டுவன உவமைகள். பொருளை விளக்கப் பயன்பட்ட உவமைகள் தற்போது இலக்கியத்தைப் புனையவும் பயன்படுகின்றன. ஒரு பொருளை இன்னொரு பொருளுடன் ஒப்பிட்டு அழகுபடுத்துவதற்கு உவமைகள் பயன்படுத்தப்படுகிறது. உவமைகள் சுருங்கிய சொற்களால் விரிந்த பொருளை விளக்குகின்றன. இவ்விரிந்த பொருளை விளக்கும் உவமைகளை புலவர்கள் சங்கப்பாடல்களில் வெளியீட்டு உத்தியாகப் பயன்படுத்தியுள்ளனர். இயற்கைப் பொருள்களோடு இயற்கைப் பொருட்களை ஒப்பிட்டும், உடல் உறுப்புக்களை இயற்கையோடு ஒப்பிட்டும், இயற்கைப் பொருட்களை உடல் உறுப்புக்களோடு

உவமைப்படுத்தியும் கவிதைகளைப்  
படைத்துள்ளனர்.

உள்ளத்துள் தோன்றும் உணர்ச்சிகளை  
வெளிப்படுத்த உவமைகளைக் உத்தியாகக்  
கையாண்டுள்ளனர். இதனை,

**“பேர் அமர்க் கண்ணி இருந்த ஊரே  
நெடுஞ்சேன் ஆர்இடை யதுவே நெஞ்சே  
ஈரம் பட்ட செவ்விப் பைம்புனத்து  
ஓர்ஏர் உழவன் போலப்  
பெருவிதுப் புற்றன்றால் நோகோ யானே”  
(குறு.பா-131)**

என்னும் பாடல் உரைக்கிறது. ஈரம் பொருந்திய  
நிலத்தை ஓர் ஏரைப் பெற்ற உழவன் உழ  
விரைதலைப் போல வினைமுற்றிய  
தலைவனுடைய நெஞ்சமும் தலைவியை  
அடைய விரைந்ததாகக் குறிப்பிடுகிறார்.

வினைமுற்றி மீள்வான் தேர்ப்பாகற்குச்  
சொல்லியது என்னும் சூழலில் மருதன்  
இளநாகனார் புனைந்த பாடலில் உவமை  
என்னும் உத்தி பயின்று வந்துள்ளது. தலைவன்  
வினைமுடித்து வரும் வழியில் கானக்கோழி தன்  
பெடைக்கு இரையை ஊட்ட விரையும்  
நிலையைத் தலைவன் காண்கிறான். அக்காட்சி  
தலைவனுக்குத் தலைவியை விரைவில் அடைய  
வேண்டுமென்ற எண்ணத்தை உருவாக்கியது.  
இதனை,

**“உருக்குறு நறு நெய் பால் விதிர்ந்தன்ன  
அரிக் குரல் மிடற்ற அம் நுண் பல் பொறிக்  
காமரு தகைய கான வாரணம்  
பெயல் நீர் போகிய வியல் நெடும் புறவில்  
புலரா ஈர் மணல் மலிரக் கெண்டி  
நாள் இரை கவர மாட்டி, தன்  
பேடை நோக்கிய பெருந்தகு  
நிலையே”(நற்.பா-21)**

என்ற பாடலடிகள் காட்டுகின்றன. உருக்கிய  
நெய்யினில் பாலை சிதறினாற் போல, அழகிய  
நுண்ணிய புள்ளிகளையும் கடைகின்ற  
குரலையுடைய மிடற்றினையும் உடைய  
கானக்கோழி என அதன் உடல் அழகு  
காட்சிப்படுத்தப்பட்டுள்ளது. புலவர்கள்  
உவமைகளைக் கவிதைப் புலப்பாட்டு  
உத்தியாகப் பயன்படுத்தியுள்ளனர் என்பது  
புலனாகிறது.

**உள்ளுறை**

அகப்பாடலுக்கே உரிய உத்தியாக உள்ளுறை  
விளங்குகிறது. உள் + உறை = உள்ளே உறைவது.  
அதாவது வெளிப்படையாகச் சொல்லப்பட்ட  
உவமை வடிவான சொற்றொடரின்மீதுள்ளே,  
பிறிதொரு பொருள் கொள்ளக் கிடைப்பது  
உள்ளுறை உவமம் ஆகும். அகமாந்தர் கூற்றாக  
வரும் பாடல்களில் இவ்வுள்ளுறை உவமம்

பயின்று வருகிறது. தொல்காப்பியர்  
இவ்வுள்ளுறை உவமத்தை,

**“உள்ளுறுத்து இதனோடு ஒத்துப்பொருள்  
முடிக என  
உள்ளுறுத்து உரைப்பதே உள்ளுறை உவமம்”  
(தொல், அகம், நூ.51)**

எனச் சுட்டுகிறார். கவிஞன் உள்ளுறுத்துக்  
கருதிய பொருள் இதனோடு ஒத்து முடியும் என்று  
நினைத்து உள்ளுறுத்து உரைப்பது உள்ளுறை  
உவமமாகும். உள்ளுறை உவமம் தெய்வம்  
ஒழிந்த பிற கருப்பொருள்களை இடமாகக்  
கொண்டு பிறக்கும். இவ்வுள்ளுறை உவமத்தைச்  
சங்கப் புலவர்கள் ஒரு வெளியீட்டு உத்தியாகக்  
கையாண்டுள்ளனர்.

இரவுக்குறி வந்து போகும் தலைவனிடம்  
தோழி. வரைவுகடாயது என்னும் சூழலில் கபிலர்  
புனைந்த பாடலில் உள்ளுறை உவமம் பயின்று  
வந்துள்ளது.

**“வேரல் வேலி வேர்க்கோட் பலவின்  
சாரல் நாட செவ்வியை ஆகுமதி  
யார்அஃது அறிந்திசினோரே சாரல்  
சிறுகோட்டு பெரும்பழம் தூங்கி யாங்கு  
இவள்  
உயிர்தவச் சிறிது காமமோ பெரிதே”  
(குறு.பா-18)**

என்ற இப்பாடலில் பலாமரத்தின் சிறிய  
கொம்பில் பெரிய பழம் தொங்குவதைப்போல  
தலைவியின் சிறிய உயிரில் பெரிய காமநோய்  
உள்ளது எனத் தோழி கூறுகிறாள். ஆதலால் நீ  
அவளை விரைவில் திருமணம் செய்து கொள்ள  
வேண்டும் என்கிறாள். இங்குப் பலாமரத்தின்  
பழம் கனிந்து விழுவதற்கு முன் உரியார் அதைக்  
கொள்வதைப் போல நீயும் இவள் உயிர்  
விடுவதற்கு முன் அவளை மணந்து கொள்க  
என்ற குறிப்புப் பொருளையும்  
வெளிப்படுத்துமிடத்தில் உள்ளுறை உவமம் ஒரு  
உத்தியாகப் பயன்படுத்தப்பட்டுள்ளது.

சிறைப்புறமாகத் தோழி  
செறிப்பறிவுரீஇயது என்னும் சூழலில் அமைந்த  
பாடலிலும் புலவர் இவ்வுத்தியைப்  
பயன்படுத்திக் கருத்தை  
வெளிப்படுத்தியுள்ளார். நாரையினால் இன்பம்  
அடைந்த அதன் பெடை, தன்  
துணையில்லாததால் வருத்தமடைந்து,  
மீன்களையும் உண்ணாது, தாழை மரத்தின்  
கிளைகளில் வருத்தத்தோடு தங்கும். இங்கு.  
அஃறிணை உயிரினமாகிய நாரையின் பெடை  
தன் சேவலுக்காக வருந்துவதைப் போலத்  
தலைவனால் நலனடைந்த தலைவியும் உணவை  
உண்ணாது தனிமையில்  
இற்செறிக்கப்பட்டிருக்கிறாள் என்ற கருத்தை  
வெளிப்படுத்த இவ்வுத்தி பயின்று வந்துள்ளது.  
இதனை,

**"தோடு அமை தூவித் தடந் தாள் நாரை  
நலன் உணப்பட்ட நல்கூர் பேடை  
கழி பெயர் மருங்கில் சிறு மீன் உண்ணாது  
கைதைஅம் படு சினைப் புலம்பொடு வதியும்"  
(நற்.பா-178)**

என்ற அடிகளால் அறிந்துகொள்ளலாம்.

**இறைச்சி**

இறைச்சியும், உள்ளூறையும் அகப்பாடல்களில் மட்டுமே பயன்படுத்தப்படும் உத்தியாகும். இது குறிப்பாய் பொருளை உணர்த்தும். "அகப்பாடல்களில் வரும் உரிப்பொருள் என்பது. மக்களின் புணர்தல், பிரிதல், இருத்தல், இரங்கல், ஊடல் என்பனவும் அவற்றுக்கு நிமித்தமாக வருவனவுமாம். இவ்வுரிப் பொருளுக்குப் புறத்தாக, பிறிதொரு 'உரி' போல வருவனவே இறைச்சி, அவை பறவை, விலங்கு முதலிய உயிரினங்களின் காதல் செயல்களாய், முற்கூறிய மக்களின் உரிப்பொருட் செயல்களுக்குத் துணை செய்யுமாறு வருவன" எனத் தமிழண்ணல் கூறுகிறார்.(தமிழண்ணல், தொல்காப்பியரின் இலக்கியக் கொள்கைகள்,ப.92). அகமாந்தர்களின் காதல் உணர்வுக்குப் பின்னணியாக அமைந்து அவ்வுணர்வைத் தூண்டுவனவாக இறைச்சி அமைகின்றது. குறுந்தொகை, நற்றிணை கவிதைகளில் புலவர்கள் இவ்வுத்தியை அதிக அளவில் கருத்துப் புலப்பாட்டிற்குப் பயன்படுத்தியுள்ளனர். தலைவி, தோழி கூற்றுப் பாடல்களில் இவ்வுத்தி அதிகமாகப் பயன்படுத்தப்பட்டுள்ளது.

மாமிலாடன் என்னும் புலவர். பிரிவிடை ஆற்றாளானக் கவன்ற தோழிக்குக் கிழத்தி கூறுவதாகப்புனைந்தப்பாடலில்,  
"ஆம்பற் பூவின் சாம்பல் அன்ன  
கூம்பிய சிறகர் மனைஉறை குரீஇ  
முன்றில் உணங்கல் மாந்தி மன்றத்து  
எருவின் நுண்தாது குடைவன ஆடி  
இல் இறைப் பள்ளித்தம் பிள்ளையொடு  
வதியும்  
புன்கண் மாலையும் புலம்பும்  
இன்றுகொல் தோழிஅவர் சென்ற நாட்டே"  
(குறு.பா-46)

எனக் குறிப்பிடுகிறார். மாலைக் காலத்தில் ஊர்க்குருவி உணவுகளைத் தின்றுவிட்டு தன் குஞ்சுகளோடு வீட்டு இறப்பிலேயுள்ள தன் கூட்டிலே தங்கும். தலைவன் சென்ற இடத்திலும் தம் குட்டிகளோடு குருவிகள் தங்கும் மாலையைக் காணும் போது தலைவன் நாமும் நம் மகவோடும் தலைவியோடும் சேர்ந்து தங்க வேண்டும் என்று நினைத்து விரைவில் திரும்புவர் என்ற குறிப்புப் பொருளையும் உணர்த்துகிறது.

பிரிவுணர்ந்து வேறுபட்ட தலைவியைத் தோழி வற்புறுத்தியது என்னும் சூழலில் கள்ளம்பாளனார் புனைந்த பாடலிலும் இறைச்சிப் பொருள் காணப்படுகிறது. தலைவன் சென்ற வழியில் பெண்புலி குட்டிகளை ஈன்றதனால் உண்டானப் பசியையும் நோயையும் போக்கும் பொருட்டு ஆண்புலி. கொம்பையுடைய ஆண்யானையின் மீது பாய்ந்தது. இங்குப் பெண்புலியின் பசியைப் போக்க ஆண்புலி களிற்றின் மீது பாயுமென்பது, தலைவியோடு தடையில்லாமல் இல்லறம் நடத்த வேண்டித் தலைவன் கொடுஞ்சுரத்தினையும் அஞ்சாது பொருளீட்டச் சென்றான் என்ற குறிப்புப் பொருளையும் கொண்டுள்ளது. இதனை,

**"கல் அளைச் செறிந்த வள் உகிர்ப் பிணவின்  
இன் புனிற்று இடும்பை தீர. சினம் சிறந்து  
செங் கண் இரும் புலிக் கோள் வல் ஏற்றை  
உயர் மருப்பு ஒருத்தல் புகர் முகம் பாயும்  
அருஞ் சுரம் இறப்பு என்ப".(நற்.பா-148)**  
என்ற அடிகளால் புரிந்து கொள்ளலாம்.

**நெஞ்சோடு உரையாடல்**

சங்கப் பாடல்களில் புலவர்கள் நெஞ்சோடு பேசுவது என்ற உத்தியைப் பொருள் புலப்பாட்டிற்குப் பயன்படுத்தியிருப்பதை அறிய முடிகிறது. பெரும்பாலும் தலைவன் கூற்றுப் பாடல்களிலேயே இவ்வுத்தி பயன்படுத்தப்பட்டுள்ளது. குறிஞ்சித் திணைக் கவிதைகளில் இவ்வுத்தி அதிகமாகப் பயின்று வந்துள்ளது. இருநூல்களிலும் இவ்வுத்தியைப் புலவர்கள் கையாண்டுள்ளனர். கபிலர் இயற்றிய குறிஞ்சித் திணை சார்ந்த,

**"இரண்டு அறி கள்விநம் காத லோளே  
முரண்கொள் துப்பின் செவ்வேல் மலையன்  
முள்ளூர்க் கானம் நாற வந்து  
நள்ளென் கங்குல் நம்ஓ ரன்னள்  
கூந்தல் வேய்ந்த விரவுமலர் உதிர்த்து  
சாந்துஉளர் நறுங்கதுப்பு எண்ணெய் நீவி  
அமரா முகத்தள் ஆகி  
தமர்ஓ ரன்னள் வைகறை யானே". (குறு.பா-  
132)**

என்ற கவிதை இரவுக்குறி வந்து நீங்குகின்ற தலைவன் நெஞ்சோடு பேசுவதாக அமைகின்றது. தலைவி இரவில் தன்னோடு சேர்ந்து ஒழுகுவதாகவும் பகலில் சுற்றத்தாரோடு சேர்ந்து ஒழுகுவதாகவும் நெஞ்சிடம் உரைக்கிறான். களவு ஒழுக்கத்தைப் பிறர் அறியாதவாறு தலைவி மறைத்து ஒழுகுகிறான் என்னும் கருத்தைப் புலவர் நெஞ்சிடம் மொழிவது போல் படைத்திருக்கிறார்.

தலைவன் பொருள் ஈட்டுவதற்காகத் தலைவியைப் பிரிந்து செல்ல எண்ணுகிறான். ஆயினும் பயணத்தை அவன் விரும்பவில்லை.

**நற்றிணை குறுந்தொகையில் வெளியீட்டு உத்திகள்**

தன் மனம் தான் பிரிந்து செல்ல எண்ணுகிறது என்னும் நிலையில் அம்மனதுடன் அவன் உரையாடுவதாக 'பாலத்தனார்' என்னும் புலவர் கவிதைப் புனைந்துள்ளார். அதாவது, தலைவியின் நலனைப் புகழ்ந்து பேசும் தலைவன் அவளைப் பிரிய எண்ணவில்லை. ஆனால் மனம் அவளைப் பிரிய எண்ணுகிறது என்னும் நிலையில் கவிதை அமைகிறது. 'இவள் அரவணைப்பில் கிடந்தும் அமைகின்ற நிலையிலிருந்தும் நீங்கி நாம் செல்ல மாட்டோம். ஆயினும் நீ பொருள் தேடு முயற்சியில் மேம்பாடு அடைய எண்ணுகின்றாய். இங்ஙனம் சென்றால் அவளைப் பிரிய வேண்டும் என்பதை நீ உணரவில்லை. உண்ணிடம் அன்பு இல்லை. நீ நீண்ட காலம் வாழ்க' எனத் தலைவன் கூறுகிறான். தன் செயலை நெஞ்சின் மேல் ஏற்றி மொழிகிறான். இவ்வுத்தி கவிதை நலத்தை மேம்படுத்துவதைக் காணலாம். இதனை,

**“சுணங்கு அணி ஆகம் அடைய முயங்கி  
வீங்கு உவர்க் கவவின் நீங்கள் செல்லேம்  
நியே, ஆள்வினை சிறப்ப எண்ணி, நாளும்  
பிரிந்து உறை வாழ்க்கை புரிந்து  
அமையலையே  
அன்பு இலை, வாழி, என் நெஞ்சே!”  
(நற்.பா-52)**

என்னும் கவிதையடிகள் வாயிலாக வெளிப்படுவதைக் காணலாம்.

#### சொல்நிலை உத்திகள்

கவிதையைக் கட்டமைக்கும் போது சொற்களைப் புலவர்கள் பலநிலைகளில் பயன்படுத்துவர். இவை சொல்நிலை உத்திகள் எனப்படும்.

#### வினை வடிவ உத்தி

ஒரு செயலைச் செய்ய முனையும் போது அச்செயலின் தீவிரத்தை முன்வைப்பதற்கு வாக்கிய நிலையில் வினை வடிவங்களைத் தொடர்ந்து பயன்படுத்தி கருத்தை வெளியீட்டுள்ளதைக் காண முடிகிறது.

**“கன்றும் உண்ணாது கலத்தினும் படாது  
நல்ஆன் தீம்பால் நிலத்து உக் காஅங்கு  
எனக்கும் ஆகாது என்னைக்கும் உதவாது  
பசலை உணிஇய வேண்டும்  
திதலை அல்குல்என் மாமைக் கவினே”  
(குறு.பா-27)**

என்னும் கவிதையிலும் வினை வடிவ உத்திக் காணப்பெறுகிறது. இக்கவிதையில் **உண்ணாது, படாது, ஆகாது, தவாது, வேண்டும்** என வினை வடிவங்கள் தொடர்ந்து பயின்று வந்துள்ளன. அதாவது தன் நலத்தைத் தலைவன் அனுபவிக்காமல், பசலை உண்கிறது எனப் பிரிவின் துயரத்தைத் தலைவி வெளிப்படுத்தும்

போது இவ்வினை வடிவங்கள் தொடர்ந்து வந்து கவிதையின் பொருளை வலுவடன் கட்டமைத்துள்ளன.

நற்றிணையிலும் வினை வடிவத்தை அடுக்கி தம் கருத்தினை வெளியிடும் உத்தி முறையைப் புலவர்கள் எடுத்தாண்டுள்ளனர். பெருங்குன்றூர் கிழார் என்னும் புலவர் பல கருத்துக்களை வினை வடிவ முடிவுடன் அடுக்கிக் கூறியுள்ளார். தலைவன் பிரிந்து செல்வான் என்பதை அறிந்த தலைவி தன் துயரை வெளிப்படுத்தும் நிலையில் இக்கவிதை அமைகிறது. இதில், கார்காலத்தின் தன்மையை வெளிப்படுத்தும் போது இவ்வுத்தி பயன்பட்டுள்ளது. அதாவது **மழையால், குளம் நிரம்பல், மரம் தழைத்தல், பயிர் வளர்தல், கொடிகள் சந்தனமரத்தில் படர்தல்** ஆகிய செயல்களைப் புலவர் அடுக்கிக் கூறுகிறார். இங்குக் கார்காலத்தினால் ஏற்படும் நிகழ்வுகள் வாசகர் மனதில் இடம்பெறுவதற்கு இவ்வுத்தி பயன்படுகிறது. இதை,

**“நிலம் நீர் ஆர. குன்றம் குழைப்ப  
அகல் வாய்ப் பைஞ் சுணைப் பயிர்  
கால்யாப்ப  
குறவர் கொன்ற குறைக் கொடி நறைப் பவர்  
நறுங் காழ் ஆரம் சுற்றுவன அகைப்ப  
பெரும் பெயல் பொழிந்த தொழில எழிலி”  
(நற்.பா-5)**

என்னும் கவிதையடிகள் புலப்படுத்துகின்றன.

#### உம்மைச் சொல் அடுக்கி வருதல்

சங்கப் புலவர்கள் உம்மைச் சொற்களை அடுக்கிச் சொல்லியும் தம் கருத்துக்களைப் புலப்படுத்தியுள்ளார்கள். அள்ளூர் நன்முல்லையார் என்னும் புலவர் தலைவனின் துயரை எடுத்துரைக்கும் இடத்தில் இவ்வுத்தியைப் பயன்படுத்தியுள்ளார். எல்லாவகைப் பொழுதும் தனக்குத் துன்பத்தை நல்குவதாகவும் ஆகவே தான் வாழ்வதா, சாவதா எனக் குழம்புவதாகவும் புலவர் கவிதையைக் கட்டமைத்துள்ளார். இவ்விடத்தில் காலையும், பகலும், கையறு மாலையும், யாமமும், விடியலும், தூற்றலும் வாழ்தலும் என 'உம்' என்னும் இடைச்சொல் இணைந்து வரும் சொற்களை அடுக்கிக் கூறி தம் கருத்தை வெளிப்படுத்துகிறார். இதனை.

**“காலையும் பகலும் கையறு மாலையும்  
ஊர்துஞ்ச யாமமும் விடியலும் என்றுஇப்  
பொழுதுஇடை தெரியின் பொய்யே காமம்  
மாஎன மடலொடு மறுகில் தோன்றித்  
தோற்றேன் தூற்றலும் பழியே  
வாழ்தலும் பழியே பிரிவுதலை வரினே”  
(குறு.பா-32)**

என்னும் கவிதைப் புலப்படுத்துகிறது.

தலைவன் பிரிந்து செல்லும் சூழவில் மனம் வருந்துகிறாள் தலைவி. அவள் தன் வருத்தத்தைத் தோழியிடம் எடுத்துரைக்கிறாள். அப்பொழுது தலைவன் தன் உடல் நலத்தை வியந்து வருணித்த நிலையைச் சூட்டுகிறாள். இவ்விடத்தில் உம்மைச் சொற்களை அடுக்கிக் கூறி புலவர் தம் கருத்தை வெளிப்படுத்தியுள்ளார். இதனை,

**"கண்ணும் தோளும் தண் நறுங் கதுப்பும்  
திதலை அல்குலும் பல பாராட்டி,  
நெருநலும் இவணர்மன்னே!". (நற்.பா-84)**

என்னும் பாடலடிகள் மெய்ப்பிக்கின்றன.

#### முடிவுகள்

- ❖ குறுந்தொகை நற்றிணையில் பெரும்பாலான பாடல்களில் உள்ளுறை, இறைச்சி போன்றவைகள் வெளியீட்டு உத்தியாகப்பயன்படுத்தப்பட்டுள்ளன. உள்ளுறைகள் பெரும்பாலும் தலைவன் தலைவியைத் திருமணம் செய்யத் தூண்டுவதாகவோ, பரத்தையர்களின் தொடர்பினைச் சூட்டுவதாகவோ அமைந்துள்ளன.
- ❖ பாடல்களில் குறிப்பாய் பொருள் உணர்த்த இறைச்சிகையாளப்பட்டுள்ளன. பெரும்பான்மையானப் பாடல்களில் இறைச்சி வெளியீட்டு உத்தியாகப் புலவர்களால் பயன்படுத்தப்பட்டுள்ளது.
- ❖ தலைவியைப் பற்றிய எண்ணங்களும் ஏக்கங்களுமே நெஞ்சோடு உரைத்தல் உத்தியாக வெளிப்பட்டுள்ளதை உணர முடிகிறது.
- ❖ மேலும் வினை வடிவங்களைப் பயன்படுத்துதல், உம்மைச் சொற்களை அடுக்கிப் பேசுதல், போன்ற பல சொல்நிலை உத்திகளையும் பொருள் புலப்பாட்டிற்காகப் புலவர்கள் பயன்படுத்தியுள்ளனர்.
- ❖ அடியளவில் நீண்ட நற்றிணைக் கவிதைகளை விட அடியளவில் குறைந்த குறுந்தொகைப் பாடல்களிலேயே அதிகமான சொல் நிலை உத்திகள் கையாளப்பட்டுள்ளன.
- ❖ நற்றிணை கவிதைகளில் உள்ளுறை, இறைச்சி போன்றவையே பெரும்பான்மையான கவிதைகளில் பொருள் புலப்பாட்டு உத்தியாகச் செயல்பட்டுள்ளதை அறிய முடிகின்றன.

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## Challenges and Remedies to Overcome the Difficulties in English Language Learning

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### Abstract

In this research, it has been discussed that teaching a second language provides the general challenges faced by students in the classroom and how to handle them with remedial work effectively. Remedial teaching in the English language is designed to provide additional support to students who are struggling academically. It is considered to help these students reach their peers by providing them with targeted guidance and support in areas where they are working. Teachers can be highly rewarded for fulfilling the path that provides the opportunity to help students all over the world achieve their language-learning goals.

**Keywords:** Challenges, English language, remedies, practice, knowledge, skills, progress, difficulty, provide, confidence, learning, efficacy.

### Introduction

English is the most studied second language in the world, compared to more than other languages in the world. English language learners can easily find course books, apps, online lessons and many other sources. They won't need to struggle to get materials and courses. The challenges of English language learning are pronunciation difficulties, grammatical issues, vocabulary acquisition and cultural differences. Learners will also meet the obstacles related to confidence and motivation, which can be a hindrance to their progress.

However, many students can overcome these hurdles and succeed in their English language learning. This study will provide practical remedies to explore the common challenges faced by English language learners. By understanding the challenges and implementing effective remedial measures, learners can improve their English language skills, improve their educational proficiency and professional efficacy, and employ these aspects in different domains.

### Objectives

1. To establish the foundation for lifelong learning.
2. To get them ready for further / higher education.
3. To help the learners to overcome the learning difficulties
4. To enable students to learn and comprehend the written and spoken Form of English language
5. To teach functional English to the learners and to polish their Reading skills,
6. To develop the ability in students to use English in day -to -day life and real life.
7. To provide learning materials to the learners who lag behind their peers.

### Research questions

1. What are the challenges in learning the English language?
2. What are the factors that make learners face difficulties in learning the

English language?

3. What types of remedies can be used to address learning challenges?

### **Review of the Literature**

English is widely used in education, so students need to be proficient in the language to access a wider range of reading materials and academic references, most of which are in English (Mamat,2016)

Mastering the correct pronunciation of English words and phrases can be challenging, especially for learners from non-English speaking backgrounds. The sounds, intonation, and rhythm of English can be vastly different from those of the learners' native languages, making it difficult to achieve accurate pronunciation (Long M.H.1996)

Making mistakes demonstrates that students have learned from their mistakes and understand what they should do differently in the future. When learning English, learners were influenced by issues such as shyness, pronunciation problems, a lack of linguistic knowledge, and incorrect vocabulary item usage, according to Khan (2007)

When learning a foreign language, the basic vocabulary we have in that language is one of the most important micro skills to develop. Of course, all micro skills such as grammar, vocabulary, and pronunciation are very important. But Everything will be more difficult if the learners communicate without vocabulary than without grammar (Jahfal Fadhil Ramadhan,2021)

Important that teachers and learners know whether the high-frequency words have been learned. Appendix 3 of this book contains a vocabulary test that can be used to measure whether the high-frequency words have been learned, and the progress of the learner in the learning of low-frequency vocabulary (Nation, P. 2001).

The trend of globalization has spread and developed English around the world. A number of people from various continents are

able to speak English nowadays. As the most popular used language in the world, in various forms, English is estimated to be spoken by 400 million people as a mother tongue and an additional 2 billion as a second and/foreign language (Rintaningrum, 2016)

Teachers can help pre-adolescent females with depression. A Norwegian longitudinal study of pre-adolescents indicated that women who received greater support from their professors were more likely to be depressed. (Vadivelu.B,2019)

Illuminating the role of teacher training in bolstering pedagogical effectiveness and improving student outcomes, policymakers and educational stakeholders can better prioritize and allocate resources towards initiatives that support the professional development of rural educators (Borg et al., 2016)

Teachers can prioritize self-care and well-being, recognizing the emotional demands of teaching and the importance of maintaining a healthy work-life balance. This can involve engaging in mindfulness practices, setting realistic goals and boundaries, and seeking support from colleagues and mentors (Lambert, 2017).

Effective teacher training in rural areas also encourages collaboration among educational stakeholders, including local communities, to create sustainable development within the education ecosystem. This involves integrating local knowledge into formal education while leveraging digital tools and blended learning to bridge access gaps (Park, J., &Savelyeva, 2022).

### **Importance of English language learning**

There is no doubt that the language of the modern world is English. Although this is not necessary for daily communication, it is very

helpful for most of the people today to understand English online and its frequent use in professional applications. Remedial teaching can help students improve their confidence and academic performance. It can also help the students learn at their own pace in a congenial environment. More so the remedial teaching can help the students correct their mistakes in their speaking and writing and enable them to become good at English, achieving the expected proficiency.

### **Factors involved in challenges in learning English**

Like each language, English has its own hurdles and language obstacles that can frustrate students and slow the learning process. Teaching a new language for students is a subtle and time - consuming process. There is not enough time to teach English and practice the same well. Frequent absence or attention issues can often lead to poor academic performance. Some physical problems or behavioral issues may also lead to challenges in English language learning. There are many students who have poor memory power, lack of confidence, motivation and difficulty in understanding new concepts/abstract ideas. Thus weak comprehensive power and short span of attention may also lead to their weak performance.

Another possible cause of challenges in learning can be due to interference from the concepts that have been previously learnt or over generalization on the basis of previous learning. Students may pursue their mother tongue fluently as a difficulty in learning English. They may have difficulty in using the English language because of the influence and interference of their mother tongue in their family circumstances. A better learning environment does not come from some uneducated parents. Students' mental state or lack of learning ability is also the reasons for

difficulty in learning the English language. Progressing to the next class without acquiring the basic language skills in their respective classes.

Another reason is that the students do not attend the school regularly due to poor family environment, poor physical health and lack of interest. Thus the students feel discomfort, that affects their learning in the classroom or outside the classroom. Most girls are facing challenges in English language learning, some of which are socially -based social expectations, controlling their contribution, the lack of confidence in the classroom, and the exposure to English outside the school. And the refusal to give priority. Domestic chores for women is more than male educators can often be prevented from their learning time and attention

### **Challenges and Remedies**

#### **Difficulty with Pronunciation and Accent**

One common hurdle in English language learning is pronunciation. English has a complex phonetic system, and mastering the correct pronunciation of words is really daunting. In addition, many of the students find difficulty in pronouncing the new words as they learned them due to various factors. Many learners struggle with specific sounds, intonation patterns, and accents.

To improve your pronunciation, it's essential to listen to native English speakers and practice speaking aloud. Imitating their pronunciation and intonation will help train their ear and mouth to produce the correct sounds. Additionally, focusing on specific sounds that are challenging for and practicing them regularly can make a significant difference. Online resources, such as pronunciation guides and language learning apps, can also be valuable tools for improving pronunciation. So, the language learners should utilize these resources to practice and receive feedback on their pronunciation skills.

### **Grammar and sentence structure**

Most English language learners can be challenged to learn English verbs, phrasal verbs, articles, spelling and idioms. Because these are the significant features of English, which are very different from other languages in the world, or it requires a lot of memorization. Even the English grammatical rules for their own speakers will be confusing. Problems with sentence, verb forms and word sequence would cause significant challenges to language learners.

To overcome this challenge, it is important to have the best foundation in English grammar. Start by taking basic rules and gradually progress to more advanced ideas. Exercises and quiz can help strengthen the understanding of grammatical rules. Conducting a comprehensive reading in English will improve the understanding of grammar and sentence structure. How to focus on how the sentences are configured and the use of different grammatical structures. In addition, looking for ideas from own speakers or qualified language teachers will reinforce the areas where English language learners need improvement

### **Limited Reading and Writing Skills**

Students may struggle with reading and writing skills, as these skills require not only strong vocabulary and grammar knowledge but also an understanding of English sentence structure and syntax.

To help the learners improve their literacy skills, teachers can provide explicit instruction on grammar and sentence structure, such as analysis and synthesis of sentences, graphic organizers, and sentence diagramming. Additionally, you can encourage your students to read and write in English outside of the classroom, such as by reading English books or writing emails in English to pen pals.

### **Vocabulary Acquisition and Retention**

Building a solid vocabulary is crucial for effective communication in any language. However, lack of vocabulary acquisition can be a significant roadblock for language learners. With thousands of words to learn, it's important to have effective strategies and techniques in place to expand their vocabulary. One effective method is to incorporate new vocabulary into their daily life. For example, create flashcards or use vocabulary apps to review words regularly. Additionally, reading English books, watching movies and TV shows, and listening to podcasts can expose them to a variety of vocabulary.

To improve retention of vocabulary, the learner should use new words in sentences and engage in conversations applying the vocabulary they've learned. Contextualizing words helps to reinforce their meaning and usage in different situations.

### **Handling Language obstacles and cultural differences**

English language learning is not just confined with vocabulary and grammar; this also involves understanding of the culture and customs of English-speaking countries. The cultural differences can also be challenging for language learners. Cultural differences are often a challenge for ESL students in the classroom. Students of different cultures may have different habits, beliefs and communication styles that can lead to misunderstanding.

Teachers can face this challenge by providing cultural awareness activities that promote different cultures and respect. For example: these activities include debate on cultural terms and values and opportunities for students to share their own cultural experiences with their classmates. This challenge can help you deal with the combination of multi-cultural materials and resources in subjects. To overcome these

obstacles in another way, watching movies and television shows, reading books of English writers are pertinent factors. It not only helps improve language skills, but also enhances cultural understanding and the ability to communicate effectively.

#### **A Lack of Self-Confidence and Motivation**

It's common for students to experience frustration as they strive to master the new words, pronunciation, grammar, and syntax associated with a new language. As such, it's not uncommon for them to become discouraged, for they do fear - making mistakes which would embarrass themselves in front of their peers. That's why it's essential to motivate students to learn the new language during every step of their journey. Depending on a new language requires commitment and standard practice. Without motivation, it is difficult to go in advance along the path of language learning.

To deal with this challenge, it is important to determine clear goals for learners; and find ways to be motivated. This includes setting up reach of reach, rewarding them to achieve them, or finding a study group or language exchange partner to take charge of you. In addition, creating a study table and sticking to it can help them develop discipline and ensure continuing to improve their English skills.

#### **Professional development for teachers**

It is important that teachers believe themselves as a role model and educator, because it plays an important role on their student's self-perception and performance. Lack of mastery in English language may be one of the problems for the acquisition of language skills and improvement of English knowledge.

The trained language teacher has a vast opportunity to apply innovative methods and to help them overcome the learning difficulties of their students. Such measures are important for the long-term performance of the remedial teaching programs to encourage teachers to

continue their professional development workshops, seminars and courses on remedial learning strategies can improve the teachers skills.

#### **Conclusion**

Positive attitude and proper training are required to overcome the difficulties in English language learning. The conclusion of the study aims at recommending curriculum and pedagogical approaches and methods for improving competence in terms of English language teaching. The influence of teachers plays an important role in the progress of the students. Technologies can be a supplement for remedies in English language teaching. A suitable environment should be provided for the students to practice in English. The efficacy of the teachers plays a prime role in the progress of students. Teachers should ensure the participation of the learners and make the students' language learning meaningful and effective. Opportunities should be provided to students to converse in English. In today's technical world, teachers need to improve themselves to educate students.

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## **Food as a Bridge between Cultures: An Analysis of Gastronomic Transculturalism in Julie Otsuka's *The Buddha in the Attic***

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### **Abstract**

This article explores the role of food in bridging cultural divides in Julie Otsuka's *The Buddha in the Attic*. The novel tells the story of Japanese immigrant women in early 1900s America, showing how food unites cultures and helps people share their traditions. These women cook, share, and change their food habits to balance their old and new identities and connect with their new environment. Through the close analysis of the significant food references in the novel, this article examines how food serves as a means of cultural exchange and connection between Japanese and American cultures, by breaking down cultural walls and helping people understand each other better. Furthermore, this article highlights the significance of Gastronomic Transculturalism in facilitating cross-cultural understanding and exchange.

*Keywords:* food, cultural unity, cultural exchange, Julie Otsuka, *The Buddha in the Attic*.

### **Introduction**

Food is much more than just a source of energy, it is also a means of cultural communication that breaks boundaries, creating communities among people. Gastronomic transculturalism refers to the blending of food, culture, and identity when people from diverse backgrounds come together. It is about how food can bridge

cultural gaps thereby creating unity, new flavours, traditions, and narratives. Imagine a Japanese immigrant in the United States making sushi with a hint of apple pie spice from America. This is known as gastronomic transculturalism. It is a fusion of different cultures and it celebrates the differences and similarities of other cultures. It is a way to connect and get along with people from other cultures.

In Julie Otsuka's novel *The Buddha in the Attic*, food is a recurring theme in the daily lives of immigrant women. In the story, Otsuka uses food as a symbol to represent the culinary heritage of the picture brides and their lofty expectations as well as their dreams of the new country. Through this, food becomes a medium for these women to maintain a connection to their cultural roots, as well as a tool for adapting to their new surroundings by creating bonds with the American people around them.

The author of the book Julie Otsuka is a Japanese-American writer whose works mainly focus on immigration experience and cultural identity. She was born to a Japanese-American family in Palo Alto, California, US, in 1962 and grew up in a house that was deeply rooted in traditional Japanese customs. This has greatly

influenced her writing and the main focus of her literary works is her family's history with particular emphasis on their World War II experience, a time when Japanese-Americans were evicted from their homes in the USA and had their rights taken away. Her book *When the Emperor Was Divine* published in 2002 is about the story of a Japanese-American family during this critical, historical period. *The Buddha in the Attic* published in 2011 is her second book, it presents the story of Japanese immigrant women who lived in the early 1900s. It has won the PEN/ Faulkner Award in the year 2012. The novel is written in a unique collective voice and focuses on themes such as identity, belonging, and the difficulties of starting in a completely different place. Apart from these prominent themes food is also an important recurring theme in the novel which has been less explored by critics and scholars.

This study explores the role of food in bridging cultural divides in *The Buddha in the Attic*. It reflects on how food serves as a means of cultural connection and exchange between Japanese and American cultures. It mainly focuses on how food serves as a medium of cultural fusion and shapes the experiences of the Japanese picture brides in the story, highlighting the importance of gastronomic transculturalism in uniting the people of two different cultural groups.

### **Food as a Means of Cultural Connection**

In the novel *The Buddha in the Attic*, the Japanese picture brides immigrate to America at the beginning of the 20th century to marry men they have never met before. The novel portrays how these women constantly make attempts to adapt and adjust to their new country. Otsuka has used collective storytelling to expose issues concerning identity, displacement, and the lives of Japanese immigrant women who try to hold on to their cultural roots while adapting to the new American life.

Food plays a significant role in the novel helping Japanese immigrant women maintain their cultural identity as well as to feel connected with their new American surroundings. They carry with them cherished recipes and culinary traditions from Japan, like making *tsukemono* (pickled vegetables) and *mochi* (a sweet rice treat), which remind them of their homeland. These traditional foods provide the women with a sense of comfort in the new country. By sharing meals and cooking together food helps the Japanese picture brides to create moments of comfort and solidarity to forget their suffering for a little while. For instance, Otsuka presents a scene in the novel where the women sit together sharing bowls of rice and miso soup, bonding and feeling comfort in their common cultural traditions. Through these shared meals, the women temporarily forget the difficulties they encounter every day and it gives them feelings of warmth and closeness. Thus food is an important factor that helps the characters to hold on to their identities and to build a feeling of closeness to one another. Besides that, food also provides them with a sense of emotional attachment, bringing the memories of their original background to them and making them feel a sense of stability amidst changes in their lives. Those familiar flavours and beloved dishes bring them comfort and a sense of reassurance when times get tough and life becomes challenging.

In another example, one of the women, makes a pot of *ochozuke* (rice with tea), a dish that her mother used to do when she misses home, and when she ate that, she would feel a little less alone says Otsuka. It shows that the women realize that cooking and loving family dishes are ways to deal with the challenges of their new lives, which give them a sense of comfort and bond with their motherland. Based on these examples which Otsuka presents, food is, thus, a kind of cultural bridging or, in other words, it

enables the Japanese immigrants to not only conserve their identities but also develop a feeling of community. This novel presents food not just as a source of living but also as a strong tool for connection and cultural preservation. It helps women deal with the adversity of displacement, maintaining their cultural base and promoting a feeling of belonging in a distant land.

### **Food as a Medium for Cultural Exchange**

In Otsuka's *The Buddha in the Attic*, food is used as a gateway for people from two different cultural backgrounds to interact. There are several instances in the novel where food serves as a powerful tool for creating connections between Japanese immigrants and their American husbands, neighbours, and colleagues. Japanese immigrants in the United States utilize food to demonstrate their culture and become friends with their new American environment. The women maintain the Japanese heritage and learn to make sense of their American lives by incorporating American culinary practices into their traditional Japanese cooking, resulting in a blend of flavours and methods that reflect their double identity. This blending of culinary practices represents their cultural adaptation. For example, the immigrant women learn to bake pies using fruits from nearby orchards, a distinctly American practice. They add family Japanese touches, such as a hint of cinnamon and a hint of sugar, and are surprised to find that the pies remind them of the mochi they used to do at home. This blending of traditional ingredients highlights the ability of food to draw parallels between their traditional Japanese dishes of the women and the new American meals they learn to make. The act of baking pies also shows their willingness to adopt new cultural practices while still preserving their Japanese inheritance. By mixing the culinary traditions of their

hometown with those of their adoptive country, they promote gastronomic transculturalism.

There is another instance in the novel where women prepare a traditional Japanese lunch for their bosses, in an effort to share their culture and promote mutual understanding. They make dishes like sushi, tempura, and soup and give it to their bosses. At first, the bosses were hesitant to take a bite, but soon as they did, they were surprised by how much they enjoyed the unique flavours. The positive response from their bosses reflects the potential of food to act as a medium for understanding and acceptance despite the various cultural differences and the willingness of the American bosses to get involved and appreciate the Japanese culture. These shared meals also mark a significant attempt towards bridging cultural differences between Japanese women and their American bosses. By introducing their bosses to Japanese cuisine, these women not only share a part of their heritage but also create an opportunity for cross-cultural exchange and connection. Here the act of sharing food serves not only as a gesture of kindness but also helps in building cultural exchange and mutual respect. This scenario exemplifies the role of food as a universal language that is capable of transcending cultural barriers by bringing people of different backgrounds together.

In the novel, food becomes a symbol of compassion and care, by which people connect across cultural divides. In a scene where an immigrant woman becomes ill, and her American neighbour gives her chicken soup. This small but heartfelt gesture breaks cultural boundariesdemonstrates the universal power of food as a means of expressing empathy and solidarity. In this situation the neighbour chose to make chicken soup, a dish that is very much associated with cure and comfort in American culture, to make it clear that they are feeling

empathetic and want to comfort them during a time of need. The woman who receives it feels it as an act of kindness and genuine care. Food sharing in this context becomes a powerful symbol of love and connection, highlighting its ability to gather individuals from various origins. The neighbour's gesture is not just to provide food but it becomes an expression of care and support that transcends cultural differences. This act of gastronomic transculturalism highlights the power of food to connect different communities, creating mutual respect, belonging, and understanding. Through such gestures of generosity, the Japanese picture brides begin to feel a stronger connection to their American surroundings.

Therefore through such gastronomic instances in the novel food becomes a universal language that transcends the various cultural barriers, allowing individuals to connect at a deeper level. Through the fusion of Japanese and American flavours and sharing traditional Japanese meals with their American husbands, colleagues, and neighbours, the Japanese picture brides use food as a means of promoting connections in America.

### **Conclusion**

In conclusion, Julie Otsuka's *The Buddha in the Attic* illustrates how food transcends cultural boundaries and becomes a medium for cultural connection and exchange. It plays a significant role in the life of Japanese immigrants, who are faced with the tests and opportunities of cultural adaptation. Through this study, it becomes evident that the culinary traditions in the novel serve as a bridge between the Japanese picture brides' homeland and their new American lives. Thus in the novel food becomes a source of comfort and solidarity by allowing these immigrant women to preserve their cultural heritage while adapting to their new environment. The sharing of traditional

Japanese dishes with their American husbands, neighbours, and colleagues, and by blending the foodways and culinary practices, they promote mutual exchange and understanding of each other's cultures. Through this exploration, Otsuka makes it clear that food has the universal power to unite people despite cultural differences. Therefore in a world often marked by various cultural divisions, food becomes a platform where people belonging to different cultures can find a common ground for cross-cultural exchange and mutual understanding thereby creating unity. Otsuka's novel *The Buddha in the Attic* thus illustrates how food can create avenues for gastronomic transculturalism.

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## **Impact of Migration and Transformation in Benyamin's *Goat Days***

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### **Abstract**

Migration is a process of social, cultural, and psychological changes in which an individual leaves one country and settles in another. The reasons behind migration include seeking better employment opportunities and experiencing cultural and sociological changes by moving from one geographical location to another. Migrants leave behind family, children, culture, food habits, happiness, etc., to pursue better employment. Most Malayalis aspire to settle in Gulf countries, but the situation is entirely different; they are caught between language barriers, cultural adjustments, and a new atmosphere where they often feel mistreated. This paper aims to portray the lifestyle and traumas faced by Malayalis in Gulf countries and to understand the social, cultural, and psychological impacts of migration through the study of Benyamin's novel *Goat Days*. The novel explicates the life of Najeeb Muhammad, whose dream as an Indian, especially as a Malayali emigrant, is to work in the Persian Gulf and earn enough money to send back home, but he faced a series of incidents that led to a slave-like existence herding goats in the middle of the Saudi desert. This paper explores the existential crises of the life of the protagonist Najeeb Muhammad in *Aadu Jeevitham* by Benyamin, which was translated

by Joseph Koyippally in English. It focuses on the cultural transformation of the protagonist, leading him to slavery, psychological traumas, and hardships.

### **Keywords**

Migration, cultural identity, emigration, dream, cultural dislocation, traumas and psychological factors.

### **1.1. Introduction**

In recent decades, migration has emerged as a widespread phenomenon, with millions of individuals relocating across borders in search of improved living conditions or to escape unfavorable circumstances. Broadly defined, migration refers to the movement of people from one location to another, driven by economic, social, or political factors. This movement can lead to either temporary or permanent changes in residence and may occur within a country's borders or across international boundaries. Migration typically manifests in two primary forms: forced migration, which is prompted by factors such as political instability, religious persecution, or natural disasters in the home region, and voluntary migration, which is motivated by economic aspirations, such as better job prospects or financial gains.

## 1.2. Concept of Migration and Its Psychological Impacts

The term ‘migration’ originates from the Latin word *migrate*, meaning to change one’s residence. According to *The Encyclopedia Americana*, migration refers to the organized, voluntary movement of a significant number of individuals from their familiar environment to a new one (48). Similarly, *The International Encyclopedia of Social Science* describes migration as the relatively permanent movement of people across considerable distances (286). The *International Encyclopedia of Population* further defines it as a form of geographical mobility involving a shift in usual residence between defined political or statistical areas, or between different types of residential zones (448).

Migration has been a fundamental aspect of human existence since the earliest times. While human migration dates back to the Stone Age, the rapid industrialization and urbanization of the modern era have significantly accelerated this process. Advances in transportation and communication have further facilitated the movement of thousands of people, particularly from developing nations, who leave their homelands in pursuit of new opportunities. Migration is a key driver of social and demographic change. As C.J. Lewis observes, migration is a dual process: it is both a response to economic and social shifts and a catalyst for change in regions that gain or lose migrants (01). Consequently, migration has become a critical area of study due to its profound and multifaceted impact on contemporary society, influencing the socio-economic dynamics of both origin and destination countries.

At its core, migration involves the crossing of a spatial boundary by individuals or groups as they change their residence. However, the concept of migration encompasses both space and time. Space is relevant in two ways: the place of departure and the place of arrival. Similarly, the

time factor is defined by the duration of stay in each location.

Understanding the psychological processes associated with migration has become a significant challenge. The exploration of migration experiences from a psychoanalytic perspective has gained traction only in the last four decades. Loss is an inevitable aspect of migration, with nearly every migrant experiencing multiple forms of loss. Primary losses include the separation from loved ones or the homeland, while secondary losses may involve self-respect and identity. These losses can be physical, such as the absence of social support or the homeland, or symbolic, such as the erosion of cultural ties. Such losses often lead to grief, which can be seen as a psychological response to migration. Julia Mirsky notes: “Mourning in migration is not a static state but a dynamic process, akin to the journey all mourners undergo—from initial denial of loss to eventual acceptance and reconciliation with its reality” (14).

Psychoanalytic studies of migration emphasize the centrality of mourning. The loss of significant objects—such as familiar places, landscapes, food, language, and customs—triggers pain and initiates a mourning process. Over time, as immigrants adapt to their new environment, they gradually let go of these lost objects. Through identification, they begin to associate aspects of these lost objects with elements in their new surroundings, thereby reshaping their identity. This transformative process is exemplified by Najeeb, the protagonist of Benyamin’s novel *Goat Days*.

### 1.3. The Novel *Goat Days*: Textual Analysis

*Goat Days* (2002) is a novel by Bahrain-based Indian author Benyamin, originally written in Malayalam as *Aadujeevitham* and later translated into English by Dr. Joseph Koyippally in 2012. The story follows Najeeb Muhammad, an Indian migrant who dreams of working in the Gulf States to repay his debts and provide a better life for his

wife, Sainu, and their child. However, his dream turns into a nightmare as he finds himself trapped in a slave-like existence, herding goats in the harsh Saudi desert. After enduring immense suffering, Najeeb eventually escapes with the help of a man named Ibrahim. Joy Gosney describes the novel as “the strange and bitter comedy of Najeeb’s life in the desert” and “a universal tale of loneliness and alienation” (back cover, Benyamin, 2012).

*Goat Days* aligns with numerous diasporic narratives that highlight the struggles of labor migrants from India who travel to Gulf countries in search of better opportunities. The novel’s vivid and poignant portrayal of the lives of these migrants in a remote Arabian desert is both unsettling and thought-provoking. Through Najeeb’s story, the book sheds light on the brutalities faced by millions of labor migrants. It transcends time and space to reveal the displacement and helplessness of individuals like Najeeb, who are trapped in the desert and forced into slavery. By being translated into English, the novel amplifies the voices of these migrants, making their plight heard globally. It delves into the diasporic experiences of its protagonist to expose the harsh realities of life in the Gulf. Benyamin addresses the motivations behind voluntary migration, its consequences, and the psychological toll it takes on migrants. The novel serves as a cautionary tale for those who dream of migrating to foreign lands in pursuit of a better life. It narrates the story of a determined labor migrant who, despite facing deprivation and agony in the Arabian desert, ultimately returns to his homeland to share his harrowing experiences. This work highlights the often-overlooked South Asian diaspora in Gulf countries.

Like many Malayalis, Najeeb dreams of migrating to the Gulf to improve his financial situation. When a friend informs him about a visa opportunity, he seizes it, mortgaging his house and his wife’s jewellery and borrowing money

from fellow sand miners to fund his journey (36). With hopes of a brighter future, Najeeb and his companion, Hakeem, arrive in Riyadh, where Najeeb joyfully exclaims, “City of my dreams, I have arrived. Kindly receive me. Ahlan wa sahlan! (43).” However, his dream quickly turns into a nightmare when he and Hakeem are kidnapped at the airport and forcibly taken to a goat shed in an unfamiliar desert by a local Arab. During the journey, Najeeb begins to sense the grim reality of his situation. His distress is evident in his words: “From that moment, like the maniyana fly, an unknown fear began to envelop my mind. An irrational doubt began to grip me, a feeling that this journey was not leading me to the Gulf like that I had been dreaming about and craving for (52).”

Upon arriving at the goat shed, Najeeb quickly realizes the nature of his new life. The sight and sound of the lambs, along with the intimidating figure of his overseer, fill him with dread. He reflects:

“I was somewhat aware of the situation I had ended up in, and about the nature of my job. I shuddered for a second thinking about becoming another scary figure (62).”

From this point onward, Najeeb begins to experience profound isolation and despair in the desert. The novel traces his social, cultural, and psychological transformation as he grapples with the harsh realities of his new life, leading him to an existential crisis. The drastic change in his surroundings triggers an identity crisis, forcing Najeeb to confront the loss of his former self.

### **1.3.1. Social Transformation of Najeeb**

In the *Masara* (the desert camp), Najeeb is subjected to grueling labor and deprived of basic necessities like sufficient food and water, even for drinking or washing. He recounts one such incident in the novel when, exhausted and unwell, he receives no sympathy or relief. He says: “Fatigue sunk in, and my running stomach made it worse. I complained to the scary figure and to the

Arbab, nevertheless, my workload was unaffected. The Arbab cared only about my work, not about my discomfort (94).”

Another harrowing incident occurs when Najeeb is attacked by a he-goat while taking the herd for a walk, only to be brutally beaten by the Arbab afterward. His pain is palpable when he describes: “I saw fumes coming out of its nostrils. The next moment, it charged at me, and without giving me a chance to evade, hit me right on the chest... Then when I opened my eyes, the Arbab was in front of me. All the Arbab did was pour some hot water on my face. Then he called me *himar* (donkey) and shouted something (117).”

The Arbab remains furious, showing no concern for Najeeb’s suffering, and orders him to gather the scattered goats. Najeeb recalls: “I became conscious of a terrible pain in my left hand. An immense unbearable pain. The hand was swollen. I told the Arbab that my hand felt broken. He removed his belt and hit me and shouted at me to run and fetch all the goats quickly. The Arbab warned me that it would be my end if even one of them was lost (117-118).”

These incidents, among others in the novel, highlight Najeeb’s plight as an unheard, exploited, and pitiable figure in his workplace. Such dire circumstances force Najeeb to undergo a profound transformation in his beliefs, social identity, and cultural understanding. In their book *Sociology*, James Fulcher and John Scott discuss the relationship between socialization and identity formation. They describe socialization as the process through which individuals learn to become functioning members of their society, adopting its customs, traditions, and values. This process shapes an individual’s sense of self and social identity, influencing their behavior and interactions with others (121-39). The absence of socialization can lead to an identity crisis, causing individuals to lose their sense of self and transform into entirely different beings.

Although Najeeb once dreamed of becoming a shepherd as a child, the reality of the job proves to be far more painful than he ever imagined. He reflects:

“We shouldn’t dream about the unfamiliar and about what only looks good from afar. When such dreams become reality, they are often impossible to come to terms with (124).”

Cut off from proper human interaction, Najeeb feels deeply alienated. His joy at seeing anyone other than the Arbab is evident when he describes: “I lived on an alien planet inhabited by some goats, my Arbab, and me. The only interruptions to the monotony of my life were the visits of the water truck twice a week, the hay truck once a week, and the wheat trailer once a month. These vehicles were the only means by which I could connect with the outside universe... my heart would flutter with inexpressible joy whenever those vehicles reached the Masara (125-126).”

Thus, even the slightest opportunity to connect with the outside world brings Najeeb immense relief. The lack of socialization plunges him into an identity crisis, as he struggles to adapt to his isolated existence. Over time, Najeeb begins to identify more with the goats than with humans, leading to an existential crisis. His transformation underscores the devastating psychological effects of isolation and the loss of social identity.

### **1.3.3. Cultural Transformation of Najeeb**

In the novel, Najeeb undergoes a profound cultural transformation as he is forced to adapt to the life of a shepherd in the *Masara*. The narrative highlights how Najeeb is compelled to abandon his deeply ingrained habits, such as bathing, brushing his teeth, cleaning himself, and sleeping at nine after dinner. At home, he would never even drink coffee without taking a bath, but in the *Masara*, he is forced to eat without performing his morning rituals. This violation of his habits deeply affects his sense of identity and cultural roots, but the harsh circumstances leave him no

choice. As he admits, “Hunger for one and a half days forced me to ignore my habits (68).”

Najeeb also has to compromise his standards of cleanliness due to the severe water scarcity in the desert. He resorts to cleaning himself with stones after defecation, a far cry from his usual practices. He reflects with anger: “I had never faced such a predicament in my life... without water, nothing happened in my life. Cleanliness had been my ideology... but the breaking of all my habits began that day... the harshest for me was this ban on sanitation (78).”

His food habits also undergo a drastic change as he adapts to the new culture. On his first day in the *Masara*, Najeeb is given *khubus* (a type of bread) to eat without any accompaniments. Over time, he becomes accustomed to eating *khubus* dipped in water three times a day. This is a stark contrast to his life in Kerala, where people boil milk before drinking it. In the desert, however, he is expected to drink unboiled milk, which disgusts him. These socio-cultural shifts take a toll on Najeeb’s psychological well-being.

Humans are inherently social beings, craving interaction and companionship. Prolonged isolation can lead to severe psychological challenges, including depression and mental trauma. In the novel, Najeeb is subjected to extreme isolation in the desert, with only his Arbab and the goats for company. Since the Arbab is not friendly and Najeeb cannot understand Arabic, his situation is akin to solitary confinement. He has no opportunity to speak to another person or connect with the outside world. This profound loneliness and isolation deeply affect his mental state. The importance of human interaction is poignantly illustrated when Najeeb realizes that the “scary figure” (another worker) has disappeared from the *Masara*. He reflects: “A few words were all that we had exchanged. Didn’t know his name, native place, nothing. Still, it hurt a lot when I realized he had gone. I couldn’t fathom the reason for that pain. It might

have originated from the anguish of intense loneliness (99).”

The melancholic mood that often overcomes Najeeb leaves him feeling increasingly helpless. Over time, he begins to identify more with the goats than with humans, a stark indication of his psychological deterioration and the erosion of his sense of self.

### 1.5. Conclusion

Identity crisis, often leading to psychological trauma, is a universal challenge that almost everyone faces at some point in life. While its intensity and triggers vary depending on an individual’s circumstances and social environment, the effects of identity crisis are largely similar. In the novel *Goat Days*, the protagonist Najeeb experiences an identity crisis due to his social and cultural transformation, which ultimately leads to profound psychological trauma.

This paper aims to explore the identity crisis faced by Najeeb in *Goat Days*. It highlights various instances in the novel that contribute to his sense of lost identity, portraying the struggle of a man caught between his humanity and the animal-like existence forced upon him. The paper seeks to illustrate how Najeeb’s identity becomes fragmented as he grapples with his transformation from a human being to a figure more akin to the goats he herds.

The psychological impact of Najeeb’s social and cultural transformation pushes him into an existential crisis. He becomes an existentialist, shaped by his alienation, his status as an outsider in a foreign society, and his exile from the *Masara*. The absurdity of his meaningless life as a goat, his constant internal conflicts, his awareness of the nothingness of his existence, and his eventual rejection of the goat-like life all contribute to his existential awakening. Najeeb emerges as a seeker of identity, freedom, and meaning in life. For him, his native land and society represent the ultimate purpose of his

existence. This drives him to flee the desert and return to Kerala, his homeland, where he hopes to reclaim his sense of self and belonging.

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## Challenges and Opportunities in Open and Distance Learning

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### ABSTRACT

Open and Distance Learning (ODL) has become an increasingly popular mode of education, offering flexible and accessible learning opportunities for learners worldwide. However, while it provides significant advantages, it also presents distinct challenges, especially in the context of language learning. Though open and distance learning (ODL) has emerged as a transformative force in education, breaking barriers of time and space and expanding access to learning opportunities, it faces its fair share of challenges like the lack of direct interaction, technological barriers, and reduced teacher feedback making language acquisition more difficult for learners. This paper explores the challenges and remedies to overcome the difficulties in language learning within ODL environments. It discusses common difficulties such as lack of motivation, engagement, and immediate feedback, and examines how ODL platforms, when utilized effectively, can offer solutions such as interactive multimedia resources, peer collaboration, and self-paced learning. By identifying and addressing these challenges, this paper highlights potential remedies that can enhance language learning in ODL settings, thus contributing to more effective and efficient language acquisition strategies in online and distance learning environments.

**Key words:** ODL, Education, Technological barriers, Breaking barriers, fair share of challenges, peer collaborations, self-paced learning

### INTRODUCTION

Communication is simply the way one shares ideas, feelings, and information with others. Good communication happens when both people understand what's being shared. It's how people connect, solves problems, and builds relationships whether it is talking, texting, or even just listening. This can also happen through speaking, writing, body language, and even facial expressions. Communication is an essential part of human life where everyone communicates in various ways and the purpose of communication is to make sure the message one intends to share is received and understood by the other person. Simply put, communication is the bridge that connects all! When communication is clear and open, it cultivates trust and understanding. On the other hand, poor communication leads to misunderstandings, frustration, and even the breakdown of relationships. By improving communication skills, one can navigate the world around more effectively, achieving their goals. But communication isn't just about words. Listening is also an important part of communication. While it's not just about talking, it's about paying attention to what the other person is saying. When one listens carefully, they show respect and let the other person know we care about what one is saying.

In a way, this medium is incredibly helpful in teaching because it's the main way instructors share knowledge with learners. Whether it's explaining a new topic, answering questions, or giving instructions, clear communication helps learners understand what's being taught. When an instructor communicates well, learners follow along, ask for help when needed, and engage in the learning and everyone fully use communication to encourage one another, offer comments, and create a positive learning environment, be it online or offline.

While online learning has its pros, communication can be a challenge because it's harder to connect with others in the same way as in a classroom. When learning online, one may not always have the opportunity to ask questions in real-time or get instant feedback from their teacher and classmates, leading to confusion and misunderstandings, especially if the instructions and lessons are unclear. Additionally, without face-to-face interaction, it's easy to miss out on non-verbal cues like body language and facial expressions, making it harder to understand the emotions and intent behind the message. In a physical classroom, instructors can easily notice if a learner is disengaged, but in an online setting, they may not always be able to tell if learners need help unless they reach out. This lack of direct interaction often leads learners to feel isolated, unsure about their progress, and reluctant to ask for help even when they need it, resulting in frustration.

While this presents one take, technical issues are another obstacle to communication in online learning. Problems such as slow internet connections, video and audio disruptions, and software glitches make it difficult for learners to follow and engage with the material. These technical difficulties not only hinder the clarity of the lesson but also lead to delays and misunderstandings, ultimately reducing the effectiveness of communication. Even when the

lesson is well-presented, technical disruptions prevent learners from fully participating in the learning process, undermining their ability to stay connected and focused.

In addition to technical issues, online learning relies heavily on written communication, including emails, discussion boards, and messaging platforms. While this approach can be effective in certain contexts, it often lacks the nuance of verbal communication, making it easy for tone and intent to be misunderstood. Without the ability to interpret vocal inflection and facial expressions, learners and instructors struggle to gauge the intended meaning of messages, leading to misinterpretation and a sense of disconnection from the learning environment. Consequently, these challenges amplify communication gaps in the online learning experience.

Also, these challenges are mostly relevant to Open and Distance Learning (ODL), as this type of learning relies heavily on technology and remote communication. In ODL, learners and instructors often don't meet face-to-face, and lessons are delivered through online platforms, textbooks, and other digital media. In ODL, where interactions are often mediated through online platforms and digital materials, ensuring clear and effective communication is critical to the learner's success. Complex and unclear content further exacerbates misunderstandings, complicating the learning experience.

The lack of in-person interaction in ODL also contributes to feelings of isolation among many. Unlike traditional classrooms, ODL does not provide regular opportunities for instructors to assess learners' understanding or offer timely support without the ability to observe non-verbal cues like body language. These limitations leave both instructors and learners feeling disconnected and uncertain about their progress, negatively impacting learning outcomes. ODL places a greater emphasis on

learners' self-discipline and independence. Without the structure and routine of a physical classroom, learners struggle to stay organized, meet deadlines, and remain engaged with the coursework. Balancing ODL with other responsibilities presents a real challenge in maintaining effective communication for feedback, encouragement, and guidance, which are critical for learner success in ODL environments.

Despite these challenges, ODL offers numerous opportunities that make it a compelling educational model. One of its greatest strengths is the flexibility it provides, allowing learners to learn at their own pace, on their own schedules, and from any location. This adaptability makes ODL especially beneficial for individuals balancing studies with work, family, and other commitments. By removing geographical constraints, ODL opens doors to education for learners in remote areas and those without access to traditional educational institutions.

While ODL also offers diverse learning opportunities, ranging from certificate programs to advanced degrees, across various disciplines, learners have the freedom to select courses that align with their interests and career aspirations without being limited by the offerings of local institutions. Furthermore, the cost-effectiveness of ODL makes it an attractive option for many learners. Reduced expenses for travel, housing, and facilities, combined with lower tuition fees in some programs, make education more affordable and accessible to a broader audience, while chosen ODL.

Another advantage of ODL is its integration of technology, which enhances the learning experience through multimedia resources, interactive tools, and online collaboration platforms. These technologies build engagement, provide real-time feedback, and simplify interaction between learners and instructors. Moreover, the focus on technology

in ODL further encourages lifelong learning, enable individuals to up-skill and pursue knowledge at any stage of life. This flexibility ensures that learners can continue their education irrespective of age and background, making ODL a versatile and inclusive educational model.

In conclusion, while Open and Distance Learning presents challenges such as communication barriers, technical difficulties, and the need for heightened self-discipline, it also offers good opportunities for flexibility, accessibility, and affordability. By addressing these challenges through robust support systems, innovative technologies, and effective teaching strategies, this paper claims that ODL can evolve as a viable and attractive option for learners worldwide and the future of education will likely see an increased reliance on ODL, emphasizing the need for ongoing improvements to overcome its natural challenges, maximizing its latent benefits in language learning.

The paper thus discussed the strengths and limitations of Open and Distance Learning, highlighting its accessibility to learners of all locations, ages, and qualifications, addressing the challenges encountered in ODL, underscoring the importance of combining language learning with innovative teaching strategies.

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## The Influence of Social Media in English Language Teaching

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### Abstract

Communicating with fellow individuals and other living beings has always been one of the ultimate purposes in human evolution. The methods of communication and the tools and accessories used for the improvement have been changing over the years. The emergence of technical advancement in communication has brought the entire world close to us erasing the overseas boundaries. The influence of COVID - 19 marooned human mobility and even the academia stunned and took to online teaching. The influence of social media took an upper hand trying to bridge the gap and both the learners and the educators sought the aid of various technical tools to take up classes and see to that the learning continued some way or the other. As communication takes two modes – formal and informal, the language used also differs considerably. When it comes to the language learning aspect, adolescents and university learners tend to clip and crop words while using polysyllabic words among their peer groups and in informal situations. As it is the tendency of humans to use the oft –repeated words, we also find the impact of social media significantly on the language learners. We also come across specific learner groups use specific words and phrases among themselves. This paper explores the notable influences of the social media both the fair as well as the

unhealthy ones on the English language learners.

**Keywords:** L2 acquisition, barriers, social media, impact, addiction.

### Introduction:

#### The Influence of Social Media in English Language Teaching

“The initiatives for changing programs and pedagogy may come from within the profession-from teachers, administrators, theoreticians, and researchers” (Richards, C.2001, 252)

There are a variety of factors that have influenced language teaching trends in the past and yet there are a lot to identify and to be updated in the present as well as in the future. “The potential of the Internet, the World Wide Web, the social media platforms in trending and other computer faces and technological innovations is likely to capture the imagination of the teaching profession in the future as it has in the past and will influence both the content and the form of instructional delivery in language teaching” (Richards, C.2001,p253)

ICT is more than a teaching tool. Its potential for improving the quality and standards of pupils’ education is significant. Equally, its potential is considerable for supporting teachers, both in their everyday classroom role, associated with it, and in their counting training and development.” (Dr. Ashok .Saini.2011,p56)

David Gordon Smith and Eric Baber, in their “Teaching English with Information Technology” discuss some of the reasons for incorporating IT into teaching.

They are:

- If we work for an organisation such as British Council or a University where IT skills are important for our career.
- Our location prevents us from teaching and need something to re-awaken (y)our interest in reading;
- We feel a bit stale and need something to re-awaken (y)our interest in teaching;
- We’re a freelance teacher and we want to make ourselves more employable by increasing our potentials by honing our skills.
- Our students have asked our suggestions on how they can use technology to enhance their learning, or have been tuned to incorporate IT in our teaching especially during the lockdown due to COVID -19.

We’re simply curious about these important new developments in our field.

Although the language teaching starts with face to face classes, new technologies and pandemic situation allow the language teachers to explore many opportunities to learn English language in more interesting ways, applying gamification methods too wherever feasible.

“Technology should always be part of what a teacher is currently doing with a class, and only be used to promote and extend learning. It should not be something special, done as a break from regular classroom learning or as a reward for good behaviour”. (Stanley,G. 2013, p9).

The Internet is also an ideal mechanism for encouraging students to assume responsibility for their own learning. As resources on varied field are found abundantly, students can quench their thirst for knowledge. They become active

participants to search information, and they are able to define their learning needs, assess its value, build their own knowledge base and communicate their discoveries. The two skills that students need to cultivate in using Internet are, first, they should know navigating the Internet and then manage the large amounts of information they find. By navigating or surfing Net, they get helps to define terms. Search engines get them all the information they seek in an efficient way. Once students analyse and organize information, they turn to put them all together to arrive at an end product.

Social networks are a relatively new phenomenon. Geocities was one of the web's first social networking sites. They began in 1994. In 1997, AOL Instant Messenger launched. In 2003, MySpace launched, with Face book following in 2004. Next up was Twitter in 2006. Come 2008, Face book overtook MySpace as the leading social networking site, and now we have the elusive and mysterious Google +.

Each class can be extended to any duration of time and it is made possible with the students’ access to internet, their virtual socialization in social networks like Google meet, Zoom, Kahoot, Google Classroom, Photo Math, Near Pod, Quizlet and the active involvement in texting messages from their handset through an application called WhatsApp or instagram, or in a higher level, their interest in creative writing in web blogs and vlogs.

In language teaching and learning, technology can be used for:

- Accessing information, including information about language.
- Exposure to the target language.
- Entertainment ( i.e. reading/ listening for pleasure).
- Creating text
- Publishing learner work

- Communicating and interacting with other language users/learners
- Creating community
- Managing and organising learning (e.g. learning management systems, online vocabulary notebooks, etc.)

Theories like Cognitive and Socio-cultural theories evolved in the context of traditional language teaching and learning; they facilitate teaching, learning process in online too. “Both theoretical positions have the potential to inform research and practice in educational computing and in CALL”. (Levy, M. 1998, Two Conceptions in Learning and Their implication for CALL at the Tertiary Level, *ReCALL* 10(1): 86-94).

IT can empower a teacher and improve teaching for the following reasons:

- It provides access to up-to-date material on every imaginable topic.
- It makes transferring straightforward information very simple, potentially allowing spending classroom time more meaningfully.
- It can help to create exercises and materials that are easily reusable, thereby saving time in the long run.
- It renders geographical distance less significant or even insignificant.
- It can be cheaper than face-to-face teaching.
- It allows non-native speakers to interact with native speakers.
- It allows students to study at their own pace, whenever they want.
- It enables people living far apart to come together and form communities.
- It can be intrinsically motivating and fun.

Many people have exposure with the World Wide Web and experience with visiting websites, vlogs, blogs, facebook, instagram,

WhatsApp and many other social media applications which provide an enormous resource to use with students. Some people have already started using online materials to provide activities and exercise types. Using Emails and Google forms for giving home works or other exercises and assignments that are to be submitted as writing tasks, using websites of EFL/ESL to use interactive language exercises with the students, using Internet Audio/Video conferencing, using Social Network Sites as an extension of classroom teaching, encouraging Blog writing are some of the technological aids that are brought up into the new system of teaching language.

Podcasts can be used for several educational purposes. Here are some of them:

- Podcasts are great alternatives for delivering research content or lessons to students who need remedial or extended support.
- Students can create their own podcast to share their learning experiences with each other and also with other students from other schools.
- Teachers can record audio podcast to provide additional and revision material to students to download and review at a time that fits them the best.
- Podcast can hugely benefit auditory learners and help them in their learning.
- Creating podcast allows students to develop several important skills such as researching, writing, speaking effectively, solving problems, managing time, grabbing attention and improving their vocabulary.

With the help of a microphone and audio recording software the teacher can record her voice. The audio file can be published online or in the class blog. Some platforms like Babbel, Busuu, Livemocha, Italki.com, Palabea, Lang 8,

Voxwapp, My Happy Planet ,Edmodo @ “Facebook for school,” have evolved as specific social networks for English Language learning.

The Indian education industry is committed to advance education through technology. A shift is being witnessed which has the following impact on the education system:

- a) Teaching needs to be engaging, online, accessible and interactive to capture the attention of a student. All Higher Educational Institutions are extending their research by providing access to their programmes online and increasing enrolment locally and globally.
- b) Students today spend a lot more time on devices like computers, mobile devices, and online services like YouTube and Facebook. They are comfortable with digital media, and are using these tools actively to prepare and create their school and personal project or research paper to upload their personal video, which they scripted, directed and edited themselves. (Dr.Saini,2011).

At a cognitive level, insufficient familiarity with the tools being used may cause techno-stress and cognitive overload, especially when technical challenges that overstretch learners are coupled with demanding multimodal environments participants are under more pressure than in asynchronous environments which are dominated by one mode to improve this may become less of a probe.

The anonymity of a virtual environment can help overcome anxiety – learners may feel less inhibited when unable to see co-participants and their reactions (Benfield, 2000; Roed,2003) and relationships may develop which are as deep as in face-to-face settings(Walther, 1996.). In CMC research, Blyth (2008) takes a closer look at the four main approaches which he classifies

as: technological, psycho linguistic, socio cultural and ecological.

The most commonly reported CMC benefits of this study are: Increased quantity and quality of L2 production, increased L2 discourse functions, greater L2 syntactic complexity, equalization of student and teacher roles and improved motivation. He concludes that as the Internet enters its second decade, there will always be new form of technology (eg. Skype, i-phone, etc.). As a consequence, technology focused, descriptive research will continue to play an important role.

Psycholinguistic approaches to language acquisition are focused on the importance of social interaction and noticing. Swain’s study states that learners may become aware of their own linguistic deficiencies while engaged in communication and make attempts to fix the problem by pushing themselves to use linguistic forms beyond their control.

An empirical study by Blake (2000) framed in terms of Interactionist SLA examined the use of synchronous that program, Remote Technical Assistance, in terms of the Interaction Hypothesis. Blake argued in it that the findings suggest that CMC may provide learners with alleges benefits ascribed to the interaction hypothesis, that is “apperceived input, which can subsequently be used to modify and improve their vocabulary” (P.133)

Thorne’s(2003) study examines the various cultural influences on the use of Internet communication tools such as email or chat by foreign language learners. Warschauer (2008) noted that previous CALL research conducted from socio-cultural perspective has largely focused on issues of culture, literacy and identity in three specific context: Individual network classroom, Informal online learning

and Tele collaborative exchanges between classes. (Warschauer 1996; Warschauer, Kren 2000)

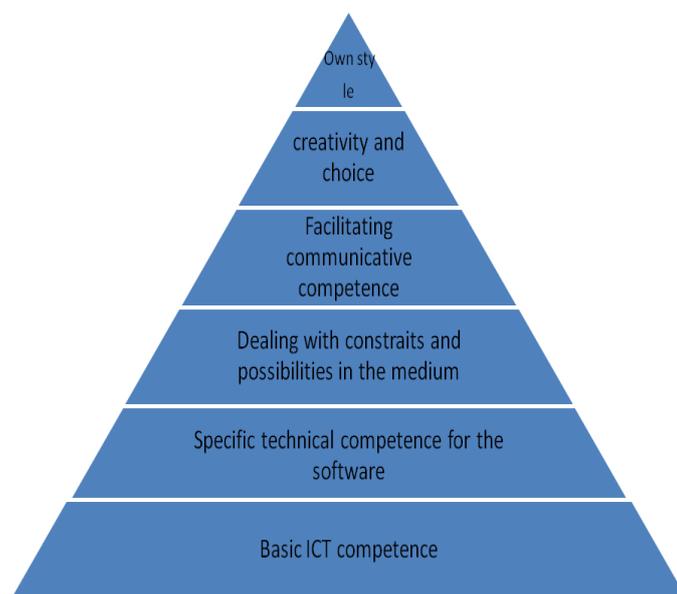
The latest theoretical approach to researching online discourse is the ecological approach. (Kramsch 2003; Leather & van Dam 2003 Vancier 2004) Proponents of an ecological framework for analysing online discourse argue that Internet is best understood as a network of networks or a system of interlocking systems, that is an ecology.

Lemke's insights about community boundaries are as useful as pointers to where CMCL identity research could go. He makes two points. One relates to the site of cultural development that is the classroom, and hints at the architectural ecosystem within which the functions of traditional classrooms are played out: "The classroom is no different from anywhere else in our world of social artefacts. Its developmental input is there not only on the walls but in the very fact that there are walls' (2002:75). "Few communities today insulate their members effectively from the subversive texts and values of other communities. Barriers between cultures and languages are weaker today; our loyalties to them are moderated by our multiple lives and lifestyles.'(2002:75).(Lemke.J.2002: Language Development and Identity :Multiple Timescales in the Social Ecology of Learning, in Kramsch (ed.), Language Acquisition and Language Socialization. London and Newyork, Continuum :1-30)

With these theoretical perspectives in mind, CMC started doing its research on how social network can be involved in language learning. When the setting of the learning process getting changed, the role of the tutor too gets modified. In sociocultural theory, the tutor is no longer seen as an instructor and transmitter of

knowledge. Instead the tutor is a participant in the learning process, facilitates interaction among learners and guides them through their learning.

For tutoring languages online, Hampel and Stickler(2005) propose a 'pyramid model' with seven skills level, which include technical expertise, knowledge of the affordances, socio-affective skills and subject knowledge. Lastly, teachers should learn to teach creatively and develop a personal (and personable) teaching style in an online medium that has fewer/different modes of communication compared to the more familiar face-to-face setting. The authors also argue for the importance of training to enable teachers to become competent users of the functions of the technology, fully aware of its affordances.



**Skills pyramid**

(HampelR.andU.Stickler, 2005: New skills for new classrooms:Training Teachers to teach languages online, Computer Assisted Language Learning 18(4):311-26).

**Conclusion:**

Many classroom teachers using technology have anecdotal evidence of their learners being

motivated and engaged, and this is often a major reason for using learning technologies. There is also evidence that the use of technological tools empowers learners to transcend the traditional concept of the classroom (Drexler,2010) and can lead to learners taking greater ownership of their learning (Terrel, 2011), especially through being actively involved together outside the classroom.

Technology can be a highly engaging and interactive tool, providing a source of real language, both written and spoken, in the classroom, and motivating learners to produce more language than they otherwise might have done. So far in this chapter, favours of Facebook learning are argued. A thorough knowledge on online resources may help the educators to utilize technology especially using Internet in their teaching process. The following section of this chapter throws glimpse on the abundance of Internet resource that helps in English language teaching, learning process.

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## **Fostering Multilingual Proficiency: Effective Strategies for Integrated Language Learning Environments**

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### **Abstract**

Multilingual proficiency has become a critical skill in today's interconnected world, necessitating effective strategies for language acquisition. Integrated Language Learning Environments (ILLEs) offer a dynamic approach by blending traditional language instruction with technological advancements to enhance linguistic and cultural competence. ILLEs incorporate interactive learning methodologies such as group discussions, role-playing, and collaborative projects, supplemented by modern digital tools like AI-driven platforms, gamified applications, and virtual reality simulations. These environments create immersive, learner-centric experiences that cater to diverse educational contexts—from early childhood education to advanced professional learning. However, challenges such as technological accessibility, teacher training, and infrastructure investment must be addressed to ensure widespread implementation. By integrating multilingual education with cultural exposure, ILLEs foster critical thinking, adaptability, and cross-cultural communication skills, preparing learners for success in a globalized world. This study highlights best practices in early education, explores technology-enhanced language learning in modern pedagogy, and emphasizes the need for inclusive, innovative, and engaging language acquisition frameworks (Garcia et al., 2009).

**Keywords:** Multilingual Proficiency, Integrated Language Learning Environments (ILLEs),

Language Acquisition, Cultural Competence, Technology-Assisted Learning, AI in Education, Virtual Reality, Gamified Learning, Blended Learning, Language Pedagogy.

### **Introduction**

Multilingual proficiency is highly appreciated and most needed skill in today's interconnected world. Integrated Language Learning Environments (ILLEs) provides an approach to combine technical advancements with traditional language to highly develop the cultural competence, unique approach that combines traditional language instruction with technological advancements to foster linguistic and cultural competence (Brown 2007). "Integrated learning fosters the ability to connect concepts across disciplines, enabling learners to think critically and apply knowledge in real-world contexts". *Drake S M. & Burns, R.C. (2004). Meeting standards through Integrated Curriculum. Alexandria, VA: ASCD.* ILLEs is based on interactive methods such as group discussions, role-playing, and collaborative projects to empower communication skills. These strategies can be supplemented by technology-driven tools like virtual reality (VR) simulations, AI-based platforms, and gamified learning applications (Kramsch, C. 1993). For example, tools like Duolingo and Rosetta Stone make the learners to simplify their learning experiences, catering to their pace and style. Additionally, cross cultural harmonization through content like

regional literature, films, and historical anecdotes allows learners to develop intercultural sensitivity while mastering linguistic nuances (Brown 2007).

Barriers of implementing ILLEs, such as technological accessibility and resistance to adopting modern methodologies, must be addressed. Brown (2007) highlights that “successful language learning is a result of well-supported environments,” which necessitates investment in infrastructure, teacher training, and resource sharing. By creating inclusive and collaborative environments, ILLEs can empower learners with the tools needed to thrive in multicultural societies (Kramersch, C. 1993).

The concept of Integrated Language Learning Environments (ILLEs) is believed that language and culture are inseparable. “To learn a language is to have one more window from which to look at the world” (Chinese Proverb). Advanced pedagogical methods and digital tools are combined with immersive cultural experiences by ILLEs resulting in enhanced linguistic proficiency and cultural understanding (Garcia et al., 2009).

An important component of ILLEs is their ability to provide a learner-centric approach. Through methods like blended learning, learners can able to switch between traditional classroom activities and self-paced online sessions. For example, AI-powered platforms adapt content based on learners’ progress, offering real-time feedback and tailored exercises (Brown 2007). Additionally gamification techniques like Furthermore, gamification techniques such as point systems and interactive storytelling remains engage and motivate the learners throughout their journey (Garcia et al., 2009).

Virtual collaborations and cultural exchange programs with native speakers connects the learners with the language’s real-world context (Kramersch, C. 1993). However, challenges like

limited funding and technological disparities continue to affect widespread implementation. To overcome these obstacles, policymakers and educators must focus on community-driven initiatives and cost-effective solutions. As argued by Crystal (2003), “Language is the means of getting an idea from my brain into yours without surgery,” highlighting the transformative power of language learning when supported by the right environment.

By connecting linguistic and cultural divides, ILLEs not only provides the learners with valuable communication skills but even prepare them to contribute meaningfully to a globalized world (Brown 2007)..

Building on the foundation of multilingual proficiency, Integrated Language Learning (ILL) facilitates an approach that adapts to numerous educational contexts. ILL fosters cognitive and linguistic development through engaging strategies in early education whereas in modern period it integrates digital tools and innovative methodologies. Both the periods demonstrate the need of equipping learners with the skills to navigate a multilingual world not just language acquisition but also cultural competence and global readiness.

### **Integrating Language Learning into Early Education: Best Practices**

Early childhood is a crucial period for language development, making it an ideal stage for integrating language learning into education. Early exposure to language learning provides cognitive development, empowers communication skills, and lays the base for multilingual proficiency. The following best practices ensure effective integration of language learning in early education:

#### **Immersive Language Environments**

A language rich environment is such created to immerse the students in constant linguistic exposure. Classroom should be posted with both bilingual or multilingual posters, label and

storybooks for children to familiarize with different languages. To enhance vocabulary and comprehension, activities could be given like singing songs, engaging in roleplay and multiple languages storytelling.

### **Play-Based Learning**

Language comprehension is more effective when children learn through play methods and engage themselves in interactive games and hands on activities to encourage children to use language naturally. For example, through treasure hunts with clues in different languages may promote both linguistic skills and problem solving.

### **Culturally Inclusive Content**

Children can understand the cultural contexts of language through integrating cultural diversity into language education. To make the language learning relatable and enriching, teachers can include traditional stories, music and customs from various cultures (Crystal, D. 2003). According to Garcia et al. (2009), “Cultural content enhances language learning by providing meaningful connections.”

### **Technology-Assisted Language Learning**

Through audio- books, educational apps, and interactive videos the young learners would make language acquisition easy accessible and engaging. Platforms such as Lingokids and Starfall focus on early language development with age-wise content may support reading, writing, and speaking.

### **Parental Involvement**

Parents play a crucial role in supporting early language learning. Schools can encourage the parents to read along with their children and engage in language games, or speak their native language at home. Collaborative efforts create a consistent language-learning environment between parents and educators

### **Teacher Training and Professional Development**

Children are equipped with the strategies and skills to teach the languages effectively in early education. Workshops, online courses, and peer mentoring helped teachers to adopt innovative approaches tailored to young learners (Garcia et al., 2009).

### **Encouraging Peer Interaction**

Social interaction is very fundamental to language development. Group activities like cooperative games, puppet shows, and small group discussions may enhance children to communicate and practice with new words. These interactions will build confidence and fluency as a supportive system.

### **Assessment through Observation**

In early education, assessment would be natural and unobtrusive. Teachers can assist children during play, storytelling, or singing to assess their language progress. Formative assessments will provide insights into the areas needing attention while appreciating individual achievements (Kramsch, C. 1993).

Integrating language learning in early education provides immersive environments, play-based methods, and cultural content that ensures a holistic approach to multilingual proficiency. By combining innovative strategies with parental support and teacher training, educators can create a nurturing foundation for lifelong language acquisition (Drake 2004). Early exposure to multiple linguistics not only enhances cognitive abilities but also teaches empathy and cultural awareness (Brown 2007).

### **Integrated Language Learning in the Modern Period**

In today’s globalized world, Integrated Language Learning (ILL) has become a tool of essential approach to language acquisition, that effect the changing needs of learners in the modern era. The integration of digital technologies has diversified teaching strategies, and a more worldwide approach to

communication that has transformed traditional language classrooms.

Here's how ILL works in the modern period:

### **Technology-Enhanced Language Learning**

Modern tools such as mobile applications, online platforms, and language learning software (e.g., Duolingo, Babbel, or Memrise) have refined language learning (Crystal, D. 2003). These platforms create learners to practice speaking, listening, reading, and writing at their own pace, integrating various forms of media—such as videos, podcasts, and interactive quizzes—to allow dynamic, immersive environments. The flexibility of online resources makes learners access language learning at any time, that come across geographical and time constraints (Garcia et al 2009).

### **Blended Learning Approaches**

Blended learning blends face-to-face teaching by giving learners a hybrid experience with digital content that caters to different learning styles. Teachers uses traditional classroom methods alongside interactive online tools to fortify lessons, such as assigning group discussion or projects online, using video lessons to introduce new vocabulary for deeper learning. This method helps learners to develop both autonomous and collaborative skills, essential for language fluency (Crystal, D. 2003).

### **Personalized Learning with AI and Adaptive Tools**

Artificial Intelligence (AI) and adaptive learning technologies are creating the future of ILL by customized learning experiences. AI-powered tools, such as Grammarly or language chatbots, offer real-time feedback, making an efficient language learning and personalized. These tools adapt to the learner's proficiency level providing targeted exercises to improvise vocabulary, grammar, and pronunciation based on the needs of individual (Drake 2004).

### **Collaborative Learning and Social Media**

Social media and collaborative platforms, such as Google Classroom and Edmodo, promote peer learning and communication in a multilingual environment. Through this group chats, online debates, and collaborative projects, students engage with others from around the world, applying their linguistic skills in authentic, real-world contexts. This also promotes cross-cultural exchanges, that broaden learners' global perspectives.

### **Virtual and Augmented Reality**

Virtual Reality (VR) and Augmented Reality (AR) equip immersive experiences that provide the learners to practice language in context. For example, VR can teach real-world environments where the learners can interact target language such as navigating a market or ordering food in a restaurant. These tools equip contextual and situational language learning to help learners to better understand cultural nuances, thereby deepening their engagement with both language and culture.

### **Data-Driven Insights**

Modern language learning platforms utilize data analytics to track the learners' competence and recognize areas for improvement. This data-driven approach prepares the teachers and learners with actionable perspective assuring that the teaching methods align with the learners' individual learning paths. For example, platforms can provide vocabulary acquisition or grammar mastery and provides personalized lessons accordingly (Crystal, D. 2003).

### **Culturally Responsive Teaching and Global Contexts**

Modern ILL strategies stresses the language curriculum into the integration of diverse cultural perspectives and global contexts. By uniting authentic materials like news articles, podcasts, or films from different parts of the world, students are exposed to real-world language use and cultural nuances. This

approach provides an appreciation for diversity and inculcates the students to see language as a bridge to global communication and understanding.

### **Focus on Multilingual Proficiency**

Today's scenario the language learners are not just acquiring one language but often multiple languages. This prioritize on multilingualism aligns with global shifts toward interconnectedness and cultural exchange. Through ILL, not only the students are becoming expertise in their target languages but are also pursuing how to navigate and appreciate different languages and dialects within a global context (Crystal, D. 2003).

### **Enhanced Teacher Professional Development**

In modern era continually teachers are expected to adapt their skills to the ever-evolving language learning landscape. Professional development programs that focus on technological tools, pedagogical strategies, and intercultural competency are important for adapting educators with the tools they need to foster effective ILL environments (Brown 2007). In the modern period Integrated Language Learning is a dynamic, multifaceted approach that includes cutting-edge technologies, global communication tools, and culturally receptive teaching. By acquiring to technological advancements and looking over personalized, collaborative, and immersive experiences, modern ILL is poised to empower learners with the language and cultural skills which is necessary for thriving in a globally connected society.

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## **Leveraging Technology to Foster Autonomy in Multilingual Learners: A Case Study of Self-Paced Language Learning Platforms Like Coursera**

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### **Abstract**

This study investigates how key self-paced online learning platforms for multilingual learners encourage autonomy among those multilingual learners. In this highly regarded era of multilingualism, these platforms uniquely afford learners the opportunity to navigate towards pursuing the acquired education at their own pace, even as they seek to attain and sustain competency in multiple languages. Being one of the most recognized online learning platforms, Coursera provides features such as flexible time, interactive exercises, and multilingual support, catering to the diverse language needs of learners worldwide. The study analyses how these high-tech tools help learners become more responsible for their educational journey, focusing on the central part of autonomy in effective language acquisition. It will explore learners' interactions with features provided on the platform, such as subtitles, language-switching options, and tracking progression, assessing their utilities for creating the learning experience (Zimmerman 1990). It will also evaluate the extent to which self-paced platforms respond to the cognitive, motivational, and cultural specificity challenges of multilingual learners.

Corroborating findings suggest that while the tools of Coursera have significantly sanctioned

greater control and flexibility for learners, much literature is yet to discuss in-depth the provision for less commonly spoken languages and the need for a more culturally pluralistic representation. The study also identifies various systems-level challenges such as limited reach across obscured communities or other occasional technical glitches that may hinder the educational processes.

While this research shows the strengths and challenges of self-paced language learning platforms, it illuminates the much-needed organizational insight on their effects on multilingual education. The concluding section puts forward reform action points that would enhance such platforms in design and functionality to suit a wider dimension of learners, thereby enhancing the inclusiveness and effectiveness of a digital learning ecosystem.

**Key Words:** learner autonomy, multilingual learners, self-paced learning, educational technology, Coursera, digital language acquisition, inclusive education.

### **Introduction**

In an increasingly integrated world, multilingualism stands as a vital asset transcending all barriers of culture and lingua, providing an important base for personal, academic, and professional advancement

(Zimmerman 1990). Once necessitated, 21st-century language combinations have now become inextricably linked to the facilitation of global communication, cultural understanding, and career advancement in our connected world. Digital technology and online learning will completely transform how we teach and research languages. Self-paced learning platforms like Coursera have now arisen as effective tools for their drivers to enable oneself in acquiring and honing critical language skills at their own rates to encourage flexible and equitable learning for them. This development is huge in assisting other types of learners who may have some restrictions for receiving education in normal classrooms, either due to time constraints or geographical and financial limitations.

It is needless to mention here that Coursera has become one of the heralding MOOC platforms for self-paced learning through the multifarious courses offered as relevant for second language acquisition. A huge variety of language courses conducted by an instructor in reputed universities and institutes is provided by Coursera with a distributed audience with different language-related objectives and levels of competence in the learning process. From agantium courses in popular ones like Spanish and Mandarin to advanced ones in minority or niche languages, the platform aspires to democratize language learning and make it available to everyone. In addition, lasting features like subtitles, progress trackers, and interactive quizzes make it easy for learners to take charge of their learning path and very engaging. These aspects are essentially empowering multilingual learners to track progress, access tricky concepts, and stay continuously motivated on their language learning journey.

The rise of self-paced e-learning has sprung from the ongoing demand for tailored and

flexible learning solutions that properly address a myriad of learner needs. Self-paced systems provide options that differ from more traditional classroom modes of instruction, which are often characterized by set schedules and rigid curricula. In self-paced platforms, learners can choose experiences suited to their goals, interests, and modes of learning. The liberal flexibility afforded by the technology has proven particularly helpful for multilingual learners. These learners often need resources that are specially designed for them and a personal touch to master those nuances in terms of a new language. Coursera, for example, provides learners with an excellent opportunity to set their own pace of learning, access resources as needed, and integrate language practice into their daily lives. Digital platforms can support language acquisition in a globalized context.

Despite its many advantages, Coursera's efficacy in supporting multilingual learners is, however, not without limitations. While the platform boasts excellent course offerings and various learner-centric tools, many challenges still persist in self-paced language learning. For example, the lack of instant instructor-student peer interaction might not help develop conversational skills, or cultural fluency, integrated into language learning. Plus, self-paced learning often requires considerable self-discipline and intrinsic motivation, something several learners might not reasonably expect to sustain over long hours. Technology challenges, for instance, poor Internet connectivity or unfamiliarity with technology, may also prevent learners from accessing Coursera resources. Hence, this has opened further research opportunities and innovation avenues for the better design and delivery of self-paced language learning platforms.

The growing reliance on digital platforms for education makes it necessary to investigate how

**Leveraging Technology to Foster Autonomy in Multilingual Learners: A Case Study of Self-Paced Language Learning Platforms Like Coursera**

Coursera assists multilingual learners in achieving their language-learning goals. This research aims to look into the strengths and limitations of self-paced platforms such as Coursera, focusing particularly on their influence on language acquisition. Through analyses of user experiences, course designs, and platform features, this study aims to identify best practices that lead to successful language learning outcomes. The study will also address other areas for potential improvement, along with recommendations for enhancing the efficacy of self-paced platforms in meeting the needs of multilingual learners (Anderson 2014). Improved learner autonomy is arguably one of Coursera's greatest strengths. The platform uses subtitles, which allows learners to better understand the course material, and meanwhile it especially helps understand instructors who are native speakers of target languages. Research has shown that the incorporation of subtitles can bolster comprehension and vocabulary by providing visual reinforcement while listening (Vanderplank 4). Another feature of the Coursera design is interactive quizzes, which act as formative assessments enabling learners to check their knowledge and get immediate feedback. This not only fosters active learning, but it also helps learners recognize areas they still need practice. Moreover, the progress-tracking capabilities of Coursera instill that sense of accomplishment in the learner, alongside the motivational component of helping the learner to keep at their language-learning pursuits over time.

The limitations of using Coursera for self-paced language learning have also drawn attention. It is evident that language learners are better motivated to engage in speaking and listening practice in interactive, real-world settings (Blake 27). Without real-time interaction with their instructors or peers, students may not develop speaking fluency or sociocultural

competence in their language studies, attributes viewed as crucial to language proficiency. The asynchronous aspects of Coursera's courses may also foster an isolationist condition for students, especially for those thriving in collaborative and social learning environments. To overcome these limitations, it would be wise to audiences an innovative approach such as virtual language exchanges, peer discussions, and live question-and-answer sessions, supporting the self-paced learning experience.

Thus, Coursera is hardly pushing multilingual learners into a category to define a potential for self-paced platforms to issue a case for establishing a language education. In response to the digital instruments involved, learner-centered designs have already brought Coursera results that tend to democratize access to language-learning resources. Certainly, the platform's limitations raise substantial needs for ongoing research and innovation to better the practice. This study sets out to engage with this issue, examining the experiences of multilingual learners on Coursera, and outlining the recommendations to improve later design and delivery of self-paced language courses. As this global demand for flexible and accessible learning solutions continues to swell, platforms like Coursera find themselves in a unique position to redefine the future of language education in a multifaceted world.

### **Review of Literature**

The review delves into four interconnected themes that underpin the study: autonomy in language learning, technology in education, multilingualism and digital platforms, and the unique position of Coursera as a language-learning platform. These themes together provide the backbone of understanding how self-paced platforms such as Coursera push multilingual learners toward their language learning goals.

### **Autonomy in Language Learning**

Learner autonomy is central to modern language education. Littlewood (1999) describes autonomy as "the ability of the learners-not the teachers-to take charge of their learning," stressing individual responsibility and self-regulation. Multilingual learners find it particularly difficult, because upon entering new language environments they are faced with complex cognitive and linguistic challenges. These learners must integrate multiple linguistic systems, manage overall cognitive load, and master various affective barriers, such as anxiety or self-doubt. Within these confines, autonomy allows the learners to set their goals, select relevant strategies, and monitor their progress (Chik 2014).

There has been a long-standing argument that autonomy is not an innate ability but rather a skill that can be cultivated through appropriate learning environments and tools. Benson (2001) has suggested that ample opportunity be given to the learner to practice independent decision-making, diversify their learning resources, and monitor their learning strategy. Self-paced learning environments such as Coursera are excellent settings to provide for autonomy by allowing learners to pace themselves, come back to difficult ideas, and include language practice in their daily lives. Autonomy, however, also requires a large degree of self-motivation, something that some learners find difficult to maintain. Littlewood (1981) noted that in autonomous learning, the weight of responsibility is shifted from the instructor to the learner; such a shift may be difficult for learners who are accustomed to teacher-led instruction. This then begs the necessity to provide platforms like Coursera with motivational tools and support systems.

### **Role of Technology in Language Learning**

As for the pervasive impact technology has had on language education, extensive research has

been documented over the years. Warschauer and Healey (1998) state that the technological advancements of recent times have democratized educational possibilities and made possible self-autonomy in learning through resources and tools for learning. According to them, only technology would make learning flexible, personalized, and interactive, all of which were not achievable by any prior traditional classroom settings. Digital platforms, as an illustration, can offer multimedia resources, like videos, audio recordings, and interactive quizzes, and therefore be able to address one-dimension meaning in language learning. Moreover, it facilitates asynchronous learning, enabling learners to proceed at their own pace and revisit materials at their convenience whenever they like (Chik 2014). Learning from authentic linguistic content-including news articles, podcasts, and videos-is absolutely essential for the development of cultural competence and contextual appreciation. Warschauer (2000) also works to demonstrate how technology fosters collaboration and communication by providing examples of virtual language exchanges and discussion forums that connect learners from one part of the globe to another.

The use of technology for language learning is useful particularly for multilingual learners. Tools such as speech recognition software, digital flashcards, and language learning apps allow learners to work on pronunciation, vocabulary building, and grammar reinforcement. Along with web-based technology, authentic language resources, such as news articles, podcasts, and videos, help to foster learners' development of cultural competence and contextual understanding. Warschauer (2000) emphasises that technology acts as a medium through which collaboration and communication are developed, citing

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examples of virtual language exchanges and forums that connect learners around the world. However, with these benefits come challenges to technology-mediated learning. The scant information available recently indicates that without contact with classmates and teachers, the development of communicative and interpersonal skills may hinder conversational fluency, which lies at the core of language proficiency (Blake 27). In particular, given the seemingly illusory nature of learning mediated by technology, the divide would exacerbate the problem, for learners living in resource-poor regions might not use the technology due to unreliable internet connections or inaccessible digital devices. This paints a scenario in which it becomes necessary to purposely cultivate technology-based platforms that are both inclusive and accessible.

#### **Multilingualism and Digital Platforms**

Multilingualism is a complex phenomenon entailing the ability to communicate in multiple languages with varying degrees of proficiency. Dewaele et al. (2019) have asserted that multilingual learners, on the one hand, face challenges of a cognitive and affective nature, such as handling language-based interference and maintenance motivation across time. The digital platforms have arisen as very valuable tools to address some of these challenges in the provision of linguistic support, adaptive content, and personalized learning paths (Kukulka-Hulme 2016).

Another key advantage of these platforms is instant feedback and correction, which is essential for multilingual learners who need to correct their errors while they still matter. Artificial intelligence (AI)-driven recommendations and adaptive content are utilized at platforms such as Coursera, for example, for similar tasks. If a learner is struggling with verb conjugations in French, the course may offer targeted practice exercises and

explanatory videos to help reinforce that learner's understanding. Dewaele et al. (2019) further emphasize and prompt the use of translation tools and multilingual glossaries as aids to comprehension, providing some relief of cognitive load. This would prove especially beneficial for beginner learners who would need 'scaffolding' to facilitate the transition from their home language into the target language.

Caution should be taken, however, against excessive reliance on digital tools, with researchers pointing out that language learning is social and cultural by nature. While platforms such as Coursera could provide valuable linguistic input, they fall short of interactive and immersive experiences fundamental to developing conversational skills and cultural fluency. There's also a need to underline the necessity for hybrid models, combining resources on a digital platform with other hands-on, real-world opportunities.

#### **Coursera as a Learning Tool**

Coursera is one of the most successful MOOCs, offering a prominent number of courses that span many disciplines, even the area of language learning. These courses aim at giving learners some structure and flexibility and have gained the attention of those who want to adopt new skills at their own pace. The global character of Coursera and its extensive selections of languages make it a good platform for multilingual learners. Such learning can take place in the mother tongue or common European languages such as Spanish, French, and Mandarin, along with other languages that are less commonly taught (Canagarajah 2019).

An important strength of Coursera is the learner-friendly system readings with subtitles, progress-trackers, and quizzes. These features allow learners to see their progress, rethink some more challenging concepts, and test their knowledge in a low-stakes environment. In addition, cooperation with the leading

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universities and institutions assures skilled instructors to teach these courses, thus adding to the platform's strengths.

However, several drawbacks might be observed, some of which were already mentioned. Some drawbacks include conversational and communication skills for learners engaged asynchronously. Secondly, since most of the material uses video to present information, this could prove a limitation for those whose learning styles favor interactive environments and peer interaction. To be able to further engage learners, other features could be incorporated, such as live Q&A sessions or other peer interaction interfaces and virtual language exchanges (Dewaele 2019).

### **Methodology**

Fifty multilingual learners enrolled in language courses on Coursera were chosen to participate in this study. Those selected were based on two criteria: fluency in at least two languages and active enrollment in a Coursera language course at the time of the study. This selection guaranteed representatives of multilingual learners with different linguistic backgrounds, proficiencies, and learning goals, assisting in comprehensively understanding multilingual learner experiences. Participants from diverse age ranges, geographical locations, and target languages were included in the sample to represent diversity.

### **Data Collection**

A mixed-methods approach was used to collect both quantitative and qualitative data, ensuring a well-rounded view on the experience of learners.

- **Surveys:** All 50 participants completed a structured questionnaire in which conclusions about learner autonomy, motivation, and perceived effectiveness of the Coursera suite were assessed, including Likert-scale questions and open-ended responses.

- **Interviews:** Semi-structured interviews were conducted with 10 participants, selected through stratified random sampling to ensure representation of various linguistic and demographic backgrounds. These provided in-depth qualitative insight into the learners' experience, challenges, and strategies in language acquisition.

- **Engagement Metrics:** Though self-reported data were collected, Coursera's engagement metrics, such as course completion rates, average time spent watching lessons, and interactions with tools (e.g., subtitles, quizzes, and discussion forums), were analyzed. These metrics provided an objective view of learner engagement and behavior (Zheng 2015).

### **Data Analysis**

Surveys were analyzed statistically in order to look for trends, correlations, and differences among participants. Quantitative data were simply visualized through graphs and tables. Qualitative data from interviews were foundationally coded, using Braun and Clarke's (2006) framework to look for repetitive themes, patterns, and unique insights. Lastly, the triangulation of data from surveys, interviews, and platform analytics ensured the reliability and validity of findings.

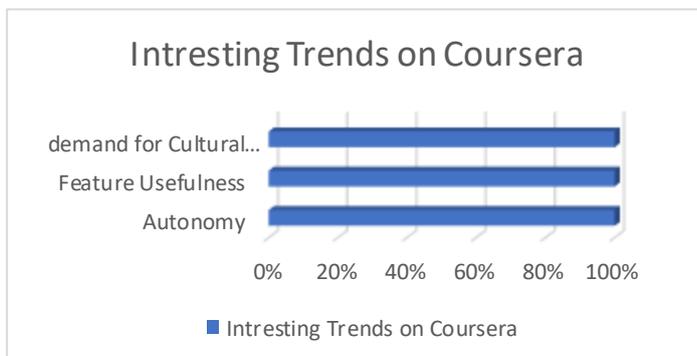
### **Results**

#### **Survey Findings**

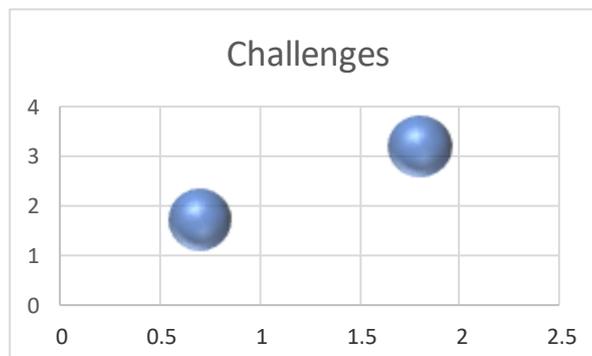
The survey's findings reflect interesting trends: learner autonomy and the assessment of the efficiency of the various tools available on Coursera

- Of the participants, 84% reported an increased feeling of autonomy over the management of their learning schedules, and this implies that learning on the self-paced Coursera empowers a learner to take control of his or her education.
- About 76% of the learners indicated platform features like subtitles, adaptive

quizzes, and progress tracker as highly useful in navigating multilingual learning challenges. These tools were cited as key in enhancing understanding and for supporting customized learning pathways.



- 62% of the participants expressed a desire for more cultural inclusiveness in course content, region-based examples, culturally relative phrases, or materials covering linguistic diversity.



### Interview Insights

Interviews of a semi-structured nature were used to take participant experience through qualitative themes. Respondents always pointed to the flexibility offered by Coursera, as allowing them to integrate learning into everyday life experiences. The access to diverse and high-quality resources made available to

### Platform Analytics

According to the Coursera analysis, courses with interactive features, such as quizzes or discussion forums, had much higher completion rates; this points heavily to the value of engagement-based designs.

- Subtitles and options for switching languages were the most used learning supports and capable of addressing multilingual learners' needs.

### Findings

The study findings point to several strengths and areas identified as needing further improvements to help Coursera support multilingual learners' language learning goals. Findings were organized around three main themes: promoting autonomy, enhancing multilingual support, and attending to challenges.

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them by globally eminent institutions was also cited as a huge advantage. Despite this, the respondents mentioned two major challenges

- Limited support for less commonly spoken languages, which typically do not have course offerings on Coursera.
- Technical issues; for instance, with video playback and quizzes that disrupted learning sporadically.

### 1. Promoting Autonomy

One of the marked advantages of the Coursera platform is learner autonomy. The self-paced nature allows learners to organize their learning schedules in accordance with their personal and professional commitments, thus putting the total ownership of learning in their hands. The flexibility is quite valid for multilingual learners as they have to constantly juggle between language learning and several responsibilities. Survey data collected indicate that 84% of participants reported a much increased capacity to manage their study schedules in an independent format. This is further reinforced by the interview data that indicated that participants believed the ability to go back and forth to lessons and pause and restart their courses, as well as focus on areas of personal interest, was crucial to maintaining their

motivation and coops in the whole process of learning.

## **2. Improving Multilingual Support.**

These tools, which include subtitles, adaptive quizzes, language-switching functions, and others, were appreciated by learners all over. 76% of participants stated that they found such features extremely helpful in addressing the unique difficulties related to multilingual learning. Subtitles were consistently praised for their supportive role in understanding and reinforcing through visual representation of spoken language; furthermore, language switching allowed them to switch between their native language and the target language when necessary to be more clear. However, there is still a big gap in support for languages that are spoken commonly. Respondents felt a need for greater push towards inclusion for the inclusion and equity of these respective learners through the provision of tools and courses.

## **3. Challenges.**

There must be some challenges, despite the strength inherent in Coursera's offerings (Holec 2015). 62% of participants felt that there was an increased need for much more culturally diverse material within the course- examples from the region, culturally relevant idioms, and varied teaching other kinds of materials. Some learners encountered technical challenges like video-playback issues and quiz function glitches, making the sequence of learning experience disturbance ever present. These challenges should be addressed for maximum benefit to be made of the platform (Holec 2015).

## **Conclusion**

Self-paced learning platforms, like Coursera, are transforming the educational sphere for multilingual learners. The platforms have convincingly explained that they have capacity for engendering learning autonomy, since they enable learners to take control of the learning process. The high degree of flexibility has given

learners the chance to plan their learning schedule, revisit study materials, and select high-quality resources throughout their learning journey according to their personal objectives and preferences. This could be of utmost importance among multilingual learners, especially with the added complexity of dealing with multiple linguistic systems and diverse learning objectives. The tools of Coursera-such as subtitles, language-switching options, adaptive quizzes-play the most significant role in enhancing comprehension and further motivating learner engagement.

However, while Coursera has several advantages, the present study indicates areas it needs to improve on. The main challenge, according to respondents, is the limited support for less commonly spoken languages on the platform. While widely spoken languages like English, Spanish, and Mandarin are well supported, learners trying to study niche or regional languages often find themselves at a loss for resources. Expanding language offerings and cultural inclusion would substantially improve the appeal and usability of the platform. Participants also expressed a preference for teaching materials that acknowledge side views of specific cultures, well-acquainted idiomatic expressions, tailored region-specific examples, and contextually relevant materials.

Technical form, including hitches, occasional students find learning experiences disrupted by the glitches in videos and quizzes. These would improve user satisfaction as well as the reliability of the platform as a whole if that critical issue were removed.

As such, this study finds that perhaps Coursera serves as a prime example of empowered multilingual learners in education technology by engendering independent availability for learners. A lot of desires have to be added as far as the concept of functional capability and

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inclusivity is concerned so that the platform would possibly attend to the diverse needs in potentiality when making decisions for learners across the globe, and self-paced and open platforms continue to evolve.

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**APPENDIX**

S.NO	QUESTIONS	A	S	U	R	N
1	I consider myself fluent in more than one language.					
2	I am confident in my ability to learn a new language through self-paced platforms like Coursera.					
3	The captions to be found on Coursera courses are textually well-meshed into the concept, so they really help in understanding the subject matter.					
4	The flexible scheduling on Coursera allows me to plan my learning effectively.					
5	I think woven quizzes in Coursera help me remember and apply everything I have learned.					
6	The overall quality of the language instruction on Coursera meets my expectations.					
7	The courses I've taken on Coursera include enough examples and explanations to assist in multilingual learning.					
8	But the option to toggle between languages (if offered) really makes the course clear and functional for me.					
9	Coursera provides enough language resources for the languages generally spoken (like English, Spanish, and Mandarin).					
10	Coursera helps provide job opportunities and learning resources for languages spoken less widely.					
11	The Coursera portal gives me the right amount of control for me to take charge of the process of learning my new language.					
12	I feel Coursera encourages me to take motivation in learning my language at a pace suitable for me.					
13	It's easy for me to go back and check information from previously taught lessons on Coursera whenever I wish to review my learning.					
14	Coursera encourages me to become empowered in directing my own learning and reduces my reliance on my instructors.					
15	The platform provides a learning experience that fits into my daily routine quite well.					
16	I experienced some technical problems (for instance, video not playing correctly or quiz refusing to open) when interspersing the technology in my course-learning experience.					
17	The cultural relevance of materials in the course really helps me understand the language in practical contexts.					
18	Coursera courses could use more culturally diverse and region-representative examples that would enhance the learning experience.					
19	I believe Coursera offers enough room and support for students who may experience technical issues during the course.					
20	I would recommend it to other multilingual learners for the provision of a wondrous toolkit and resource for effective language learning.					

## La Revitalisation Linguistique et le Développement Durable

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### Abstract

Les langues sont un élément essentiel de l'identité et du patrimoine culturels, car elles englobent l'histoire et les connaissances écologiques de leurs peuples. Avec un linguiste mondial estimant que près de 40% des langues dans le monde sont menacées, la revitalisation des langues est devenue une question de préservation culturelle ainsi que de développement durable. Cet article analyse le croisement entre la revitalisation des langues et les objectifs de développement durable (ODD) des Nations Unies, en se concentrant sur la façon dont le multilinguisme agit comme un atout pour la durabilité environnementale, l'inclusion sociale et le développement économique. Au moyen d'une étude de cas de la région de Papouasie-Nouvelle-Guinée et de divers autres exemples, le document explique comment les langues autochtones comprennent la prévoyance écologique traditionnelle et la durabilité des pratiques de biodiversité qui sont en péril. En outre, le document illustre l'impact sociopolitique de la revitalisation des langues dans les économies du tourisme culturel et linguistique en échange de la justice sociale et de l'autonomisation des sociétés opprimées. Ce document reconnaît l'aide politique qui soutient la mondialisation et la servitude. Pourtant, il y a une ouverture pour le changement global à travers des mouvements de base et des collaborations internationales. En fin de compte, la préservation des langues menacées va au-delà du domaine culturel.

### Introduction

**« Les langues sont la clé du patrimoine culturel, et la préservation de la diversité linguistique est essentielle pour parvenir à un développement durable. »**

Adapté de la position de l'UNESCO sur la diversité linguistique.

Les langues sont les piliers de l'identité culturelle et font partie du patrimoine humain. Au-delà du but de la communication, les langues incarnent l'histoire, les traditions et la sagesse écologique des communautés qui les parlent. Tragiquement, de nombreuses langues autochtones et minoritaires sont menacées d'extinction en raison de l'assimilation culturelle, de la mondialisation et de la domination croissante de quelques langues mondiales comme l'anglais, l'espagnol et le mandarin. L'UNESCO (Organisation des Nations Unies pour l'éducation, la science et la culture) affirme qu'environ 40 % des langues du monde sont menacées, une langue étant perdue tous les quinze jours. Cette situation appelle une action urgente pour revitaliser les langues en voie de disparition, non seulement pour la préservation des cultures mais aussi pour accélérer les chances de succès du développement durable.

D'autre part, le développement durable, tel que prévu par les Objectifs de développement durable (ODD) des Nations Unies, est la conservation de l'environnement, l'inclusion sociale et la résilience économique. La conservation de l'environnement implique la protection de la biodiversité, l'atténuation des changements climatiques et l'utilisation durable des ressources naturelles. L'inclusion sociale implique la réduction des inégalités, la promotion des droits de la personne et un accès équitable à l'éducation, aux soins de santé et aux possibilités. De plus, la résilience économique a pour but de générer une croissance durable, de diminuer la pauvreté et de garantir la stabilité des économies pour le bénéfice de tous. Le quatrième aspect ou l'identité culturelle est également important car il soutient les piliers en conservant

la pratique, la langue et le système de connaissances autochtones essentiels à une pratique durable. À ce titre, un parcours équilibré et inclusif vers le bien-être mondial est atteint par tous ces aspects.

La revitalisation des langues touche à tous ces objectifs en termes de conservation du savoir écologique autochtone, d'inclusion dans l'éducation et de promotion des communautés marginalisées. En outre, la revitalisation des langues est étroitement liée à la réalisation des objectifs de développement durable (ODD) des Nations Unies. Puisque la préservation de la diversité linguistique mène à l'inclusivité, la revitalisation des langues cible la plupart des ODD, qui comprennent l'éducation de qualité (ODD 4), la réduction des inégalités (ODD 10), l'action pour le climat (ODD 13) et les villes et communautés durables (ODD 11). Cet article traite de la relation entre la revitalisation des langues et le développement durable, en explorant comment la diversité linguistique favorise l'amélioration de la durabilité environnementale, sociale et économique. l'impact de l'éducation en langue maternelle, l'autonomisation des communautés marginalisées, le potentiel économique des industries culturelles et les défis et opportunités dans les efforts de revitalisation linguistique.

À travers des études de cas et des stratégies globales, l'article explique pourquoi la préservation des langues menacées est nécessaire pour construire un avenir durable et inclusif.

### **La langue comme patrimoine culturel et système de connaissances**

Le langage est un dépôt de connaissances collectives qui façonne la façon dont les communautés perçoivent et interagissent avec leur environnement. Pour les peuples autochtones, la langue est intimement liée aux traditions, aux rituels et aux pratiques écologiques qui représentent l'expérience accumulée au fil des siècles et toute la sagesse des expériences vécues. La langue est aussi un véhicule pour les expressions immatérielles de la culture par le biais du folklore, des histoires orales, des chansons et des rituels. Ces composantes de la culture ne peuvent souvent pas

être racontées en dehors de la langue dans laquelle elles sont rapportées. Lorsque la langue disparaît, les expressions culturelles qui seront perdues ou très modifiées le sont aussi. Ces langues contiennent des terminologies uniques, des histoires orales et des métaphores qui reflètent leur lien profond avec l'environnement naturel.

Par exemple, les Samis d'Europe du Nord ont plus de 300 termes pour désigner la neige, chacun décrivant des caractéristiques spécifiques cruciales pour la navigation dans leur environnement arctique (Berkes et Armitage, 2011). De même, les Kayapos du Brésil utilisent leur langue pour répertorier les utilisations médicinales extensives des plantes de la forêt tropicale, dont beaucoup sont inconnues de la science aujourd'hui (Posey, 1985). La section suivante cherche à approfondir le lien entre le langage et l'environnement.

### **Le langage et l'environnement : une relation symbiotique**

Il va de soi que la langue et l'environnement sont intimement liés puisque par le langage on communique et, en tant que tel, maintient vivantes les connaissances sur l'environnement. Ce phénomène est appelé diversité bioculturelle, c'est-à-dire la relation entre la diversité biologique, culturelle et linguistique. C'est la façon dont les cultures et les langues humaines sont enracinées dans la biodiversité de leurs environnements. Les cultures et les langues se façonnent et sont façonnées par les écosystèmes au fil du temps. Ce concept souligne le fait que les pratiques culturelles, les connaissances traditionnelles et les expressions linguistiques émergent souvent en réponse à des contextes écologiques spécifiques, et ces éléments contribuent ensemble à la résilience et à la durabilité des systèmes humains et naturels. Les langues autochtones codifient souvent des pratiques durables qui ont été affinées au fil des siècles et sont donc cruciales pour la conservation de l'environnement (Maffi, 2001). Les connaissances écologiques traditionnelles (CCEE) sont le savoir et les pratiques accumulés

par les communautés autochtones concernant leur environnement naturel. Les connaissances ici sont transmises oralement par le biais du langage, y compris des questions telles que la production alimentaire grâce à l'agriculture durable, la gestion de l'eau et la préservation de la biodiversité.

Par exemple, les Maasai sont considérés comme l'une des tribus les plus connues qui vivent traditionnellement en Afrique de l'Est, principalement au Kenya et en Tanzanie, avec des formes de subsistance pastorales pratiquées depuis des siècles pour soutenir leurs écosystèmes vivants et les prairies. L'une des pierres angulaires de leur gestion des terres est le pâturage par rotation, une pratique profondément enracinée dans leurs traditions linguistiques et leurs systèmes de connaissances orales. Il y a des termes spécifiques dans le maasai qui décrivent les modèles de pâturage, les mouvements du troupeau et la qualité de l'herbe, ce qui montre une compréhension sophistiquée des écosystèmes locaux. De plus, la connaissance des changements saisonniers, des cycles de sécheresse et des ressources en eau, souvent codées dans leur langue, aide les Maasai à optimiser leurs horaires de pâturage. Ces pratiques durables ont été identifiées comme des techniques efficaces contre la désertification et la biodiversité dans les savanes (Niamir-Fuller, 1999).

De même, dans les hautes terres andines, les communautés quechuas ont perfectionné la technique de production du "chuño", des pommes de terre lyophilisées destinées à un stockage durable. Il s'est développé génération après génération pour comprendre l'environnement de haute altitude.

Le processus consiste à exposer les pommes de terre récoltées aux températures glaciales de la nuit, puis à les soumettre au soleil intense pendant la journée. Ce processus est répété pendant plusieurs jours, après quoi les pommes de terre sont piétinées pour éliminer l'excès d'eau et laissées à sécher complètement. Voici une étude de cas détaillée qui met davantage en

évidence le lien entre la langue et l'environnement.

### **Étude de cas – Papouasie-Nouvelle-Guinée**

Plus de huit cents langues différentes sont parlées en Papouasie-Nouvelle-Guinée (PNG); c'est l'un des endroits les plus diversifiés linguistiquement dans le monde. Cela est en grande partie lié à la vaste biodiversité du pays, car il existe de nombreux cas où les langues autochtones codent des connaissances écologiques détaillées spécifiques aux environnements locaux. À travers la Papouasie-Nouvelle-Guinée, les communautés utilisent leur langue pour documenter les espèces locales, les connaissances écologiques traditionnelles et les pratiques de gestion durable des ressources, principalement dans les secteurs de la pêche et de l'agriculture (Maafi, 2005).

#### **1. Enregistrement des espèces indigènes**

Au fil du temps, les langues de la Papouasie-Nouvelle-Guinée ont développé des vocabulaires spécifiques pour décrire les écosystèmes locaux. L'utilisation de termes faisant référence à des espèces telles que les poissons et les plantes, ainsi qu'à leurs habitats et comportements respectifs ou à leur place dans le système en témoigne. Cette richesse de connaissances, dans la plupart des cas transmises oralement, aide les communautés à réaliser des espèces qui favorisent la sécurité alimentaire et l'équilibre écologique selon Bown (2011). En outre, des recherches ont indiqué que les connaissances écologiques traditionnelles transmises par le biais du langage transmettent des indicateurs tels que la richesse des espèces et l'état de santé. Par exemple, certains noms de poissons spécifiques impliquent un comportement de frai et une disponibilité saisonnière tels que des pratiques de pêche durables sont utilisées (National Research Institute of Papua New Guinea, 2010).

#### **2. Pratiques de pêche durables:**

Il ressort clairement de la sous-section ci-dessus que les systèmes traditionnels de pêche appliqués en PNG mettent l'accent sur la durabilité. Un exemple est illustré ci-dessous :

- Zones de protection marine : La plupart des communautés mettent de côté les zones "tabous" où la pêche est interdite pendant un certain temps pour donner aux poissons une chance de reconstituer leur population. Celles-ci sont fondées sur les normes culturelles et l'usage du langage dans la définition de l'intendance écologique (Johannes, 2002).

- Pratiques propres aux espèces : Les langues autochtones décrivent le poisson à différents stades de son cycle de vie. De cette façon, les juvéniles ne sont pas ciblés pour la récolte, ce qui permet de maintenir la population (Novaczek, Mitchell, & Veitayaki, 2005).

Ces pratiques assurent non seulement une utilisation durable des ressources marines, mais préservent également l'identité culturelle en renforçant le lien entre la langue, la tradition et l'environnement.

### **3. Menaces et efforts de préservation**

Malgré la résilience des systèmes traditionnels, la mondialisation et la dégradation de l'environnement menacent à la fois la biodiversité et les langues autochtones qui soutiennent le savoir écologique. Les efforts visant à documenter et à revitaliser ces langues, par exemple au moyen de recherches participatives et de programmes de conservation dirigés par la collectivité, sont essentiels pour maintenir ce patrimoine bioculturel (Maffi, 2005; Johannes, 2002).

#### **Le langage comme moteur de la croissance économique et du tourisme**

La revitalisation des langues en voie de disparition peut ouvrir la voie à des investissements économiques, notamment dans les domaines du tourisme, des industries culturelles et des activités de développement durable.

- Tourisme culturel Le tourisme culturel est un autre domaine où la préservation des langues et des traditions autochtones est nécessaire à la croissance économique. Par exemple, la revitalisation de la langue māori aide

à attirer les touristes qui voudront faire l'expérience de la culture maorie, comme des spectacles haka et des visites guidées de Te Reo Māori. Initiatives favorisant l'emploi, la fierté culturelle et le développement durable.

- Industries linguistiques : La revitalisation des langues favorise également la résilience économique en créant des possibilités dans l'enseignement des langues, la traduction et la production médiatique. Les communautés autochtones ont lancé des stations de radio, des émissions de télévision et du contenu en ligne dans leur langue maternelle, générant ainsi des revenus tout en préservant le patrimoine culturel.

#### **Le langage comme outil d'équité sociale et de responsabilisation**

La langue est un outil puissant pour l'inclusion sociale et l'autonomisation. La revitalisation des langues en voie de disparition contribue à lutter contre la marginalisation historique des peuples autochtones, leur donnant une voix plus forte dans les processus sociaux, politiques et économiques.

- Les langues autochtones dans l'arène politique : la reconnaissance officielle par la Bolivie de 36 langues autochtones a permis aux peuples autochtones d'être représentés et impliqués dans le gouvernement et l'élaboration des politiques. Cette inclusion linguistique est devenue un moyen important d'éliminer les inégalités et de promouvoir l'intégration sociale (Hornberger, 2009). En Afrique du Sud, l'établissement de onze langues officielles a engendré le multiculturalisme et permis de surmonter les inégalités linguistiques de l'apartheid (Alexander, 2000).

- Revitalisation de la langue et des sexes : La revitalisation de la langue est également liée à l'équité entre les sexes. Dans de nombreuses communautés autochtones, les femmes sont les principales transmettrices des connaissances linguistiques et culturelles. L'autonomisation des femmes par le biais de programmes linguistiques renforce non seulement les efforts de

revitalisation, mais favorise également l'égalité entre les sexes. Par exemple, au Canada, les femmes autochtones ont pris l'initiative d'enseigner des langues en voie de disparition comme le cri et le mohawk, créant ainsi des possibilités d'apprentissage intergénérationnel (First Peoples' Cultural Council, 2014).

- **Language Revitalization**

La revitalisation des langues contribue à raviver la fierté culturelle au sein des communautés marginalisées.

À Hawaï, par exemple, la renaissance de la langue hawaïenne, 'Ōlelo Hawai'i, a suivi le rythme des activités telles que la danse hula traditionnelle, l'agriculture de taro et la navigation céleste pour naviguer sur les îles.

Ces pratiques ne sont pas seulement des expressions culturelles, mais aussi des pratiques durables enracinées dans la gestion environnementale (Wilson et Kamanā, 2001; UNESCO, 2016).

La préservation des langues en voie de disparition assure le maintien du patrimoine culturel, favorisant un sentiment d'appartenance et d'identité. En outre, il rassemble les gens pour préserver leur patrimoine linguistique et contribuer à la cohésion sociale. Des organisations internationales, comme l'UNESCO et le WWF (Fonds mondial pour la nature), travaillent en collaboration avec les communautés autochtones afin d'inclure les CET dans le plan de conservation mondial.

En revitalisant les langues menacées, ces initiatives visent à préserver la sagesse écologique qui y est ancrée et qui favorisera une gestion durable de l'environnement.

### **Éducation Revitalisation des langues**

L'éducation est un moteur fondamental du développement durable, et la langue joue un rôle crucial dans le façonnement des résultats scolaires. Pour de nombreuses communautés autochtones, l'accès à l'éducation dans leur langue maternelle est nécessaire pour favoriser la réussite scolaire et la continuité culturelle.

- L'enseignement des langues autochtones est établi de façon concluante par la recherche, car les enfants apprennent mieux s'ils sont

enseignés dans leur langue maternelle, en particulier pendant la scolarité précoce. L'enseignement dans la langue maternelle améliore l'alphabétisation, le développement cognitif et l'estime de soi; les taux d'abandon scolaire sont minimisés. Dans les sociétés multilingues, les programmes d'éducation bilingue se révèlent réalisables tant en termes de préservation culturelle que d'objectifs académiques plus larges. Par exemple, au Guatemala, des programmes d'éducation bilingues ont été mis en place dans les langues mayas comme le K'iche' et le Q'eqchi, ce qui améliore considérablement les résultats scolaires chez les élèves autochtones (Benson, 2004). De même, au pays de Galles, l'intégration du gallois dans le programme d'études a revitalisé la langue tout en favorisant les résultats scolaires (Jones & Morris, 2007).

- **La technologie dans l'apprentissage des langues** : La technologie a changé la dynamique de la revitalisation du langage. Grâce aux applications mobiles, aux cours en ligne et aux salles de classe virtuelles, les apprenants peuvent accéder à des langues menacées, même dans des régions difficiles d'accès. Des sites comme Duolingo proposent des cours de hawaïen, de navajo et de gaélique écossais entre autres aux apprenants du monde entier (Lewis, Simons, & Fennig, 2015; Duolingo, 2023).

### **Les défis et Les Opportunités**

La revitalisation des langues a gagné beaucoup de terrain malgré ces défis de sous-financement, le manque de volonté politique et la suprématie des langues mondiales. Cependant, les défis eux-mêmes sont aussi une source d'opportunités pour l'innovation et la collaboration. L'un des principaux facteurs de revitalisation des langues sont les mouvements populaires; un exemple serait l'Alaska, où la revitalisation du tlingit a été menée par des ateliers communautaires, des événements de narration et des ressources numériques. Il y a l'UNESCO et le Projet sur les

langues en voie de disparition pour les organisations internationales qui offrent une exposition interculturelle et la disponibilité des ressources, amplifiant les voix des communautés autochtones ainsi que des contributions techniques et financières essentielles. Ces efforts, conjugués à l'esprit communautaire et aux coopérations mondiales, ont un énorme potentiel de transformation en ce qui concerne l'initiative de préservation et de revitalisation des langues.

### Conclusion

En conclusion, la revitalisation des langues est une entreprise vitale qui va au-delà de la préservation des mots et qui se plonge dans le cœur de l'identité culturelle, des connaissances traditionnelles et du développement durable. Les langues autochtones englobent des siècles de sagesse écologique, de pratiques sociales et de stratégies de survie, ce qui rend leur préservation cruciale non seulement pour la diversité culturelle mais aussi pour relever les défis mondiaux tels que le changement climatique et l'inégalité sociale. Bien que les défis, tels que le financement, le manque de soutien politique et la domination des langues mondiales soient encore évidents, ils donnent également de la place à la créativité, aux initiatives locales et aux collaborations au niveau international.

Les ateliers et autres outils numériques utilisés dans le cadre de la revitalisation des langues sont quelques-uns des éléments qui démontrent la force du leadership local. Des organisations telles que l'UNESCO et le projet sur les langues en voie de disparition illustrent la puissance des collaborations mondiales pour faire entendre la voix des peuples autochtones et leur fournir les ressources dont ils ont tant besoin. En favorisant l'inclusion linguistique et en favorisant l'intégration des connaissances traditionnelles dans les cadres modernes, la revitalisation des langues peut ouvrir la voie à des sociétés plus équitables, durables et culturellement riches. La préservation des langues n'est pas seulement un impératif culturel, c'est une nécessité mondiale.

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## Revitaliser La Langue Française Une Perspective Large

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### Résumé

La langue française, historiquement reconnue pour sa richesse culturelle et son prestige littéraire, fait face à des défis majeurs à l'ère de la mondialisation, des avancées technologiques et de la domination de l'anglais en tant que lingua franca mondiale. Cet article examine l'évolution historique du français, son déclin actuel ainsi que les facteurs contribuant à la diminution de son influence. Les principaux défis identifiés incluent le manque d'intérêt, une promotion insuffisante et la préférence croissante pour l'anglais dans l'éducation, les affaires et la communication numérique. De plus, diverses initiatives de revitalisation sont explorées, telles que les programmes d'immersion linguistique, les recherches académiques, l'enseignement précoce, la documentation linguistique, les collaborations internationales, les festivals culturels et les politiques gouvernementales. Des études de cas, notamment au Québec et au Canada, illustrent des efforts réussis de préservation linguistique. L'article conclut que la revitalisation du français ne concerne pas seulement la conservation d'une langue, mais aussi la préservation de son identité culturelle dans un monde en pleine évolution. Grâce à des actions stratégiques et continues, la langue française peut conserver sa pertinence et son influence pour les générations futures.

**Mots-clés:** Langue française, mondialisation, déclin linguistique, identité linguistique, préservation linguistique, patrimoine culturel, multilinguisme, revitalisation linguistique, politique linguistique, éducation bilingue.

### Introduction:

*“Le génie de la langue française, issue d'uneseulesouchelatine, a triomphé le plus souvent dans le sens contraire - dans la simplicité, l'unité, la clarté et la retenue.”*

**-LYTTON STRACHEY**

Le français n'est pas seulement une langue, mais un symbole de culture, d'amour et d'émotions. Demandez à n'importe quel Français de naissance quelle est l'importance de la langue pour lui et il vous répondra instantanément qu'elle est le symbole de sa culture et de son éthique. Depuis des siècles, la langue française est un objet de fierté nationale pour le peuple français. On estime que le français compte environ 310 millions de locuteurs et qu'il est une langue officielle dans plus de 27 pays à travers le monde. Cependant, aujourd'hui, à l'ère de la mondialisation, de la modernisation et de la libéralisation, la sécurité linguistique est devenue un élément essentiel de la sécurité culturelle et de la sécurité de l'information au niveau national. Bien que la langue soit considérée comme le principal moyen de communication, il ne fait aucun doute qu'elle joue un rôle important dans les aspects culturels clés et l'identité d'une région géographique. Cependant, l'intensification de la mondialisation a conduit à l'utilisation prépondérante de l'anglais comme lingua franca mondiale dans des domaines tels que la technologie, l'économie et l'éducation, ce qui a considérablement modifié les pratiques linguistiques des nations du monde entier, y compris la France. La prédominance de la langue anglaise a suscité des craintes dans la province française, car la plupart des

jeunes ont désormais très désireux d'acquiescer des connaissances en anglais pour s'adapter à l'ère numérique d'aujourd'hui. C'est cette crainte qui a incité le gouvernement et de nombreux amoureux de la langue française à se pencher sur la question et à élaborer divers plans et stratégies pour maintenir et ramener leur langue dans leur domaine culturel, revitalisant ainsi leur identité dans l'environnement mondial d'aujourd'hui.

### **Français- Bref Historique:**

*“Le français est la langue qui transforme la saleté en romance.”*

#### **Stephen King**

La langue française, très largement désignée comme le « langage de l'amour », a une histoire riche qui remonte à plusieurs siècles et s'étend également au-delà des territoires de la France.

Les racines de la langue remontent à l'Empire romain qui a été introduit en Gaule (France moderne) par les conquérants et les colons romains à partir du 1er siècle avant JC. Nul doute que l'évolution de la langue est une histoire de guerre, de conquête et d'influence. Au fil des siècles, cette langue a évolué en vieux français, en moyen français et maintenant qui est connu comme le français moderne. Un autre moment crucial qui reste encore dans l'histoire est la conquête normande de l'Angleterre en 1066 qui a clairement marqué un autre moment vital dans l'histoire de la langue française. Après la victoire de Guillaume le Conquérant à la bataille d'Hastings, le français normand devient la langue de l'élite dirigeante en Angleterre, aux côtés du latin.<sup>1</sup>

Le Moyen-âge voit une nette montée en puissance de la langue française, qui se hisse au rang des langues les plus prestigieuses dans le

domaine littéraire et diplomatique. Sans doute, la France a vu un grand nombre de prix Nobel de littérature à tout moment. L'émergence de la cour royale à Paris qui fut le centre du pouvoir culturel et politique au cours du Moyen Âge normalisa et promut la langue comme une identité particulière de leur terre. C'est à cette époque que des œuvres littéraires de premier plan, comme les “Chansons de geste” (poèmes épiques) et la tradition troubadour du sud de la France, ont largement contribué au développement des formes poétiques et des styles narratifs en langue française. En bref, l'histoire de cette langue est un témoignage complet de son évolution dynamique. Le XVIIe siècle a vu l'émergence de la France moderne et, en 1635, l'Académie française a été fondée par le cardinal de Richelieu pour protéger la langue et la littérature.<sup>2</sup>

#### **Scénario Actuel:**

*“En français, il y a un grand fossé entre la prose et la poésie ; en anglais, il n'y a guère de différence.”*

#### **Victor Hugo**

Selon le classement 2024, la langue française occupe la 5e place parmi les langues les plus parlées au niveau mondial. Dans l'ère actuelle largement marquée par la mondialisation, l'usage de l'anglais comme langue principale de communication comme lingua franca globale a en fait modifié les pratiques linguistiques de nombreuses nations, dont la France. De nombreuses personnes dans le monde considèrent que le français est la langue la plus difficile à communiquer et à comprendre lorsqu'elle est parlée par d'autres. Ils préfèrent généralement l'anglais comme langue de choix en raison de sa facilité de

<sup>1</sup><https://edzym.com/blog/french-language/> Pg 2 de 10

<sup>2</sup><https://timesofindia.indiatimes.com/world/europe/french-language-day-on-march-20-theme-significance-and-how-to-celebrate/articleshow/108634768.cms> Pg 3 de 10

communication, ce qui explique pourquoi il se classe numéro un. Cet état d'esprit conduit les individus à perdre l'intérêt pour le désir d'apprendre la langue française. Le principal facteur attribué à l'érosion de la langue peut être identifié comme suit:

➤ **Manque d'intérêt pour la langue:**

L'apprenant n'a pas pu comprendre le français parce qu'il ne comprenait aucun mot français, car c'était assez difficile pour lui. De plus, ils ne savaient pas quels mots français utiliser pour exprimer leurs pensées dans ce contexte, ce qui a mené à des moments d'hésitation.

➤ **Promotion insuffisante:**

Dans certains pays, on ne fait aucun effort pour promouvoir la langue française au sein des établissements d'enseignement.

Certains jeunes apprenants expriment le désir d'étudier la langue française, mais les autorités supérieures des établissements estiment que ce sera un défi et qu'il faudra beaucoup de temps aux étudiants pour maîtriser la langue.

➤ **La croissance de la langue anglaise:**

Le déclin de la langue française peut être lié à diverses raisons, notamment l'utilisation généralisée de l'anglais dans les affaires mondiales, l'éducation et le contenu en ligne.

De plus, la mondialisation favorise les migrations, ce qui peut entraîner un affaiblissement de l'identité linguistique à mesure que les individus et les communautés francophones s'adaptent aux environnements principalement anglophones. L'impact mondial des États-Unis et du Royaume-Uni dans des domaines tels que la politique, l'économie et la culture, l'importance de l'anglais dans des domaines comme les sciences, la technologie et l'enseignement supérieur. Le point de

vue selon lequel l'anglais est une langue universelle qui facilite la communication entre les différents locuteurs. Par conséquent, l'acquisition et l'utilisation de l'anglais sont devenues une priorité pour beaucoup, souvent au détriment du français.

**L'impact:**

*“La France ne peut être la France sans la grandeur.”*

**Charles De Gaulle**

La langue française demeure toujours à la racine de l'identité culturelle et de la communauté. Au fur et à mesure que la langue s'érode, ces communautés risquent de perdre une composante importante de leur histoire culturelle. Ce type d'impact est attribué de différentes manières :

- La sous-utilisation de la langue française entraîne une perte d'originalité linguistique et d'héritage culturel.
- Les jeunes générations se détachent de la langue française, perdant l'identité des traditions culturelles.
- La domination mondiale de l'anglais, qui a conduit au déclin de la langue française dans la culture et l'histoire pop.

**Relance Des Initiatives:**

*“La beauté de la langue française, c'est qu'elle est à la fois précisée et nuancée.”*

**Jean-Paul Sartre**

Avec l'avènement de la mondialisation, il est important de comprendre l'impact et le déclin significatif de la langue française qui était autrefois un symbole de statut et d'identité culturelle et la nécessité de prendre diverses mesures pour ramener le charme ancien.

➤ **Programmes d'immersion:**

Les programmes d'immersion sont l'un des meilleurs moyens de garder une langue vivante. Avec l'aide d'un tuteur spécialisé qui a

une compétence dans le sujet aidera à apprendre la langue telle quelle. Beaucoup de techniques de communication, une charge d'activités en groupe serait un moyen efficace de créer l'intérêt parmi les nouveaux apprenants aussi.

➤ **Programmes de recherche:**

La recherche est un des outils de toute méthode d'étude. Une recherche dans le domaine des langues est aussi importante que tout autre domaine de recherche. Une recherche permettrait au chercheur non seulement de comprendre l'histoire, mais aussi d'énumérer les problèmes et de trouver une solution globale au problème. Encourager les étudiants à entreprendre des recherches en linguistique est une autre méthode pour faire revivre la langue dans sa forme originale.

➤ **Programme pour enfants:**

On dit que pour réussir, il est important de commencer tôt. Par conséquent, le programme pour les tout-petits est un moyen efficace de garder une langue vivante. Les débutants apprennent la langue des aînés autochtones sur une base régulière. De plus, concevoir le programme sous forme de chansons avec un attrait visuel plus grand qui attirerait les enfants en bas âge et préparerait ainsi la voie à une revitalisation. Il est également important d'encourager les parents à parler leur langue maternelle à la maison avec le tout-petit, ce qui constitue une autre façon de développer la langue. De plus, les tout-petits ont tendance à saisir très rapidement toute chose qui restera toujours avec eux dans leur subconscient.

➤ **Rôle des linguistes:**

Le rôle des linguistes est très important pour la préservation d'une langue. Les spécialistes des

langues devraient avoir une compréhension approfondie de la langue et leur rôle dans la communauté pour diffuser la langue par le biais d'œuvres littéraires et créatives serait une autre méthode efficace.

➤ **Documentation et dépôts:**

La documentation est aussi essentielle que tout autre outil. Il est important que chaque œuvre littéraire dans la langue maternelle soit documentée et conservée dans des dépôts. Cela permettrait aux générations futures de connaître la valeur de leur langue et le rôle qu'elle joue dans la formation de leur identité culturelle.

➤ **Collaboration internationale:**

Les programmes d'échange entre les étudiants sont un autre moyen de construire la langue. La création de possibilités pour les étudiants d'autres pays serait un moyen efficace de diffuser la langue. Les partenariats entre pays non francophones peuvent contribuer à renforcer les liens et aussi à sensibiliser sur la diversité linguistique.

➤ **Festival culturel et du livre:**

Organiser un festival culturel annuel pour mettre en valeur le patrimoine culturel de la culture française, en encourageant les participants de divers pays à participer au programme, ce qui contribuerait à revitaliser la langue. Organiser des festivals du livre mettant en valeur les meilleures œuvres littéraires d'auteurs français est une autre façon de garder cette merveilleuse langue vivante. Ouvrir les portes aux œuvres littéraires, traduire des livres en français, peindre, jouer de la musique, diriger un festival littéraire annuel est une autre façon de ramener efficacement la gloire de la langue française.

➤ **Possibilités:**

- La création d'opportunités à l'échelle mondiale est un moyen d'attirer les jeunes générations pour apprendre une langue. Avec de larges opportunités ouvertes, il y aurait certainement une saine concurrence à travers le monde pour acquérir des connaissances et la maîtrise de la langue.

➤ **Médias et technologie numérique:**

La technologie offre de nombreuses opportunités dans le monde moderne d'aujourd'hui pour promouvoir une langue. Le développement d'outils linguistiques en français, de cours créatifs en ligne, de plateformes de médias sociaux, etc., offrent de nombreuses méthodes pour influencer les gens à apprendre une langue. Le développement d'applications linguistiques en français contribuerait certainement à combler le fossé entre la langue et la technologie. Des applications comme Duolingo, TV5 Monde etc., se révèlent être une méthode facile pour favoriser la langue française. L'intelligence artificielle est aussi une aubaine pour améliorer l'utilisation des langues à l'ère numérique.

➤ **Politiques gouvernementales**

Les gouvernements, les institutions et les organisations internationales ont un rôle clé à jouer dans la revitalisation de la langue. Il faut élaborer diverses politiques et prendre les mesures appropriées pour positionner leur langue dans leur domaine culturel afin de raviver leur identité. La promotion de l'éducation bilingue dans les écoles du monde entier est une mesure que le gouvernement a prise. Par exemple, la "loi de Toulouse" entre autres cadres juridiques reconnaît non seulement le statut juridique de ces langues mais délimite également clairement les obligations du gouvernement en matière de

protection et de promotion de la diversité linguistique. La "loi de Toulouse", promulguée en 2014, vise spécifiquement à protéger et promouvoir les langues locales et minoritaires. En vertu de cette loi, ces langues sont reconnues comme équivalentes au français par la loi et le gouvernement est chargé de les sauvegarder et de les promouvoir.<sup>3</sup>

**ETUDES DE CAS:**

Dans le but de revitaliser la langue française, la province du Québec et le Canada ont pris des mesures sous forme d'élaboration de politiques. Des lois comme la Loi 101 ou la Charte de la langue française<sup>4</sup> ont été adoptées pour assurer la survie de la langue française dans cette ère de mondialisation.

Au-delà, elle est également en passe de devenir la langue principale de l'éducation, du travail et de la vie publique.

**Nids de langues<sup>5</sup>:** Ce programme s'adresse aux tout-petits. Les tout-petits et les débutants sont laissés avec des aînés qui maîtrisent le dialecte autochtone et les enfants ont appris la langue maternelle des aînés par des chansons et des pièces de théâtre culturellement pertinentes. Le modèle de nid linguistique a réussi à migrer dans le monde entier en très peu de temps.

**Conclusion:**

La langue est considérée comme un droit fondamental et comme la clé de voûte d'une identité culturelle. Bien que la revitalisation d'une langue ne soit pas aussi facile qu'il n'y paraît, elle est pourtant nécessaire en cette heure cruciale où le monde entier reste interconnecté avec la domination de l'anglais. Cette domination représente un défi important pour la survie de la langue française. Entreprendre des mesures de

<sup>3</sup><https://risingnepaldaily.com/news/40385> Pg 9 de 10

<sup>4</sup><https://shs.hal.science/halshs-00826047/PDF/>

<sup>5</sup><https://www.sapiens.org/language/language-revitalization/> Pg 10 de 10

revitalisation ne consiste pas à préserver la langue, mais plutôt à préserver son identité culturelle. Grâce à des efforts continus et collaboratifs, il est possible de faire en sorte que le français continue à se glorifier aujourd'hui et pour toujours.

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## Socio-economic Conditions and Problems of Labour Workforce Participation in MSMEs

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### Abstract

This study explores the socio-economic conditions and challenges faced by labourers in MSMEs are important for the economy but can cause people to live under challenging circumstances. The research aims of the study were to analyze the socio-economic conditions of workers, examine factors influencing labour participation, and assess the challenges faced. A survey of 95 workers was conducted, with data analyzed through correlation and multiple regression methods. The findings revealed that low wages, job insecurity, and poor working conditions were the most pressing challenges, significantly affecting labour participation and productivity. The study further identified the critical factors influencing workforce participation, including wage disparity and job stability. In conclusion, addressing issues such as fair wages, job security, better working conditions, and opportunities for skill development could lead to enhanced workforce satisfaction and greater productivity in MSMEs, eventually helping the industry to be sustainable and expandable.

**Keywords:** MSMEs, Labour Workforce, Socio-economic Conditions, Challenges, Job Insecurity.

### Introduction:

The role of MSMEs in national economic development is particularly important in developing nations like India. These businesses are the foundation of industrial and economic growth, creating jobs, reducing poverty, and ensuring economic stability. In India, MSMEs account for around 30% of GDP and more than

45% of total exports, according to the Ministry of MSME (Ministry of MSME, 2021). Despite their importance, the labour workforce participation in MSMEs faces numerous socio-economic challenges that significantly affect the overall productivity and growth of these enterprises. The socio-economic conditions of workers in MSMEs are varied, often characterized by low wages, irregular working hours, lack of social security benefits, and limited opportunities for skill development and career progression (Sharma & Kumar, 2020). These conditions are further exacerbated by the informal nature of many MSMEs, where labour laws are either poorly enforced or entirely absent. Labour force participation in these sectors is influenced by dimensions of education, age, gender, caste, family income & the availability of alternative employment opportunities (Deshpande & Vaidyanathan, 2018). Additionally, MSMEs often operate in labour-intensive industries with precarious working conditions, making workers more vulnerable to exploitation, unsafe working environments, and social inequities (Gupta & Soni, 2019). The research problem addressed in this study revolves around understanding the socio-economic conditions that influence labour workforce participation in MSMEs, with particular emphasis on the challenges faced by workers. A thorough investigation of these aspects will give significant insights into the workforce dynamics inside MSMEs and aid to the creation of policies that improve labour conditions and promote productivity. The study seeks to analyze and assess the working

conditions, socio-economic factors, and key barriers to workforce participation in MSMEs, thereby offering a comprehensive understanding of the underlying problems in this critical sector (Chatterjee & Saha, 2018). The significance of this study lies in its ability to highlight the challenges faced by workers in MSMEs, which is an area often overlooked in traditional economic research. This study will help policymakers, MSME owners and labour organisations improve working conditions and boost worker participation by focusing on the socio-economic aspects that influence it (Ali & Khan, 2019). Furthermore, understanding these socio-economic barriers can guide the creation of interventions that foster inclusive growth, enhance productivity, and align with national development goals such as those outlined in the Sustainable Development Goals (SDGs) and India's Vision 2047 (Rao & Reddy, 2021). This literature survey of this field is enriched on MSMEs and labour workforce participation by examining primary data from 95 workers employed in various MSMEs. Through this empirical analysis, the study will not only document the challenges workers face but also explore potential solutions to improve their socio-economic conditions (Prakash & Tiwari, 2020). This study will help us understand how socio-economic variables affect workforce engagement and the overall performance of MSMEs more nuanced by focussing on the experiences of the working force in these businesses (Sharma & Kaur, 2019). Within this framework, the research aims to analyse the socio-economic situations of 95 workers in MSMEs, evaluate the obstacles encountered by labourers in MSMEs, and determine the socio-economic variables that influence labour workforce participation in MSMEs.

### **Review of Literature**

The socio-economic conditions and challenges faced by the labour workforce in MSMEs and

their importance to economic growth, especially in developing nations like India, has prompted a great deal of research on these businesses. Deshpande & Vaidyanathan (2018) note that despite the significant role of MSMEs to India's GDP, labour participation is hindered by socio-economic disparities such as caste, gender, and education. Sharma & Kumar (2020) argue that low wages and lack of social benefits in MSMEs discourage workforce participation, a sentiment echoed by Gupta & Soni (2019), who suggest that informal labour markets and poor working conditions exacerbate these issues. Workers' lack of skills and inadequate access to training programs, as highlighted by Jain & Kaur (2020), further limit participation in MSMEs. Moreover, Chatterjee & Saha (2018) discuss labour rights violations within MSMEs due to poor enforcement of labour laws, which leads to exploitation. Studies by Ali & Khan (2019) and Rathi & Nair (2018) emphasize the specific socio-economic challenges faced by workers in rural MSMEs, such as inadequate infrastructure and limited access to social security benefits. Meanwhile, Khanna & Das (2017) focus on the broader socio-economic barriers like low wages, lack of job security, and poor working conditions that prevent full participation in the sector. Further, Sahoo & Mallick (2020) stress the importance of inclusive policies to enhance labour participation, while Prakash & Tiwari (2020) argue that the informal nature of MSMEs creates socio-economic imbalances, especially for marginalized groups. The studies of Patil & Yadav (2020) and Singh & Mishra (2021) show that low wages, unstable work conditions, and lack of benefits prevent MSME workers from realizing their potential. Bhatt & Kapoor (2019) and Rao & Reddy (2021) delve into gender and socio-economic inequalities within MSMEs, noting that women and lower-caste workers are particularly disadvantaged. Furthermore, Ghosh

& Sethi (2021) and Nair & Pillai (2019) examine the role of socio-economic conditions in limiting workforce participation in MSMEs, calling for skill development programs and better labour laws. Gupta (2018) highlights the need for educational reforms to address skill gaps, while Kumar (2017) advocates for better labour laws to protect workers and improve their socio-economic standing. Saini & Malhotra (2020) and Rajput & Singh (2020) conclude that addressing socio-economic inequalities within MSMEs is essential for improving labour market dynamics and increasing workforce participation. Collectively, these studies underscore the importance of improving working conditions, providing social security, and addressing skill development to enhance labour participation in MSMEs.

### Methodology

This study measures the socioeconomic elements and challenges to labour force involvement in MSMEs using quantitative approaches. To compile primary data, we will interview and poll 95 workers from various MSMEs at certain sites in-depth. The study will probe issues like income, education, employment situation and eligibility for benefits. Using statistical techniques like percentage, correlation and regression analysis, data will be examined in order to ascertain how socioeconomic factors influence labour participation and the challenges faced. A multiple regression analysis was done based on the following elements to ascertain the socioeconomic conditions influencing labour workforce participation:

**Dependent Variable:** Workforce Participation (measured by the number of hours worked per week)

**Independent Variables:** Age, Educational Qualification, Income Level, Employment Type, and Working Hours

The regression model is specified as:  $Y$  (Workforce Participation) =  $\beta_0 + \beta_1$  (Age) +  $\beta_2$  (Education) +  $\beta_3$  (Income) +  $\beta_4$  (Employment Type) +  $\beta_5$  (Working Hours) +  $\epsilon$

### Results and Discussion

**Part-1:** To analyze the Socio-economic Conditions of the Workers in MSMEs. The analysis of the socio-economic conditions of workers in Micro, Small, and Medium Enterprises (MSMEs) aims to understand the factors influencing their participation and overall well-being. This section presents the findings based on primary data collected from 95 workers in MSMEs. The socio-economic conditions are analyzed across various parameters, including income, education, employment type, working hours, and access to social benefits. The results provide a comprehensive view of how these conditions impact labour force participation and the overall quality of life of workers.

**Table 1: Socio-economic Conditions of Workers in MSMEs (N=95)**

Parameter	Frequency (N)	Percentage (%)
<b>Age Group</b>		
18-30 years	45	47.37
31-45 years	30	31.58
46-60 years	15	15.79
Above 60 years	5	5.26
<b>Educational Qualification</b>		
No formal education	10	10.53
Primary School	15	15.79
Secondary School	40	42.11
Higher Secondary	20	21.05
Graduate and	10	10.53

above		
<b>Income Level (Monthly)</b>		
Below ₹10,000	30	31.58
₹10,000 - ₹20,000	40	42.11
₹20,001 - ₹30,000	20	21.05
Above ₹30,000	5	5.26
<b>Employment Type</b>		
Permanent	60	63.16
Temporary	30	31.58
Contractual	5	5.26
<b>Working Hours</b>		
6-8 hours	50	52.63
9-12 hours	30	31.58
Above 12 hours	15	15.79
<b>Total</b>	95	100.00

Source: Primary data

The socio-economic analysis of workers in MSMEs reveals several important trends. The age distribution indicates a young labour force, with 47.37% of workers being between 18-30 years old, reflecting a high level of youth employment in the sector. Educationally, the majority of workers (42.11%) have only completed secondary school, highlighting a significant skill gap among the workforce. This suggests that MSMEs may need to invest in skill development programs to improve the

employability of their workers. In terms of income, 42.11% of workers earn between ₹10,000 and ₹20,000 per month, while 31.58% earn below ₹10,000, indicating that the majority of MSME workers earn low wages. These figures suggest that income disparities within the sector could be a barrier to improving workers' socio-economic conditions. Regarding employment type, 63.16% of workers are in permanent positions, while 31.58% are in temporary employment, which could impact job security and long-term socio-economic stability for these workers. The working hours data shows that most workers (52.63%) work 6-8 hours a day, with a notable percentage (31.58%) working 9-12 hours, suggesting long working hours that might affect their overall well-being.

**Part-2:** To Examine the Socio-economic Conditions Influencing Labour Workforce Participation in MSMEs

This section examines the socio-economic conditions influencing labour workforce participation in MSMEs. The dependent variable in this analysis is "Workforce Participation," which is measured by the number of hours worked per week. The independent variables include age, educational qualification, income level, employment type, and working hours. These variables are assessed through correlation and multiple regression analysis to determine their impact on workforce participation. The results aim to provide insights into how socio-economic factors influence the labour market within MSMEs.

The links between the workforce participation and the exogenous variables are found by means of correlation analysis.

**Table-2: Identify the relationships between the socio-economic conditions and workforce participation**

Variable	Workforce Participation	Age	Educational Qualification	Income Level	Employment Type	Working Hours
Workforce Participation	1	0.58**	0.65**	0.42**	0.56**	0.72**
Age	0.58**	1	0.45**	0.30*	0.52**	0.61**
Educational Qualification	0.65**	0.45**	1	0.55**	0.60**	0.68**
Income Level	0.42**	0.30*	0.55**	1	0.40**	0.53**
Employment Type	0.56**	0.52**	0.60**	0.40**	1	0.59**
Working Hours	0.72**	0.61**	0.68**	0.53**	0.59**	1

(Source: Primary data - Note, \*\* - Highlights correlation @ 1% Level & \* - Highlights correlation @ 5% Level)

The correlation evaluation shows major positive relationships between workforce participation and all independent variables (age, educational qualification, income level, employment type, and working hours). The utmost correlation is between working hours and workforce participation ( $r = 0.72, p \leq 0.01$ ), indicating that the more hours a worker is required to work, the more likely they are to participate in the labour force. Age ( $r = 0.58, p \leq 0.01$ ) and educational qualification ( $r = 0.65, p \leq 0.01$ ) also show

strong correlations with workforce participation, suggesting that older and better-educated workers tend to work more hours. Income level ( $r = 0.42, p \leq 0.01$ ) and employment type ( $r = 0.56, p \leq 0.01$ ) also influence participation but to a lesser degree. The effect of socioeconomic circumstances on worker involvement in MSMEs was examined by means of cause and effect analysis.

**Table-3: Estimated Regression Coefficients of impact of socio-economic conditions on workforce participation in MSMEs**

Variable	Coefficient ( $\beta$ )	Standard Error (SE)	t-Statistic	p-value
Constant (Intercept)	2.14	0.95	2.25	0.028
Age	0.08	0.03	2.67	0.009
Educational Qualification	0.12	0.05	2.4	0.017
Income Level	0.1	0.04	2.5	0.015
Employment Type (Permanent)	0.15	0.06	2.5	0.016
Working Hours	0.2	0.05	4	0.000
R	0.852			
R <sup>2</sup>	0.721			
Adjusted R <sup>2</sup>	0.703			
F-Statistic	45.36			0.000

Source: Primary data

The model accounts for 72 percent of the variance in workforce participation based on the detailed analysis using the multiple regression analysis ( $R^2 = 0.72$ ). This model is highly significant, with an F-statistic of 45.36 and a p-value of 0.000. This indicates that the workforce engagement in MSMEs is significantly affected by the socio-economic determinants when taken as a whole. Age has a significant positive coefficient ( $\beta = 0.08$ ,  $p = 0.009$ ), suggesting that older workers are more likely to participate in the workforce, likely due to greater job stability and experience. Educational qualification also positively influences participation ( $\beta = 0.12$ ,  $p = 0.017$ ), with higher education leading to more opportunities for workers to engage in the workforce. Income level ( $\beta = 0.10$ ,  $p = 0.015$ ) indicates that workers earning higher incomes are more likely to participate in the labour force. This could be due to financial stability and the need to maintain or increase earnings. Employment type ( $\beta = 0.15$ ,  $p = 0.016$ ) shows that workers in permanent positions tend to

work more hours and are more likely to stay engaged in the workforce, as job security encourages longer-term participation. Working hours ( $\beta = 0.20$ ,  $p = 0.000$ ) is the strongest predictor of workforce participation. The more hours a worker is expected to work, the more likely they are to engage actively in MSMEs.

**Part-3: To Assess the Challenges Faced by Labourers in MSMEs**

The study evaluates the challenges faced by labourers working in MSMEs. Labourers in this sector often encounter various obstacles that affect their productivity, job satisfaction, and overall well-being. These challenges can range from low wages, lack of job security, limited opportunities for skill development, and inadequate working conditions. This section presents the findings of the survey conducted on 95 workers, focusing on the most significant challenges they face. The results of the survey are analyzed to provide insights into how these challenges impact labour force participation and performance in MSMEs.

**Table 4: Severity of Challenges Faced by Labourers in MSMEs**

Challenges	Frequency		Severity of Challenges Faced by Labourers in MSMEs		
	N	%	Not Severe (%)	Moderately Severe (%)	Severe (%)
<b>Low Wages</b>	58	61.05%	5.26%	33.68%	61.05%
<b>Job Insecurity</b>	52	54.74%	9.47%	36.84%	54.74%
<b>Poor working Conditions</b>	47	49.47%	7.37%	43.16%	49.47%
<b>Lack of Social Security Benefits</b>	41	43.16%	11.58%	45.26%	43.16%
<b>Limited Opportunities for Skill Development</b>	35	36.84%	12.63%	51.58%	36.84%
<b>Long Working Hours</b>	30	31.58%	15.79%	52.63%	31.58%
<b>Lack of Career Growth Opportunities</b>	27	28.42%	16.84%	54.74%	28.42%
<b>Poor Health and Safety Standards</b>	22	23.16%	19.47%	57.89%	23.16%

Source: Primary data

The pivotal challenge persisting the workers in MSMEs is low wages, with 61.05% of respondents considering it a severe issue. Many workers report that the wages they receive are insufficient to meet basic living expenses, which severely affects their financial stability. This challenge is compounded by the lack of wage increments, leading to dissatisfaction and low motivation. Job insecurity ranks as the second most significant challenge, with 54.74% of workers reporting it as severe. This is primarily due to the temporary and informal nature of employment in MSMEs, where workers are often hired on short-term contracts without any guarantee of long-term job stability. The fear of losing their job without prior notice or compensation creates anxiety and reduces their overall productivity. Poor working conditions are also a major concern for workers in MSMEs, with 49.47% considering it a severe issue. Many workers face inadequate infrastructure, lack of ventilation, poor lighting, and insufficient sanitation facilities, which create a challenging and sometimes unsafe work environment. These conditions negatively impact the health and well-being of workers, potentially leading to absenteeism and reduced productivity. Workers in MSMEs are generally not provided with social security benefits like health insurance, pensions, or paid leave. This lack of benefits is perceived as a severe challenge by 43.16% of the respondents. The absence of a social safety net leaves workers vulnerable in case of illness or accidents, affecting their long-term security and wellbeing. Many workers in MSMEs report that there are limited opportunities for skill development within their organizations. Only 36.84% consider it moderately severe, but the long-term impact of not having opportunities for further education and career advancement can lead to stagnation and low morale among workers. This

challenge hampers the potential for personal growth and the overall development of the workforce. Long working hours are reported as a challenge by 31.58% of workers. In many MSMEs, workers are expected to work beyond the standard working hours without adequate compensation or rest. Their emotional and physical well-being is negatively impacted which make them end up being less productive as a result of burnout. Workers in MSMEs report a significant lack of career growth opportunities, with 28.42% considering it a severe issue. There are minimal prospects for promotions or advancements, leading to dissatisfaction and higher employee turnover. Lastly, poor health and safety standards are a concern for 23.16% of workers. While this is less severe compared to other challenges, it remains a significant issue, particularly in manufacturing sectors where workers are exposed to hazardous conditions, machinery, and chemicals.

### **Conclusion**

The analysis of socio-economic factors influencing workforce participation in MSMEs reveals that factors like education level, wage disparity, and job insecurity significantly affect labour force involvement. The correlation and multiple regression analyses demonstrate that job security and wage conditions are key determinants of labour participation. The severity of challenges faced by workers, including low wages, poor working conditions, and lack of career growth, further exacerbate their dissatisfaction, ultimately impacting productivity and retention. The findings underscore the need for addressing wage equity, improving working conditions, and creating opportunities for skill development and career progression within MSMEs. By mitigating these challenges, MSMEs can enhance workforce participation, job satisfaction, and overall productivity, leading to sustainable growth in

the sector. These interventions are crucial for fostering a motivated, secure, and skilled labour force in the MSME sector.

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## National Mission on Oil Palm and Cultivation in India

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### Abstract

India is one of the largest consumers of edible oils, with palm oil playing a significant role in meeting domestic demand. The National Mission on Oil Palm (NMoOP) was launched to enhance domestic palm oil production and reduce reliance on imports. This study examines the growth, challenges, and policy measures related to oil palm cultivation in India. The country's edible oil consumption is heavily dependent on imports, with palm oil accounting for 38% of total consumption. The Indian government has implemented various initiatives, including the National Mission on Edible Oils - Oil Palm (NMEO-OP) to expand oil palm cultivation and improve productivity. States like Andhra Pradesh, Telangana, and Karnataka have demonstrated significant progress in increasing oil palm plantations, but challenges such as high initial investment, long gestation periods, and fluctuating market prices persist. The research highlights the state-wise expansion of oil palm plantations, government support mechanisms, and the economic impact of increasing domestic production. Despite promising growth, infrastructure development, farmer incentives, and sustainable policies remain crucial for achieving self-sufficiency in palm oil production. Addressing these challenges through research, investment, and policy frameworks can lead to a sustainable and profitable oil palm industry in India.

**Keywords:** Oil Palm Cultivation, National Mission on Oil Palm, Edible Oil Imports,

Sustainable Agriculture, Palm Oil Production, Government Policies, NMEO-OP

### Introduction

India is the fourth-largest consumer of edible oil globally, accounting for 10 percent of the world's oilseed production, with an estimated production of 28 lakh tonnes in 2023-24. The share of palm oil in India's total edible oil consumption has increased significantly, rising from 13 percent in 2007 to 38 percent in 2024. Each year, approximately 9 million tonnes of palm oil are imported, costing around Rs. 40,000 crores, which constitutes nearly 56 percent of the country's total edible oil imports. Palm oil is mainly used for domestic food consumption, with refined palm oil being the most widely used type. Consumption patterns, availability, pricing, and import policies have had a significant impact on the economy. Palm oil consumption began to rise in the 1990s and has been predominantly supplied through imports, which accounted for 25 million tonnes of total edible oil imports in 2023-24. The price of palm oil is largely determined by imports from Malaysia and Indonesia. India's contribution to global palm oil production is 3.70 lakh hectares dedicated to palm oil cultivation. This area has grown at an impressive rate of 21 percent annually over the last five years. In 2023, India imported 8.34 million tonnes of palm oil, while the total demand for edible oils in 2023-24 was 25 million tonnes. India continues to rely on imports to meet its domestic demand for edible and palm oils.

**National Mission on Oil Palm and Cultivation in India**

## Literature Review

Research has focused on the economic viability of oil palm farming, the challenges involved, and the technological advancements that have facilitated its growth. Notably, Singh (2008) emphasized that oil palm cultivation, though economically viable, requires substantial initial investments and has a long gestation period. These factors deter many farmers from engaging in oil palm farming. However, with government support and technological advancements, the industry has seen increased interest in recent years.

Abraham (1988) identified the critical factors for successful oil palm cultivation, including adequate rainfall, suitable soil conditions, and biological activity. He recommended several regions in India, including Karnataka, Andhra Pradesh, Kerala, Tamil Nadu, and Maharashtra, as ideal for oil palm cultivation.

The early years of oil palm development in India were marked by trials and pilot projects, particularly in Andhra Pradesh. Prabhakara Rao (1999) noted that small-scale plantations, combined with matching processing facilities, held brighter prospects compared to large-scale plantations. The initial challenges were overcome through better management practices, leading to significantly improved yields by 1993. Sukumar (1999) observed the potential of the Krishna district in Andhra Pradesh, identifying 100,000 hectares as suitable for oil palm cultivation. This region benefitted from various government incentives, although the implementation of the Oil Palm Act presented challenges for the farmers.

Madhusudhana Rao (2008) further highlighted the positive development of the oil palm industry in Andhra Pradesh, noting the establishment of the first oil palm plantation in 1987-88 and the launch of pilot projects by the Department of Biotechnology in the early

1990s. This set the stage for further expansion in the region.

In terms of policy and research, Singh (2009) identified Andhra Pradesh, Karnataka, and Tamil Nadu as the primary states for oil palm cultivation in India. He noted the significant improvements in oil palm production, processing, and utilization within these states. Kalanithi Nesaretnam (2009) emphasized that palm oil would continue to play a crucial role in the global oils and fats market, with increasing consumer acceptance and no significant health risks associated with its consumption.

## Materials and Methods

This research utilizes secondary data collected from government publications, specifically from the Directorate of Economics and Statistics and the Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India. The study focuses on the area, production, and yield of oil palm at the state level in India. The research paper is structured in five sections: the first section introduces and objectives; the second section reviews relevant literature; the third section discusses the methodology and data sources; the fourth section examines the production structure and resource use in India; and the final section provides concluding remarks.

### 4.1. Policies Governing Edible Oilseeds in India

India was a net exporter of oilseeds until the 1960s, after which the country became heavily reliant on edible oil imports. The Indian government responded to this challenge by launching initiatives to improve domestic oilseed production. The National Oilseed Development Project (NODP) in 1984-85 and the Technology Mission on Oilseeds (TMOS) in 1986 were pivotal in revitalizing oilseed cultivation and reducing India's dependence on imports.

**National Mission on Oil Palm and Cultivation in India**

In the 1980s, oilseeds became a part of India's agricultural policy focus. The **National Oilseeds Development Project (NODP)**, launched in 1986, was one of the first major efforts to boost oilseed production. The project provided financial support to oilseed farmers, improved seed varieties, and encouraged the use of modern farming techniques. The policy also aimed at raising the area under oilseeds and improving overall productivity.

The 1991 economic liberalization brought significant changes to India's agricultural policies, including those governing oilseeds. The **Technology Mission on Oilseeds (TMO)** was launched in 1991 as a key intervention in the oilseed sector. This mission aimed to enhance the production and productivity of oilseeds by improving the agricultural practices, promoting the development of better seed varieties, and supporting research and development efforts. In the 2000s, the government began to initiatives was the **National Mission on Edible Oils- Oil Palm (NMEO-OP)**, which was aimed at boosting oil

palm cultivation in India. This was driven by the idea that oil palm could be a high-yielding crop for oil production and would help reduce India's reliance on palm oil imports. By the 2010s, the issue of India's heavy dependence on edible oil imports became more pressing. The country's edible oil imports accounted for more than 60 percent of domestic demand. The **National Mission on Edible Oils - Oilseeds (NMEO-Oilseeds)** was introduced in 2021 with the aim to significantly increase the production of oilseeds and reduce dependence on imports. The scheme focused on enhancing the area under oilseed cultivation, improving productivity, and providing financial support for research and development in the oilseed sector. The **National Food Security Mission (NFSM)** has a dedicated component for oilseeds, aiming to increase oilseed production in a sustainable manner. Additionally, the government is incentivizing the cultivation of oil palm, with initiatives to increase oil palm plantations in suitable states.

**Table: 1 State-wise Oil Palm Area Expansion Targets and Achievements (Area in ha)**

State	2014-15		2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Target	Ach.												
Andhra Pradesh	14000	9259	12500	5284	12500	6002	11500	6157	12000	6508	8000	6642	10000	8801
Chhattisgarh	250	250	1500	1500	2500	1288	1500	844	2000	863	460	226	300	159
Goa	0	13	0	9	0	0	20	5	20	2	0	9	0	0
Gujarat	450	281	311	573	451	217	550	428	608	245	600	389	225	166
Karnataka	3100	1911	2000	1151	1600	966	1500	1120	1600	1463	1700	1350	1700	634
Kerala	500	24	100	5	50	9	50	6	50	2	0	8	0	94.02
Odisha	1246	1246	1744	1374	1260	1918	2050	812	1527	629	750	703	700	223
Tamil Nadu	1600	398	1511	623	1500	801	1500	906	1200	741	600	451	450	573
Telangana	2000	972	2000	434	3000	673	2000	1413	1930	870	2400	2133	2500	1823
Total (A)	23146	14354	21666	10953	22861	11874	20670	11691	20935	11323	14510	11911	15875	12473
NE States														
Arunachal Pradesh	0	0	1200	0	1500	750	1215	843	1738	1159	1500	374	2240	1120
Assam	1000	0	560	560	1500	465	1000	814	1914	357	300	0	1200	300
Manipur	0	0	0	0	0	0	0	0	0	0	0	0	200	136
Meghalaya	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mizoram	4000	2789	3361	2981	3000	1669	2400	896	1400	608	500	111	2200	38
Nagaland	0	0	550	140	1200	1032	1000	800	1000	1000	1100	1100	1100	1100
Tripura	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (B)	5000	2789	5671	3681	7200	3916	5615	3353	6052	3124	3400	1585	6940	2693
Total (C)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	28146	17143	27337	14634	30061	15790	26285	15044	26987	14447	17910	13496	22815	15166

Source: National Mission on Edible Oil, Ministry of Agriculture and Farmers Welfare, Government of India.

The Oil Palm Area Expansion program, launched in 2014, aims to bring an additional 182,500 hectares under oil palm cultivation by providing incentives such as income loss compensation, irrigation systems, and intercropping support. Despite some challenges in states like Tamil Nadu and Karnataka, where awareness and interest among farmers have been low, Andhra Pradesh has shown remarkable success, exceeding its targets. The **National Mission on Oil Palm** and its progress in various states during 2014-2015 to 2017-2018 is given in Table 1. The **National Mission on Oil Palm** aims to reduce India's dependency on edible oil imports by promoting oil palm cultivation across various states. **Andhra**

**Pradesh** showed steady growth, achieving 6,157 ha. in 2017-2018, though still below the target. **Chhattisgarh** had modest achievements, especially in 2017-2018, with only 844 ha. planted against the target of 1,500 ha. **Gujarat** achieved a moderate pace, and **Karnataka** consistently surpassed its targets, achieving 1,120 ha. in 2017-2018. **Odisha** also showed positive results, surpassing its target in 2017-2018. **Tamil Nadu** made steady progress, reaching 906 ha. out of the target of 1,500 ha. in 2017-2018. Some states have made notable progress in cultivating oil palm, others have faced difficulties in achieving the targets set under the **National Mission on Oil Palm**.

Table: 2 Production of Oil Palm Fresh Fruit Bunches (FFBs) from 2014-15 to 2020-21 (Prn in Tonnes)

State	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Andhra Pradesh	1007553	1147780	1137398	1427828	1379215	1277760	1471521
Karnataka	12638	14740	11912	12917	13238	12685	15877
Tamil Nadu	6568	7810	7422	6995	7014	3798	3038
Gujarat	409	523	775	996	1053	745	7425
Odisha	3769	4569	4965	6702	6899	7106	0
Goa	2146	3217	2429	2108	2281	1716	1717
Tripura						0	0
Assam	0	0	0	0	0	0	2200
Kerala	40798	40611	34198	30220	30269	27201	27627
Andaman & Nicobar							0
Mizoram	2096	3780	4796	5238	5298	4600	10563
Nagaland							280
Telangana	57873	75447	88119	147516	197632	208826	149488
Chhattisgarh	0	0	18	5	6	279	6
Total	1133850	1298477	1292032	1640525	1642905	1544716	1689743

Source: National Mission on Edible Oil, Ministry of Agriculture and Farmers Welfare, Government of India

Table: 3 Production of Crude Palm Oil during 2014-15 to 2020-21 (Production in Tonnes)

State	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Andhra Pradesh	170478	193562	190999	234696	232938	208359	237900
Karnataka	2176	2538	2051	2224	2280	2184	2734
Tamil Nadu	1019	1222	1115	938	1017	553	429
Gujarat						NA	0
Odisha	557	618	NA	0	0	0	
Goa	388	581	437	379	411	309	305
Tipura							
Assam							
Kerala	6515	7015	5929	5191	4609	4824	4281
Andaman & Nicobar							
Mizoram	365	496	603	648	625	535	
Telangana	10012	12499	8947	27275	37205	38050	26690
Chhattisgarh						NA	
Total	191510	218531	210081	271351	279085	254815	272339

Source: National Mission on Edible Oil, Ministry of Agriculture and Farmers Welfare, Government of India

The progress of oil palm cultivation in India from 2014-2015 to 2020-2021 shows varied growth across states in Table 2. **Andhra Pradesh** experienced significant growth, increasing from 1,007,553 ha. in 2014-15 to 1,471,521 ha. in 2020-21. **Karnataka** saw modest growth, rising from 12,638 ha. to 15,877 ha. during the same period. **Tamil Nadu** showed fluctuations, peaking at 7,810 ha. in 2015-16 but dropping to 3,038 ha. by 2020-21. **Gujarat** showed steady progress, increasing from 409 ha. to 7,425 ha. **Odisha** grew from 3,769 ha. to 6,702 ha. by 2017-18. **Chhattisgarh** had minimal growth, with only 6 ha. by 2020-21.

The total area of oil palm cultivation in India grew from 1,133,850 ha. in 2014-15 to 1,689,743 ha. in 2020-21, with significant growth in **Andhra Pradesh** and **Telangana**. States like **Karnataka** and **Mizoram** also showed positive progress, while **Kerala** and **Tamil Nadu** saw a decline. Some states, such as **Assam** and **Chhattisgarh**, had minimal or no growth. The data reflects the diverse progress and challenges in expanding oil palm cultivation under the National Mission on Oil Palm.

#### 5. Summary and Conclusion

The **National Mission on Oil Palm** aims to reduce India's dependency on edible oil imports by promoting oil palm cultivation across various states. **Andhra Pradesh** showed steady growth, achieving 6,157 ha. in 2017-2018, though still below its target. **Chhattisgarh** had modest progress, with only 844 ha. planted against a target of 1,500 ha. **Karnataka** consistently surpassed its targets, achieving 1,120 ha. in 2017-2018. **Odisha** also performed well, surpassing its target, while **Tamil Nadu** reached 906 ha. out of its 1,500-ha. target.

Despite these efforts, the full potential of 2.8 million ha. has not been realized, and oil palm cultivation in India remains in the early stages. Challenges like infrastructure, farmer

incentives, and market access hinder progress. However, with continued investment and support, oil palm cultivation could become a major contributor to India's edible oil production in the future.

The progress of oil palm cultivation in India from **2014-2015 to 2020-2021** shows varied growth across states. **Andhra Pradesh** saw significant growth, expanding from **1,007,553 ha.** in 2014-15 to **1,471,521 ha.** in 2020-21. **Karnataka** experienced modest growth, increasing from **12,638 ha.** to **15,877 ha.** **Tamil Nadu** fluctuated, peaking at **7,810 ha.** in 2015-16 but dropping to **3,038 ha.** by 2020-21. **Gujarat** showed steady progress, growing from **409 ha.** to **7,425 ha.** **Odisha** increased from **3,769 ha.** to **6,702 ha.** by 2017-18.

The total area of oil palm cultivation in India grew from **1,133,850 ha.** in 2014-15 to **1,689,743 ha.** in 2020-21, with significant contributions from **Andhra Pradesh** and **Telangana**. States like **Karnataka** and **Mizoram** also showed positive progress, while **Kerala** and **Tamil Nadu** saw a decline. Some states, such as **Assam** and **Chhattisgarh**, had minimal or no growth. The data highlights both the progress and challenges faced in expanding oil palm cultivation under the **National Mission on Oil Palm.**

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## **New Education Policy and Economic Growth Contribution in India**

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### **Abstract:**

Education continues to evolve through progressive changes that answer the changing social needs of cultural and economic developments in society. Inclusion and equity remain main goals of the educational system that connects to democratic systems and cultural growth and economic progress. Indian education policy maintained its development through legislation enacted from 1968 into 1986 and 1992 while introducing the latest reform through the New Education Policy (NEP) 2023 that promotes holistic education and digital aptitude and skills training. Educational reform under NEP 2023 involves three main developments including a 5+3+3+4 educational structure design and digital learning incorporation and vocational training support. This paper examines how these reforms affect education while examining technological roles in learning and forecasts future economic growth while it demonstrates how policy and cultural values meet technological innovation to form India's future direction.

### **Keywords:**

New Education Policy, 5+3+3+4 structure, Holistic Learning, Digital Education, Skill Development, Education Reforms, Economic Growth, Inclusivity, Education System in India, National Educational Technology Forum (NETF), Multidisciplinary Education.

### **Introduction**

Changes in learning institutions over time that people wish to implement based on cultural expectation uptake lead to better social progress and equal democratic participation. The representative democratic will and solidarity alongside economic growth drives necessary transformations in the way knowledge is acquired through its related control mechanisms. A strong sustainable economic development serves as the fundamental requirement for building a quality educational system while multiple factors involved in developing equitable education need major financial input from public and private sectors. Education represents a complex quality-based system which produces major impacts on society as well as culture and politics. The qualitative phenomenon of education demonstrates exceptional capability to affect human life within social, cultural, political, economic and scientific domains. Economic science defines education as a mixed commodity which produces social benefits for society when people achieve educated status on various social development measures. Difficult information distribution and creation it offers both private benefit and public benefit qualities which make information distribution and creation difficult. The democratic welfare government focuses on developing teaching infrastructure for everyone but places equal emphasis on providing education of high quality through fair and equal access to everyone. The education system of

India follows distinct patterns compared to global norms since political and social and cultural and economic engagements along with barriers have deeply contributed to social isolation. The government addressed educational inequalities by developing programs that dealt with these established facts in a complete and determined manner. The Indian government together with state governments launched various policy structures and programs to create a robust education system which mainly focuses on educating students with equal access to opportunities. The educational policies from 1968 and 1986 followed by the 1992 policy framework focused on developing fair and just educational approaches for universal learning. The development of an educational system that achieves social targets across time and space depends mostly on economic aspects together with educational delivery systems and highly qualified instructors and instructional tools and technology innovation and digitalization procedures. The official government policy documents from 1986 and 1992 contain extensive information regarding the subject. (See additional details in the government policy documents. In addition, the annual report of the Government of India's Ministry of Education). The "New Education Policy 2023" marks a historic turning point for the educational sector of the nation. This modern policy matches updated needs by introducing new learning approaches and digital education standards and skill-based instruction. The Government of India revised the National Education Policy during 2023 to control educational policy development within schools and colleges. The latest policy includes substantial changes which aim to turn India into an international leader in knowledge production. As per the policy the Ministry of Human Resource Management received its renamed identity as "Ministry of Education". The

Government of India intends to achieve 100% Gross Enrollment Ratio (GER) in school education by 2030 through the universalization of preschool through secondary school education besides medical and legal education.

### **Major Reform in New Educational Policy**

- The new policy eliminates all distinctions between arts, sciences, academic fields, vocational learning, curricular work and extracurricular activities.
- The new policy establishes foundation reading together with numerical expertise as its fundamental priority.
- The new model of education consists of 5 years followed by 3 years then 3 more years and finally a period of 4 years.
- All learners studying across different states will preserve their right to avoid any required learning of state-specific languages.
- Students possess the right to take their Board Examinations twice during their academic period.
- Education spending by the government will reach 6% of national GDP although it currently stands at 1.7%.
- The establishment of the gender inclusion fund will reach 100% completion.
- The government will fully dedicate itself to delivering satisfactory educational learning opportunities for talented students.
- The duration of undergraduate courses will extend to four years.
- An applicant needs a 4-year integrated B.Ed. Course as the minimum requirement to pursue a teaching career.
- HEIs should follow a Common Admission Examination structure as part of their admission process.
- The Master of Philosophy educational program will no longer exist in the education system.

- Secondary School students will select between arts and crafts education together with vocational courses and physical education subjects.

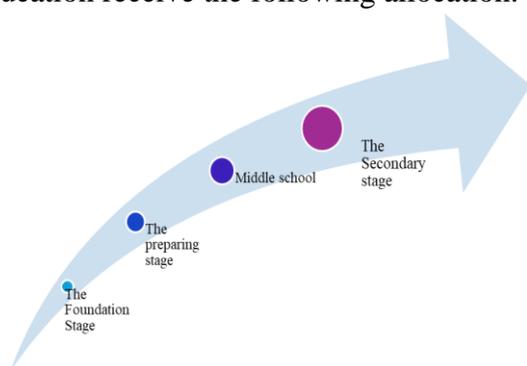
The PARAKH organization will create standards for Board Examinations through its Performance Assessment Review and Analysis of Knowledge for Holistic Development program. Indian literature together with other classical languages will become mandatory parts of the educational curriculum under the government leadership.

The exams for students will be conducted only in classes 2nd, 5th, and 8th but not annually.

#### **The 5+3+3+4 Structure:**

The NEP 2023 introduces the 5+3+3+4 structure as its most prominent change which replaces the existing 10+2 structure. The 10+2 format operated in the educational system for a very extended time period. The whole structural metamorphosis proves baffling to children who have been following this pattern. We will describe here the 5+3+3+4 educational system and its distinction from the former 10+2 education approach.

The government established four segments for student education through its new Pedagogical and Circular Structure. The system consists of four sections named Secondary, Middle, Preparatory and Foundational. The four educational phases of a school career develop students through each academic phase of their learning journey. These four sections of student education receive the following allocation.



#### **Stages of Student Education under New Education Policy**

1. Student training in the Foundation Stage extends for a period of 5 years. These five years comprise three years of services at Anganwadi/Pre-Primary/ Balvatika together with first and second grade education programs.
2. The Preparing Stage requires three years to complete its whole duration. The third and fourth grades will belong to the intermediate level while the fifth grade represents the secondary level of education under new policy.
3. The Middle School runs from grade 6 through grade 8. The three-year duration serves as training for future high school education.
4. Students will need four years instead of two to finish their class 9th through class 12th secondary education.

#### **Significance of 5+3+3+4 Structure**

The government supports a learning model called 5+3+3+4 because it enhances the mental growth of students. Under this methodology the government expects to occupy different phases of child education for their positive development. Student education bases will receive full support across primary through secondary levels under the 5+3+3+4 educational structure compared to the traditional 10+2 model. Under the new approach students should acquire the maximum educational benefits from their right to education. The framework was established specifically for children between the ages of three and eighteen instead of six to fourteen. The educational support begins with students during their first academic stage. The proposed framework will boost student retention rates to a notable degree. The implementation of this structure will maintain more students within their original academic institutions throughout their education. The new framework delivers advantages in all possible ways to support children. Our nation's future will receive

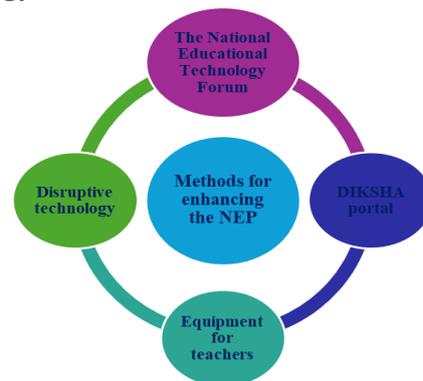
sole advantages from the improved literacy rates brought by this system.

### **Digital Inclusions under New Education Policy**

NETF functions as an independent forum under the new educational policy to organize open dialogue about technology applications for enhancement of learning with assessment and planning and management systems. This policy integrates suitable technology across all educational levels for managing classrooms and helping teacher development while providing equality in access to education to marginalized students and streamlining the planning and management processes. School and higher education sectors will achieve better connectivity between DIKSHA/SWAYAM and additional technology-based educational platforms. Higher education institutions will combine disruptive technology research activities with the creation of modern instructional materials that include online education for advanced subjects.

This set of recommendations operates as a comprehensive model to encourage online education as a response to recent epidemic and pandemic increases to establish alternative quality education when regular in-person instruction becomes unavailable. A new dedicated unit at the MHRD aims to coordinate development work on digital infrastructure together with digital content creation and capacity training for both school and higher education needs.

### **Methods for enhancing the NEP with digital technology in education:**



1. The National Educational Technology Forum (NETF) functions as an independent exchange platform allowing free conceptual discussions to expand educational processes including learning methods and administrative tasks along with educational assessment procedures. This platform provides educational facilities with up-to-date information to help make technology decision choices while spreading new educa. The organization will provide essential recommendations to both the federal and state governments regarding research-based technological strategies for education improvement. The National Educational Technology Forum establishes educational standards for online learning along with content and pedagogical standards through regional and national events with educational technology experts and entrepreneurs. The NETF performs an evaluation of new technologies followed by categorization before sending them to the Ministry of Education together with estimated adoption day schedules.

2. Education software development must occur by states in major Indian languages to provide free access for teachers and students within remote areas through DIKSHA portal. Such applications should be stored through the Digital Infrastructure for Knowledge Sharing (DIKSHA) portal which serves Indian teachers as their complete teaching lifecycle platform.

3. Each teacher will receive appropriate digital equipment that allows them to bring technology into their instructional practices. Technology implementation in NEP 2020 demands school and institutional projects to blend together while requiring regular updates following user-based quality evaluations.

4. The National Research Foundation will collaborate with higher education institutions to support AI-based application research that develops online teaching materials and courses through its partnership with HEIs. The establishment of trainings and programs will teach new vocational abilities that will be needed after Artificial Intelligence adoption replaces current educational professions.

#### **Tools and Platforms for Classroom Content Delivery:**

1. The implementation of technology under NEP 2020 will use existing online systems SWAYAM, DIKSHA and SWAYAMPRAKHA to deliver experimental and practice-based content to all students together with monitoring student performance tracking. SWAYAMPRAKHA offers 32 DTH channels through which educational modules of high quality air continuously for all seven days of the week.

Online teaching tools such as digital whiteboards and smart projectors help teachers to work together with students while including video clips and group writing and storing educational material. These tools link to different distant displays that enable hands-on presentations across diverse locations. The Bonus points Smart Class Plus system functions as an excellent model where teachers can easily use their whiteboard to access interactive material and obtain all necessary teaching tools.

1. The educational software type and apps such as Extra Marks Smart Class Plus enable students to receive customized learning experiences which specifically manage their

learning speed. Teaching strategies become more specific because teachers create purposeful instruction toward the students who learn at a slower pace. Smartphones allow teachers to maintain effortless programmatic access as well as create simple feedback platforms which help teachers communicate with students' parents.

2. The recently established PARAKH along with other organizations will create standardized assessment templates for educational evaluation. The assessment templates should contain NEP 2020 student competencies together with twenty-first century abilities.

#### **New Education Policy and Economic Growth Contribution**

The nation requires education to achieve independence as well as modernization and development. The first essential component of NEP 2020 is termed "Holistic and Multidisciplinary Education." The decision to accept multidisciplinary education in the NEP brings forward major progress because it enables students to take diverse subjects that link learning across different fields. Such an educational approach stimulates original thinking capabilities while developing intelligence regarding knowledge connections. The educational system aims to enable learners to select their preferred classes between arts, humanities, languages, science, social science, soft skills and ethics courses and professional and technical and vocational courses no matter their current field of study. A multidisciplinary education approach under this framework leads to completely developed students.

The education system should operate as a learner-led system instead of remaining unyielding with a teacher-led structure. The former education system refused learners access to curriculum selection beyond what the initial program selection allowed. The NEP places

particular importance on education that advances development through successive learning stages which start in basic schools. The teaching initiative transforms its focus from cognitive competence to develop students into socially capable individuals with emotional skills and creative traits to overcome diverse life challenges. The policy now rejects memorization-based techniques while focusing on competency education methods. Critical thinking combined with innovative solutions emerge from these educational measures that society needs in its fast-evolving environment.

ABC, or Academic Bank of Credits, is another NEP pillar that provides a lot of flexibility to the learner. This bank functions similarly to digital banks for money, but it will keep track of the learner's credits in an online secure ledger. These credits are available to any learner as well as any institution. Students and learners will have the option of transferring their acquired credits from institution "A" to institution "B" in order to receive any degree or credential. This will allow learners to switch institutions while keeping their credits intact, which was a problem in the prior system.

The entire globe recognizes the history and significance of the Indian knowledge system. India has a long history of education and knowledge. NEP also intends to revitalize the use of IKS and encourage Indian Knowledge System research. The best practices of the Indian Knowledge System must be infused into the current education system and revitalized so that it can nourish our country's youthful minds. Mathematics, including Vedic mathematics, medicine, the environment, economics, law, agriculture, linguistics, games, Yoga, literature, music, social sciences, philosophy, astronomy, science, technology, and liberal arts will be among the subjects

Projects like as NPTEL, SWAYAM portal, and other such online channels, along with good

internet and mobile technologies, are bringing education to the learners' doorsteps. Outcome-based education is another cornerstone of the NEP. It is also critical to assess pupils' learning. Students' grades must be based on criteria. The teaching must be centred on the students. The curriculum must include a mix of subject-matter, ethics, liberal arts, and community service courses that can instill 21st century abilities. Courses such as data structures, programming, machine learning, and artificial intelligence must be covered. Evaluation methods must be unique and capable of judging the learners' learning achievements. Simply studying, reading, and reproducing will increase the learner's rote learnability rather than improving one's intellectual talents or practical knowledge. Oral examination, written examination, public examination, external assessment, continuous and thorough evaluation, and competency-based assessment can all be used to assess learners. NEP has prioritised ongoing, formative, and competency-based evaluation. The assessment is designed to assess higher-order abilities such as analytic ability, critical thinking, and conceptual clarity. The National Education Policy 2020 (NEP 2020) is a strategy framework for reforming India's education with an emphasis on a knowledge-driven economy. It emphasizes choice-based multidisciplinary education, innovation and entrepreneurship, skill development and employment, all of which are matched with knowledge assimilation and application.

The education policy places a premium on quality teacher recruitment and training. Teachers will be hired through a four-year integrated programme. Almost all centrally financed institutions have begun this four-year integrated course. Among these are the world-renowned Indian Institute of Technology and other important institutions in the country. The

quality of teachers generated by these institutions will be world-class, which will translate into the level of students' learning. Aside from that, NEP includes ongoing professional development training for teachers and school leaders. The efforts of Prime Minister Narendra Modi and Union Minister Dharmendra Pradhan in not just establishing the National Education Policy 2020 but also demonstrating a willingness to implement it more quickly are commendable. I attended both the "Akhil Bhartiya Shiksha Samagam" and the "Akhil Bhartiya Shiksha Samagam," where I had the opportunity to hear from our Hon'ble Prime Minister and Minister of Education, as well as other learned educationists from our country. I am convinced that this education strategy will serve as a catalyst for progressive reforms at all levels of education in India, and that its impact on altering our country's future will be far-reaching.

### **Conclusion**

India is developing by leaps and bound, the economic growth of country is at its best, which could be compared the prior period of British colonial era. The national GPD contribution to the world economy was around 32%. It was one of the wealthiest country in the world. The scenario has changed dramatically after the colonial period. The country struggled to its core, the problem of unemployment, poor education, scarcity of food and lacking of chronic health amenities put the national into under developed nation. The economic reform of 1990 enlightens the path of reform in the field of education and employment.

The new government has given more emphasis on international trade and inviting multinational companies to invest and setup their venture in India. The growth of trade and multinational companies in India creates job opportunities. The prevailing education condition and acquired by students are lacking

the needed skills and knowledge. Hence, a new bill on reforming the prevailing education system has flagged out. The new educational policy bills were presented and passed in the parliament.

The reform and changes in the policies give relaxation to long term learning pattern. It also gives emphasis on importance of our culture, knowledge and heritage of nation. Needed research on scriptures and monuments should be carried out in order to examine the unknown knowledge left by our ancestors. The policies contribute in enhancing skill based knowledge of students for required employability. Hence, implementation of new education policies will help in reforming the nation in long term.

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## **Agriculture Public Policy Measures in India**

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### **Abstract**

Agricultural policy comprises the laws, strategies, and measures governing the domestic agriculture sector, including the production, trade, and processing of agricultural goods and by-products. These policies address multiple concerns, such as ensuring food availability at fair prices, maintaining food safety standards, and enhancing environmental sustainability.

In India, the key objectives of agricultural policy focus on addressing critical challenges such as inefficient resource utilization, dominance of low-value crops, and an unfavourable cost-benefit ratio in agricultural activities. The latest National Agricultural Policy introduces measures aimed at improving farmers' welfare, tailored to meet specific regional requirements across states and union territories.

State governments are supported in transforming national goals into localized action plans by formulating operational strategies based on agro-climatic conditions and other regional factors. These plans are developed at the district level by multi-disciplinary experts and later consolidated at the state level. Additionally, states are encouraged to establish an effective feedback mechanism to ensure that policies directly address farmers' concerns.

The Department of Agriculture and Cooperation has set up an Inter-Ministerial Committee to devise an action plan for implementing these policy measures. Furthermore, the Agriculture Coordination Committee, chaired by the Prime

Minister, oversees and integrates the execution of the new agricultural policies.

**Key Terms:** Agricultural Policy, Public Distribution System, Minimum Support Price, Buffer Stocks, Pradhan Mantri Annadata Aay Sanrakshan Yojana, Foreign Trade Policy, National Mission for Sustainable Agriculture.

### **Introduction**

Agricultural policy refers to the set of laws, tools, and strategies that regulate the domestic agriculture sector, including the production, trade, and processing of agricultural products and their by-products. These policies aim to ensure food availability at reasonable prices, maintain food safety standards, and promote environmental sustainability. Despite the diversity in agricultural policies across regions, their overall impact within a given period can be measured through agriculture support indicators, which facilitate comparisons across time and between countries.

The agricultural price policy in India consists of three major components: Minimum Support Price (MSP), Buffer Stocks, and the Public Distribution System (PDS). The government procures key crops at MSP to maintain buffer stocks and ensure food distribution through PDS for social welfare. The broader objectives of agricultural policy include addressing inefficiencies in natural resource utilization, overcoming the predominance of low-value agriculture, and improving the cost-benefit ratio of farming activities.

**Main Tools of Agricultural Policy.** The Indian agricultural policy framework includes six major policy measures:

1. **Price Management and Marketing Channels** – Ensuring fair pricing and efficient distribution of farm produce.
2. **Agricultural Input Subsidies** – Providing financial assistance for seeds, fertilizers, and other farming essentials.
3. **Common Services for Agriculture** – Infrastructure, research, and technical support for the sector.
4. **Food Accessibility for Targeted Groups** – Ensuring essential food items are available at subsidized rates for vulnerable populations.
5. **Regulated Trade Markets** – Governing cross-border transactions through trade policies.
6. **Federal and State Responsibilities** – While states handle several aspects of agricultural policy implementation, the central government plays a crucial role in shaping national strategies, funding programs, and managing international trade policies. Additionally, it oversees the **National Food Security Policy** to ensure food availability nationwide.

### **New policy measures for Marketing of Agricultural Commodities**

Marketing policies for agricultural goods cover all levels, from farmers to consumers, and involve key regulations such as the Essential Commodities Act (ECA) at the national level and Agricultural Produce Market Committee (APMC) Acts at the state level. These regulations influence producer prices by controlling the pricing, procurement, storage, and trade of essential commodities. Farmers primarily sell their produce in regulated wholesale markets (mandis), where government procurement takes place under the Minimum Support Price (MSP) scheme. Since agricultural regulations vary by state, differences exist in the implementation of APMC Acts, leading to

variations in market structure and efficiency across India.

#### **Implementation of Acts**

To enhance agricultural marketing and trade, the Electronic National Agricultural Market (e-NAM) was launched between 2016 and 2017. The Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act was introduced as a recommendation for state governments to modernize agricultural trade. The e-NAM platform integrates 1,000 APMC markets across 18 states and 3 Union Territories (UTs), with over 17 million farmers and 1,05,000 traders registered as of 2021.

The Commission for Agricultural Costs and Prices (CACP) advises the central government on Minimum Support Prices (MSP) for 23 essential agricultural commodities annually. These recommendations are based on two cost assessments:

1. **Actual paid-out costs of production**, including expenses for seeds, fertilizers, and irrigation.
2. **Imputed value of family labor**, considering unpaid labor contributions by farmers' families.

Additionally, some state governments offer bonus payments on top of the MSP for key crops. The Food Corporation of India (FCI), along with national and state-level agencies, facilitates the procurement of food grains such as wheat, rice, and coarse cereals to ensure price stability and food security.

#### **Objectives of Study**

The overall objective of the research paper has examined “Agriculture Public Policy Measures in India”.

#### **Specific Objectives of the study are:**

1. To study the significance agriculture public policy measures in India
2. To identify the various types of Agriculture public policy.

3. To study the government efforts to promotion of agriculture public measures in all the states

### **Methodology**

Research is a systematic investigation involving materials and sources to establish facts and draw conclusions. It begins with a question or problem and follows a structured approach to find answers. A researcher must be well-versed in both research methods and methodology to conduct effective studies. Descriptive research is commonly used in this study, involving surveys and fact-finding inquiries. Its primary goal is to describe the current state of affairs. This research paper is based on journals, published theses, and government reports.

### **Input Support Price Policy and Subsidized Pricing**

Key agricultural inputs such as fertilizers, electricity, and water are heavily influenced by government policies. Additional support is provided for seeds, machinery, credit, and crop insurance. In recent years, state-level loan waivers have increased, with local governments compensating financial institutions for debt forgiveness. According to Reserve Bank of India (RBI) records from 2019, more than 70% of agricultural loans come from formal financial institutions such as commercial banks, while the remainder is sourced from informal lenders like moneylenders.

### **Irrigation and General Agricultural Services**

General service policies emphasize developing and maintaining irrigation infrastructure. Budgetary support plays a crucial role in public stockholding and agricultural innovation, ensuring farmers have access to modern inputs and knowledge.

### **Public Distribution System for Food Grains**

Food grain distribution operates under the joint responsibility of the central and state governments within the framework of the National Food Security Policy.

Key responsibilities include:

- The central government allocates food grains and oversees transportation from surplus to deficit states via the Food Corporation of India (FCI).
- State governments manage the distribution process by allocating supplies, identifying eligible families, issuing ration cards, and ensuring delivery through Fair Price Shops (FPS).
- Additional welfare programs also function under the National Food Security Policy to enhance food security.

### **Foreign Trade Policy for Agricultural Products**

India's Foreign Trade Policy (FTP) for agricultural products is formulated and implemented by the Directorate General of Foreign Trade (DGFT) and is revised every five years, with annual reviews in consultation with relevant agencies. The Basic Customs Duty (BCD) is a statutory rate determined during the annual budget approval process.

#### **Agricultural Product Exports**

For decades, India has regulated agricultural exports through various measures, including:

- Export restrictions and prohibitions
- Licensing requirements
- Quotas and taxes
- Minimum export prices
- State trading requirements

The 2018 Agricultural Export Policy introduced key reforms:

1. No export restrictions on processed and organic agricultural products.
2. Consultations among stakeholders and the Agriculture Ministry to identify essential food security commodities that may be subject to export restrictions under special market conditions.

3. Reducing import barriers for agricultural products used in processing and re-exporting.

### **The National Mission for Sustainable Agriculture**

Environmental sustainability measures have gained prominence, particularly through government-initiated missions. The National Mission for Sustainable Agriculture (NMSA) became operational in 2015, focusing on soil and moisture conservation, comprehensive soil health management, efficient water management, and mainstreaming rain-fed technologies in rural areas.

The Farm Water Management initiative, a component of NMSA, aimed to enhance water use efficiency through drip and sprinkler irrigation systems, improved water application and distribution methods, and secondary water storage. In 2016, these activities were integrated into the “Per Drop More Crop” component of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY).

### **Soil Health Management**

Soil health management is a critical part of the National Mission for Sustainable Agriculture, aimed at promoting Integrated Nutrient Management (INM) by balancing chemical fertilizers (including secondary and micronutrients) with organic manures and bio-fertilizers. The goal is to improve soil health and productivity while providing farmers with soil test-based recommendations through enhanced soil and fertilizer testing facilities. The Soil Health Card (SHC) Scheme, implemented since 2015, provides farmers with detailed soil nutrient status reports and personalized fertilizer recommendations, helping them optimize soil fertility and productivity.

### **Promotion of Organic Farming**

India has introduced special schemes to promote organic farming, such as the Paramparagat Krishi Vikas Yojana (PKVY), which encourages traditional organic farming practices. Additionally, efficient irrigation and watershed management initiatives are being implemented under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). Missions like the National Mission on Agricultural Extension and Technology focus on developing soil health and climate-resilient agro-ecological systems through technical assistance and sustainable farming practices.

### **Public Support for Agriculture**

Public support for agriculture has reached record levels as governments implemented measures to protect both consumers and producers from the COVID-19 pandemic and other economic crises. According to the Agricultural Policy Monitoring and Evaluation 2022 report, 54 monitored countries provided an average of USD 817 billion in agricultural support during 2019–2021, reflecting a 13% increase from 2018–2020.

### **Efficient Agricultural Policies**

Efficient agricultural policies play a crucial role in meeting the growing demand for safe and nutritious food while ensuring sustainable agricultural development. As global demand for food, feed, fuel, and fiber rises, governments must address key challenges, including:

- Enhancing productivity growth
- Improving environmental sustainability (e.g., reducing greenhouse gas emissions)
- Building resilience to climate change and unforeseen shocks

Although government support for agriculture has increased in response to global crises, only a small portion of this funding has been allocated toward long-term goals, such as climate change

mitigation and food system challenges. The OECD Agricultural Policy Monitoring and Evaluation Report evaluates these efforts and provides policy recommendations to governments.

### **Trade Policy Developments in 2021-22**

- May 2021: The Ministry of Commerce and Industry removed selected pulses from the import quota list until November 2021.
- July 2021: The Ministry of Finance temporarily eliminated the 20% tariff on lentils.
- September 2021: The tariff on lentils imported from the U.S. was increased from 10% to 20%, while the Agriculture Infrastructure Development Cess on imported lentils was lowered from 20% to 10% (Ministry of Finance, 2021).

### **Genetically Engineered Soybeans**

In August 2021, the Ministry of Commerce and Industry (MoCI) announced the import of 1.2 million tonnes of genetically modified crushed and de-oiled soy cake classified as a non-living modified organism (NLMO) until 31 October 2021. This decision aimed to support the poultry industry facing higher soymeal prices due to shortages. The approval was granted after the Ministry of Environment, Forest and Climate Change (MoEFCC) confirmed that crushed de-oiled cake falls under the NLMO category (AMIS, 2021).

In September 2021, the MoCI authorized the import of soybean meal and soy cake derived from genetically engineered soybeans until January 2022.

### **Bilateral Trade Agreements**

- January 2022: India and the United States signed a framework agreement allowing:
  - U.S. exports of alfalfa hay and cherries to India

- Indian exports of mangoes and pomegranates to the U.S.
- First-time imports of pig meat and pig meat products from the U.S.
- April 2, 2022: India and Australia signed an interim Economic Cooperation and Trade Agreement, under which India agreed to reduce tariffs on Australian agricultural exports, including:
  - Sheep meat, wool, and wine
  - Tariffs on wine (minimum USD 5 per bottle) reduced from 150% to 100%
  - Tariffs on premium wine (minimum USD 15 per bottle) reduced to 75%
  - Exclusions: Imports of milk, dairy products, seed oil, walnuts, pistachios, wheat, rice, millet, apples, sugar, oil cake, and chickpeas remain restricted.

### **WTO Dispute on Sugar and Sugarcane**

In January 2022, India appealed the World Trade Organization (WTO) Dispute Settlement Body's ruling on the case brought by Brazil, Australia, and Guatemala regarding India's sugar and sugarcane policies.

The WTO panel report (December 14, 2021) found that:

1. India's price support programs (including Fair and Remunerative Price and State Advised Price) exceeded WTO-permitted levels.
2. India provided export subsidies through support schemes, violating WTO export subsidy obligations.

### **Extension of Foreign Trade Policy (FTP) 2015-20**

Due to the COVID-19 pandemic, the Foreign Trade Policy (FTP) 2015-20 was extended three times since 2020. In September 2021, its application was further extended until March 31, 2022.

### **Conclusion**

The new National Agricultural Policy measures for promotion of Farmers welfare and adapted operational to suit the local needs in various states and union territories. State governments would be supported to convert national goals into local action policy measures points by preparing operational plans for implementing new agriculture policy, taking into account the agro-climatic and other local conditions. Such operational plans has prepared at the district level by a multi-disciplinary professional group and integrated at the state level. The Government's agriculture public Policy for agricultural produce seeks to ensure remunerative prices to growers for their produce with a view to encourage higher investment and production as well as safeguarding and protecting the interests of consumers by making available supplies at reasonable prices. The agriculture price policy also seeks to evolve a balanced and integrated price of agriculture commodities structure in the perspective of the overall needs of the economy. To achieve this end, the Government in each season announces Minimum Support Prices for major essential agricultural commodities and organizes purchase operations, wherever required, through public, cooperative, and other designated agencies to ensure that prices do not fall below that level for welfare of farmers. The minimum support prices being uniform throughout the country, the

Commission had to arrive at an all-India weighted average cost as inputs to agriculture price policy formulation. Since price policy was a resultant of informed judgement of various factors, there could not be any mechanical formula of how much weight was to be given to each factor in the exercise of price policy formulation. The margin of minimum support price over the cost of production varied widely and no norms had been prescribed for fixing the margin over the cost of production. Thus, there is a need for greater transparency in the method of arriving at minimum support price over the cost of production.

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## A Study on Institutional Credit for Agriculture and Allied Activities in India

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### Abstract

Agriculture plays a significant role in the development of the Indian economy. However, agriculture's contribution to GDP has decreased from 52 per cent in the 1950s to below 20 per cent from 2010 onwards. According to the Statistical Report on the Value of Output from Agriculture and Allied Sector (GoI), the share of agriculture and the allied sector in overall GVA at current prices accounted for 18.1 per cent in 2022-23. The agriculture sector is an important component of the Indian economy as it provides a livelihood to a large section of the people in the country. Indian agriculture and allied sectors broadly cover four activities, viz., crop, livestock, forestry, and fisheries. To stimulate the productivity of these activities, the Government of India has, from time to time, given policy thrusts that led to the various agricultural revolutions. As a result, the agriculture sector has become self-sufficient and emerged as the net exporter of several agricultural commodities like rice, marine products, cotton, etc. Institutional credit is critical for agricultural development, and its role has further increased in rural development. To facilitate institutional credit, particularly in agriculture and allied activities, commercial banks, regional rural banks, and cooperative banks are the three main rural financial institutions that provide institutional credit at the village level. Besides the absence of a proper legal framework and lack of records relating to their agricultural activity, they face difficulty in accessing institutional credit. Therefore, the present study attempts to study

institutional credit for agriculture and allied activities in India covering the period between 2010-11 and 2022-23. The study found Amongst total institutional credit, the scheduled commercial banks remained the largest component in the loan issued by institutional credit.

**Keywords:** SCBs, RRBs, Cooperative Banks, and Agriculture & Allied Activities.

### Introduction

In India, the share of agriculture in the gross domestic product has registered a steady decline from 52 per cent in 1950-51 to 15 per cent in 2006-24. Agricultural growth has remained lower than the growth rates witnessed in the industrial and services sectors. Even though the share of agriculture in GDP has declined over the years, the number of people dependent on agriculture for their food and livelihood has remained unchanged. According to Census 2011, out of the total workers of 481.7 million, there are 118.7 million cultivators and 144.3 million agricultural labourers, which means approximately 55 per cent of the total workers were employed in agriculture and the allied sector. As per the Agriculture Census 2015-16, the country's total number of operational holdings was 146 million, and the total operated area was 157.14 million hectares in 2015-16. The small and marginal holdings taken together (0.00-2.00 ha) constituted 86.21 per cent, while their share in the operated area stood at 47.34 per cent in 2015-16. The average size of landholding in 2015-16 was 1.08 hectares. The high impact on inputs and modest impact on output mean that

the additional capital investment has been more important in substituting for agricultural labour than in increasing crop output. India has systematically pursued a supply-leading approach to increase agricultural credit. The objectives have been to replace moneylenders, relieve farmers of indebtedness, and achieve higher levels of agricultural credit, investment, and agricultural output. The effect on crop output is not large, even though agricultural credit has strongly increased fertiliser use and private investment in machines and livestock. Between bank nationalisation in 1969 and the onset of financial liberalisation in 1990, bank branches were opened in over 30,000 rural locations that had no prior presence of commercial banks. This branch expansion was an illiberalization of India's social banking experiment, which sought to improve the access of the rural poor to cheap formal credit. Therefore, the present study attempts to analyse the study of institutional credit for agriculture and allied activities in India covering the period between 2010-11 and 2022-23.

### **Need for Study**

The production of crops, besides the weather-induced fluctuations, significantly depends on the availability of inputs like fertilisers, irrigation, certified seeds, credit support, and appropriate price signals. Minimum support prices indicated upfront and before the sowing seasons act as effective incentives for the acreage response of the crops. The area under irrigation and changes in the monsoon around its long-term trend are two of the factors that determine how food grains and agricultural output deviate from their long-term trends. In the present study, we take a re-look at the problem by quantitatively assessing the impact of institutional credit expansion on agriculture. The Reserve Bank of India (RBI) and the Government of India (GoI) have taken several

measures to facilitate increased credit flows to the agriculture sector. The Government of India has taken several measures to increase institutional credit flow to farmers, particularly small and marginal farmers, within the fold of institutional credit. However, actual disbursements exceeded the targets for every year.

### **Problem of Study**

Informal sources of finance, be they local money lenders, landlords, traders, etc., charge more than a 20 per cent rate of interest, often keep land as collateral against loans, and have a very high recovery rate. On the other hand, rural financial institutions charge almost half of the interest rate, do not take land as collateral for most of the crop loans, and still face high defaults. The major objective of RFIs is eliminating informal finance through moneylenders, who have always been allowing leniency in their financial policies. Despite the impressive growth in formal agricultural credit, there are several issues and challenges. As per the NAFI Report, the average loan taken by agricultural households indicated that 72 per cent of the credit requirement was met through institutional sources and 28 per cent from non-institutional sources. Further, in the absence of a proper legal framework and a lack of records relating to their agricultural activity, they face difficulty in accessing institutional credit. Lending to the agriculture sector has shifted over time to include more farmers who were previously denied credit, but it is still inadequate to the farmers' requirements.

### **Objectives of the Study**

1. To analyse the growth of the institutional credit for agriculture and allied activities in India.
2. To examine the performance of the institutional credit by SCBs, RRBs and Cooperative Banks.

3. To evaluate the role of financial institutions for institutional credit in agriculture development.

### Methodology

The present study completely relies on secondary sources of data available in the report of the Handbook of Statistics on Indian Economy, Reserve Bank of India (RBI). In order to study the growth and performance of institutional credit for agriculture and allied activities in India, statistical tools such as averages, ratios and growth rates were widely used.

### Institutional Credit and Agriculture Development

Agricultural activities have been divided into two broad heads, viz., crop production and allied activities. The allied activities cover livestock, forestry, fisheries, etc. Institutional credit plays a crucial role in driving agricultural development by providing farmers with the

necessary funds for investments and modernization, leading to increased productivity and output. The present study analyses the institutional credit for agriculture and allied activities in India covering the period between 2011-12 and 2022-23. Table 1 shows the composition of institutional credit loans issued for agriculture and allied activities. Within the loan issued by the total institutional credit, scheduled commercial banks (SCBs) constituted a major component, constituting, on average, 73.2 per cent during the period covered under study, and the remaining 15 per cent and 11.8 per cent were constituted by cooperatives and regional rural banks (Figure 1). Amongst total institutional credit, the SCBs remained the largest component in the loan issued by institutional credit, which increased from 64.6 per cent in 2010-11 to 76.9 per cent in 2022-23.

**Table 1: Components of Loan Issued in the Institutional Credit (Rs. Crore)**

Year	Co-operatives	SCBs	RRBs	Total
2010-11	78121 (22.7)	222792 (64.6)	43965 (12.7)	344878 (100)
2011-12	87963 (19.3)	312877 (68.7)	54450 (12.0)	455290 (100)
2012-13	111203 (16.9)	484499 (73.5)	63681 (9.7)	659383 (100)
2013-14	119964 (16.4)	527506 (72.2)	82653 (11.3)	730123 (100)
2014-15	138470 (16.4)	604376 (71.5)	102483 (71.5)	845329 (100)
2015-16	153295 (16.7)	642954 (70.2)	119261 (13.0)	915510 (100)
2016-17	142758 (13.4)	799781 (75.0)	123216 (11.6)	1065755 (100)
2017-18	150321 (12.9)	871080 (74.9)	141216 (12.1)	1162617 (100)
2018-19	152340 (12.1)	954823 (76.0)	149667 (11.9)	1256830 (100)
2019-20	157367 (11.3)	1070036 (76.8)	165326 (11.9)	1392729 (100)
2020-21	190682 (12.1)	1194704 (75.8)	190012 (12.1)	1575398 (100)
2021-22	243220 (13.1)	1415964 (76.0)	204180 (11.0)	1863364 (100)
2022-23	243824 (11.3)	1663942 (76.9)	257078 (11.9)	2164844 (100)
<b>Annual Average</b>	<b>(15.0)</b>	<b>(73.2)</b>	<b>(11.8)</b>	<b>(100)</b>

**Source:** Reserve Bank of India (RBI): Handbook of Statistics on the Indian Economy.

In absolute terms, the SCBs of total institutional credit of agriculture and agricultural activities, which stood at Rs. 222792 crore in 2010-11, increased to Rs. 954823 crore and further increased to Rs. 1663942 crore in 2022-23. On the other hand, agriculture increased from Rs. 78121 crore to Rs. 243824 crore, and RRBs increased from Rs. 43965 crore to Rs. 257078 crore in 2022-23. The total loan outstanding of institutional credit had increased from Rs. 344878 crore in 2011-12 to Rs. 915510 crore in 2014-15 and further increased to Rs. 2164844 crore in 2022-23.

Table 2 reveals that loans outstanding of institutional credit for agriculture and allied activities. Amongst the major components of loans outstanding of institutional credit, SCBs continued to be a major component, constituting, on average, 73.5 per cent.

**Table 2: Loans Outstanding of Institutional Credit for Agriculture and Allied Activities (Rs. Crore)**

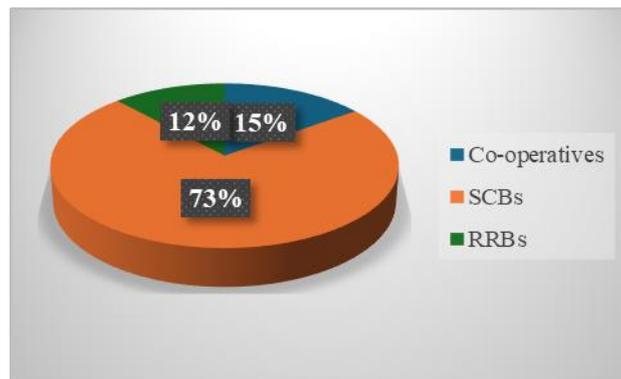
Year	Co-operatives	SCBs	RRBs	Total
2010-11	76674 (15.7)	357584 (73.1)	55067 (11.3)	489325 (100)
2011-12	92458 (15.3)	443298 (73.1)	70385 (11.6)	606141 (100)
2012-13	119775 (16.6)	522478 (72.4)	79500 (11.0)	721753 (100)
2013-14	135245 (18.4)	503532 (68.3)	98207 (13.3)	736984 (100)
2014-15	154287 (16.2)	683969 (71.9)	112604 (11.8)	950860 (100)
2015-16	156121 (14.1)	814841 (73.8)	133401 (12.1)	1104363 (100)
2016-17	226698 (21.6)	668109 (63.7)	153416 (14.6)	1048223 (100)
2017-18	184396 (14.4)	924084 (72.2)	171301 (13.4)	1279781 (100)
2018-19	178820 (13.0)	995114 (72.6)	197432 (14.4)	1371366 (100)
2019-20	187262 (13.3)	1012858 (71.9)	208772 (14.8)	1408892 (100)
2020-21	199457 (8.8)	1842028 (80.9)	234786 (10.3)	2276271 (100)
2021-22	230604 (9.2)	2025721 (80.6)	257174 (10.2)	2513499 (100)
2022-23	244161 (8.5)	2339379 (81.6)	283691 (9.9)	2867231 (100)
<b>Annual Average</b>	<b>(14.2)</b>	<b>(73.5)</b>	<b>(12.2)</b>	<b>(100)</b>

**Source:** Reserve Bank of India (RBI): Handbook of Statistics on the Indian Economy.

In absolute terms, the loan outstanding of SCBS, which stood at Rs. 357584 crore in 2011-12, increased to Rs. 814841 crore in the year 2015-16 and further increased to Rs.

However, the loans outstanding by cooperatives and RRBs had declined substantially and stood at 14.2 per cent and 12.2 per cent, respectively, during the period covered under the study (Figure 1).

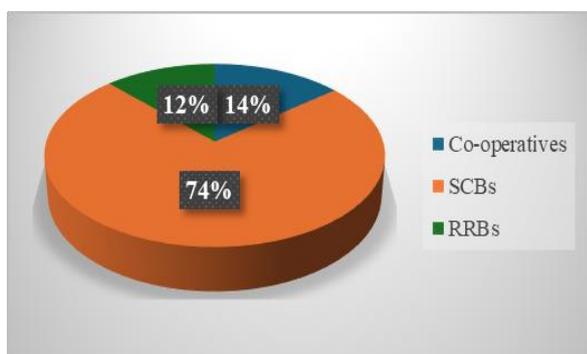
**Figure-1: Components of Institutional Credit-Loan Issued by SCBs, Co-operatives and RRBs**



2339379 crore in 2022-23. On the other hand, the loan outstanding of cooperatives increased from Rs. 76674 crores in 2011-12 to Rs. 244161 crores in 2022-23, and RRBs increased

from Rs. 55067 crores in 2011-12 to Rs. 283691 crores in 2022-23 during the study period. The total loan outstanding of institutional credit had increased from Rs. 489325 crore in 2011-12 to Rs. 950860 crore in 2014-15 and further increased to Rs. 2867231 crore in 2022-23.

**Figure 2: Components of Institutional Credit Outstanding of SCBs, Co-operatives and RRBs**



### Conclusion

Institutional credit plays a crucial role in driving agricultural development by providing farmers with the necessary funds for investments and modernisation, leading to increased productivity and output. Therefore, the present study attempted and found that amongst total institutional credits, the SCBs remained the largest component in the loan issued by institutional credit, constituting, on average, 73.2 percent during the period covered under study, and the remaining 15 percent and 11.8 percent were constituted by cooperatives and regional rural banks (RRBs). In terms of loans outstanding of institutional credit, SCBs continued to be a major component, constituting, on average, 73.5 per cent. The present study suggests that the government should fix agriculture credit disbursement targets for the banking sector every year, and banks have consistently surpassed these targets. This study also suggests rescheduling farmers' past-due debts and granting them access to new loans.

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## Environmental Governance in India: Policies, Challenges and Future Directions

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### Abstract

Environmental governance refers to the practices, processes, and institutions that shape the management and protection of the environment. In India, the issue of environmental governance has gained significant attention in recent years due to increasing concerns over environmental degradation and its impact on sustainable development. This article provides a review of the literature on the policies, challenges, and future direction of environmental governance in India. The article argues that while India has made progress in enacting environmental laws and policies, several challenges still exist in their implementation and enforcement. These challenges range from limited institutional capacity, inadequate allocation of resources, and lack of public participation. The article concludes by suggesting some measures for the improvement of environmental governance in India, including strengthening institutions, promoting public awareness and participation, and enhancing coordination among different stakeholders.

**Keywords:** Environmental Governance, Sustainability, India, Climate Change, Environmental Policies

### Introduction

Environmental governance involves intricate governance components that address diverse environmental aspects holistically, engaging a broad spectrum of actors and stakeholders (UNEP, 2007). Environmental governance in India has been a topic of great concern in recent years as the country grapples with the challenges of sustainable development and conservation. With a rapidly growing population and a booming economy, India's environment is under immense pressure from human activities

such as urbanization, industrialization, and resource exploitation. The need for effective environmental governance has never been more urgent, and as we look toward the future, it is crucial to identify the key directions that need to be taken to ensure the protection and management of India's natural resources.

Environmental governance is the process through which policies, laws, and regulations are implemented to ensure the sustainable use and protection of natural resources. It aims to strike a balance between economic development and environmental conservation, recognizing that both are essential for long-term well-being. In India, with its rapidly growing population and economy, the need for effective environmental governance has never been more urgent. The history of environmental governance in India can be traced back to the early days of independence when the government enacted several laws to protect the environment. The consumption of natural resources, viz., air, water, land, and biota, in the production process of economic activity, the discharges from it, and the quality of life improvement shall have to keep in mind the finite resource base, the rights of people, legal framework and the implications of one's actions (UNEP 1996).

Environmental governance encompasses regulations, legislations, acts and their implementation, policy frameworks, institutional decisions, and their impact on human interaction with the environment. The environmental governance process enables various entities within the system, including private and public sectors, NGOs, and local communities, to address and manage concerns related to environmental degradation and

hazards. This involves making crucial decisions to safeguard the environment (Haque, 2017). Furthermore, the role of civil society and the involvement of local communities in environmental decision-making processes is crucial for effective environmental governance in India. Community participation not only ensures that local perspectives and needs are taken into consideration, but it also fosters a sense of ownership and responsibility for the environment. Community-based initiatives such as the Chipko Movement, in which villagers in Uttarakhand protested against deforestation, have shown the power of community involvement in environmental conservation. Environmental governance is a complex and multifaceted concept that encompasses various social, economic, political, and institutional dimensions. It involves the management and protection of natural resources, as well as the interactions between human beings and their environment. The primary objective of environmental governance is to achieve sustainable development, which entails meeting the needs of the present without compromising the ability of future generations to meet their own needs.

#### **Literature review**

The onset of environmental governance in post-independent India commenced a quarter-century after gaining Independence. This initiation followed the return of Prime Minister Indira Gandhi from the United Nations Conference on Human, Environment, and Development held in Stockholm in 1972 (Suvarnakhadi, n.d.). India has a long history of environmentalism, with the first environmental law being enacted in 1972, the Wildlife Protection Act. Since then, the country has made significant progress in enacting environmental laws and policies to protect the environment and promote sustainable development. The most significant policy framework for environmental governance in India is the National Environment Policy (NEP) of 2006, which aims to provide a strategy for conserving natural resources and protecting the environment. The policy focuses on promoting sustainable development by

integrating environmental concerns into all developmental policies and programs.

A critical aspect of environmental governance in India is the role played by the judiciary. The Supreme Court and High Courts have been active in protecting the environment and enforcing environmental laws. The landmark judgment in the case of *M.C. Mehta v. Union of India* (1986) was a turning point in the judiciary's involvement in environmental issues, leading to the emergence of the principle of 'polluter pays.' This principle holds that polluters are responsible for the costs of environmental protection and remediation. Moreover, the judiciary has also been instrumental in directing the formulation of environmental policies and guidelines, such as the 'Precautionary Principle' and 'Sustainable Development' principle.

Shiva's (1991) research on environmental movements in India concentrated on the influence of environmental groups in shaping the country's environmental governance. Scholars such as Kothari (2001), employing a theoretical framework supported by empirical case studies, argue that the growing awareness among the public regarding their environmental rights and the rise of nationwide environmental movements have become focal points for policymakers. This attention signifies a recognition of the significance of people's environmental consciousness and organized movements in influencing policy decisions. India's environmental resources are constrained, and their depletion is exacerbated by the rapid growth of the population and unregulated economic development. The vital need for sustainable development hinges on these resources, but they are being eroded due to environmental pollution and degradation resulting from unchecked expansion (Sandhu, V & Sidhu, A. S, 2015).

Another research study outlined the challenges hindering the development of an environmentally responsible perspective. The author examined how organizations address environmental challenges and opportunities within corporate finance, investments, and financial institutions. The focus was on

innovative programs and initiatives implemented in these three major branches of finance (White, M.A., 1995). Regrettably, conventional governance tools like building codes and planning laws in India have not effectively sped up the shift towards environmentally sustainable construction and urban development (Aijaz, R, 2012).

### **Existing Policies**

Indian environmental law primarily addressed claims related to tortuous actions, such as nuisance or negligence (Divan and Rosencranz, 2001). The enactment of the Water (Prevention and Control of Pollution) Act in 1974 marked a significant milestone, providing the legal foundation for environmental protection. Subsequent major legislations included The Forest Conservation Act (1981), The Air Prevention and Control of Pollution Act (1986), The Environmental Protection Act (1986), The National Environment Tribunal Act (1995), and The National Environment Appellate Act (1997).

Environmental resources form the fundamental and obligatory foundation for sustainable development, yet face depletion due to pollution and deterioration; India, in its commitment, has implemented over 200 environmental laws, with notable constitutional provisions, reflecting a systematic analysis of governmental initiatives within the broader framework (Sandhu, V & Sidhu, A. S, 2015). The Wildlife Protection Act of 1972, the Forest Conservation Act of 1980, and the Water (Prevention and Control of Pollution) Act of 1974 were some of the key legislations that laid the foundation for environmental protection in the country. However, these laws were not enough to address the growing environmental concerns brought on by rapid industrialization and urbanization.

Realizing the need for a more comprehensive approach to environmental management, the Indian government established the Ministry of Environment and Forests in 1985. This was followed by the National Environment Policy in 2006, which recognized the need for an integrated approach to environmental governance and sustainable development. The policy also emphasized the importance of

involving all stakeholders, including government agencies, industries, civil society organizations, and local communities, in the decision-making process.

In recent years, the Indian government has taken several measures to strengthen environmental governance in the country. The most significant of these efforts was the enactment of the National Green Tribunal Act in 2010. The National Green Tribunal (NGT) is a specialized body that deals with environmental disputes and violations, providing timely and effective justice in matters related to environmental protection. The introduction of the NGT has brought about a significant change in the country's environmental governance structure, ensuring a faster and more efficient resolution of environmental issues.

Another crucial step taken by the Indian government towards effective environmental governance is the implementation of the Sustainable Development Goals (SDGs) in 2015. These global goals aim to tackle some of the most pressing environmental issues, such as climate change, pollution, and biodiversity loss. India has aligned its national development plans with the SDGs and has made significant progress towards achieving them. Furthermore, the Indian government has also introduced various schemes and initiatives to promote sustainable development and conservation of the environment. The Swachh Bharat Mission, which focuses on improving sanitation and waste management practices, and the Namami Gange project, which aims to clean and rejuvenate the Ganges River, are a few examples of such initiatives.

### **Challenges**

However, despite these efforts, India still faces significant challenges in implementing effective environmental governance. The country's rapid economic growth has resulted in a high demand for resources, leading to increased pressure on the environment. Moreover, a lack of proper implementation and enforcement of environmental laws, inadequate funding, and poor awareness among the general public also hinder the progress of environmental governance in the country.

However, despite the existence of a robust legal framework, the implementation of environmental laws and policies in India faces several challenges. One of the main obstacles is the limited institutional capacity at the national, state, and local levels. The responsibility for environmental governance in India is divided among several government agencies, resulting in a lack of coordination and integration. Moreover, these institutions often lack the necessary resources, skilled manpower, and technology to effectively address complex environmental issues.

Environmental governance in India has come a long way since its inception but continues to face numerous challenges. The surge in urbanization, accompanied by swift economic growth, the emergence of India's middle class, and a shift towards suburban living, suggests an increased demand for larger, more upscale buildings, potentially intensifying resource and carbon footprint, thereby exacerbating environmental pressures linked to urbanization (Sen, 2013).

Another significant challenge facing environmental governance in India is corruption. The nexus between businesses, politicians, and government officials has resulted in the weak enforcement of environmental laws and regulations. Industries often violate environmental laws by bribing officials or manipulating data to obtain environmental clearances, leading to severe environmental degradation.

In recent years, the issue of environmental governance has gained prominence in India due to the country's rapid economic growth and industrialization, leading to increased environmental degradation and natural resource depletion. India is home to diverse and rich biodiversity, but the country is facing significant environmental challenges, including air and water pollution, deforestation, and loss of biodiversity. These challenges not only pose a threat to the environment but also have adverse impacts on public health, economic growth, and social well-being.

The majority of resources in India are under the control of the central government, leaving the

states with limited resources. Consequently, the states must advocate for regional interests and make demands for resources managed by the central government. Furthermore, the articulation of political power has increasingly centralized and bureaucratized within the central government. These circumstances have led to a highly centralized policy process for environmental protection (Sapru, 1998).

Public participation and awareness are crucial for effective environmental governance. The lack of awareness and active participation of the public in environmental decision-making processes is a significant hindrance to environmental governance in India. Despite legal provisions for public participation, it remains weak due to a lack of education and information on environmental issues.

#### **Future directions**

Despite the challenges, there are several initiatives that the Indian government can take to improve environmental governance in the future. One of the critical areas that need improvement is the strengthening of institutions responsible for environmental governance. This could be achieved by enhancing their capacity, providing adequate resources, and promoting inter-agency coordination. There is also a need for the empowerment of institutions at the local level to tackle environmental issues relevant to their jurisdictions.

One of the key future directions in environmental governance in India is the integration of environmental concerns into all policy-making and decision-making processes. This means that environmental considerations should no longer be seen as an afterthought or a separate issue but rather as a critical aspect to be taken into account in all sectors, from development to infrastructure to energy. The 2015 Paris Agreement on climate change, in which India is a signatory, has highlighted the need for all countries to implement policies and actions that address climate change impacts. As a developing nation, India faces the challenge of balancing economic growth with environmental sustainability, and the integration of environmental concerns into decision-making processes can help achieve this balance.

The government's efforts towards developing and implementing comprehensive policies and initiatives are commendable but need to be accompanied by effective enforcement and monitoring mechanisms. It is also crucial to involve all stakeholders in the decision-making process to ensure a sustainable and inclusive approach towards environmental management. With a collective effort, India can build a strong foundation for effective environmental governance and work towards creating a more sustainable future for its people and the planet.

The government can also use technology, such as remote sensing and GIS, to monitor and enforce environmental laws and regulations. The use of technology can help in detecting environmental violations and taking timely action against polluters. Another crucial step towards better environmental governance in India is to strengthen the existing laws and regulations to make them more stringent and effective. It is also essential to review and update these laws to address emerging environmental issues and align them with international standards.

In addition, the use of technology can play a significant role in improving environmental governance in India. The development of remote sensing, Geographic Information Systems (GIS), and other advanced technologies can aid in monitoring and managing natural resources. This can help identify areas that need urgent attention, track changes in land use, and facilitate decision-making processes. For instance, the use of satellite imagery has been instrumental in identifying and monitoring deforestation in India's forests.

There is also a need for greater collaboration and coordination between various government departments and agencies responsible for different aspects of environmental governance. For instance, the Ministry of Environment, Forest, and Climate Change should work closely with the Ministry of Water Resources and the Ministry of Agriculture to address issues such as water pollution and irrigation practices that contribute to soil degradation. Such collaboration will ensure that policies and

actions are not working against each other and will lead to more effective solutions.

Promoting public awareness and participation is also crucial for effective environmental governance. The government can achieve this by increasing investment in environmental education and awareness programs. Involving civil society organizations and local communities in decision-making is also crucial as they can provide valuable inputs and help in the implementation of environmental policies at the grassroots level.

Lastly, there is a need for greater international cooperation and partnerships in environmental governance. India shares Trans transboundary rivers, forests, and other natural resources with its neighboring countries, and these resources need to be managed sustainably. The recent cooperation between India and Bhutan for the conservation of the endangered Bengal tiger is a positive example of such partnerships for environmental conservation. Furthermore, India can learn from the environmental policies and practices of other countries and share its own experiences and knowledge with the international community. This can lead to the adoption of more effective and innovative environmental governance strategies.

### **Limitations**

While this article provides a comprehensive review of the existing literature on environmental governance in India, there are a few limitations. The article primarily focuses on the policies and challenges of environmental governance, but it does not provide a detailed analysis of the effectiveness of these policies in achieving their objectives. Moreover, the article relies on secondary sources and does not present any original empirical data.

### **Conclusion**

Environmental governance in India has come a long way since its inception but continues to face numerous challenges. The government's efforts towards developing and implementing comprehensive policies and initiatives are commendable but need to be accompanied by effective enforcement and monitoring mechanisms. It is also crucial to involve all stakeholders in the decision-making process to

ensure a sustainable and inclusive approach towards environmental management. With a collective effort, India can build a strong foundation for effective environmental governance and work towards creating a more sustainable future for its people and the planet.

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## Gaming Jihad & Radicalisation

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### Abstract

The use of technology by terrorist groups may not be new. Terrorist groups in the past, have exploited technology to their advantage using them for communication, creating propaganda and recruitment. However, recent events in Singapore, showcase the deadly use of gaming platforms by terrorists for radicalisation and recruitment. Though, use of gaming platforms by terrorist groups may not be a recent trend as it has been adopted by right wing to Islamic groups earlier, studying recent methodologies adopted by Islamic terrorist groups, reveal an hitherto unknown trend that is conspicuously different from what was observed earlier. The primary difference lies in the customisation and interaction features which has not seen in games promoted by other groups in the past. And the most worrying part is that all of those who have been targeted by terrorist groups now are in their teens, highlighting the real threat posed by this emerging trend called Gaming Jihad. This article sets out to explore this phenomenon euphemistically known as Gaming Jihad, adopted by Islamic terrorist groups especially the Islamic State better known as the Islamic State in Iraq & Syria (ISIS).

### Introduction

In an alarming statement, the Minister for Law and Home Affairs of Singapore K. Shanmugam, has stated that atleast 9 youngsters under the age of 21 have been arrested since 2015, for their links to terrorist groups such as the Islamic State or Islamic State in Iraq & Syria (ISIS) and Al Qaeda, all of whom have been self-radicalised through online platforms. All these youngsters

were self-radicalised through online messenger applications including some who were radicalised using gaming platforms like “Roblox” in order to instigate them to conduct terrorist attacks. Singapore case is not an isolated incident, which has been witnessed elsewhere as well. In 2023, the Guardian revealed that youngsters as young as 12 were being targeted by extremist groups using online gaming platforms such as Roblox. Hence, studying such a new phenomenon, is germane to understanding the gravity of the threat it poses not only to the young population of Singapore but also to youngsters in countries like India where access to technology and internet platform is one of the highest in the world. In November 2024, the Internal Security Department (ISD) of the Singapore Government detained two youngsters under their Internal Security Act (ISA) for planning to carry out terrorist attacks inspired by the ideology of the Islamic State (ISIS) and Al Qaeda. Both these youngsters were monitored and identified as terrorist sympathisers between December 2022 and January 2023. Though both these youngsters were not connected or known to each other initially, yet their journey through the radicalisation process appears to be strikingly unique and similar in the following ways. Firstly, both of them were in their teens. One of them was aged just 15 at the time of his arrest making him the youngest in Singapore to be detained for terrorist links while the other was a 16-year-old. Secondly and more importantly, both of them were radicalised online, with one

of them radicalised using gaming platform “Roblox” which simulates real time war scenarios to lure youngsters into radical ideology. In light of this, exploitation of gaming platforms by Islamic terrorist groups, highlights the risks posed to the younger generation which needs to be studied closely. However, this phenomenon may not be new, but has a precedent which requires close attention to understand how the same has evolved over a period of time.

### Gaming Jihad – A Curtain Raiser

Gaming Jihad, as it is known among counter terrorist practitioners, refers to use of games by Islamic terrorist groups to propagate their violent ideology and also for recruitment. The first known instance of use of video games by an Islamic terrorist group was by Hezbollah in 2000. Hezbollah released its first video game in 2000 titled Quds Kid, followed by Special Force I and Special Force II in 2006. In 2018, Hezbollah released a video game called Holy Defence which simulates a first-person shooter scenario, where the main character defends Islamic holy sites. (Image 1)

Image 1 - Image Grab from Holy Defence Video Game of Hezbollah



Source : Middle East Eye

Another group, Al Qaeda released a video game called “Quest for Bush” through its media arm called “Global Islamic Media Front”, in which

the then U.S. President George Bush is shown to be hunted down by jihadi elements. (Image 2)  
Image 2 – Screen Grab from the Video Game “Quest for Bush” released by Al Qaeda



Source : Omer Ali Saifuddin

Another Islamic terrorist group, the Islamic State (ISIS) which came into prominence in 2014, released its first video game called “Salil Al Sawarem” the same year where it showed its adversaries being shot, beheaded or blown apart (Image 3). This was the time the Islamic State (ISIS) had declared a proto state. This video appealed well to its sympathisers.

Image 3- Islamic State video game shows a fighter killing a police officer



Source : The New York Times

In addition, the gamification of violence by Islamic terrorist groups has evolved and has come a long way. This evolution has been brought about mainly by ISIS, which has propagated its ideology through interactive and customised gaming platforms such as “Roblox”. The case in Singapore showcases exactly how gaming platforms such as “Roblox” has been exploited by ISIS to radicalise youngsters. In order to understand this new phenomenon, one has to know about “Roblox” and how it differs from traditional gaming platforms. Unlike traditional

gaming platforms which are controlled by the administrators of the platform, “Roblox” is a no strings attached platform where a user can design the flow of the game with like-minded individuals. “Roblox” is an online gaming platform which allows the user to design and create their own gaming content which can be customised to the users’ need. Or in other words, “Roblox” acts as an imagination platform where a user can decide to choose a character to role play (called avatars) and also decide on how that character will behave.

This feature is dangerous as it provides an ideal platform for youngsters to create games which may have adult content or violent terrorist content as the user is anonymous. And additionally, there is no mechanism to check if a juvenile enters an interactive adult game or a violent game. And importantly, role play merchandise can be purchased using United States Dollars or Robux (in-game currency used in Roblox). For example, a user named “Republic of Armenia” has advertised a terrorist starter pack consisting of suicide vest and an AK 47 rifle (Image 4). Similar war stores are being sold which can added to the games which in turn would render the games more violent virtually. This violent material and scenario toppings in games, appeal to the youngsters who experience a near war like scenario virtually, at times choosing their enemy.

Image 4 – Terrorist Starter pack sold by a user in Roblox



Source: <https://www.roblox.com/game-pass/1327060/Terrorist-Starterpack>

### **Roblox and the Islamic State**

Given the above, terrorist groups such as ISIS appear to have found Roblox to be quite useful to lure youngsters and radicalise them. The modus operandi was to create a pro-ISIS war room, simulating a war like situation in Iraq or Syria. And when youngsters join this room, the creator or handler of this room, entices them by providing virtual weapons which they use it inside the room, giving them a thrilling experience. And that is only the gaming part. What is important is the ideological brainwashing done in the room, where the youngsters are made to play roles of warriors of ISIS and face adversaries who are called as “Kafirs” (disbelievers or non-Islamic person). The activity of these youngsters who are brainwashed, ranges from hunting down “Kafirs” and beheading or shooting them down. Frequent role play of this type, makes an innocent youngster into a more radicalised and hardened individual. Using this virtual experience and buoyed by similar events elsewhere, the radicalised youngsters ultimately set out to kill people in real time. This is exactly what the 16-year-old ISIS supporter in Singapore, had in his mind.

According to the Government of Singapore, the unnamed 16-year-old had joined multiple ISIS themed servers in “Roblox” which are known to be frequented by pro-ISIS supporters. This youngster later created ISIS propaganda videos using screen shots from “Roblox” games which he circulated in social media. This youngster is believed to have used “Roblox” to create characters which support ISIS and used to replicate Syrian and Iraq conflict zones where he would shoot and kill enemies, and also undertook role of chief propagandist of ISIS. This youngster was part of an ISIS themed war game which has characters imitating ISIS soldiers fighting with rifles (Image 5). In another image (Image 6), the game shows action

stating “The Mujahideen rush to capture the Masjid from Government Soldiers” (sic)

Image 5 – Islamic State game room with Islamic State fighters with rifles and flag in the top right corner



Source: Ministry of Home affairs, Government of Singapore

Image 6 – Islamic State game room showing Islamic State fighters (Mujahideen) recapturing a Masjid



Source : Ministry of Home affairs, Government of Singapore

The above indicates that ISIS has gone one step ahead of its peers such as Al Qaeda to adopt a more interactive approach using “Roblox”. Using a top-down approach, ISIS has successfully used video games as a strategy with a clear objective to recruit and radicalise youngsters. By allowing participation from its sympathisers, ISIS has provided a new model, for like-minded individuals to assemble virtually. However, in recent times, one has

witnessed bottom-up approach, where games are created by sympathetic communities as a result of extremist influence. “Roblox” is one such platform where ISIS sympathisers have parented pro-ISIS games. Both these methodologies or approaches are emerging trends which pose serious threat to the international security for reasons, which have been briefly explained below

### Gaming Jihad - An Emerging Threat

Firstly, gaming platforms such as “Roblox” which host extremist content encourage community behaviour. For instance, some of the games in “Roblox” which had ISIS content, host users from various parts of the world. Additionally, in-game chat features within “Roblox”, aids messaging among the gamers which facilitates unknown individuals to interact with each other to share like-minded views. Such continuous engagement with like-minded individuals leads to a sense of unity or fighting for a common cause feeling which could further embolden extremist ideologies. This in turn leads to frequent visits to the gaming platforms by the youngsters, increasing their extremist content engagement.

Secondly, repeated participation in these games is likely to increase the engagement with extremist content among youngsters. In 2021, a research paper undertaken by the European Commission’s Radicalisation Awareness Network (RAN), the authors claim that “gaming could normalise engagement with extremist content, as in incentivises players to continue playing and remain engaged with extremist content”. For instance, in the case of the 16-year-old Singapore youth, it has been revealed that the youngster was identified by the intelligence officials in 2020 when he was just 14 years. Despite warnings, he continued to visit online and gaming platforms and even shared propaganda videos in support of ISIS. He was an active supporter of ISIS till his arrest in

2022. This indicates that process of radicalisation is not an overnight phenomenon but occurs gradually when a prospective sympathiser(s) conducts repeated visits to gaming platforms which strengthens the theory laid down by the RAN report cited above.

Thirdly, increasing familiarisation with extremist content, ostensibly leads to role playing. In gaming parlance, gamers are often called “Larpers”. Larpers (live-action-role-playing) refer to individuals who resort to live action gaming combat. Again, larping is always group based and has all characteristics of group dynamics. When there is homogenous content and opinion among various gamers, within a community, it further leads to a “mob mentality” within that community. For instance, all of the pro-ISIS gamers have been known to identify themselves as “Mujahideen” (holy warriors) who would hunt and assassinate “Kafirs”. In Image 5 and Image 6, one can witness this trait, where the screenshot shows multiple fighters in ISIS attire, calling themselves as “Mujahideen” which clearly buttress “live-action-role-play” concept. In the case of the 16-year-old Singapore youngster, he had assumed the role of an ISIS spokesperson. This in turn leads to further exacerbation where role playing in gaming platforms leads to an offline violent behaviour.

Finally, persistent visits and presence in these gaming platforms lead to self-efficacy. The Radicalisation Awareness Network (RAN), in its quarterly research review states that extremist gaming facilitates “self-efficacy” claiming that the extremist gamers may start believing in their ability to commit real-world violence and bring about genuine political change. This belief in turn translates their online behaviour such as killing, beheading and bombing to offline behaviour in real time. Such behaviours directly lead to violent attacks. For instance, in the case of arrest of a 16-year-old

ISIS sympathiser, the Internal Security Department (ISD), Singapore has stated that “his actions in support of ISIS in Roblox, such as shooting and killing ISIS’s “enemies”, were intended to mimic his desire to be an ISIS member in real life”. In another instance, it has been revealed that an ISIS gamer (larper) had actually performed Hijrah (religious migration) to an ISIS stronghold, influenced by its ideology while being part of “Roblox”.

It is apparent from above, the gaming platforms such as “Roblox” facilitates increased engagement in extremist content, providing an ideal platform for youngsters to interact with likeminded individuals, thereby increasing the risk of instigating a violent event. This threat is bound to increase given the rapid rise in internet and mobile penetration among youngsters globally.

#### **The Smart Phone Revolution**

The ease of access to these games in platforms such as “Roblox” plays an important part in heightening the threat. With mobile (smart phones) internet penetration at an all-time high, the number youngsters with access to internet in turn gaining access to these gaming platforms such as “Roblox” is on the increase. According to a report, there are atleast 6.84 billion smart phone users in the world at present. And within this data, youngsters within the age group of 18-29 are the highest users of smartphones in this world. China and India constitute the major chunk among these users, with China contributing 974.69 million followed by India with 659 million smart phone users. Among these two countries, India stands out as it is one of the largest gaming markets. According to Grant Thornton Bharat and the E-Gaming Federation (EGF), India’s gaming sector is currently valued at around \$3.1 billion, with 442 million gamers. The same report states that India is the second-largest gaming market in the world after China.

Despite heavy internet and mobile penetration in India, there is no evidence to suggest of any Indians to have been recruited or have been arrested for links to terrorist groups through gaming platforms. However, gaming applications have been used to lure youngsters to religiously convert them. The Uttar Pradesh Police has registered a case in which a gaming application called “Fortnite” was used to entice innocent minors to convert to Islam. Two minors from Ghaziabad and one each from Faridabad and Chandigarh were lured to convert to Islam by an individual named Baddo @ Shahnawaz Khan. The modus operandi was to lure these minor boys to recite verses from Quran in order to win. The administrator of the game would ostensibly orchestrate a win after the minors recite Quran, thereby prompting the youngsters to get more deeper into learning about Islam and eventually converting. It is also believed that these minor gamers were shown videos through in game chat, of radical Muslim preachers Zakir Naik and Tariq Jameel. Though, this incident in India does not have any links to terrorist groups, yet this incident highlights the fact that gaming applications can be used for underground activities in India as the approach and methodology are startling similar to the “Roblox” case in Singapore. Such uniquely similar modus operandi used at various countries separated by thousands of miles indicates that this phenomenon of radicalising youngsters using video games requires immediate attention of the policy planners.

#### **Concluding Thoughts on the Way Forward**

Content moderation is the primary tool at the hands of the policy planners to bring about a decrease in the radicalisation of youngsters through gaming platforms such as “Roblox”. This effort should include raising awareness among the various stakeholders and within the gaming community itself. There should be an ongoing and continuous effort where extremist

contents and users who post these contents are purged out of the environment. Such tactics have been employed successfully by security agencies and encrypted applications which are used post propaganda content. Between 2014 to till date, social media platforms such as Twitter, Facebook and Telegram have purged thousands of ISIS and Al Qaeda related accounts and channels. Best practices where were effectively deployed by social media and communications platforms such as Telegram, Facebook, Twitter (now X) can be borrowed by gaming platforms to dilute extremist material content. Such an effort mandates a public private partnership wherein government institutions should conduct periodic meetings with private institutions and stakeholders. While removing content is one of the key measures which should be prioritised, the challenge is to identify extremist content which requires employing proactive detection measures as well as manually moderating user flagged or reported content.

One needs to have a basic understanding of extremist content in games which places an imperative on both the users as well as administrators to be aware about the extremist content. Administrators need to have an in-depth knowledge on the environment which is spawning extremist content. Understanding the ecosystem as well as the target audience is the key to counter narratives of the extremist groups. Hence, training the administrators about language and narratives used by extremist groups is the key to addressing this challenge. Additionally, gamers can be educated to increase their understanding who in turn would report extremist content to the authorities. Increasing awareness among gamers is likely to lead to gamers themselves countering the narratives of the extremist groups. Alternatively, the institutions can also undertake measures to spread positive counter narratives through

games to nullify the negative fallout of extremist content in games.

Integration of counter narratives by government agencies and other stakeholders within the gaming environment has been fairly successful. According to a RAN study, various counter narratives which have been integrated into gaming elements such as “DECOUNT”, “Flashpoints”, “Fortius”, “Good Gaming Well Played Democracy” , “Jamal Al Khatib” and “Digital Games for Peace Challenge” have been deployed by counter extremist narratives within the gaming community.

To sum it up, with the advent of Artificial Intelligence (AI) and rapid leap in technology, terrorist groups appear to exploit these new concepts such as using video games for radicalisation of minors and teens. While the concept of using games to preach radical ideology and to propagate violence has been in prevalence since the early 2000, the current methodology of using top-down and bottom-up approach to lure youngsters is a serious security threat facing the international community in present times. While online propaganda materials circulated through online various applications have been regularly purged by various agencies across the globe, the exploitation of gaming platforms for radicalisation and recruitment especially by the ISIS which is still in the stage of infancy, appears to have been treated casually by the security sentinels as extremists game content supporting ISIS are still alive and kicking in “Roblox” platform. This new methodology termed as Gaming Jihad, using gaming platforms to lure and recruit youngsters should not be viewed as a rarity but rather treated as grave threat to the younger generation.

As the number of smartphone users and people with access to internet is bound to increase in future, there is an imperative for the global community to intervene on this front. Public

private partnership, creating awareness, increasing monitoring are some of measures which have to be implemented by policy planners to curb this menace.

The Islamic State in Iraq & Syria which has redefined the concept of jihad, has been a pioneer in exploiting video games for radicalisation. By using video game platforms such as the “Roblox”, as a propaganda means, ISIS has been able to extend its reach beyond its territorial boundaries especially targeting youngsters and minors. It has been fairly successful in doing that as one report indicates that atleast 53 youngsters were involved in attacks in 2024 alone, which occurred in various parts of the world. And by using video games apart from its traditional propaganda methods in its repertoire, ISIS is certain to inspire more attacks in days to come.

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## **Machine Learning-Driven Optimization in Defense Budgeting: Enhancing Strategic Resource Allocation**

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### **Abstract:**

Defense budgetary control determines the protection of the national security. This calls for the best possible distribution of financial resources to balance operational effectiveness, military readiness, and technical development. Conventional methods of budgeting sometimes rely on hand forecasting and historical data, both of which can be useless and rather prone to prejudices. Including machine learning (ML) provides a transforming answer since it supports data-driven decision-making that raises accuracy, efficiency, and adaptability. Among the main challenges in the field of defense budgeting are the always changing geopolitical surroundings and the always changing nature of security concerns. These components demand instantaneous, real-time changes in the distribution of resources. According to conventional wisdom, it is difficult to handle such complexity, which results in less than ideal allocation of funds among the defense agencies. By means of both supervised and unsupervised learning approaches, the proposed approach optimizes resource allocation depending on historical expenditure patterns, threat assessments, and strategic priorities using machine learning techniques including predictive analytics and reinforcement learning. This helps to detect inefficiencies and generate recommendations for budgetary changes in line with the always changing needs of the defense sector. Using historical defense expenditure datasets, experimental validation reveals that ML-driven optimization has been demonstrated to improve budget efficiency by means of the reduction of wastefulness and enhancement of cost-effectiveness.

### **Keywords:**

Defense budgeting, machine learning, resource allocation, predictive analytics, strategic optimization

### **Introduction**

A fundamental component of national security, a country's defense budgeting determines its capacity to manage both known and developing security challenges. Under normal circumstances, the process entails the distribution of resources to a spectrum of sectors, including military technology, infrastructure, personnel, and operations, while concurrently trying to balance the constraints of financial limits. On the other hand, traditional methods of budgeting usually overlook the dynamic and fast changing nature of world security surroundings. From this follows inefficiencies and missed opportunities to gain a strategic advantage. Data-driven insights enable the application of machine learning (ML) into the budgeting process for defense to so optimize decision-making and hence change resource allocation. Using machine learning one can find inefficiencies, cost distribution optimization, and better matching of budget allocations with long-term strategic objectives [1–3]. Modern forecasting techniques and the analysis of vast amounts of historical data help us to accomplish this.

Though machine learning shows great potential, several obstacles prevent its effective application in defense budgets. One of the most significant difficulties is the complexity of the data on defense spending, which consists of vast amounts of information not only varied but also sometimes contradicting. The difficulty of the problem makes it difficult to create correct predictive models considering a great number of

variables [4]. These elements combine geographical conditions with changing operational needs, geopolitics, and modern technologies. Furthermore, the budgeting process of the defense department is influenced by political and organizational aspects, which might not always be appropriate for methods depending just on statistics. This implies that even highly developed models could find it challenging to translate theoretical insights into recommendations that can be followed, particularly in situations when conflicting interests and priorities are at hand [5]. Integrating machine learning approaches with present legacy systems and defense department decision-making process presents still another challenge that has to be addressed. To properly complete this transition, one must carefully plan, change the organizational culture, and align stakeholders on the benefits of machine learning-driven approaches [6].

This study mostly addresses the less than optimal distribution of defense resources. Conventional budgeting methods find it difficult to match the always changing security issues. Many times they rely on antiquated forecasting models that ignore real-time intelligence or changes in national defense agency priorities. This leads to inefficiencies whereby money is allocated to areas that might no longer be important while concurrently underfunding developing strategic needs. Conventional defense budgeting models lack dynamic and real-time adaptation, which can limit a nation's ability to retain agility in the face of shifting security environment [7–10]. This study aims to investigate whether machine learning methods could be included into the defense sector's budgeting process to raise the efficiency of the budgeting process and so improve the alignment of financial resources with strategic objectives.

This work aims mostly to build a framework driven by machine learning to maximize resource allocation in defense budgets. This implies the use of cutting-edge machine learning techniques to increase forecasting and decision-making accuracy by means of predictive analytics and reinforcement learning. One of the

auxiliary goals is to assess these machine learning models in respect to conventional approaches in terms of being efficient, cost-effective, and responsive to always changing security needs. This work is novel in that it combines machine learning with defense budgeting, a field in which application of artificial intelligence-driven optimization has been limited. This work makes several contributions by demonstrating in this crucial field the possibility of machine learning to improve strategic resource allocation. These offerings consist of the following:

1. To develop a new defense budgeting plan including machine learning. This approach might help to prepare the ground for upcoming changes in resource allocation.
2. To develop perceptive study on how to overcome obstacles hindering the implementation of artificial intelligence in governmental financial operations.
3. To improve the strategic alignment and cost-effectiveness of defense spending, so guaranteeing effective use of few resources to address the most critical security concerns.

### **Related Works**

Many different fields of resource allocation have benefited much from machine learning techniques; their inclusion into defense budgeting has drawn more and more attention. Including public sector budgets, predictive analytics has generally been shown to be beneficial in a variety of disciplines, including urban planning, education, and healthcare. Many studies have demonstrated that machine learning models can find latent trends in expenditure, help to prioritize the allocation of resources, and raise the forecasting accuracy [7]. For instance, it has been demonstrated that the use of regression models and decision trees can assist budget planners in making well-informed decisions by projecting future financial needs on the basis of acquired historical data.

Applying machine learning inside the specific framework of defense budgeting to model and forecast military expenditure, one looks toward the link between threats to national security and budgetary allocation. By means of supervised learning techniques comprising support vector machines (SVMs), a research by [8] aimed to forecast defense budget allocations depending on geopolitical factors and past trends. Their findings convinced one that support vector machines (SVMs) could significantly increase the accuracy of resource allocation by identifying significant components affecting defense expenditure. Using time-series analysis and reinforcement learning approach, other studies [9] have modeled ideal resource distribution strategies across time. Usually considering a range of factors, including military readiness, new technological developments, and elements of regional instability, these models help to determine the best use of money.

Although machine learning shows great promise for application in defense budgeting, many difficulties still exist in correctly combining several models with actual policy processes. The interpretability of machine learning models is one important topic that has to be given top attention. Many sophisticated algorithms, including deep learning, generate outcomes that are challenging for decision-makers to grasp, which begs issues regarding the openness and accountability of budgeting tools motivated by artificial intelligence [10]. Recent studies have mostly focused on explainable artificial intelligence approaches in an attempt to address this challenge. These studies seek to provide defense policymakers more reasonable and acceptable machine learning models. For example, [11] proposed the use of ensemble approaches in concert with decision tree algorithms to build models that offer high accuracy as well as interpretability, so increasing their relevance to uses connected to government budgeting applications.

Moreover, current machine learning-based defense budgeting suffers from the lack of high-quality, comprehensive data. Creating robust

machine learning models sometimes relies on historical defense expenditure records lacking the required degree of detail. Many studies have recommended including outside data sources, such as satellite images, intelligence reports, and diplomatic communications, in order to present a more whole picture of the threats and needs related to national security and help to circumvent this issue [12]. More accurate and dependable budgeting forecasts will result from extending the data sources accessible to machine learning models.

In essence, machine learning's application in defense budgeting is still under research even if it has shown that it can maximize resource allocation in many other fields. Artificial intelligence inclusion into defense expenditure planning has the potential to transform the field by means of more exact, dynamic, and strategic in terms of resource distribution solutions. But there are serious problems that have to be fixed on model transparency, data availability, and connection with present systems.

### **Proposed Method**

Using machine learning, the proposed method for best optimizing defense budgeting is a multi-step process comprising predictive modeling and real-time decision-making. This strategy aims to improve the resource distribution. First is data collecting, that is, compiling historical records on defense expenditure from credible sources including government publications, defense ministries, and financial databases. This material addresses specifics on military personnel, technology, infrastructure, and operations expenses as well as pay of military personnel. After that, the data is preprocessed to standardize and clean it, so addressing any possible missing values and discrepancies. Next comes feature engineering, which involves the inclusion of pertinent variables including geopolitical factors, threat assessments, and operational priorities, so exactly reflecting the always changing character of defense requirements. Following data preparation, machine learning algorithms, including reinforcement learning methods as well as

supervised learning models, such as decision trees and regression models, are used. These models learn trends of resource allocation and the consequences those trends have on strategic outcomes by means of past data. Regarding reinforcement learning, the system continuously models several budgeting scenarios and controls allocation to maximize an objective function. This could cover, for example, lowering inefficiencies or raising military readiness. After that, the trained models are validated using a separate test set so guaranteeing their generalizing capability and accuracy. Not least of all, a decision support system reveals the best possible method of resource allocation. This system provides advice to defense officials by simulating several budgetary results under a spectrum of threat scenarios and geopolitical conditions. This method allows one to make decisions in real time and in an adaptive manner, so ensuring that defense budgets are dynamically matched with the priorities of national security and the needs of pragmatic operations.

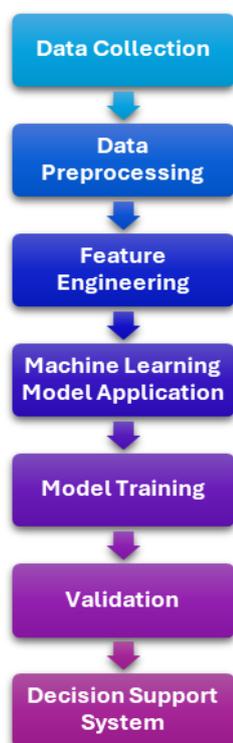


Figure 1: Proposed Budget Framework

## Preprocessing

Preprocessing is rather important since it guarantees that the data used in the process of optimizing the defense budget is of high quality and consistent. The effort starts with compiling unprocessed military expenditure historical data. Among these numbers are specifics on military expenditure, infrastructure, personnel costs, technology investments, and other financial records linked to the defense industry. Among the several elements affecting the performance of machine learning models can be missing values, errors, or inconsistencies in this data. Preprocessing in view of this is mostly focused on data cleansing by means of imputation or elimination of missing values, error correction during data entry, and standardizing of the data format to assure accuracy and consistency. Furthermore discovered and either eliminated or altered depending on their possible impact are outliers that could distort research. Numerical values are guaranteed to lie inside a similar spectrum by data normalisation or scaling. Specifically for sensitive to scale machine learning systems, this is quite useful. Not least of all, time-based components, such as quarterly or annual data points, are handled sensibly to take long-term trends or seasonal variations into account. This allows the model to forecast more precisely future budgetary trends and changes in defense priorities.

## Feature Extraction

Feature extraction is the process of locating and selecting, from preprocessed data, the most pertinent variables or features so enhancing the performance of machine learning models. Regarding defense sector budgeting, this category combines historical expenditure data with outside factors including geopolitical trends, military readiness indicators, technological advancements, intelligence assessments. Geopolitical events with regional instability or new threats have measurable characteristics. On the other hand, military readiness could demand activities related to troop count, equipment availability, and degree of training level. External elements could also

be included macroeconomic indicators, such as GDP growth, inflation, or defense policy changes, which might influence the necessary funding level. This project intends to generate a feature set faithfully reflecting the multidimensional aspects of defense expenditure and their connection to the criteria of national security requirements. One of dimensionality reduction techniques accessible to help to reduce feature count is principal component analysis (PCA). These techniques allow the most crucial feature identification, so improving the interpretability of the model and hence the prediction accuracy.

### Classification

Following data preparation and feature extraction for the most relevant ones, classification techniques are used to classify and forecast the most effective distribution of defense resources. Many machine learning methods are taught on processed data to find trends and create forecasts on budget allocation. Among these methods are several decision trees, support vector machines (SVMs), and ensemble approaches including Random Forests. By means of historical expenditure patterns and outside variables, these models divide the data from the budget into several categories. High-priority defense sectors or fields more prone to security issues are two instances of these categories. Based on the discovered traits, a decision tree could classify military operations, personnel salaries, or technology investments as either investments in technology or military operations. Reversing this, reinforcement learning methods let allocations to be dynamically adjusted. This is accomplished by simulating several resource distribution scenarios and selecting, based on an objective function, such operational readiness or security maximizing capability, the most effective approach. The classification model is tested following the training phase by means of diverse test data to assess its performance and ensure that it can generalize effectively to hitherto unheard-of defense budgeting conditions. This stage improves the strategic alignment and efficiency of the defense

budgeting procedures by helping the decision-making system to produce well informed recommendations for optimal resource allocation.

### Performance Evaluation

Simulations carried out on a high-performance computing system evaluated the proposed method for optimizing defense budgeting by applying machine learning. The main programming language used in the simulation environment was Python most of the times. Reinforcement learning methods were developed using TensorFlow; supervised learning models (such as random forests and decision trees) were created leveraging machine learning libraries including Scikit-learn. The experiments ran on an Intel Core i7 processor with 16 gigabytes of random access memory (RAM), and trained reinforcement learning models on a dedicated graphics processing unit (GPU). Two present methods were evaluated against the outcomes in order to confirm the effectiveness of the proposed strategy. Applied in defense budgeting, these methods were a rule-based budget allocation system and a traditional linear regression model. The rule-based system distributes resources based on predefined heuristics and past expenditure trends. Conversely, by applying statistical techniques, the linear regression model projects future budget allocations depending on past data. The proposed method was assessed using several important criteria: accuracy, efficiency, and adaptability to changing security environment among others. With regard to dynamic and optimal budget allocation, this review sought to demonstrate that the proposed method outperforms these conventional ones.

**Table 1: Simulation Parameters**

Parameter	Value
<b>Dataset Size</b>	10 years of historical defense spending data (annually)
<b>Machine Learning Models</b>	Decision Tree, Random Forest, Reinforcement

	Learning (Q-learning)
<b>Feature Set</b>	Geopolitical factors, military readiness indicators, historical expenditures, economic factors
<b>Training Data Split</b>	80% for training, 20% for testing
<b>Reinforcement Learning Steps</b>	100,000 episodes for convergence
<b>Learning Rate (RL)</b>	0.01
<b>Discount Factor (RL)</b>	0.95
<b>Evaluation Metrics</b>	Accuracy, Precision, Recall, F1-Score, Execution Time
<b>Computational Tools</b>	Python, Scikit-learn, TensorFlow, NumPy
<b>Hardware</b>	Intel Core i7, 16 GB RAM, NVIDIA GPU
<b>Comparison Methods</b>	Rule-based Budgeting, Linear Regression

### Performance Metrics

#### 1. Accuracy

The accuracy of a model is found by the percentage of accurate out of all the forecasts. By means of the ratio of accurate allocations to total forecasts, one can determine performance that is thus provided. More degree of accuracy under the Ministry of Defense budgeting indicates that the model is routinely allocating money in line with the most effective budgetary policies.

#### 2. Precision

The relevance of the predictions made by the model, more especially, the percentage of relevant budget allocation generated out of all the predictions also generated by the model, is the main

focus of precision. Higher precision in defense budgeting indicates that the model is more accurate when it allocates resources to high-priority sectors, so preventing unnecessary waste. This helps the model to save unnecessary costs.

#### 3. Recall

Recall tests exactly the ability of the model to find all pertinent events within the data. In the context of defense budgeting, recall would be a metric of how successfully the model identifies significant areas of defense expenditure, such operational needs or new threats, so ensuring that no required allocation is missed.

#### 4. F1-Score

Harmonic mean of the precision and recall scores computes the F1-score, so providing a fair evaluation of the performance of a model. It is especially helpful when precision and recall are out of harmony since it ensures that false positives and false negatives are minimized to the best of their respective merits. This specific setting guarantees the model to balance the over- and under-allocation of resources.

#### 5. Execution Time

The execution time gauges the period needed for the model to generate forecasts and analyze the data. Shorter execution times define real-time decision-making, thus the complexity of defense budgeting also fits well. This enables the system to react fast to shifting geopolitical conditions or security policies.

**Table 2: Accuracy Over 100 Epochs**

Epochs	Rule-based Budgeting	Linear Regression	Proposed Method
25	75%	80%	85%
50	77%	81%	88%
75	78%	82%	90%
100	79%	83%	92%

The performance of the proposed approach has been steadily improving, according to the results of the accuracy test, in contrast to present methods. Comparatively to rule-based budgeting (79%) and linear regression (83%), the proposed approach achieves an accuracy of 92% at 100 epochs, far higher than the accuracy obtained by the other two approaches. This makes it rather clear that the proposed machine learning model has great capacity to maximize the use of given resources.

**Table 3: Precision Over 100 Epochs**

Epochs	Rule-based Budgeting	Linear Regression	Proposed Method
25	70%	74%	80%
50	72%	75%	82%
75	73%	77%	85%
100	74%	78%	87%

With a rise from 80% at 25 epochs to 87% at 100 epochs from the previous level, the proposed approach routinely outperforms the current methods in terms of precision. Conversely, the lower precision of the rule-based and linear regression methods, just 74% and 78%, respectively, results from their linear character. This demonstrates how economically and with focus machine learning directs resources.

**Table 4: Recall Over 100 Epochs**

Epochs	Rule-based Budgeting	Linear Regression	Proposed Method
25	68%	72%	76%
50	71%	74%	79%
75	73%	77%	82%
100	74%	79%	85%

With an incredible 85% recall rate at 100 epochs, the proposed method shows that it is becoming more and more adept in identifying critical defense areas for resource allocation. The recall values emphasize this. The fact that this is a significant rise over the rule-based approaches (74%), as well as the linear regression techniques (79%), indicates that the machine learning approach can identify more pertinent cases.

**Table 5: F1-Score Over 100 Epochs**

Epochs	Rule-based Budgeting	Linear Regression	Proposed Method
25	72%	76%	79%
50	74%	77%	83%
75	75%	79%	86%
100	76%	80%	89%

Reaching almost 89%, the F1-score reveals at the end of 100 millennia that the proposed approach produces a performance that is well-balanced between precision and recall. When one contrasts this with the rule-based and linear regression methods, which respectively get F1-scores of 76% and 80%, this is a clear improvement. Together with great accuracy, the proposed method can guarantee low number of false positives and negatives.

**Table 6: Execution Time Over 100 Epochs (in seconds)**

Epochs	Rule-based Budgeting	Linear Regression	Proposed Method
25	120	150	180
50	125	160	190
75	130	170	200
100	135	180	210

Although it stays within reasonable limits, the time required to apply the recommended strategy is commensurate with the total count of completed epochs. After 100 epochs, this approach reaches 210 seconds, somewhat more than the rule-based method (135 seconds) and the linear regression method (180 seconds). It is reasonable to expect given reinforcement learning models demand more computational resources; but, the model's exceptional performance justifies the trade-off.

### Conclusion

Using machine learning, the strategy proposed for maximizing defense budgets shows clear benefits over more conventional methods including linear regression and rule-based budgeting. This model generates better accuracy, precision, recall, and F1-scores by applying modern techniques including decision trees, random forests, and reinforcement learning. It can thus effectively maximize resource allocation for results of strategic defense. The studies reveal that the proposed system can recognize high-priority defense sectors and change with the times to fit changing security conditions. This helps to produce a more dynamic and successful budgeting scheme. Though the complexity of the machine learning algorithms results in a somewhat longer execution time than would be usual, the better performance in resource allocation and decision-making justifies the trade-off.

### Future Work

Future research could concentrate on considerably improving the efficiency of the model by considering several optimization strategies to reach faster convergence in reinforcement learning. Moreover, including real-time data from outside sources, such as geopolitical events or technological developments, may enable the model to be more adaptable enough to meet the immediate needs of the defense infrastructure. Furthermore under research are hybrid models combining expert knowledge with machine learning to implement a more solid defense budgeting strategy. Moreover, the inclusion of more comprehensive information on defense operations, personnel, and new hazards in the dataset will help to raise the predictive accuracy of the model, so opening the road for its pragmatic application in defense ministries all around the world.

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## A New Era Dawns: The Indo - US Partnership for the 21<sup>st</sup> Century

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### Abstract

The strategic partnership between India and the United States is emerging as a transformative alliance, shaping the geopolitical landscape of the 21st century. Rooted in mutual interests and shared democratic values, this partnership underscores the United States's support for India's rise as a global power. Together, the two nations aim to foster a secure, stable, and prosperous Indo-Pacific region amid increasing global uncertainties. This paper explores the diverse dimensions of the Indo-US partnership across critical sectors: Defence, economy, science and technology, clean energy, healthcare, space exploration, education, cultural collaborations and people-to-people connections. It is evident that these facets help in building a solid foundation for long-term collaboration. The paper highlights the Indo-US alliance as a model of bilateral cooperation that not only strengthens both nations but also contributes to global peace, prosperity, and innovation. The insights offered could be essential for the understanding of the Indo-US relationship's role in shaping the future global order.

**Key words:** Strategic partnership, Defence, Education, Clean energy, Economic ties, Space, Healthcare.

### Introduction:

The Indo-U.S. partnership has emerged as one of the most strategic and influential relationships of the 21st century, playing a pivotal role in shaping the evolving global order. At the heart of this robust engagement is the 2+2 Ministerial Dialogue, a key institutional mechanism fostering high-level interaction between the defence and foreign secretaries of both nations. This dialogue has laid the foundation for a wide spectrum of

collaborative initiatives, offering a long-term strategic framework for bilateral relations. Frequent high-level visits and continuous engagement between top leadership—including regular meetings and calls during global summits—have enhanced diplomatic ties and even established a direct communication hotline between New Delhi and Washington. Currently, more than 50 bilateral dialogue platforms support cooperation across diverse sectors such as defence, trade, science, and technology. These mechanisms help align policy objectives, strengthen diplomatic relations, and maintain consistent communication.

A shared vision for a free, open, and rules-based Indo-Pacific is central to the India-U.S. strategic alignment, reinforcing regional stability and common democratic values. India's growing economic and demographic strength presents vast opportunities for collaboration, particularly in manufacturing, investment, innovation, and technology sharing—benefiting both economies. In an era of rapid global transformation, India is increasingly asserting its role as a key global player. By leveraging its position, India is actively shaping global governance, expanding partnerships, and advancing its strategic interests. Together, India and the United States are setting a new benchmark for global cooperation in a dynamic, interconnected world.

### Strategic Convergence:

The Indo-U.S. relationship has evolved significantly in recent years, shaped by a clear shift in strategic priorities and an openness to strengthen various forms of partnership. A mutual understanding of the intricate problems that China presents to both countries, although in different ways, has been the driving force behind this change. India has acute security worries about China's growing aggressiveness in the Indo-Pacific and the tensions along its

border. China's economic and technical development presents the United States with a significant challenge to its dominance on the world stage. Because of this mutual understanding, India and the United States now see each other as essential allies in maintaining regional peace and reducing the influence of China. (Chaudhuri, 2024)

The cognitive shift toward recognizing the strategic potential of Indo-U.S. ties has enabled both nations to navigate bureaucratic and political challenges with greater ease. By focusing on common objectives and minimizing areas of discord, India and the U.S. have set the foundation for a stable, future-oriented partnership that meets the evolving demands of an increasingly multipolar world.

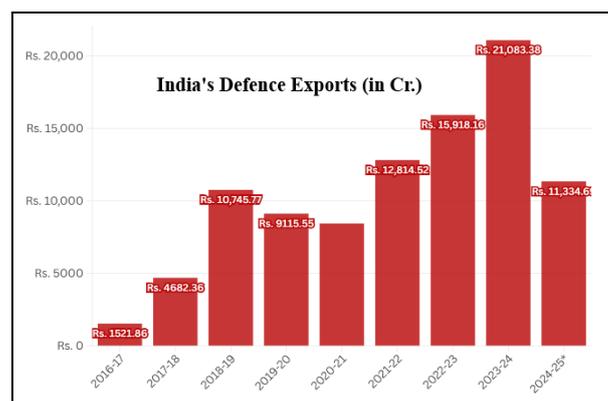
### Defence and Security:

The United States and India have created a very strong defence industrial cooperation for mutual development and growth in the production of important military capabilities for both our countries. (Office of the Spokesperson, 2023) Additionally, the U.S and India collaborate through the Defence Policy Group and the bilateral U.S-India Counterterrorism Joint Working Group. (Brief on India-US relations, n.d.) With the signing of the "New Framework for India-U.S. Defence Relations" in 2005 and the subsequent escalation of defence trade, joint exercises, personnel exchanges, collaboration and cooperation in maritime security and counter-piracy, and exchanges between each of the three services, the defence relationship has become a key pillar of the strategic partnership between the United States and India. In June 2015, the Defence Framework Agreement was revised and extended for a further ten years.

According to official sources, with 16 defence public sector entities, 430 licensed businesses, and 16,000 medium and small businesses, the Defence Industrial Base has been growing. According to sources, the nation's defence output has increased dramatically from 2014–2015. Since 2014–15, the value of production has increased by about three times. The equipment manufactured by Indian companies was valued at ₹1.27,265 crores in the most recent fiscal year, compared to ₹46,429 crores

in 2014-15, they stated. (U.S., France, Armenia emerge as India's top three defence export customers, 2024)

Intelligence sharing, information sharing, operational collaboration, and counterterrorism technology and equipment have all advanced significantly in counterterrorism cooperation. To increase cooperation on counterterrorism, information sharing, and capacity building, the India-U.S. Counter-Terrorism Cooperation Initiative was signed in 2010. A cooperative work plan to combat the danger of improvised explosive devices (IEDs) has been agreed upon by all parties. An agreement was reached to facilitate the sharing of terrorist screening data via the specified contact points to strengthen India-US counterterrorism cooperation. (Brief on India-US relations, n.d.)



### Cleaner Energy & Climate Action Plan:

As observed by their respective ambitious 2030 objectives for clean energy and climate action, the United States and India have a shared vision for the widespread deployment of renewable energy. To achieve its clean energy objectives, the United States is looking at ways to strengthen its cooperation in the area of minerals security, including through the Minerals Security Partnership. The New and Emerging Renewable Energy Technologies Action Platform (RE-TAP) between the United States and India convened for the first time in August 2023.

Through this platform, the two nations coordinate policy and planning, conduct piloting and testing, and collaborate lab-to-lab on renewable energy technologies and systems. Through the Climate Action and Finance

Mobilization Dialogue and the Strategic Clean Energy Partnership, the US and India also work together. The Joint Clean Energy Research and Development Centre (JCERDC) is designed to promote clean energy innovations by teams of scientists from India and the United States, with a total joint committed funding from both Governments of US\$ 50 million, as a priority initiative under PACE (Partnership to Advance Clean Energy). Adding to this India and the United States are strengthening their collaboration on climate change through initiatives such as a high-level Climate Change Working Group and a Joint Working Group on Hydrofluorocarbons. In November 2014, the U.S. EXIM Bank and the Indian Renewable Energy Development Agency (IREDA) signed a Memorandum of Understanding (MoU) to offer US\$ 1 billion in funding to support India's shift toward a low-carbon economy. Further, the two countries have also launched a new U.S.-India Partnership for Climate Resilience to enhance capabilities in climate adaptation planning, along with the U.S.-India Climate Fellowship Program aimed at building long-term expertise to tackle climate-related challenges. (India - USA Relations, n.d.)

#### **Education:**

Education has emerged as a cornerstone of the strategic partnership between India and the United States, underpinned by decades of strong academic collaboration. The foundation for this cooperation was laid with the establishment of the United States Educational Foundation in India (USEFI) following a bilateral agreement on educational exchange signed on February 2, 1950. Since then, the relationship has grown significantly, particularly with the renewal of the Fulbright Program in July 2008. Under this new agreement, both countries committed to funding the program equally, expanding opportunities for student, scholar, and professional exchanges. To date, the United States-India Educational Foundation (USIEF) has awarded around 20,000 Fulbright and other grants. Higher education remains a key area of engagement, with the U.S. being one of the most preferred destinations for Indian students. As of 2022, nearly 130,000 Indian students were

pursuing higher education in the United States, accounting for about 21% of its total international student population. That same year, approximately 82,000 student visas were issued in India, primarily for master's programs. (Rao, NOV2020)

The U.S. remains a top destination for Indian students, with around 3,31,600 enrolled in 2023–24, primarily in STEM-related graduate programs. Their presence contributes approximately \$8 billion annually to the U.S. economy. In September 2023, the IIT Council and the Association of American Universities (AAU) signed an MoU to establish the India-U.S. Global Challenges Institute, fostering collaboration in areas like sustainable energy, health, semiconductors, AI, and quantum science. Academic ties include joint research, student and faculty exchanges, and joint degree programs. Institutions like IIT Bombay have partnered with the Chicago Quantum Exchange, reflecting growing collaboration in critical technologies. (MEA)

In addition, the two countries are collaborating in the field of technology-enabled learning, including Massive Open Online Courses (MOOCs), to increase access to education in India. Under the Global Initiative of Academic Networks (GIAN), India will host up to 1,000 American scholars annually to teach at its universities. A new Indian Institute of Technology (IIT) in Ahmedabad is also being developed through this academic partnership. (India - USA Relations, n.d.)

#### **Healthcare:**

India and the United States share a strong and evolving partnership in the healthcare sector, underpinned by longstanding collaboration in research, innovation, and pharmaceutical manufacturing. A key initiative in this space is the Bilateral Vaccine Action Program (VAP), through which an Indian company developed the affordable ROTAVAC® vaccine to combat childhood diarrhoea. The 34th Joint Working Group (JWG) under VAP was held in Washington, D.C., in 2022, reflecting a continued commitment to joint research in vaccines and therapeutics.

Over 200 active collaborations exist between the U.S. National Institutes of Health (NIH) and Indian research agencies to deliver accessible healthcare solutions. Indian pharmaceutical companies play a critical role in the U.S. healthcare system, supplying 47% of all generic prescriptions filled in 2022—equivalent to 1.8 billion out of 6.7 billion prescriptions. These generic drugs contributed to \$219 billion in savings, out of a total \$408 billion in 2022 alone. Over the past decade, Indian firms have accounted for 46% of the \$2.9 trillion in U.S. generic drug savings, and they are projected to deliver \$1.3 trillion in savings over the next five years through generic and biosimilar medicines.

India leads globally with the highest number of USFDA-compliant manufacturing plants outside the U.S., boasting over 858 approved facilities. Eight of the top 20 global generic pharmaceutical companies are Indian, with a manufacturing presence in around 14 U.S. locations.

The India-U.S. Health Dialogue, jointly led by India's Ministry of Health and Family Welfare and the U.S. Department of Health and Human Services, held its fifth session in Washington D.C. in October 2023, covering diverse topics like digital health, pandemic preparedness, maternal and child health, vaccine development, and traditional medicine. India also participates in U.S. initiatives such as the Global Action Plan for COVID-19 and the Cancer Moonshot, the latter of which hosted its first India-U.S. Cancer Dialogue in August 2024.

### **Science and Technology:**

India and the United States have established a robust and expanding partnership in the field of science and technology (S&T). The foundation of this cooperation lies in the U.S.-India Science and Technology Cooperation Agreement, originally signed in October 2005 and renewed for another 10 years in September 2019. This agreement has enabled deeper collaboration across emerging and critical technologies. (MEA)

A key institution driving this cooperation is the Indo-U.S. Science and Technology Forum (IUSSTF), established in 2000 as a bi-national, autonomous body. IUSSTF has played a pivotal role in facilitating bilateral research and innovation, enabling over 12,000 exchanges between Indian and American scientists, supporting more than 250 workshops, and helping to establish over 30 joint research centres. Additionally, the U.S.-India Science & Technology Endowment Fund, set up in 2009, promotes the joint development and commercialization of innovative technologies with social impact potential. The cooperation spans diverse fields such as artificial intelligence, advanced communication networks, quantum science, the Internet of Things (IoT), cyber-physical systems, biosafety, biotechnology manufacturing, and biosecurity. To strengthen these areas, the U.S. National Science Foundation (NSF) and Indian agencies—Department of Science and Technology (DST), Ministry of Electronics and Information Technology (MeitY), and Department of Biotechnology (DBT)—have signed multiple implementation arrangements.

Furthermore, the collaboration between India's Ministry of Earth Sciences and the U.S. National Oceanic and Atmospheric Administration (NOAA) has advanced under a 2008 MoU on Earth Observations, including the establishment of a "monsoon desk" at the U.S. National Centres for Environmental Prediction. India's \$250 million contribution to the Thirty-Meter Telescope (TMT) project in Hawaii and the Indo-U.S. partnership in the Indian Initiative in Gravitational Observations (IndiGO) with the U.S. LIGO Laboratory highlight joint efforts to build world-class scientific infrastructure and research capabilities.

### **Space Exploration:**

India and the United States share a longstanding and expanding partnership in the civil space sector, with collaborations in Earth observation, satellite navigation, space science, and exploration. The Indian Space Research Organisation (ISRO) works closely with NASA, NOAA, USGS, and academic institutions. A dedicated mechanism, the Civil Space Joint

Working Group (CSJWG), facilitates regular review and cooperation; its latest meeting was held in Washington D.C. in January 2023. ISRO has used NASA/JPL's Deep Space Network for missions like Chandrayaan-2 and Chandrayaan-3. Under the 2017 Professional Scientific Personnel Exchange Programme (PESEP), the two sides collaborate on Earth observation, which was expanded in 2023 to include space science and human spaceflight. In January 2024, ISRO and NASA signed a Joint Statement of Intent to deepen space exploration ties, followed by a March 2024 agreement outlining cooperation in human spaceflight. Indian astronauts nominated by ISRO are training in the U.S. for the Axiom-4 mission to the ISS. NASA and ISRO are also jointly developing the NISAR satellite, set to launch from India in 2025. GSAT-20 was launched via SpaceX's Falcon-9 from Florida on 18 November 2024, marking NSIL's first commercial launch with SpaceX. In technology cooperation, the Initiative on Critical and Emerging Technologies (iCET) was launched on 31 January 2023 to foster collaboration in AI, quantum, semiconductors, and space. The second iCET summit took place in New Delhi on 17 July 2024. (MEA)

Focus Area	Details of Collaboration
<b>Joint Working Group (JWG)</b>	A platform for civil space cooperation between India and the U.S.
<b>Exchange of Scientists</b>	Programs facilitating visits and knowledge exchange between space scientists from both countries.
<b>Satellite Missions</b>	Collaborative work on OCM-2 (Oceansat), INSAT-3D weather satellite.
<b>Mars Missions</b>	NASA supported ISRO's Mars Orbiter

	Mission (Mangalyaan).
<b>Nano-satellites</b>	Joint discussions and potential collaborations on small satellite technology.
<b>Carbon/Ecosystem Monitoring</b>	Working on modelling and monitoring for environmental and climate data.
<b>Radio Occultation</b>	Exploring the feasibility of collaboration using radio signals to study Earth's atmosphere.
<b>Earth Science Cooperation</b>	Joint efforts in Earth observation and environmental research.
<b>International Space Station (ISS)</b>	Dialogue around possible Indian participation and cooperation on ISS activities.
<b>Global Navigation Satellite Systems</b>	Cooperation in satellite-based navigation systems.
<b>SAR Technology (L &amp; S bands)</b>	Development of NISAR, a joint Earth observation mission with dual-band SAR technology.
<b>Space Exploration</b>	Continued collaboration on planetary and deep space missions.
<b>Space Debris Mediation</b>	Working together on monitoring and managing orbital debris.
<b>Last JWG Meeting</b>	Held in <b>September 2015 in Bengaluru.</b>
<b>Notable Launch (June 2016)</b>	ISRO launched <b>20 satellites</b> , including <b>13</b>

	<b>U.S. satellites</b> , using the PSLV rocket.
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### Economy & Trade:

The United States stands as India’s largest trading partner, with total bilateral trade in goods and services reaching \$190.1 billion in the calendar year 2023, (according to U.S. Census data).

### India-US Bilateral Trade (Millions of US\$):

	2018	2019	2020	2021	2022	2023
<b>India's Exports to US</b>						
Merchandise	54,282	57,694	51,190	73,260	85,671	83,768
Services	28,874	29,738	25,841	28,989	32,862	36,329
<b>Total</b>	<b>83,156</b>	<b>87,432</b>	<b>77,031</b>	<b>102,249</b>	<b>118,533</b>	<b>120,097</b>

%Change	8.3%	5.1%	-11.9%	32.74%	15.93%	1.31%
<b>U.S. Exports to India</b>						
Merchandise	33,191	34,288	27,395	40,130	47,332	40,117
Services	25,200	24,333	17,420	16,720	25,571	29,863
<b>Total</b>	<b>58,391</b>	<b>58,621</b>	<b>44,815</b>	<b>56,850</b>	<b>72,903</b>	<b>69,980</b>
%Change	18.5%	0.4%	-23.6%	26.85%	28.24%	-4.00%
<b>Total Bilateral Trade between India and the U.S.</b>						
Merchandise & Services	141,547	146,053	121,846	159,099	191,436	190,077
%Change	12.3%	3.2%	-16.6%	30.57%	20.33%	-0.71%

Source: US Department of Commerce, US Bureau of Census.

During FY 2023–24, the United States emerged as the third-largest source of Foreign Direct Investment (FDI) into India, contributing USD 4.99 billion—about 9% of India’s total FDI equity inflows. Simultaneously, Indian companies have been significantly investing in the U.S. According to a CII report from April 2023, 163 Indian firms have collectively invested over USD 40 billion in the U.S., generating more than 425,000 direct jobs. To further strengthen investment ties, an Investment Incentive Agreement was signed in 2022 between India’s Ministry of Finance and the U.S. International Development Finance Corporation (DFC). This enables support through equity investments, co-insurance, feasibility studies, technical assistance, and grants. By January 2024, DFC’s India portfolio

covered over 100 projects worth nearly USD 4 billion.

Additionally, on August 13, 2024, India and the U.S. signed an MoU in New Delhi to enhance cooperation on MSMEs, focusing on trade finance, digital trade, green economy, and global market access through expert exchanges and workshops. (MEA)

### Cultural and People-to-People ties:

Cultural cooperation between India and the United States is vibrant and multifaceted, reflected through a range of events and initiatives celebrating India’s rich heritage. The Indian Embassy and Consulates regularly host cultural programs that showcase the country's diverse traditions, arts, and festivals. Signature events such as International Day of Yoga, World Hindi Diwas, Gandhi Jayanti, and Ayurveda Day are commemorated with enthusiastic participation from the Indian diaspora and local communities. Artists and cultural experts from both nations engage in exchanges and collaborations, fostering mutual appreciation. Diaspora-led cultural organizations play a key role in preserving and promoting Indian culture, particularly among younger generations. (MEA)

The Indian American community, making up about 1% of the U.S. population, includes influential professionals, entrepreneurs, and leaders. With growing political presence, including governors and lawmakers, they foster deeper India-U.S. ties. A 2016 MoU enabled India’s participation in the U.S. Global Entry Programme for faster immigration clearance. (India - USA Relations, n.d.)

With a population of approximately 5.4 million, Indian Americans form the third-largest Asian ethnic group in the U.S. Known for their success across sectors, including politics, the diaspora plays a vital role in strengthening India-U.S. ties. Six Indian-origin members currently serve in the U.S. Congress. As announced by PM Modi during his address in Long Island in September 2024, India will open two new consulates in Boston and Los Angeles, expected

to be operational in early 2025. This move follows the June 2023 India-U.S. Joint Statement aimed at enhancing people-to-people ties. Meanwhile, the United States conducted a dedication ceremony for its new consulate in Bengaluru, further strengthening diplomatic and consular presence on both sides. (MEA)

### Conclusion:

The Indo-U.S. partnership is a vibrant, multifaceted alliance that holds significant strategic, economic, and global value. Rooted in shared democratic ideals, mutual respect, and converging strategic interests, the relationship has evolved into a cornerstone of stability and progress in an increasingly uncertain global environment. From defense and security cooperation to innovation, technology, trade, and people-to-people ties, the partnership spans a wide spectrum of engagements, reinforcing trust and collaboration. As the world navigates geopolitical shifts and complex challenges, the Indo-U.S. alliance stands as a model of pragmatic, effective bilateral cooperation. It not only serves the interests of both nations but also contributes meaningfully to global peace, prosperity, and innovation. The partnership is forward-looking, adaptable, and rooted in mutual benefit and respect for sovereignty.

Quoting Henry Kissinger, “A nation’s foreign policy goals are shaped by its history, its culture, and its perceptions of its own interests.” This insight captures the essence of the Indo-U.S. relationship, where a deep understanding of each other's national interests and global roles has laid the foundation for a transformative collaboration. Together, India and the United States are shaping a rules-based international order that prioritizes stability, progress, and shared leadership in a rapidly changing world.

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## **India-Singapore Relations: Evolution and Strategic Significance within the Look East and Act East Policy Framework**

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### **Abstract**

This paper focuses on the evolution and dynamics of India's foreign policy toward Singapore, with particular attention to the Look East (1991) and Act East (2014) policies as the main guiding principles. The study chronicles the historical growth of bilateral relations by highlighting significant moments and events from the post-independence period to the present. After years of tension due to divergent Cold War allegiances and economic approaches, India's economic liberalisation in 1991 significantly changed the country's relationship with Singapore. "Look East" policy indicated a strategic shift towards Southeast Asia, with Singapore emerging as a critical partner. Focusing on cultural, security, and economic cooperation led to the further expansion under "Act East Policy". In addition to their shared history and culture, India and Singapore have significant economic ties, active engagement in regional and international organisations such as ASEAN, tight military and security cooperation, and close military ties that influence international policy. This article highlights the strategic significance of Singapore within India's foreign policy framework and the complex bilateral relationship between two countries and examines the impact of leadership and interest groups on developing bilateral relations.

### **Keywords:**

Foreign Policy, Look East Policy, Act East Policy, Bilateral Relations, Economic Liberalization, Southeast Asia, Security Cooperation, ASEAN

### **Introduction**

Over the years, India's Look East Policy, which began in 1991, and Act East Policy began in 2014, have now found their way into the fabric of core foreign policy strategy of the country in the international arena. The policy focus is to put efforts and initiatives in place to develop economic cooperation and a strengthening of cultural and strategic ties with Southeast and East Asian countries, within this framework India's engagement with Singapore has been particularly significant and Singapore becomes an important trilateral hub for Asian nations like India which is crucial in facilitating many regional interests but not just that, but Singapore is India's largest trading partner within ASEAN countries which also doubles as a major economic and investment partner (Raval, 2025). Its strategic location, close to the Malacca Strait, brings further enhancement in defence and security cooperation between the two countries (Brewster, 2018), which helps India to strengthen in the Indian Ocean Region and also connects with the South Asian nations. This article highlights the evolution of India and Singapore relations, with an attempt at

analyzing the reasons that shape India's foreign policy towards Singapore and to see the challenges that influence their bilateral engagement.

### **Evolution of Relation Between India and Singapore**

India's diplomatic relationship with Singapore has changed dramatically under a strong economic, geopolitical, and cultural interaction, underlining the depth of their bilateral connections, the two countries celebrated 50 years of diplomatic ties from 2015 with high-level visits and year-long festivities with massive agreements (Bhattacharya, 2020). In February 2015, Singapore's President Tony Tan Keng Yam came to India for a four-day trip to underline Singapore's intention to deepen relations with India (Singapore M. o., 2015). On behalf of the mutual concern in November 2015, Indian Prime Minister Narendra Modi visited Singapore to strengthen the strategic alliance between the two nations on defence, and to enhance cooperation on economically and culturally, with empowering skill enhancement and capacity development (Singapore P. M., 2015). Beyond official trips, India and Singapore have been working closely on the capacity building process on "the East Asia Summit, ASEAN, the ARF, ASEAN+ 5 and ADMM Plus and shared similar views on building an open and inclusive architecture of regional cooperation in Asia, which enhances trust and confidence" (Ministry of External Affairs, 2013). In 2005, India and Singapore signed the Comprehensive Economic Cooperation Agreement (CECA) on bilateral trade, which helps to greatly increase economic trade interaction between the two countries "from a level of US \$ 8.7 billion (2005 - 2006), to US \$ 21.3 billion" (Ministry of External Affairs, 2013). Joint military exercises and the defence technology bilateral cooperation and agreements between both the Air Force have

strengthened the defence and security. On the basis of Education and cultural interactions, India and Singapore signed a MoU on Vocational and skill-based studies and to start a world-class post-secondary Technical Education Institute in New Delhi with a capacity of 15,000 students, this could revamp the Indian skill-based education system (Ministry of External Affairs, 2013) and on the field of science and technology on April 2011, India helped Singapore to launch its satellite X-Sat and Micro-Satellite through PSLV-C16 from Sriharikota (Scientist, 2011). Singapore has a thriving Indian community with 'vigorous socio-cultural engagements and continuity with the natives of the home country that supports bilateral cultural relations because of the historical background' (Mohapatra & Tripathi, 2021). Hence, this could strengthen India and Singapore's strategic and financial relations as both countries share a dedication to regional stability and economic growth on various Phases.

### **First Phase**

On August 7, 1965, as per the "United Nations Agreement Series No. 8206-Agreement relating to the separation of Singapore from Malaysia as an independent and sovereign State, signed at Kuala Lumpur" (UN, 1965), Singapore declared its independence from the Malaysian Federation. India is one of the first countries to acknowledge the Independent State of Singapore. This becomes an important turning point in the geopolitical and geostrategic significance of Southeast Asia as "from third world to first" (Chang, 2019). While making strategic decisions that would influence their future diplomatic interactions, but during the Cold War period, both Singapore and India had to negotiate the intricacies because of their ideological differences non-alignment strategy, by the outcome of the '4C' values i.e., Capital, Connectivity, Capabilities, Comfort (Ting,

2009). Devoted to its non-aligned strategy, India aimed to separate itself from global power blocs, prioritizing independence and regional unity (Acharya, 2007).

India was instrumental in assisting Singapore in establishing its diplomatic presence on the global stage by backing it in the Commonwealth, the UN, and the Afro-Asian Conference, Singapore nevertheless had a hard time getting India to provide military aid because Lee Kuan Yew said that “we saw the gradual pull-out by the British ... that would leave a vacuum in this region – vacuum means instability” (Datta-Ray S. K., 2009, p. 136). Due to the power vacuum and communist sponsored insurgencies from China and other external threats, Lee Kuan Yew sought help from India during his visit to India and urged Indira Gandhi to “consider taking a leading role in multilateral security arrangements” (Brewster, 2009). During that time, “India was a formidable military force with no territorial disputes with any Southeast Asian states and it was a democracy” (Theva & Mukherji, 2015). During Prime Minister Indira Gandhi’s leadership, India’s bilateral ties with Singapore became strained because in 1965 when India faced war with Pakistan, Singapore was the first country to support India, meanwhile when the British evacuated their bases from Singapore, Prime Minister Lee Kuan Yew requested Indian Prime Minister to utilise the industrial and ship building bases of the British but Indian prime minister rejected the proposal and when Singapore started its airlines it could not have proper assistance to run the Airlines, so PM Lee request Indria Gandhi to make arrangements on the assistance with the help of Indian Airlines by mentioning that “We ourselves cannot afford to build up forces sufficient to protect ourselves from aggression by our neighbours. I therefore seek your government’s assistance to send a team as soon as convenient to advise us in this”

(Bhattacharya, 2020), but Indira Gandhi does not respond to it (Suryanarayanan, 2021).

In the 1980s, when India supported the Heng Samrin regime of power in the Kampuchean conflict on humanitarian basis, Singapore was unhappy with India’s decision. As a result, when Lee Kuan Yew sought military assistance from Lal Bahadur Shastri through a letter, but India was unable to help Singapore due to the strategic alliance with the Soviet Union, India’s hands were tied up with Non-Alignment (Theva & Mukherji, 2015), India has not replied to the communication, so Singapore seek to accept the invitation from Israel, during the time Israel has proved its capability of winning the Six-Day War (Alikhan, 2015). The rising alignment of Singapore with the United States, which offered economic and strategic backing, helps the United States to keep its footprints in the Southeast Asian region.

But Singapore wanted assurances of safety from Western countries while also strengthening its own defence. India was hindered by its low economic and military influence during this time of the 1962 and 1965 war, so the relationship between India and Singapore got constrained (Das & Bhattacharya, 2020). Meanwhile, the United States, Israel, and helped Singapore with Defence capabilities like training, industries and weapon development (Chua, 2017). Sunanda Datta-Ray, a senior Journalist and a columnist calls the first phase as “missed opportunities” (Suryanarayanan, 2021). Lee Kuan Yew called Indira Gandhi “the toughest woman prime minister” (Datta-Ray S. K., 2009, p. 224) because in 1966, when he came to India for an official meeting, it was unprecedented by the ‘Moscow Mafia’ in Indian diplomats not recognising Singapore as a nation followed by PM’s rigid decision towards Singapore (Datta-Ray S. K., 2009, p. 221). Due to the power politics between the U.S and the Soviet Union, it resulted in India and

Singapore's bitter relationship, and Lee says that the economy started to crumble as a result of the adoption of the "model of industrialisation through import substitution, the model says that western MNCs came into Singapore they helped us grow, brought in technology and know-how, and raised productivity levels faster than any alternative strategy could" (Singapore T. M., 2005). After the end of the Cold War, India has a position to change its foreign policy to strengthen its relationship with Singapore.

### **Post-Cold War India-Singapore Relations**

After the Cold War and the Disintegration of the Soviet Union from bipolar to multipolar world in 1991, India-Singapore relations had a massive transformation on economic reforms, strategic partnership and evolving geopolitical consensus. In July 1991, India made economic reforms from bipolar to global by adopting Liberalization, Privatization, and Globalization (LPG reforms). This economic reform of India mainly focused on liberalisation, which helps to have a free and open market system, which could attract other nations to invest in India. Under Prime Minister P. V. Narasimha Rao's administration, India's foreign policy changed its ideology from looking west to looking east. The East Focus policy will help India to enhance and develop its economic, political and strategic cooperation with the Association of Southeast Asian Nations, which leads Singapore to emerge as a key partner of India, as a result of this policy framework, I.K. Gujral's speech at Singapore in 1996 saying that "India will follow an asymmetrical policy towards neighbours whereby India should do more for neighbours than neighbours would do for India" (Basu, 1997). Through LPG, India could access Singapore's Geostrategic location for trade networks and well-established infrastructure for development and its deep expansion as an alternative power in the South Asian region. As a note towards the PM Rao's East policy,

India's contribution towards the Asia-Pacific security will remain constant as "to assuage doubts arising from its potential might" (Grare & Mattoo, 2003) which finally helped India to get in "to become a Sectoral Partner of ASEAN in 1992, a full-fledged dialogue Dialogue Partner in 1996 and a Summit-level Partner in 2002" (Indian Mission to ASEAN: Brief on ASEAN-India relations). This is because of the bilateral relationship that India had during the cold war period with Singapore, which helped to become a member of the Asia Pacific Economic Cooperation Forum (APEC) and World Trade Organization (WTO) (Wong, Wong, Mu, Tong, & Lim, 2009).

### **India's Look East Policy**

On 18 January 2007, George Yeo, Minister for Foreign Affairs of Singapore, gave a speech at the Confederation of Indian Industry Partnership Summit on Singapore-India: Roadmap to the Future he gave a brief introduction on the look east policy by saying that "If India turns inward, we can wave, we can jump up and down, flash a light, but I don't think we will receive much notice. It's only when India decides to look outwards, particularly when it looks eastwards, that Singapore comes into view" (Yeo, 2007) because Singapore is selected to attract attention to the strategic turn of India, which has long been ignored by India, but on October 18, 1991, Dr. Manmohan Singh, the Finance Minister of India, visited Singapore for an international seminar on 'Investing in India: New Business Opportunities', where he described that 'We in the Government of India thought, that if we have to market New India, we have to begin with Singapore' (Das & Bhattacharya, 2020). Singapore and India had a mutual understanding and cooperation benefits, to acknowledge that "Singapore's Deputy Prime Minister and Minister of Trade and Industry, Brig Gen Lee Hsien Loong, accompanied by a high-powered delegation, was on an official visit to India from

22 to 27 March 1992, In his discussions with Prime Minister, Brig Gen Lee expressed interest in a series of exhibitions from India to be held in Singapore with the cooperation of the Government of India on future trade and investment ties between India and Singapore was signed” (India M. o., 1992) hence Singapore became the gateway to get into the Pacific world. On the Goh Chok Tong administration in Singapore 1993, “He led 37 of Singapore’s business tycoons on a 7-day business trip to New Delhi, Bombay, and Bangalore and characterised that if India’s reforms ... kept up and the pace quickened ... India can be a mega economy, like China and Japan, in 20 to 25 years, which created mild India fever” in Singapore (Mukherji, 2015, p. 428). On 23 January 1994, Prime Minister of Singapore Goh Chok Tong visited India as a Chief Guest for the 45<sup>th</sup> Republic Day, where he stayed up to 30<sup>th</sup> January as a 7-day visit, “his visit focused on forging a strategic economic alliance with India for coordinated action by the Governments and business in both countries to enhance joint ventures in diverse areas such as tourism, civil aviation, telecommunications, real estate and highways, financial services, ports and shipping, warehousing and information exchange” (Ministry of External Affairs, South-East Asia and the Pacific, 1993). This trade visit increased by 13.7 percent, compared to the year 1991-92 (Das & Bhattacharya, 2020). In 1994-95, it was 2.8 billion-2.84 billion at a constant level (Mukherji, 2015, p. 430).

Hence Prime Minister Rao says “Singapore can well become the place where Asian unity is forged, for in the future the peoples of Asia must hold together for their own good, and for the good and freedom of the world” (Datta-Ray S. K., 2009, p. 6). In 1998, Prime Minister Shri Atal Bihari Vajpayee came “with the wider regional market” (Chanda & Gopalan, 2009) to come up from the Asian Financial Crisis. Add

on to this, the nation’s binding bilateral relationship, on 9 April 2002, Prime Minister Shri Atal Bihari Vajpayee gave the Annual Singapore Lecture on a title India’s perspectives on ASEAN and the Asia Pacific Region where he says that “Singapore has considerable strengths in the old economy and ambitions in the new economy. India has needs in the old economy and some competence in the new economy” (Ministry of External Affairs, 2002). Vajpayee’s Interest is to counter China in the South Asian region by protecting its maritime resources in the Indian Ocean region, according to India’s maritime doctrine 2004, which says that “maritime choke points along the Sea-Lanes of Communication SLOCs such as the Straits of Hormuz and the Straits of Malacca” (Singh & Rahman, 2010, p. 60). He called Singapore a “politically attractive and non-threatening” geopolitical partner and became a geo-strategic partner as well as a “gateway into the rest of Southeast Asia” (Mukherji, 2015, p. 426).

#### **Act East Policy 2015**

The Act East Policy of India, launched under Prime Minister Narendra Modi in 2014, after winning the election, Prime Minister Narendra Modi changed the policy framework of Look East Policy to Act towards the Eastern Region as ‘Act East Policy’ (AEP), which could help India to foster with easter region on Trade, economic and defence corporation. Through AEP India has a vision to enhance the bilateral relationship between India and Singapore to be a major economic partner in the South Asian Region (Das & Bhattacharya, 2020, p. 21). ‘India’s AEP sees Singapore as an important geostrategic partner for its economic growth in IOR and to connect Northeast India with the rest of East Asian countries through cultural and historical linkages by initiating new smart cities, skill development, coastal and port development’ (Das & Bhattacharya, 2020, p. 21). From 2004, India’s investment in Singapore

was US\$ \$ 351 million and in 2015, after PM's New AEP it rose up to US\$ 37.4 billion mostly on trade and business companies operated in Singapore, while India attracted Singapore's investment in ports, real estate, and construction fields, by 2006 it raised to 300 percentage (US\$ 3 billion) and US\$5 billion in 2010 and US\$10 billion in 2015 of growth (Shekhar, 2007, p. 4). From 1965 to 2015, Singapore and India's bilateral relationship grew very strongly towards the development of security, economic, maritime, business and FDI, with socio-cultural development and becoming a modernized technological growth.

As a result of the bilateral relationship in 2015, Prime Minister Narendra Modi visited Singapore on 23<sup>rd</sup> November and gave a lecture on the topic "India's Singapore Story-"India and Singapore have been together at many crossroads of time, Our relationship is written in the pages of history, culture, kinship and commerce; We stood together in friendship at the dawn of freedom; and we reached out to each other in a partnership of shared hopes. Singapore's success became an aspiration of Indians with hope for a more peaceful, balanced and stable world, Singapore became India's springboard to the world and gateway to the East and today, Singapore is one of our most important partners in the world it is wide-ranging with comprehensive defence and security relations with shared interests and a common vision with India" (Ministry of External Affairs, Government of India, 2015).

This visit of the Indian PM made both countries sign nine agreements bilaterally, "Strategic Partnership, Defence, Economic and Financial Cooperation, Culture and People-to-People Exchanges, Legal-Judicial Cooperation, Parliamentary Cooperation, Science & Technology, and Research, Innovation, Multilateral-Regional Cooperation" (Singapore H. C., 2015) and later in 2018, thirteen

agreement were signed "Joint Statement on conclusion of second review of CECA; Mutual Recognition Agreement on Nursing; Implementation agreement between Indian Navy and Singapore Navy for Mutual Coordination, Logistics and Services Support for, Submarines and Naval Aircraft visits; Extension of the MoU with Indian Computer Emergency Response Team (CERT-IN) & Information Technology, India-Singapore Computer Emergency Response Team (SINGCERT), cyber security agency of Singapore on cyber security; MoU between the Narcotics Control Bureau of India and the Central Narcotics Bureau of Singapore to Combat Illicit Trafficking in Narcotic Drugs, Psychotropic Substances and their Precursors; MoU Ministry of Personnel, Public Grievances and Pensions of India and the Public Service Division of Singapore on Cooperation with Personnel Management and Public Administration; MoU with the Department of Economic Affairs, Ministry of Finance of India and the Monetary Authority of Singapore on the constitution of a Joint Working Group (JWG) on Fintech between India and Singapore; MoU with NITI Aayog and Singapore Cooperation Enterprise (SCE) on Planning" (Affairs, 2018). From 2019-2020, India-Singapore trade reached with a tariff cut of US \$16.3 billion in 2019-2020 and FDI rose from \$13.69 billion in 2015-16 to \$14.67 billion and Singapore has invested more than 100 billion projects in India (Das & Bhattacharya, 2020, p. 23). Hence, the Act East Policy of India accelerated the development and growth of both the nation and made a way for the future.

### **Factors that Shape India's Foreign Policy Towards Singapore**

#### **Culture and History**

History of India and Singapore started from the ancient period when the Tamils started trading and ruling the entire Southeast Asian

nation. ‘Singapore’ comes from the word ‘Singha’ and ‘pura’ or Singapora, which means the ‘City of Lions’, John N Miksic, an archaeologist from National University of Singapore, wrote a book ‘Singapore and The Silk Road of the Sea 1300-1800 (2013), where he mentioned the trade and kings’ descent from Nagapatinam because in Singapore Tamil is the official language, population of Tamils are higher in South Asian Nation (Chavan, 2023). After the British took over the administration in the 1800s, Sir Thomas Stamford Bingley Raffles took over the administration in 1819-67, planned to use Singapore as a trading station by the British East India Company and controlling them from Calcutta, India.

The major population of Singapore are from the descent of Indian origin ‘64 percent people are Tamils, 8 percent people are Malayalis, 7 percent people are Punjabis, 6 percent people are Sindhis and 2 percent people are Gujaratis; 6 percent people belongs to Hindu community, 20 percent people belongs to Muslim community, 12 percent people belongs to Christianity, 7 percent people belongs to Sikhism, and there are a small number of people belongs to Buddhist community’ (Das & Bhattacharya, 2020, p. 26). Especially “70 per cent of the Tamils who dominate the Indian community with cultural identity as the oldest civilization in this world and 10<sup>th</sup> century Chola dynasty which emerged from Tamil Nadu’s fertile Kaveri valley to leave a strong imprint on South-east Asia’s life and culture and Lee Hsien Loong elaborates: Historically India has had an enormous influence on South-east Asia; economically, and culturally by the Indian origin Sri Vijaya, even the Majapahit empires, and along the Malay peninsula and Singapore too” (Datta-Ray S. K., 2009, pp. 11-13). To promote cultural heritage between India and Singapore in 1993, India and Singapore signed an MoU in the fields of ‘Arts, Archives and Heritage and extended to 2014

and to promote Indian classical arts Singapore Government and community organizations started Temple of Fine Arts, Singapore Indian Fine Arts Society, Nrityalaya, Kalamandir to conserve Indian culture in Singapore’ (GOI M. o., 2012).

### **Defence and Security Cooperation**

After the Cold War, Singapore was active in its defence corporation with India. In 2003, India and Singapore signed a Defence Cooperation Agreement (DCA) on 2003 on basis of the DCA, the Defence Policy Dialogue (DPD) was signed in 2004 by Chan Yeng Kit, which focused on “both countries to oversee and advance the bilateral defence relationship, as well as discuss areas of defence cooperation and strategic developments of mutual interest” (The Economic Times, 2014). Subsequently, in 2005, the Comprehensive Economic Cooperation Agreement (CECA) was signed by Prime Minister Dr. Manmohan Singh and Lee Hsien Loong, Prime Minister of Singapore (Singapore H. C., 2005).

Till 2015, Singapore and India mainly focused on building the trade, infrastructure and economy, due to geopolitical shift in the international arena, both the countries intended to push their resources on the Defence sector and renewed DCA. During 1994, India and Singapore started their first Naval exercise in the name of ‘Exercise Lion King’ or SIMBEX between the Indian Navy and the Republic of Singapore Navy (RSN) (PIB, 2024). Later DCA was extended from the Indian Ocean Region to the South China Sea (SCS) because of the Chinese presence in the SCS region. Later India and Singapore conducted Bold Kurukshetra, Agni Warrior, Milan, SIMTEX, and anti-submarine warfare (ASW) which were conducted between countries to enhance defence security over IOR. In 2009, India signed 5 years Defence agreement to enhance combat capabilities with Singapore Armed

Forces (SAF) and the Indian Army (IA) (Singh & Rahman, 2009).

In June 2016, India and Singapore had their first Defence Ministers or Shangri-La Dialogue with the defence minister of India, Manohar Parrikar and the Defence Minister of Singapore, Ng Eng Hen, who discussed that “bilateral cooperation in defence R&D and technology, joint research projects in mutually-beneficial areas, deepening cooperation in unmanned systems and soldier performance, setting up industry level working mechanisms in aerospace, electronics, hosting the ADMM-Plus Exercise for Maritime Security and Counter-Terrorism; cooperation in tackling transnational security threats; freedom of navigation in international waters, passage and overflight, and access to resources; protocols and norms of behaviour in the air and maritime domains” (India & Defence, 2016).

In 2017, Indian Minister for Defence Nirmala Sitharaman and Singapore Defence Minister Ng Eng Hen came together for a second DMD meeting, which focused on signing “Navy Bilateral Agreement to increase cooperation in maritime security, common security in counter-terrorism, freedom of navigation, and maritime trade and access to the global commons” (Singapore M. , 2017). The meeting was concluded with a press meet by Ng Eng Hen, say that “What has marked this successful Defence Minister’s Dialogue is the meeting of minds and shared perspectives from both Singapore and India with regard to our defence relations...” (Singapore M. , 2017). On behalf of the 2017 Defence agreement, Ng Eng Hen says “I would respond categorically - not only would we be more comfortable; we would encourage the Indian Navy to visit Changi Naval base more often” (Gurung, 2017) which could help India to extend its influence from IOR to SCS against China’s Sting of Pearl Strategy because of its location towards the Malacca Strait. In 2022, India attended a joint

meeting with Singapore on combating maritime terrorism transnational Crime, cybercrimes, and drug trafficking (GOI M. , 2022).

### **International & Regional Organisations**

In today’s world, under the LEP and AEP, India is one of the actively participating countries of the ASEAN relations. During PM Rao’s visit to Singapore in 1994, it gave a shape towards the regional importance by entering into Asia-Pacific Economic Cooperation (APEC), where he says that “the Asia-Pacific region will be our springboard to the global marketplace” (Tripathi, 1994) and now India is the sectoral and Dialogue partner of ASEAN, to enter into as a full-time member, India needs Singapore to be the backbone, but full-time membership is critical due to the trading bloc of India in Southeast Asia. Singapore considered “India is a large economic power whose prospects have brightened considerably, and its interest in wooing India is consistent with its own policy of getting all major economic powers to have a stake in its economy” (Tripathi, 1994). To boost long-term partnership for Peace, Progress and Shared Prosperity, India signed the Plan of Action (POA) on the third ASEAN-India Summit for the period of 2004 to 2010, and in 2016, for the period of 2016-2020, another POA was signed, since 1996 India has been attending ASEAN Regional Forum (ARF) to enhance its security in the IOR and South Asia. As a result of this, India became the 6<sup>th</sup> trading partner of ASEAN and 8<sup>th</sup> trading partner of Singapore (Secretariat, 2024).

### **Trade and Economic Development**

India is one of the largest trading partners of Asian nations because of its strategic location and investment capacity in the current world. Between the years of 2021 to 22, the overall trade with ASEAN is 27.3 percent, meanwhile, Singapore invested in India around 136.6 billion (Singapore H. C., 2022) and the FDI flows from USD 2.04 billion in 2022 to USD 5.63 billion in

2023 (ASEAN, 2022) and from 2002 to 2024 overall FDI is US\$ 167.47 billion (Foundation, 2024). Currently, Singapore has become the economic hub for investment and trade since 1997, its economic crisis. During 2005, to boost the Indian economy, India signed the Comprehensive Economic Cooperation Agreement (CECA) to enhance trade and investment (Singapore H. C., 2022). CECA comprise with “a free trade agreement (FTA) in goods; an arrangement for boosting trade in services, including financial services; a package to promote and provide investment flow and protection; and a new agreement to avoid double taxation, Mutual Recognition Agreements quality goods and services, liberalized visa rules for professionals, and undertakings to cooperate on several sectors like Customs, dispute settlement, intellectual property rights, education and e-commerce” (Singapore H. C., 2022). From 1993 to 1997, the trade was US\$1.08 billion, 1998 to 2002 was US\$2.3 billion, 2003 to 2007 was US\$11.5 billion, 2018-19 was US\$ 27.85 billion, 2020-19 was US\$ 17.42 billion, 2021-22 was US\$ 30.11 billion, 2022-23 was US\$35.58 billion. But cope up with the trade relationship in 2014 5s vision was implemented by the External Minister Ms Sushma Swaraj, “Scaling up of trade, Speeding up connectivity, focusing on Urban development and water management for Smart Cities, development of Skills and greater engagement with Indian States” (ORF, 2014) which boosted Indian economy to US\$ 35.61 billion in 2023-24 (Foundation, 2024).

### **Science and Technology**

India and Singapore’s science and technology evolved during the 21<sup>st</sup> century, during the Look East Policy under Prime Minister Vajpayee, Pramod Mahajan, the Minister for Information Technology and Parliamentary Affairs, India and Yeo Cheow Tong, the Minister for Communications and Information Technology,

Singapore signed an MoU on Task Force on Information Technology to change the dynamic of technology in SEA which “focus on Electronic Commerce, Electronic Government, Information Security, Human Resource Development, Research, Design and Development, and Exploring third country markets particularly of Southeast Asian countries” (PIB, 2000). Singapore and India engaged in repair and maintenance on aircraft and in the field of information and technology focused on biotechnology, pharmaceuticals, biochemistry and space research (Shankar, 2007, p. 5). In 2011, ISRO launched X-Sat, which was made indigenously by Singapore (India T. T., 2011). In December 2015, ISRO launched Six Singapore satellites, including the primary satellite, TeLEOS-1 made by Nanyang Technological University (NTU) and Defence Science Organisation Laboratories (DSOL) for earth observation (India.com, 2015). In 1 June 2018, Prime Minister Narendra Modi visited Singapore and signed 6 MoU’s related to S&T “Computer Emergency Response Team (CERT-IN) Ministry of Electronics & IT, Singapore Computer Emergency Response Team (SINGCERT), cyber security” (MEA, 2018) and other 6 MoUs with “Nanyang Technological University (NTU)” were signed to boost the Indian S & T (PMO, 2018).

### **Challenges that Affect India’s Bilateral Relations with Singapore**

From 1965 till the end of the Cold War, both countries were struck by their ideological terms of West and East, but after Look East Policy, the economic dependence and growth were stable, with the Act East Policy, it rose to a higher level with some challenges:

### **Economic and Defence Dependence on China and US**

Since 1990, China, the US, and Singapore have had a massive economic shift towards development. After US evacuates from Clark Air Base and Subic Bay Naval Base from Philippines, Singapore assisted by providing “a squadron of US fighter planes in Singapore, US aircraft carrier fleet’s visitation of Singapore’s Changi Naval Base, US combat littoral ships in Singapore, US Navy Poseidon P-8 maritime surveillance aircraft in Singapore and signed DCA (Defense Cooperation Agreement) on 2015, DCA assists on military, policy, strategic, technology and non-conventional security areas; and agreed to new areas of non-conventional cooperation, including humanitarian assistance and disaster relief, cyber defence, biosecurity and communications” (Er, 2017).

On the other side, China invested over US\$7.23 billion in Singapore with 700 projects by 2015, by 2017 it rose up to US\$72.3 billion, in 2010 Chinese army and Singapore Airforce conducted a joint military exercise and signed a free trade agreement with ASEAN (ASEAN-China Free Trade Agreement-ACFTA) (Er, 2017). Singapore revamped its defence pact with China in 2019, which focuses on including “frequent high-level dialogs and larger scale military exercises and interactions with Army, Navy and Air Force of their military” (Er, 2017). Singapore placed a balanced approach with China and U.S for its economy and defence, which affects India’s relationship by supporting Belt and Road Initiative (BRI).

### **Indian Diaspora in Singapore**

The growing ideology of Hindutva among Indians in Singapore became a hotspot of internal threats over the region. The ideology of the Indian Diaspora is to sustain the cultural and values from extinction, but under the religious potential Hindutva ideology is rooted over Singapore. This creates an internal problem between the native Singaporean Chinese, Singaporean Malays and Singaporean Indians.

Antara Chakraborty says that “the promotion of Hindutva’s exclusionary language and ideas emanating from India has the potential to cause tensions with other ethnic and religious groups in the country, posing a potential threat to Singapore’s social harmony and stability” (Chakraborty, 2023). Due to this agitation, racism started evolving in Singapore with online riots resulting in “No Indians or PRC (People’s Republic of China)” (UPR, 2014) will own a house for renting and the government of Singapore took measures to keep the situation under the control. According to the Comprehensive Economic Cooperation Agreement (CECA) 2005, Indians were working in finance and IT professions. due to Covid-19, all the industries started shutting down, Indians claim that CECA enable permanent citizenship, but the Ministry of Trade and Industry of Singapore issues a statement, “It is not true that under CECA, Indian nationals can come to Singapore and become Permanent Residents and citizens and, there is no such provision in CECA” (Industry, 2020). This becomes a challenge to the Indian Diaspora in Singapore.

### **Conclusion**

Singapore attained independence in 1965 and in the initial stage, Singapore requested India’s assistance for military and security but during the Cold War, relations grew smoothly, and during Prime Minister Narasimha Rao’s Look East Policy and administration, relations improved drastically. In 1991, liberalization of the Indian economy and the Look East Policy enhanced India’s involvement in Southeast Asia, with Singapore acting as a strategic ally. Currently, India-Singapore ties emphasize trade, Infrastructure, Science and Technology, commerce and military collaboration, with Singapore, and are positioned as India’s sixth-largest trading partner in 2021-22. The Comprehensive commercial Partnership Agreement (CECA) established in 2005 has

strengthened commercial relations and military cooperation. Nonetheless, issues persist, including Singapore's economic reliance on China and the United States, which raises apprehensions over the shrink of India's relationship with Singapore. Notwithstanding these factors, mutual strategic interests and similar values make India-Singapore ties a fundamental component of India's Act East Policy of Prime Minister Narendra Modi and India's regional involvement in Southeast Asia.

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## Non-State Armed Actors and their Geopolitical Implications

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### Abstract

The re-emergence of Non-State Armed actors altered the course of regional geopolitics, significantly impacting international relations and security. These actors, which include insurgents, militias, and transnational terrorist organizations, have gained prominence as a result of state fragility, regional and global power competition, and the evolving shift in warfare. They predominantly use asymmetric tactics, which largely affected the traditional state sovereignty and international law. This paper explores the overview of major non-state armed actors and the reasons behind their resurgence. It also examines the geopolitical implications caused due to the wide changes those actors have given. Particularly analysing the Middle Eastern region, this paper highlights the regional instability, state fragility, proxy warfare trends, and uncontrollable humanitarian crisis. This study concludes with the assertion that the resurgence in these non-state armed actors has largely challenged the notion of state legitimacy, prompting geopolitical realignments.

**Keywords:** State fragility, asymmetric tactics, regional instability, proxy wars, geopolitical realignment.

### Introduction

#### A Brief Overview of Non-State Actors

*First, a note on HAMAS.* Harakat al-Muqawama al-Islamiyya (HAMAS) is a political Islamic Resistance Movement and a Palestinian armed group that emerged in 1987 during the first Palestinian uprising or intifada. The group is primarily located in the Gaza Strip, which it has been controlling as a de facto governing body since 2007. In addition, Hamas also operates from the West Bank, Lebanon, Turkey, and various other Arab countries. The outfit's major leaders

were Yahya Sinwar, Ismail Haniyeh, Mohammed Deif, Marwan Issa, Khaled Meshaal, and Mahmoud Zahar. The group has been largely assisted by Iran and its allies like Hezbollah, a Lebanese Shia group. According to *CRS Reports*, Hamas receives USD 100 million annually from Iran.<sup>1</sup> In terms of the military, the group largely uses guerilla and suicide attack tactics. Further, smuggled and domestically produced weapons like rockets, mortars, drones, and anti-tank guided missiles were the weapons the group has used so far. It has built several tunnels inside Gaza for transportation purposes. Politically, Hamas tries to leverage its influence on the Palestinian national movement and to control the land of Palestinians.

On 7 October, the outfit carried out a highly coordinated attack on Israel, killing at least 200. In retaliation, Israeli Prime Minister Benjamin Netanyahu vowed war on Hamas. The War destroyed most of the prominent Hamas leaders. The outfit's attack on Israel brought back the regional wars. Even though Israel and Hamas are on the frontline, major military powers supporting the two sides entered into a proxy war, such as Iran, which supports Hamas and Hezbollah, conflicted with the US and its proxy, Israel.

*Second, the Houthis in Yemen.* Houthis are an extremist Shia-Islamist movement. They are located in the Saada district of northern Yemen. The group's original objective was to address Yemen's Zaidi Shia community marginalization. Eventually, it broadened their ideology to include antisemitic, Islamic fundamentalist, and anti-American sentiment. This is even reflected in their flag slogan: "Allah is great, death to the USA, death to Israel, curse the Jews, victory to Islam." The outfit receives funding and military training from Iran and its proxy group, Hezbollah. The assistance enabled the outfit to broaden its

capabilities. Most of their leaders hailed from the al-Houthi clan and were supported by tribal alliances and religious leaders.

Since the outbreak of the Israel-Hamas conflict, the group has carried out several missile and drone attacks against Israel. They launched missile attacks and hijacked commercial vessels in the Red Sea. The resurgence of Houthis and its attacks poses a serious threat to global actors disrupting regional and international stability. Yemen's strategic location and its control over the Bab el-Mandeb strait, a critical choke point connecting the Red Sea to the Indian Ocean, is the crucial factor leading to such disrupting events.

**Third, the Hezbollah's in Lebanon.** Hezbollah is an Iran-backed Lebanese Shia militia outfit. Established during the Lebanese civil war of 1975 to 1990, it evolved for the destruction of the Israeli state and to Western influences in the region. The militant group vowed allegiance to Iran and advocated an "Iran-inspired Islamist regime." The party has had a role in Lebanese politics since 1992. It has held cabinet positions since 2005. In 2009, the party entered mainstream politics. The group receives most of its training, weapons, and funding from Iran. Apart from this, Bashar al-Assad's regime in Syria provided its support. The group is largely known for its regular attacks on Jewish and Israeli targets abroad, such as the 1994 car bombing in Argentina targeting a Jewish community centre. The group's enmity with Israel dates back to the Israeli occupation of Lebanon in 1978. Although there is a continuity of clashes even after Israel's withdrawal from Lebanon in 2000.

The outbreak of the Hamas-Israel war in 2024 intensified the Hezbollah-Israel war after Israeli airstrikes ramped up on Hezbollah's infrastructure. In September 2024, communication devices like walkie-talkies and solar equipment used by Hezbollah exploded across Lebanon, killing 32, according to *BBC* reports.<sup>9</sup>

**Fourth, Hayat Tahrir Al-Sham (HTS) in Syria.** It is an Islamist-militant group active in Syria that evolved at the beginning of the Syrian Civil War. Formerly Jabhat al-Nusra, then Jabhat

Fateh al-Sham, it was a group of factions that declared allegiance to al-Qaeda. Later, it announced its independence and rebranded as HTS in 2017. Unlike other non-state armed actors, it is largely a self-funded group.

In November 2024, HTS led a major coalition of offensive operations named "Operation Deterrence of Aggression" against pro-government forces. The operation that was led by HTS leader Abu Mohammed al-Julani brought an end to the 53-year-long rule of the al-Assad clan's regime.<sup>11</sup>

**Fifth, EAO in Myanmar.** Other non-state actors such as Haiti and Ethnic armed organizations in Myanmar have also re-emerged into armed violence, which significantly changed the course of global politics.

In 2021, Myanmar faced a devastating coup de'etat led by Senior General Min Aung Hlaing, aligned with the Union Solidarity and Development Party (USDP), against the elected government, the National League for Democracy (NLD). The Military took power, destroyed numerous villages and killed many, evoking larger ethnic clashes. Since then, Ethnic Armed Organisations (EAO) such as and People's Defence Forces began fighting against the military rule in Myanmar. Recently, in December 2024, the conflict intensified with a siege of the Border Guard Police (BGP5) barracks by the Arakan Army (AA), killing at least 450 soldiers.<sup>12</sup>

### Issues

**First, the changing nature of warfare.** The rise of non-state armed actors has transformed the nature of war, making it unpredictable and asymmetrical. They use tactics like suicide bombing and cyberspace to create fear and panic, allowing states less opportunity to identify perpetrators. Non-state actors often use religion and nationalism as rhetoric, such as Hezbollah and the Taliban. They use roadside bombs, snipers, ambushes, and assassinations and intermingle indistinguishably with the civilians to use guerilla warfare techniques to coerce State actors. This strategy complicates traditional military responses and can prolong conflicts. Thus, despite the political nature of warfare, the emergence of armed non-state

actors has transcended the nature of warfare in disputes.<sup>13</sup>

**Second, the shifting power dynamics.** The trend of rising conflicts between state and non-state actors shifts the power distribution and modes of governance. They threaten the rule of law and democratic governance, thereby decentralising the state actors in many nations. Each emerging group has its characteristics. As such, few claim autonomous roles and domination over territoriality, ultimately challenging the democratically elected government. This often occurs in regions where governments struggle to maintain control, such as the Middle East and Africa. This erosion of the state's sovereignty led to power vacuums. Further, in many conflicting regions, the authority becomes largely fragmented with numerous actors involved.

**Third, regional instabilities and proxy wars.** State actors often use non-state actors to further their geopolitical interests, leading to proxy wars. State actors such as the US, Russia, Iran, and Iraq sponsor militant armed groups and support various factions in regional conflicts, which complicates the conflict landscape. Iran-backed groups like Hezbollah in Lebanon and Houthis in Yemen entered the Israel- Hamas war in 2024, escalating the conflict to the next level. The US often utilizes local militias in conflicts to achieve its strategic interests. For instance, it backed Kurdish forces in Syria. The conflict in Yemen has been characterised by a proxy war between Saudi Arabia and Iran.<sup>14</sup>

**Fourth, Impact on Humanitarian efforts.** The re-emergence of non-state armed actors and their fighting methods prolonging the conflict has had a profound impact on humanitarian efforts. The militant factions often control the territory by blocking routes, which cuts off the access to provide aid. According to the *United Nations*, over 50 million people in conflict-affected areas are in dire need of humanitarian assistance but are hindered by access restrictions. Based on the *United Nations Office for the Coordination of Humanitarian Affairs (OCHA)* reports, the UN attempted 164 times to reach the conflicting regions in the Middle East. However, it was denied by Israeli authorities.<sup>15</sup>

Further, these prolonged conflicts often disrupt civilian livelihood and result in large-scale displacements.

#### **In perspective**

The re-emergence of non-state armed actors is altering the geopolitical landscape by challenging the notions of legitimacy and authority, prompting geopolitical re-alignments. For instance, the shared concern over Iran's influence in the Middle East paved the way for strengthening ties between Israel, the Gulf and Arab states. In response, Iran strengthened its relationship with Russia and Turkey, which further complicated traditional alliances in the region. The geopolitical re-alignment can also be considered in such a way that "*rising cooperation between state and non-state actors*" satisfy their interests. Iran's continuous support to various non-state actors against Western influence, Turkey's aid and support to non-state armed groups in Syria to counter Kurdish forces, Gulf states, particularly Saudi Arabia partnering with local militia to combat Houthi forces in Yemen, US alliances with Kurdish forces in Syria against ISIS (Islamic State of Iran and Syria).

In various conflict zones such as the Middle East and Africa, the authority of the state actors declined due to the lack of powerful strong governance. Although the state actors fight back against the armed groups and nullify them, the very nature of armed groups re-emerges. This may be due to the increasing legitimacy of non-state armed actors (who are largely fighting for their ideology) among the local population.

Another significant aspect to be studied is that the re-emergence resulted in increased security threats. The conflicts led by non-state armed actors often draw regional and global powers and prolong the conflicts for years. This heightened the security threat from a particular territory to a regional and global level, which further challenged the global counter-terrorism efforts. The new technological advancements and easy access to cyberspace give an additional layer of complexity. Thus, the rising security tide and the resulting geopolitical realignment are interconnected and vulnerable to future trends.

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## **The Role of Social Media Influencer Marketing on Purchase Decisions: A Study on College Students in Chennai**

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### **Abstract**

In the rapidly evolving digital world, social media is a key centre for communication, entertainment, and information exchange. With the universal acceptance of smartphones, consumers, especially college students, are now depending more and more on social media for product suggestions and consumer opinions. Social media influencers are now powerful personalities in today's digital world, influencing the minds and buying behaviors of millions. Mobile platforms and applications such as Instagram, YouTube, and SnapChat offer an environment where influencers communicate directly with their followers, enhancing their influence over consumer behavior than ever before. This research paper addresses the role of social media marketing influencers on college students' buying decisions in Chennai, in particular, focusing on sustainable consumption practices aligned with Sustainable Development Goal 12: Responsible Consumption and Production. A questionnaire was used to collect the data, and responses were received from 100 college students from Chennai. The results indicate that social media influencer marketing provides a new approach to product promotion and it acts as an effective advertising tool to reach the young population at a shorter period. The study result reveals that the credibility and efficacy of influencer marketing depends on creating awareness of

sustainable products and brands. The results of this research will give small businesses insights on how to leverage influencer marketing, providing an inexpensive and effective method to market their products and inspire environmentally friendly purchasing habits.

**Keywords:** Social Media Influencers, Purchasing Behaviour, Sustainable Development Goals, Social media marketing

### **1. Introduction**

The concept of Marketing is continuously evolving particularly in the digital age where social media influencers have emerged as an important element who affect consumer behavior, particularly among young people, who frequently engage with platforms such as Instagram, YouTube, and Facebook. Influencer marketing focuses on fostering engagement between individuals, conveying authenticity through various forms, and influencing peer group recommendations within smaller circles. However, influencer marketing is simply a newer version of customary word-of-mouth advertising. Unlike usual endorsements from famous people, influencers on social media regularly produce content that is quite interesting and concentrated on specific niches, which resonates deeply with their audiences. Given the notably young population in India, it is certainly important to thoroughly understand the way these social media influencers affect

college students' purchasing decisions. This research examines how influencer marketing affects the buying choices of many college students in Chennai. It looks at several major things, such as trust, engagement, and brand view. These results will give more comprehension into how companies can use marketing with influencers to successfully connect with and involve this specific group.

### **Objectives**

1. To analyze the influence of social media influencers on college students' purchase decisions.
2. To assess the factors that contribute to the credibility and trustworthiness of influencers.
3. To examine the role of influencer engagement in shaping brand perception and loyalty.
4. To identify the impact of influencer marketing on impulse buying behavior.

### **Need for the Study**

The popularity of social media has also revolutionized the manner in which customers interact with businesses, moving attention from traditional advertisements to communication online. Irrespective of the locality the reach and usage of mobile phones are immeasurable, the major usage of mobile phones is to access social media platforms, where influencers play a critical role in opinion-making and purchasing decisions. Unlike traditional celebrity endorsements, influencer marketing is based on sincerity, credibility, and even being relatable, which can be an effective tool for businesses looking to target young customers.

College students, who are extremely active on social media, are most impacted by online trends and word of mouth. Social media influencers develop niche-related content, generating a feeling of affiliation and trust among their audiences. In the era of digital technology, overuse of mobile phones has

contributed to greater social isolation, weakening the power of traditional advertising media. Individuals' attention is also often drawn by social media notifications, engulfing them in an easily accessible, low-cost virtual world. With this change in consumer behavior, social media has become a common part of everyone's life, rendering traditional strategies of advertising relatively ineffective. Through this research, it is possible to investigate the influence of influencer marketing on students' behavior as consumers and gain useful knowledge for businesses regarding making sound judgments on digital advertising investments.

### **Statement of the problem**

Brands are outlaying huge amounts to hire social media influencers to market their products, but there is no evidence at the content level about the actual effect of such influencers on college students' buying behaviour in the region of Chennai. Therefore, the study tried to present the role of social media influencers on college students' buying behavior.

## **2. Review of Literature**

### **2.1 Social Media and Consumer Behavior**

Social media has changed the way customers engage with brands. As noted by Mohcine (2022), online platforms support two-way communication, enhancing the personalized and interactive nature of marketing. Consumer decision-making is largely influenced by the level of engagement on social media (Smith, 2020).

### **2.2 Influencer Marketing and Purchase Intentions**

Influencer marketing relies on the social proof principle, whereby people are likely to emulate the decisions and suggestions of people they look up to (Brown & Hayes, 2018). Research by Arora & Sharma (2021) indicates that authenticity and relatability are central to an

influencer's power to influence purchase decisions.

### 2.3 College Students as a Consumer Segment

Young adults, particularly college students, represent a significant consumer demographic that is highly responsive to social media trends (Gupta & Mehta, 2022). Research by Johnson (2023) indicates that peer recommendations and influencer endorsements impact their buying decisions more than traditional advertisements. This study builds on existing research by focusing specifically on college students in Chennai, a dynamic urban market with high digital engagement.

Research Gap: While influencer marketing on social media has become increasingly popular, little is known about how it uniquely affects purchasing decisions among college students

## 3. Methodology

### 3.1 Research Design

This study adopts a descriptive research design, using a quantitative approach to analyze the influence of social media influencers on purchase decisions.

### 3.2 Data Collection

- Primary Data: A structured questionnaire was distributed to college students in Chennai through online and offline modes.
- Sample Size: 100 college students from different institutions in Chennai.
- Sampling Technique: Convenience sampling was used to select participants actively engaged in social media platforms.

### 3.3 Variables Considered

Independent Variable: Social media influencer attributes

- Social Media Usage & Influencer Engagement
- Purchase Influence
- Trust & Credibility of Influencers
- Brand Loyalty & Awareness

**Dependent Variable:** Purchase decision of college students.(Impulse Buying & Marketing Impact)

### 3.4 Data Analysis

The collected data was analyzed using statistical tools such as percentage analysis, regression analysis, chi square and correlation to understand the relationship between influencer marketing and purchase behavior.

### 3.5 Hypothesis

H1: Influence of Social Media Influencers on Purchase Decisions H2: Factors Contributing to Influencer Credibility & Trustworthiness H3: Role of Influencer Engagement in Brand Perception & Loyalty H4: Impact of Influencer Marketing on Impulse Buying Behavior

### 3.6 Statistical Tools Used

- Regression Analysis
- Correlation Analysis
- Chi-Square Test

## 4. Analysis

**Objective 1:** To analyze the influence of social media influencers on college students' purchase decisions.

**Hypothesis 1:** Influence of Social Media Influencers on Purchase Decisions

**H<sub>0</sub> (Null Hypothesis):** Social media influencers do not significantly influence college students' purchase decisions.

**H<sub>1</sub> (Alternative Hypothesis):** Social media influencers significantly influence college students' purchase decisions.

The R<sup>2</sup> value is 0.416 indicates that 41.6% purchase decisions are explained by social media usage and influencer engagement. P-value = 0.000 → Significant relationship (p < 0.05). Coefficient = 0.580 → A one-unit increase in social media usage & engagement increases purchase influence by 0.58 units. Since the P value p < 0.05, we reject Null hypothesis H<sub>0</sub> and accept H<sub>1</sub>, meaning social media influencers significantly influence purchase decisions.

**Objective 2** - To assess the factors that contribute to the credibility and trustworthiness of influencers.

**Hypothesis 2:** Factors Contributing to Influencer Credibility & Trustworthiness

◆  $H_0$ : There is no significant relationship between an influencer's credibility (followers, reviews, brand usage) and students' trust in them.

◆  $H_1$ : There is a significant relationship between an influencer's credibility and students' trust in them.

The Correlation Coefficient value 0.382 indicates that there exists moderate positive correlation between variables and the  $p$ -value =  $<0.001$  denotes the Significant relationship ( $p < 0.05$ ) Coefficient of 0.382 is a moderate positive correlation, it suggests that as social media engagement increases, trust in influencers also increases. Since the  $p$ -value (from Pearson's test) is  $< 0.05$ , we reject  $H_0$  and accept  $H_1$ , meaning influencer credibility significantly affects trust.

**Objective 3** - To examine the role of influencer engagement in shaping brand perception and loyalty.

$H_3$ : Role of Influencer Engagement in Brand Perception & Loyalty

◆  $H_0$ : Influencer engagement does not significantly impact students' perception of a brand or brand loyalty.

◆  $H_1$ : Influencer engagement significantly impacts students' perception of a brand and brand loyalty.

$R^2 = 0.211 \rightarrow 21.1\%$  of brand loyalty is explained by social media usage and influencer engagement.  $p$ -value = 0.000  $\rightarrow$  Significant relationship ( $p < 0.05$ ). Coefficient = 0.476  $\rightarrow$  A one-unit increase in social media engagement increases brand loyalty by 0.476 units.

Since  $p < 0.05$ , we reject  $H_0$  and accept  $H_1$ , meaning influencer engagement significantly

impacts brand perception & loyalty.

**Objective 4** - To identify the impact of influencer marketing on impulse buying behavior.

$H_4$ : Impact of Influencer Marketing on Impulse Buying Behavior

◆  $H_0$ : Influencer marketing does not significantly impact impulse buying behavior among students.

◆  $H_1$ : Influencer marketing significantly impacts impulse buying behavior among students.

Chi-Square Statistics = 78.28.  $p$ -value = 0.0000575 ( $p < 0.05$ )  $\rightarrow$  Significant relationship. Since  $p < 0.05$ , we reject  $H_0$  and accept  $H_1$ , meaning influencer marketing significantly impacts impulse buying behavior among students.

## 5. Findings and Conclusion

● Influencer Credibility: 78% of respondents agreed that trust in an influencer plays a major role in their purchase decisions.

● Engagement & Interaction: 65% of students indicated that frequent interaction with an influencer enhances their interest in promoted products.

● Content Relevance: 72% of students preferred influencers who create content that aligns with their interests and needs.

● Brand Awareness: 60% of students discovered new brands through influencer recommendations.

● Purchase Intentions: 55% admitted to making at least one purchase based on an influencer's suggestion in the past three months.

## Discussion

The study examined the influence of social media influencers on college students' purchasing decisions, trust, brand loyalty, impulse buying, and the effectiveness of influencer endorsements compared to traditional advertising.

### H1: Influence of Social Media Influencers on Purchase Decisions

The regression analysis showed a significant positive relationship ( $p < 0.05$ ) between social media usage and purchase influence, confirming that influencers significantly impact students' buying decisions. This highlights the growing reliance on influencer recommendations over traditional advertisements.

### H2: Factors Contributing to Influencer Credibility & Trustworthiness

The correlation analysis revealed a moderate positive correlation ( $r = 0.395$ ) between influencer credibility (followers, reviews, brand usage) and students' trust. This suggests that students tend to trust influencers more if they perceive them as authentic and knowledgeable. Factors such as frequent brand engagement and genuine reviews enhance credibility.

### H3: Role of Influencer Engagement in Brand Perception & Loyalty

Regression results indicated that influencer engagement significantly impacts brand loyalty ( $p < 0.05$ ), with 20.9% of brand loyalty explained by influencer engagement. This finding suggests that frequent interactions with influencers create a stronger emotional connection to brands, leading to repeat purchases and long-term customer retention.

### H4: Impact of Influencer Marketing on Impulse Buying Behavior

The chi-square test confirmed a statistically significant association ( $p < 0.05$ ) between influencer marketing and impulse buying. This implies that students are more likely to make unplanned purchases when exposed to influencer promotions, particularly limited-time offers and discount codes. The psychological urgency created by influencers effectively drives impulse purchases.

The findings of this study confirm that social media influencers play a crucial role in shaping college students' purchasing decisions, brand

trust, loyalty, and impulse buying behavior. Influencer credibility, engagement, and promotional strategies significantly impact students' perceptions of brands.

### Conclusion

Social media influencer marketing plays a significant role in shaping the purchase decisions of college students in Chennai. Factors such as influencer credibility, engagement, and content relevance influence consumer trust and brand perception. The study highlights the growing importance of digital marketing strategies in reaching younger audiences effectively. Brands should collaborate with influencers who align with their target audience's interests and maintain authenticity to enhance engagement. The study also suggests that companies should invest in long-term influencer partnerships rather than one-time promotions for sustained consumer impact.

Scope: Further research can explore the effectiveness of different influencer categories (micro, macro, celebrity) and their varying impacts on purchase decisions across different product segments.

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## **Challenges and Opportunities: A Comprehensive Study of Self-Help Groups and their Role in Financial Stability**

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### **Abstract**

This study examines the challenges and opportunities faced by self-therapy groups (SHGs) and the role in promoting financial stability within the community. SHGs, which focus primarily on the strengthening of marginalized groups, particularly women, are subject to numerous hurdles, including limited access to resources, training, financial inadequate management, marketing and raw material sourcing challenges only. These challenges hamper the potential for sustainable growth and economic success. However, this study also determines significant growth options. B. Improved access to financial services, improved training programs, promote better marketing strategies, and strengthened cooperation between SHG and financial institutions. Through comprehensive analysis, this article presents an important role in promoting financial inclusion, improving socioeconomic conditions, and contributing to community development. It also includes implementation able recommendations to overcome the barriers facing SHGs, allowing them to thrive and achieve greater financial stability.

### **Introduction**

Self help groups (SHGs) are also involved in men, but are usually financial brokers between 10-20 local people, usually women, often women. SHG is the most common in India, but is also available in other South and Southeast Asian countries. These groups are generally composed of individuals with daily wage jobs. Members contribute small amounts of money to a common fund, which is managed by one member, and used to provide loans to those in need within the group. Initially, members make regular small savings contributions over time until there is sufficient money available for lending. Once the fund reaches a viable amount, it can be lent to members or others in the community for various purposes. Many SHGs in India are linked with banks to facilitate micro-credit services. (Muruges, 2014)

Self-Help Groups can be either registered or unregistered. They usually consist of micro-entrepreneurs who share similar social and economic backgrounds, voluntarily joining together to save small amounts of money. The common goal is to create a shared fund that can be used for emergency needs, with an emphasis on mutual assistance. The funds collected are

used to provide loans to members, helping them become self-employed. The collective nature of the group ensures the proper utilization of loans and timely repayment, using peer pressure and shared accountability. These groups operate without requiring collateral, similar to the solidarity lending model used by microfinance institutions. To simplify financial tracking, flat interest rates are commonly applied to loans. Self-Help Groups are often initiated by government organizations, which typically focus on poverty alleviation. SHGs are seen as a means of achieving broader objectives, such as empowering women, fostering leadership among disadvantaged individuals, increasing school enrolment, improving nutrition, and promoting family planning. In India, SHGs also help bridge the social divide between high-caste and low-caste individuals (Neela, 2020). While financial intermediation is a key aspect of SHGs, their primary aim is often centred around these other social and developmental goals. This can sometimes limit their growth as a significant source of capital for local communities, as well as their ability to pool and manage capital collectively, a role historically fulfilled by credit unions.

### **Objective of this Study**

1. Analysis of the effects of self-therapy groups (SHGs) on member financial stability.
2. It focuses on income generation, savings and access to loans.
3. Equality, executive development, community Co-Cohesion.

### **Statement of the Problem:**

Self-Help Groups (SHGs) have emerged as a significant tool for financial inclusion, poverty alleviation, and socio-economic development, particularly in rural and underserved communities. Through collective savings and lending mechanisms, SHGs provide their members with access to credit, promote self-

employment, and help improve financial stability. However, despite their potential, SHGs face several challenges that hinder their growth and effectiveness. These include inadequate financial management, limited access to formal financial institutions, regulatory issues, and varying levels of member engagement and participation. Moreover, while SHGs contribute to financial stability for many, the long-term sustainability and scalability of these groups remain uncertain, particularly when they are reliant on external support, such as government programs or bank linkages. (V. Agarwal, 2014) This study aims to examine the challenges that SHGs encounter in their operations and the opportunities available to enhance their role in fostering financial stability among marginalized communities. It seeks to understand the effectiveness of SHGs in promoting economic empowerment, improving income levels, and creating access to credit, while also identifying strategies for overcoming the barriers they face in ensuring their sustainability and broader impact. The study will also explore the potential of SHGs to contribute to overall economic development and financial inclusion, particularly in the context of India's diverse socio-economic landscape.

**NABARD's 'Self-Help Group Bank Linkage' program** enables many self-help groups, particularly in India, to borrow from banks after accumulating their own capital. This model has gained attention as an effective method for providing micro-finance services to impoverished populations that are often underserved by traditional banks or financial institutions. By consolidating individual savings into a collective deposit, self-help groups help reduce banks' transaction costs and create a substantial deposit volume. This allows the bank to cater to small rural depositors while offering them competitive interest rates

A 2006 report by NABARD estimated that there were 2.2 million self-help groups in India, comprising 33 million members who have accessed loans from banks through the linkage program. This figure excludes self-help groups that have not borrowed from banks., organizations like self-help groups have proven to be effective tools for poverty alleviation. The Self-Help Group Bank Linkage Program has been particularly dominant in certain states, with a notable concentration in the southern region, including Andhra Pradesh, Tamil Nadu, Kerala, and Karnataka. These states accounted for 57% of the total self-help group credits linked during the financial year 2005-2006. (DeepjyotiChakraborty, 2013-14)

#### **Advantages of financing through Self-help group**

An economically disadvantaged individual gains strength by being part of a group. Additionally, financing through Self-Help Groups (SHGs) lowers transaction costs for both lenders and borrowers. Lenders benefit by managing a single SHG account instead of dealing with numerous small individual accounts. On the other hand, borrowers within an SHG reduce costs related to travel (to and from the bank or other locations) for paperwork and minimize workday losses spent on loan applications. (pattendan)

When successful, Self-Help Groups have greatly empowered marginalized individuals, particularly women, in rural areas. SHGs have also played a crucial role in diminishing the influence of informal lenders in these regions. Many large corporate entities in India are now actively supporting SHGs in various areas. Moreover, SHGs help borrowers overcome the challenge of lacking collateral. Within these groups, women can openly discuss their issues and collectively find solutions. (Thangarajan, 2024).

#### **Challenges Faced by Self-Help Groups:**

Self-help groups (SHGs) encounter a variety of challenges in different areas. The key issues are outlined below:

##### **Lack of Awareness Among Members:**

Despite efforts to raise awareness of available programs, many group members of the support provided to them are not aware of it. A key part of the group still doesn't understand the benefits of access.

##### **Limited Training Resources:**

The preparing given to SHG individuals in regions such as item determination, quality control, generation procedures, administration, and bundling is frequently deficiently. This ruins their capacity to compete with more grounded, more set up businesses.

##### **Raw Material Challenges:**

SHG usually obtains ingredients individually from suppliers and buys them in small quantities. As a result, they are missing out on services such as discounts and credit facilities available to large buyers. Furthermore, there is no coordinated system for purchase or proper storage of materials. This increases cost and inefficiency

##### **Marketing Issues:**

Marketing plays a key role in the success of SHGS, but faces a variety of challenges, including the lack of connection with marketing institutions. Unknown or inefficient distribution channels

##### **Instability and Lack of Unity Among Women's Groups:**

One of the recent challenges in women-led self-help groups is instability as several married women face issues of shifting due to changes in their personal lives. Moreover, members themselves frequently undermine their solidarity through infighting.

##### **Exploitation by Dominant Members:**

Sometimes more learned members of self-help groups exploit members of the group who are

illiterate or have less knowledge, resulting in them getting an unjustly bigger share of the profits generated by the group.

**Weak Financial Management:** Within these particular commingled groups, the financial profit gained from business endeavouring arrives at not being optimized as it features towards personal bills like marriage or house-building costs and this breaks the dreaming that the group anticipated to see to stay in the framework.

**Low Profitability:** As a result, the return on investment is not encouraging in some Self-Help Groups (SHGs) due to poor management, high production costs, and low emphasis on product quality.

**Inadequate Financial Support:**

The financial assistance provided by supporting agencies is often insufficient to meet the actual needs of the SHGs, particularly in covering labour costs, and subsidies are inadequate.

**Non-Cooperation from Financial Institutions:**

Financial institutions are often not supportive or responsive when it comes to providing loans or other forms of assistance to SHGs, undermining their effectiveness.

**Inadequate and Undertrained Staff:**

The staff from rural development departments often lack the necessary training and positive attitude to address the challenges faced by SHGs and help them become self-reliant.

**Lack of Support from Line Departments:**

SHG members often struggle to get the help they need from line officers, who may not be cooperative or responsive. This lack of support prevents the successful implementation of the group's objectives.

**Conclusion & Suggestions to Minimize the Problems Faced by Self-help group:**

The following suggestions are offered to minimize the above mentioned issues of Self-help group:

Information about locally available materials and their diverse applications should be shared with Self-Help Groups (SHGs). Groups focused on bottom up innovation using these materials should receive significant support and training. The local authorities can do surveys from panchayat level to have a complete understanding of material availability.

Therefore, in order to overcome the challenges towards the marketing of products from SHGs, organizations at the state level need to extend their reach beyond a particular region by scaling the support across the state.

Self-Help Groups in the same panchayat could register a cooperative society. This cooperative would then market products from different SHGs with one single brand name. In addition, the cooperative might also conduct promotional sales types of business and help out in seeking rare raw materials for the interested member groups. Non-Governmental Organizations (NGOs) can play a vital role in empowering women entrepreneurs by offering basic education, motivation, training, and financial assistance. As members of SHGs may not all possess the same skills and expertise, NGOs can identify less efficient members and provide the necessary training to enhance their capabilities. Short-term training programs can be organized at the panchayat level to help develop their skills. The Rural Development Department should organize frequent awareness campaigns to educate SHG participants about the various assistance schemes available to them. Finally, financial institutions should provide adequate financial support to SHGs based on their actual

performance, without any bias related to caste, politics, or other factors.

The positive shifts in values and attitudes within SHG members demonstrate the success of socio-economic empowerment initiatives, which yield relatively quick results. These programs work together to foster comprehensive development of children, women, households, and communities. Ultimately, this process promotes the self-fulfilment of each member, guiding SHGs towards achieving their goals with a clear strategic direction.

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## **Independent Auditor’s Opinion on the Internal Audit System in Tamil Nadu State-Owned Companies**

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### **Abstract**

As per clause 3 (xiv) of the Companies (Auditor’s Report) Order, 2020, (CARO, 2020), the statutory auditor shall state in his report on the financial statements of certain classes of companies whether the company has an appropriate internal audit system in place considering its size and nature of business and whether he had considered the reports of the internal auditor while forming his opinion on the internal audit system.. This study aims to explore whether independent auditors’ reports include such a statement of opinion on the internal audit system and the consideration of internal audit reports, with respect to Tamil Nadu state-owned companies. For this purpose, publicly available independent auditors’ reports on the annual financial statements of State-Owned Companies / Public Sector Undertakings (PSUs) of the Government of Tamil Nadu for the year ending March 2023 were analyzed. According to the findings, 29 out of 58 government companies did not get an opinion from independent auditors about their internal audit system or internal audit reports. The research also explores reasons for the omission of such opinions in the independent auditors’ reports. The research also looks at what has to be done to make sure that internal audit system is established in state-owned companies and independent auditors invariably provide his opinion thereon.

**Key words:** Tamil Nadu State-Owned Companies, PSUs, Internal Audit, Independent Auditor, Statutory Auditor, CARO 2020.

### **Introduction**

As per the Audit Code, 1950 issued by the Comptroller and Auditor-General of India (CAG), “In auditing the accounts of a commercial undertaking, the (external) Audit has to frequently accept the results of what is known as “Internal control”, i.e., the continuous internal audit carried out by the staff of the concern itself by means of which the work of each individual is independently checked by other members of the staff. It is an important part of Audit, therefore, to scrutinise the system of “internal control” ...and to see that it is adequate in itself and as independent in character as circumstances permit and to assure itself that the system is being applied efficiently. The extent of scrutiny to be applied should depend on the adequacy of the system of “internal control” and on the completeness and accuracy with which it is being applied”. (Audit Code, 1950). Thus, the concept of internal audit as an integral part of the internal control system and its relevance for the independent auditors of commercial undertakings was well recognized as early as 1950 by the CAG.

The definition of internal audit, as stated in the *Framework Governing Internal Audits, 2018* issued by the Institute of Chartered Accountants

of India (ICAI), encapsulates contemporary perspectives on the role of internal audit: “Internal audit provides independent assurance on the effectiveness of internal controls and risk management processes to enhance governance and achieve organisational objectives”. (ICAI, 2018)

According to the Institute of Internal Auditors, USA (IIA), “the internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes”. (IIA, 2024)

The definition and scope of the internal audit function has evolved significantly over the period. It has transformed from being a limited subset of internal control focused primarily on financial statements to encompassing all organizational functions and activities. Today, it an indispensable tool for modern management, contributing to value creation and organizational effectiveness.

The previous Companies Act, 1956, as well as the current Companies Act, 2013, and the regulations enacted thereunder, acknowledge the significance of the internal audit system and the successive Companies (Auditor's Report) Orders requires the independent auditor to evaluate internal audit reports and form an opinion regarding the adequacy of internal audit in the course of his duties. In addition, all state-owned companies/ PSUs were directed (April 2002) by the Government of Tamil Nadu (GoTN) to constitute an Audit Committee and to appoint internal auditors.

Therefore, this research attempts to study how far the independent auditors provided opinions on the internal audit system in the state-owned

companies of the GoTN as per the applicable rules and Government directives.

#### **OBJECTIVES**

- (i) To study how many independent auditors have provided their opinion on internal audit systems and considered internal audit reports in their audit reports on the financial statements of state-owned companies/PSUs under the GoTN, as per legal and regulatory requirements.
- (ii) To examine the reasons for not providing an opinion on the internal audit systems and for not considering internal audit reports.
- (iii) To evaluate the actions required to guarantee legal and regulatory compliance.

#### **Literature review**

The following paragraphs provide an effort at a literature review on the subject of internal audits. This body of work draws on a wide range of published sources, including scholarly journals, popular periodicals, and online resources.

- (i) Orhan Bozkurt, in his research article, "The Impact of Auditors' Duties and Internal Audit Procedures on Independent Audit Decisions", examines the relationship between auditors' perceptions of their responsibilities and the decisions made by independent external auditors. The article was published in the Research Journal of Finance and Accounting (2014). The results show that external audits are more effective when internal auditors are prepared and aware of their responsibilities. This research, focused on gathering insights from Turkish auditors and accountants, aims to enrich the literature on the subject. To ensure objective and reliable data from independent external auditors, it is essential to streamline internal audit procedures and foster

greater collaboration between internal and external auditors. (Bozkurt, 2014)

- (ii) The research conducted by Dr. Rajesh Kumar Agrawal, published in the International Journal of Innovative Research and Creative Technology (2015) under the title "*Study on appointment of internal auditors by companies in Mumbai area*", delves into the number of companies that have utilized this services of internal auditor and the factors that have prevented them from doing so. Conclusions drawn about reasons for not appointing an internal auditor include obstacles like inadequate internal controls, poorly executed delegation of authority, an existing internal audit department with fewer employees, management's expectation that independent auditors will conduct a full audit, management's ignorance of operational risk, and poor corporate governance standards. (Agrawal, 2015)
- (iii). In their study titled "Internal audit attributes and external audit's reliance on internal audit: Implications for Audit Fees" published in the International Journal of Auditing (2012), Zulkifflee Mohamed, Mazlina Mat Zain, Nava Subramaniam, and Wan Fadzilah Wan Yusoff set out to investigate two facets of internal audit quality: the auditors' ability to perform their jobs well and the value they add when auditing financial statements. The researchers concluded that audit fees tend to be cheaper when internal audit workers have certificates, past expertise in auditing and accounting, and when the organization's internal audit competence is high. (Mohamed, Mat Zain, Subramaniam, & Wan Fadzilah, 2012)

**Research gap:** The extensive search in libraries and the internet revealed that there is little research material available on the topic, i.e., "*independent auditor's opinion on the internal audit system*". This study aims to fill this gap

with a specific context of state-owned companies of the GoTN.

### **Study Design And Methodology**

#### **(i) Scope of the study:**

To be eligible for inclusion in this analysis as Tamil Nadu state-owned firms (PSUs), only those that are actively operating and have a paid-up share capital that is at least 51% held by the GoTN and registered under the firms Act, 2013 are considered.

#### **(ii) Source of data:**

*Secondary data:* The audit report of independent auditor on the annual financial statements of the Tamil Nadu State-Owned Companies were obtained from PSUs websites and through the Right to Information Act, 2005.

#### **(iii) Sample size:**

58 out of 72 operating<sup>1</sup> companies owned by the GoTN as of 31 March 2023.

#### **(iv) Analysis of data:**

Independent auditor's opinion on the internal audit system in the Tamil Nadu State-Owned Companies were compared and analysed with respect to the requirement stipulated in the Companies (Accounts) Rules, 2014 (CAR, 2014) and CARO 2020 and the Orders issued by the GoTN.

#### **(v) Limitation of the study:**

- (a) The study is confined to state-owned companies where the Government of Tamil Nadu holds at least 51% of the paid-up capital.
- (b) This study excludes joint venture companies involving the GoTN and entities such as the Union of India, Foreign Institutional Investors, the public, and Central Public Sector Undertakings, where the GoTN holds less than 51 per

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<sup>1</sup> Other than a company that is not currently carrying out any business activities or operations called a dormant company or defunct company or non-working company.

cent of the paid-up capital. Additionally, non-operational companies in which the GoTN holds more than 51 per cent of the paid-up capital are also not considered.

- (c) This study considers only the independent auditor's reports on the accounts of the state-owned companies as of 31 March 2023.

### Discussions

The requirement for internal audits was encompassed within the concept of internal control specified in Clause 4A(vi) of the Manufacturing and Other Companies (Auditor's Report) Order, 1975 (MAOCARO, 1975), issued under Section 227(4-A) (Companies Act, 1956, p. 120). Accordingly, the report prepared by the independent auditors on the financial statements of manufacturing, mining, or processing companies shall include a statement whether "there is an adequate internal control procedure commensurate with the size of the company and the nature of its business for the purpose of stores, raw materials including components, plant, machinery, and equipment, and other assets". (MAOCARO, 1975)

Later, the idea of internal audit was specifically laid out in clause 4(xv) of the Manufacturing and Other Companies (Auditor's Report) Order, 1988 whereby the independent auditor's report on the accounts of certain<sup>2</sup> companies shall include a statement as to "whether the company has an internal audit system commensurate with its size and nature of its business" (MAOCARO, 1988). This was in addition to the independent auditor's statement on internal control procedure as per clause 4A(x) of MAOCARO 1988. Similar requirements were

<sup>2</sup> "Companies having a paid-up capital exceeding ₹ 25 lakh as at the commencement of the financial year concerned or having an average annual turnover exceeding ₹ 2 crore for a period of three consecutive financial years immediately preceding the financial year concerned." (MAOCARO, 1988)

provided in <sup>3</sup> clauses 4(iv) and 4(vii) of the Companies (Auditor's Report) Order, 2003. (CARO, 2003)

For the first time in February 2003, the requirement for internal audit was specifically provided under the newly inserted Section 581ZF of the Companies Act, 1956 which stipulates that "every producer company<sup>4</sup> shall have an internal audit of its accounts carried out, at such interval and in such manner as may be specified in articles of association, by a chartered accountant". (Companies Act, 1956, p. 239)

As part of the complete revamping of the Companies Act, 1956, Section 138 of the Companies Act, 2013 was revised to include a new provision relating to internal audit. Under this provision, certain<sup>5</sup> kinds of companies appoint a chartered accountant, cost accountant, or any competent person chosen by the Board to carry out an internal audit of the business's activities.

Incidentally, with significant increase in threshold requirements of paid-up share capital (from ₹50 lakh to ₹50 crore) and turnover (from ₹5 crore to ₹200 crore) under CAR 2014, compared to CARO 2003, companies that were previously somewhat mandated to have an internal audit system under CARO 2003, are now no longer required to maintain internal audit system under CAR 2014.

<sup>3</sup> "Companies listed in the stock exchanges and/or other companies having a paid-up capital and reserves exceeding ₹ 50 lakh as at the commencement of the financial year concerned or having an average annual turnover exceeding ₹ 5 crore for a period of three consecutive financial years immediately preceding the financial year concerned." (CARO, 2003)

<sup>4</sup> "Designed for groups of farmers and producers primarily involved in agriculture and related activities/objects specified in Section 581D". (Companies Act, 1956, p. 231).

<sup>5</sup> "Every listed company; and every unlisted companies having paid up capital of ₹50 or more or turnover of ₹200 crore more or outstanding borrowings of ₹100 or more or deposits of ₹50 crore or more during preceding financial year; and every private company having turnover of ₹200 crore more or outstanding borrowings of ₹100 or more during preceding financial year" (CAR, 2014)

Further, as per Clause 3(iv) of the Companies (Auditor's Report) Order, 2015, the auditor's report on the account of certain specified<sup>6</sup> companies, shall include a statement "*whether there is an adequate internal control system commensurate with the size of the company and the nature of its business, for the purchase of inventory and fixed assets and for the sale of goods and services and whether there is a continuing failure to correct major weaknesses in internal control system*". (CARO, 2015)

While successive MAOCAROs and CAROs have required independent auditors to express their opinion on companies' internal audit functions since 1975, this requirement was not included in the Companies (Auditor's Report) Order, 2016. (CARO, 2016) Later, the Government of India, through the Companies (Auditor's Report) Order, 2020, reintroduced the requirement for the independent auditor's opinion on the internal audit function of certain specified<sup>7</sup> companies.

Accordingly, as per Clause 3 (xiv), "*the independent auditor's report on the accounts of a company shall include a statement on – (a) whether the company has an internal audit system commensurate with the size and nature of its business; and (b) whether the reports of the Internal Auditors for the period under audit*

<sup>6</sup> "Except banking companies, insurance companies, companies licensed to operate under section 8, of the Companies Act, 2013, One Person Companies, and Private Companies with a paid-up capital and reserves not more than ₹ 50 lakh and which does not have loan outstanding exceeding ₹ 25 lakh from any bank or financial institution and does not have a turnover exceeding ₹ 5 crore at any point of time during the financial year." (CARO, 2015)

<sup>7</sup> "Except banking companies, insurance companies, companies licensed to operate under section 8, of the Companies Act, 2013, One Person Companies, and Private Companies, not being a subsidiary or holding company of a public company, having a paid-up capital and reserves not more than ₹ 1 crore as on the balance sheet date and which does not have total borrowing exceeding ₹ 1 crore from any bank or financial institution at any point time during the financial year which does not have a total revenue as disclosed in Schedule III to the Companies Act (including revenue from discontinuing operations) exceeding ten crore rupees during the financial year as per the financial statements." (CARO, 2020)

*were considered by the independent auditor*". (CARO, 2020)

Incidentally, the independent auditor is required to provide his opinion on the internal audit system of a company under CARO 2020, even if the company is exempt from establishing internal audit system as per CAR 2014. This is due to the broader scope of CARO 2020, which now includes all public limited companies (whether listed or unlisted) and significantly lowers the threshold requirements for private limited companies. The turnover threshold has been reduced from ₹200 crore to ₹10 crore, and the borrowing threshold has been reduced from ₹100 crore to ₹1 crore, compared to CAR 2014. In 2000, the Companies Act, 1956 was amended to include a new Section 292A<sup>8</sup>, which mandates that public companies with paid-up capital of at least ₹5 crores establish an Audit Committee as a Board level committee. In terms of Section 292A (5), the internal auditor, if any, is required to attend and participate at the meetings of such Audit Committees. Following this, the GoTN entrusted (April 2002<sup>9</sup>) the inspection work of the State PSUs to the respective Audit Committees of the State PSU and prescribed a format for undertaking internal audit biennially. Further, the GoTN instructed (October 2005) to constitute Audit Committees even in respect of companies whose paid-up capital is less than ₹5 crore. Additionally, in May 2012<sup>10</sup>, the GoTN directed that PSUs had the authority to choose their own internal auditors and proposed several ways in which these auditors may work in tandem with their external counterparts.

<sup>8</sup> This requirement under Section 292A (5) of the Companies Act, 2056, was later deleted in the replaced Section 177 of the Companies Act, 2013.

<sup>9</sup> Government of Tamil Nadu, Finance (BPE) Department G.O.Ms.No.137 dated 17.4.2002.

<sup>10</sup> Government of Tamil Nadu Letter No.18062/ Fin (BPE)/ 2012 dated 9.5.2012.

After reviewing the relevant laws and regulations, such as the Companies Act, 2013, the Companies (Accounts) Rules, 2014, the Companies (Auditor's Report) Order, 2020, the Corporate Governance Guidelines from the Department of Public Enterprises (Government of India), and numerous directives from the Finance (BPE) Department of the GoTN, it becomes clear that state-owned enterprises function similarly to listed public limited companies. Within this structure, the government acts as the legal shareholder, representing the public interest, which is the principal stakeholder. Therefore, it is critical to check if the internal audit system is adequate based on the independent auditor's evaluation and opinion.

#### **Findings**

The analysis of independent auditor's reports on the accounts of 58 state-owned companies of Tamil Nadu as of 31 March 2023 revealed following: –

- (i) Independent auditors gave a full opinion on 29 out of 58 enterprises, noting that, on the whole, the companies' internal audit systems were adequate for their sizes and types of businesses as per CARO 2020.
- (ii) Independent auditors did not comment on the existence of the internal audit system for fifteen companies. Out of these, the internal audit system is mandatory for five companies as per CARO 2020.
- (iii) Independent auditors opined that 'the company did not have an internal audit system despite its applicability' in respect of three companies.
- (iv) Independent auditors opined that the company has an internal audit system in three companies, and they considered the internal audit reports. Additionally, independent auditors believed that the internal audit system was out of proportion

to the company's size and kind of operations.

- (v) Independent auditors opined that the company's internal audit system is adequate for its size and kind of operation in one company without commenting whether they considered the internal audit reports for forming such opinion.
- (vi) Independent auditors stated that the internal audit system exists in one company but remained silent as to whether the company's internal audit system was adequate for its size and kind of business, and whether or not the reports were taken into consideration.
- (vii) Despite CARO 2020 being applicable to six companies, the independent auditors submitted their compliance reports without including an opinion on the internal audit system.

The findings reveal that the independent auditors provided full opinions for 46 companies and partial opinions for two companies out of a total of 58 companies as per CARO 2020. Further, the auditors either opined that the internal audit system was not applicable or provided no opinion on the internal audit despite applicability of CARO 2020 in respect of 10 companies.

#### **Suggestions**

- (i) Government of India may consider aligning the requirements for establishing an internal audit system under CAR 2014 with the independent auditors' reporting requirements under CARO 2020.
- (ii) Government of India may consider incorporating mandatory provisions in CAR 2014 and CARO 2020 for establishing an internal audit system in all state-owned and controlled companies.
- (iii) Government of Tamil Nadu may issue orders mandating all state-owned and controlled companies to establish a robust

internal audit system, notwithstanding any provisions in the Companies Act, 2013, CAR 2014, or CARO 2020.

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## The Role of Brand Anthropomorphism in Language Learning Apps

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### **Abstract:**

This paper aims to explore the impact of brand anthropomorphism mainly through the use of mascots in language learning apps. Although there exists an array of literature pertaining to brand anthropomorphism, there is none connecting brand anthropomorphism and language learning apps. This study aims to fill this gap in the literature. An online survey was conducted among the users of language learning apps and the results were recorded. The results concluded that Anthropomorphism in language learning apps is supported by the liking and psychological closeness that the consumers feel towards the anthropomorphic entities. Anthropomorphism also helped in engaging and retaining the users. We also found out that although social media presence of anthropomorphized entities were noticed by the users, there is still room for improvement. It was also found out that anthropomorphized entities had a positive influence in habit formation which is substantial for such self-development apps. This study opens doors for new literature in the area of Brand anthropomorphism in self-development apps.

**Key words:** User Engagement and Retention, Social Media and Viral Marketing, Emotional Brand Attachment, Habit formation, Liking, Psychological closeness.

### **Introduction:**

Learning a new language is considered to be an aspect of self-development because of the

underlying positive effects such as enhanced cognitive abilities, improved communication skills, strengthen confidence and has the ability to open up new cultural and professional opportunities. In the recent years, language learning apps have become very popular among people of different ages. The popularity of language learning apps is due to how engaging these applications are and mainly because of the convenience they provide while developing new language skills. Among the many ways of enhancing user retention experience and habit formation, Anthropomorphism- giving human-like traits to non-human entities has proven to be a powerful tool. One such example is the use of mascots which provide a friendly and motivating presence. This article explores the role played by Brand anthropomorphism in user engagement, consistency and how it subtly influences learners to form emotional connections that foster sustained learning efforts. We try to investigate the psychological and behavioural impacts that these virtual companions play which could impact the effectiveness of language learning apps.

### **Brand anthropomorphism:**

Anthropomorphism is attributing human attributes to non-human entities. So when the clown fish Marlin and Dory try to find nemo displaying human qualities such as perseverance, kindness, loyalty and humor they exemplify anthropomorphism by displaying

such relatable human traits. The idea behind using brand anthropomorphism – attributing human characteristics to brands and products, is due to association of such anthropomorphic entities as relatable entities thereby forming emotional connections with brands similar to the connection and relationship they have with other people. Brand Anthropomorphism allows brands to communicate their messages in a manner which is relatable to the customers and ultimately influencing consumer perceptions and purchase intention.

#### **Emotional Brand Attachment:**

Emotional Brand Attachment can be described as the emotional attachment a customer forms towards a product which creates a personal and meaningful connection over time which goes beyond the functional benefits of the product. The attachment arises mainly due to the positive emotions that the consumers feel towards the brand. Brands that are successful in emulating such emotions from its customers tend to create a loyal and lasting relationship with its customers because of the emotional connection. The customers even tend to forego price differences and the occasional let downs from the brand with which they have a strong emotional connection.

#### **Psychological Closeness:**

Psychological closeness is the emotional and perceived mental proximity that a person feels towards objects, organisations, ideas, entities, etc. So, for example, when you are in a foreign environment, encountering someone from your own home country or hometown makes you feel a sense of belonging and familiarity. Even though you have never met this person before the shared nationality and cultural background creates an immediate connection. This phenomenon is called as psychological closeness. Psychological closeness can foster strong bonds between customers and brands

when customers feel that brands align with their personal values and increasing trust and loyalty

#### **Review of literature:**

**Jie Han *et.al* (2023)** have conducted a comparative study to explore the effect of cobrand anthropomorphism on product evaluation and purchase intention with a mediated role of brand identify fit. The researcher has adopted online survey method to collect perception on anthropomorphism and non-anthropomorphism advertisement effectiveness with respect five selected products. The result indicates that clothing, cosmetics and shoes are highly preferred cobrand products and toys, watch and cars are least preferred cobrand products among business school stakeholders. Further, the outcome of the study proves that cobrand anthropomorphism significant increases the consumer evaluation and purchase intention rather than non-cobrand anthropomorphism products. In addition, cobrand anthropomorphism increases the brand identify fit for the selected products. The researchers concluded that there is need to understand antecedents of brand alliance success and brand identify cultural relationship commitment to make cobrand strategy is a key for success.

**Fu Liu *et.al* (2022)** executed a study which opens up new areas of comparative analysis on warmth and competence in brand anthropomorphism. They have included elements of social exclusion and they also try to explore the mediating role of the customer's need for uniqueness. They also blend in the product type into the mix. The researchers have used an online survey platform. Their study shows how the effectiveness of an Advertisement featuring anthropomorphic brands depends on the type of social exclusion (rejected vs ignored) and that it also has significance in a customer's need for uniqueness. They have also arrived at the

conclusion that the perceived effect applies only when dealing with products of high safety and that customers tend to lean into competence irrespective, while dealing with less safe products. The study concludes with future directions for research on the other types of brand anthropomorphism and other influencing factors.

**Y.(W.) Li, L.C. Wan, X. Luo *et.al* (2023)** have examined the role of anthropomorphism in curatorial practices, mainly emphasizing on how museum exhibits with human-like characteristics affect visitor's experiences. Their research addresses the challenges faced by museums due to the perception of museums as unapproachable by younger audiences. Their findings make it clear that anthropomorphized exhibits could reduce the psychological distance of the visitors thereby engaging the visitors emotionally, leading to increase in intention to (re)visit, learn more, and recommend the museum. The researchers recommend further studies to use implicit approach and neuromarketing techniques to provide analyses of the anthropomorphized effect.

**Z. Wang *et.al* (2023)** focused their research on the emerging area of entomophagy and how anthropomorphism can have a positive influence on the marketing of insect food. They have stated that food neophobia acts as an impediment for the growth of the insect food industry. A crowdsourcing platform was used to conduct the study which lead to the following conclusions that anthropomorphized insect images on packaging significantly increased the purchase intention of customers for insect foods and that these findings are mediated by two important variables which are psychological closeness and food neophobia. Their study suggests that anthropomorphized packaging can be an effective marketing tactic to promote insect foods, given that the consumers are not highly neophobic.

**Tae Hyun Baek *et.al* (2023)** conducted a study to understand the role of anthropomorphism in designing artificial intelligence based robo-advisor on investment decisions. The researchers wanted to find out if humanizing AI-powered robo-advisors has a positive impact on investment decisions on the users. Three experimental studies were conducted which resulted in the findings that, customers who were prevention focused were more inclined to invest more money when exposed to humanlike robo-advisors but customers who were promotion focused had the opposite effect. They pointed future research in the direction of investigating various levels of anthropomorphism on consumer behaviour in various financial contexts.

**Michela patrizi *et.al* (2024)** conducted a survey to find out the consequences of brand anthropomorphism in voice based artificial intelligence contexts. The researchers tried to find how branding outcomes are affected by brand anthropomorphism in name-brand voice assistants and they also delve into understanding the relationship between brand anthropomorphism, brand trust and how perceived trust moderates this relationship. An online self-administered questionnaire was used among young adults for this study. The findings show support to the previous studies made, that brand anthropomorphism positively influences brand trust and further they find that perceived risk moderates the relationship between brand anthropomorphism and brand trust.

**Jieon Lee *et.al* (2023)** have discussed about how anthropomorphism of the profile picture of an AI psychotherapy chatbot affects its users' self-disclosure and perception. The researchers try to find out the right level of anthropomorphism in psychotherapy chatbots. An online experiment was conducted which gave the following results. The degree of anthropomorphism of the chatbot's profile

picture did not have a significant effect on self-disclosure. However, the higher degree of anthropomorphism increased the liking for the chatbot and liking for the chatbot did play a significant role in users' self-disclosure.

**Need for the study:**

As language learning apps have become more popular in recent years, understanding user engagement and user retention has become crucial factors for success. The study aims to prove that app mascots play a huge role in contributing to the user engagement and can foster emotional connections and encourage habit formation, which can be useful while formulating marketing strategies. The study focuses on psychological and behavioural impacts of brand anthropomorphism, which can contribute to a greater understanding of consumer behaviour in digital environments. While research exists on brand anthropomorphism in various contexts there is not much study conducted on its influence in language learning apps.

**Objectives:**

1. To examine the role of brand anthropomorphism in User engagement.

2. To analyze the impact of brand anthropomorphism on User retention and Habit- formation.
3. To evaluate the effect of anthropomorphized characters on emotional attachment and psychological closeness.
4. To investigate the use of app mascots for social media marketing and viral marketing.
5. To assess the overall influence of brand anthropomorphism in language learning apps.

**Research methodology:**

**Sources of Data:** This study used primary data collection method. In this research, the primary data was collected through a well-designed questionnaire.

**Size of Sample:** The sample size is 120 respondents.

**Sample unit:** Majority of the respondents were adults. The data used for analysis was taken from the respondents who have used language learning apps beforehand.

**Table 1. Demographic Profile of the Respondents**

Frequency (%)	
<b>Age Group</b>	
18 years to 24 years	88 (73%)
25 years to 34 years	14 (12%)
35 years to 44 years	8 (7%)
Above 44 years	10 (8%)
<b>Gender</b>	
Male	74 (62%)
Female	46 (38%)
<b>Level of Education</b>	
SSLC	25 (21%)
Bachelor' Degree	57 (47%)
Master's Degree	38 (32%)
<b>Marital Status</b>	
Single	96 (80%)

Married	24 (20%)
<b>Family Annual Income</b>	
Below Rs. 2,50,000	47 (39%)
Rs. 2,50,000- Rs. 5,00,000	44 (37%)
Rs. 500,001- Rs. 10,00,000	14 (12%)
Rs. 10,00,001- Rs. 20,00,000	10 (8%)
Above Rs. 20,00,000	5 (4%)

**Interpretation:**

The above table helps us understand that the majority of users (73%) fall within the age group of 18-24, followed by 25-34 (12%), 35-44 (7%), and above 44 (8%). This suggests that adults, particularly those in the 18-24 age group, are the primary users of language learning apps. Males account for a larger portion of the sample (62%), while females account for 38%. Nearly half (47%) of the respondents hold a Bachelor’s

degree, while 32% have a Master’s degree. This indicates that higher-educated individuals tend to be more engaged with these apps. A significant (80%) of respondents are single, which might suggest that individuals with less family commitments have more time to engage in self-development activities like language learning. A variety of income brackets are represented, with many users falling in the Rs. 250000 to Rs. 500000 range.

**Table 2. Regression Analysis on Influence of brand anthropomorphism in language learning apps.**

Variables	S.E	C.R	Estimates	P value	Supported
Usage	0.108	6.207	0.850	0.000	Supported
Interaction	0.085	4.411	0.334	0.000	Supported
Engagement	0.070	5.407	0.526	0.000	Supported
Emotional Attachment	0.076	2.730	0.178	0.000	Supported
Social Media & Viral Marketing	0.086	5.587	0.423	0.000	Supported

From the above table 2, it is found out that all the fit indices surpassed the suggested acceptance levels, indicating this model presents a good fit. The Anthromorphism has a positive influence on all the variables and it is positively associated with User retention and Habit-formation, emotional attachment and psychological closeness.

**Findings and Suggestions:**

**User Engagement and Retention:** Anthropomorphized entities such as mascots have a positive influence on engaging and retaining users through forming emotional connections that can encourage habit formation.

**Psychological closeness and emotional attachment:** Anthropomorphized entities have proven to make users feel psychologically close thereby creating emotional attachment and favouring usage of the application.

**Social Media and Viral Marketing:** The social media presence of anthropomorphized entities are noticed by the users but are not taken seriously and thereby not achieving the desired effect.

**Habit Formation ability:** In the area of Habit formation a clear positive majority was not found due to most users feeling neutral about the ability of anthropomorphic entities in forming a habitual experience. This paves way to creating a more habit-forming experience by

using anthropomorphized entities in language learning apps.

**Marketing Implications:** The study helped us in finding that app mascots can be positively used for viral marketing and social media campaigns but it was also made clear that users are not willing to share their achievements, journey and experience of language learning apps which should be noticed and measures to solve this issue should be taken.

**Recommendations of apps:** Majority of the respondents agreed that they would recommend language learning apps with anthropomorphic features to others which shows the positive influence of anthropomorphism in language learning apps.

**Conclusion:**

The study has several contributions relating to anthropomorphism and language learning apps. The underlying effect of brand anthropomorphism on aspects such as emotional brand attachment, user retention, habit formation and psychological closeness. The analysis has shown a clear connection between the above mentioned aspects and brand anthropomorphism but there seems to be room for improvement when it comes to viral marketing using anthropomorphic features. The study concludes with directions for future research with brand anthropomorphism and self development applications as a whole.

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## Impact of Cryptocurrency on Traditional Banking Systems

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### Abstract

This study explores the impact of cryptocurrency on the traditional banking system, examining investor perceptions and regulatory concerns. The research findings indicate that 91% of investors accept that cryptocurrency influences banking, with a positive correlation between adopting cryptocurrency and support for stricter regulation and monitoring. The results highlight the growing recognition of cryptocurrency's disorderly role and the need for regulatory frameworks to ensure financial activity and stability. Traditional banks must adapt to integrate blockchain technology, while governments should establish clear policies in the market for investors to manage risks. This research focuses on the shifting financial landscape and the potential future of cryptocurrency in banking.

**Keywords:** Cryptocurrency, Traditional banking, Government regulations, Decentralized financial services.

### Introduction

The popularity of cryptocurrencies has brought a radical and drastic change in the global financial scenario and caused the already established banking system several difficulties. By using the decentralized blockchain

technology, cryptocurrencies like Bitcoin and Ethereum minimize the need for traditional financial banking systems. Cryptocurrencies facilitate peer-to-peer transactions with low fees, faster processing time, and higher transparency than traditional banks, which are subject to centralized and concentrated control and regulatory oversight. Discussions of digital currencies' potential to take over the current banking system have been generated by their decentralized character.

Traditional banks depend on paper currencies and legal establishments that govern lending procedures, monetary policy, and transaction security. The rise of cryptocurrencies, however, offers a different financial system that functions beyond these limitations. Borderless transactions, financial inclusion for the untapped customers, and decentralized financial services (DeFi) that do not involve middlemen like banks are made possible by digital currencies. Traditional banking institutions must incorporate blockchain technology and investigate digital assets in response to these advancements, which present both opportunities and challenges in the new era. The constantly evolving and dynamic relationship between cryptocurrency and traditional banking will

shape the future of global finance for a positive run, determining whether these two systems will coexist or compete.

The traditional banking sector has seen numerous advantageous changes due to cryptocurrency, mostly as a result of increased efficiency and innovation. The underlying technology advancement of cryptocurrencies, blockchain, provides better security and transparency. In order to ensure the safety of international payments and to cut down on the expense of international money transfers, several institutions are implementing blockchain technology. This technology increases customer trust, guarantees ironclad transactions, and reduces the risk of fraudulent activities. Therefore, banks can provide more dependable and effective financial services, which benefits both individuals and companies.

The growth of financial inclusivity is another notable advancement. Many people are deprived of financial services due to the high standards of traditional banking institutions. By eliminating the need for bank accounts and enabling people to save, transact, and receive money using digital wallets, cryptocurrencies offer an efficient alternative. Considering the people in unbanked developing nations with limited access to financial institutions, this is a great advantage. Banks can expand their client base and provide services to people who were excluded from the financial system by adopting digital currency.

### **Methodology**

Study population: Adults aged 18 and above

Sample Collection Methodology: A convenient sampling method was adopted

**Data Collection Technique:** Google Forms questionnaire technique was used

The questionnaire was designed with 23 questions concerning the research topic. The questionnaire was designed with multiple-choice questions to ease the data collection

process, focusing on quantitative and qualitative aspects. The questions were associated with awareness and opinions on cryptocurrency and banking regulations.

The demographic profile of the respondents was collected for study purposes from January 2025 to February 2025. The results are tabulated for more insights into the study.

**Sample size:** Questionnaires were sent to 120 respondents. However, only 100 respondents filled out the form which is used for statistical analysis and interpretation.

**Types of data:** Both Primary and Secondary data were used

Statistical package: The SPSS package has been used for Data Analysis and interpretation

### **Statistical tools applied:**

- Frequency Table
- Percentage analysis
- Friedman test
- Correlation analysis
- Pie Chart

### **Results And Discussion**

The data reveals a nearly equal gender distribution, with 52% male and 48% female respondents. The majority of participants (57%) are between 18-24 years old, indicating a predominantly younger population interested in innovative and fast growing investments.

In terms of education, 57% hold undergraduate degrees, while 43% have postgraduate qualifications, indicating a well-educated sample. Income distribution shows that 48% earn between 0-20,000, while only 14% have an income above 60,000, emphasising a greater number of lower-income earners. (Table.1)

The P value is less than 0.05, therefore null hypothesis is rejected. There's a statistically significant difference between mean ranks regarding the causes which motivate the investors to invest in cryptocurrency were  $\chi^2(2) = 16.061$  and  $p = .001$ .

Based on the Mean Ranks relating to factors of motivation, Integration services (2.74) is ranked 1<sup>st</sup>, followed by Security (2.58) in second place, Familiarity (2.47) in third place and Understanding (2.22) in last place.

Overall, this data implies that the successful adoption of cryptocurrency in traditional banking requires a strong focus on integration and security while also promoting awareness and user education. (Fig.1)

The p-value is < 0.001, this correlation is statistically significant. The positive correlation suggests that individuals who believe cryptocurrency will gradually replace the traditional banking system are also more likely to support stricter government regulation of cryptocurrency. People positive about cryptocurrency's future still acknowledge the need for government intervention to mitigate risks like fraud, security breaches, or financial instability (Fig.2)

The data shows that 91% of investors believe cryptocurrency influences traditional banking, with 34% strongly agreeing and 57% agreeing. 26% remain neutral, while only 3% disagree. This indicates a strong positive sentiment toward cryptocurrency's impact on banking. The minimal opposition suggests widespread recognition of cryptocurrency's disruptive role. Traditional banks may need to adapt to the evolving financial landscape (Fig.3)

The study suggests that Governments should establish clear yet adaptable regulations to support cryptocurrency growth while ensuring financial security. Traditional banks must embrace blockchain technology and explore cryptocurrency integration to stay competitive. Financial institutions should conduct educational campaigns to increase awareness of cryptocurrency risks and benefits. Collaboration between banks and crypto platforms can create innovative financial solutions. Regulatory

bodies must monitor market trends to adjust policies in response to evolving cryptocurrency dynamics. Investors should diversify their portfolios, considering both traditional assets and digital currencies for balanced risk management. Stricter measures should be implemented to prevent fraud, money laundering, and cybersecurity threats in cryptocurrency markets. Governments can encourage research and development in blockchain technology to enhance financial inclusion. Central banks should explore the potential of Central Bank Digital Currencies (CBDCs) as a bridge between traditional and digital finance.

Figures

Fig.1:

**Test Statistics<sup>a</sup>**

N	100
Chi-Square	16.061
df	3
Asymp. Sig.	.001

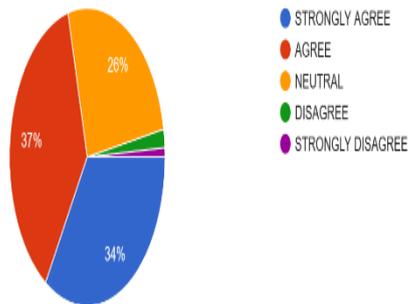
a. Friedman Test

Fig.2:

		2. Do you believe that Cryptocurrency will eventually replace traditional banking system <sup>a</sup>	4. Do you believe that the government should regulate cryptocurrency more strictly
2. Do you believe that Cryptocurrency will eventually replace traditional banking system <sup>a</sup>	Pearson Correlation	1	.382**
	Sig. (2-tailed)		<.001
	N	100	99
4. Do you believe that the government should regulate cryptocurrency more strictly	Pearson Correlation	.382**	1
	Sig. (2-tailed)	<.001	
	N	99	99

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Fig.3:



Tables

Table.1:

Gender		
Basis	Frequency	Percentage
Female	48	48
Male	52	52
Age		
Basis	Frequency	Percentage
18-24	57	57
25-31	21	21
32-38	12	12
Above 39	10	10
Educational Qualification		
Basis	Frequency	Percentage
Undergraduate	57	57
Postgraduate	43	43
Income level		
Basis	Frequency	Percentage
0-20000	48	48
20001-40000	26	26
40001-60000	12	12
Above 60000	14	14

**Conclusion**

The study concludes that cryptocurrency significantly impacts traditional banking, with

most investors acknowledging its influence. The correlation between belief in cryptocurrency adoption and the need for stricter regulations highlights the complex perspective—while many see crypto as the future, they also recognize potential risks. This suggests that banks must adapt by integrating blockchain technology, and regulators must create balanced policies to ensure financial stability.

As cryptocurrency’s popularity and adoption grows, proactive measures are needed to address security, fraud, and market stability. Collaboration between traditional banks and crypto platforms can create innovative financial solutions. Educating investors and further research on neutral perspectives will help shape the future of cryptocurrency in the financial ecosystem. This study provides insights into the evolving role of cryptocurrency and its potential impact on traditional banking systems.

**Acknowledgement**

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## Efficient *In vitro* Propagation and Antibacterial activity of *Aerva lanata* (L.) Juss. ex. Schult.

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### Abstract

*In vitro* plantlet regeneration of *Aerva lanata* (L.) was successfully achieved using nodal segments cultured on Murashige and Skoog (MS) medium supplemented with various growth hormones. The highest callus induction was observed in nodal explants cultured in MS medium containing 1.0 mg/L 2,4-D and 1.0 mg/L BAP. Direct shoot induction was also most effective on MS medium supplemented with 1.0 mg/L BAP and 2,4-D, producing the maximum number of shoots. Additionally, well-developed nodal callus successfully generated roots on half-strength MS medium fortified with 1.0 mg/L IAA and 1.0 mg/L GA<sub>3</sub>. This protocol is simple, rapid, and efficient for *in vitro* propagation of *A. lanata* from nodal explants. Furthermore, the methanolic leaf extract of *A. lanata* was tested for antibacterial activity against *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Staphylococcus aureus*, and *Bacillus subtilis*. Among these, *P. aeruginosa* (26.7%) and *K. pneumoniae* (24.4%) exhibited remarkable antibacterial activity at a concentration of 150 µg/µL. These findings suggest that the methanolic leaf extract of *A. lanata* has potential for the purification of bioactive compounds and biomedical applications.

**Keywords:** *Aerva lanata*, nodal explant, *in vitro*, Organogenesis; Methanolic extract, antibacterial activity.

### Introduction

*Aerva lanata* (L.) Juss. ex Schult., commonly known as Polpala and referred to as Sirupulai in Tamil, is a branched, prostrate, perennial herb belonging to the family Amaranthaceae. It grows wild in the hot regions of India and has been traditionally used for various medicinal purposes. The plant is renowned for its wide range of pharmacological properties, including anthelmintic, demulcent, anti-inflammatory, diuretic, expectorant, hepatoprotective, nephroprotective, antidiabetic, antihyperglycemic, antimicrobial, cytotoxic, hypoglycaemic, antihyperlipidaemic, and antiparasitic effects (Nagaraj et al., 2025). Scientific studies have validated their therapeutic potential. Aqueous and alcoholic extracts of *A. lanata* leaves, stems, and roots have demonstrated significant diuretic activity in albino rats (Vetrichelvan et al., 2000). The hepatoprotective effects of the plant are attributed to its polyphenolic compounds, tannins, and vitamin C, as shown by Vetrichelvan et al. (2000), with hydroalcoholic extracts offering protection against paracetamol-induced liver damage in rats. The plant also exhibits hypolipidaemic effects, as its aqueous suspension reduces calcium oxalate urolithiasis induced by ethylene glycol in rats (Singh et al., 2020). Anti-inflammatory activity has been observed in benzene and alcoholic extracts, which effectively inhibited carrageenan-induced hind

paw oedema in rats. The ethanol extract of the whole plant has notable nephroprotective properties, and its alcoholic extract significantly reduces blood sugar levels in alloxan-induced diabetic rats (Akanji et al., 2018). Methanolic extracts of the plant have demonstrated antimicrobial activity against both Gram-positive and Gram-negative bacteria (Brindhadevi et al., 2023). Ethyl acetate and methanol extracts exhibit antifungal effects against *Aspergillus fumigatus*, *A. niger*, and *Candida albicans* (Chowdhury et al., 2000). Moreover, petroleum ether, ethyl acetate, and methanol extracts of *A. lanata* exhibit cytotoxic activity against Dalton's Lymphoma Ascites (DLA) tumour cell lines. (Nevin and Vijayammal 2006).

In addition, *A. lanata* is used to treat haemorrhage during pregnancy, promote healing of burns, reduce inflammation, alleviate headaches, manage skin conditions, dissolve kidney and gallbladder stones, clear the uterus postpartum, and suppress lactation. The medicinal properties of plants are attributed to various secondary metabolites, such as flavonoids, alkaloids, steroids, polysaccharides, tannins, phenolic compounds, and saponins. Several active constituents, including sitosterol palmitate, hentriacontane,  $\beta$ -sitosterol and its D-glucoside,  $\alpha$ -amyrin, syringic acid, vanillic acid, feruloyl tyramine, feruloyl homovanillylamine, narcissin, aervitrine, and botulin, have been isolated from this plant

(Bhardwaj et al., 2024). The current demand for this medicinal herb is fulfilled through the use of natural populations. However, extensive exploitation poses a potential threat to their survival (Burungale et al., 2023). Additionally, seed dormancy and limited seasonal availability necessitate the exploration of alternative propagation methods for in vitro studies. Biotechnological tools play a vital role in the mass propagation and genetic improvement of medicinal plants through techniques such as in vitro regeneration and genetic transformation. Among these, micropropagation stands out because of its numerous advantages over traditional vegetative propagation, which is often limited by several constraints (Bao et al., 2024). Micropropagation significantly enhances the multiplication rates. Although there are only a few reports on the in vitro regeneration of *A. lanata* from nodal segments, the present study aimed to establish an efficient direct regeneration system using nodal segments and evaluate the antibacterial activity of *A. lanata*.

## 2. Materials and Methods

### 2.1. Chemicals

Analytical grade chemicals were sourced from Loba, Himedia, S. D. Fine Chemicals, E. Merck, Qualigens, and Sigma Chemicals (U.S.A.).

### 2.2. Source of Plant material and surface sterilization

The plants were collected from Guru Nanak College, Velachery, Chennai, Tamil Nadu, India (Fig. 1). Nodal explants were surface sterilised using 1% sodium hypochlorite for 10 min, followed by 0.1% mercuric chloride



Fig.1. *Aerva lanata* in natural habitat

tion and Antibacterial activity of *Aerva lanata* (L.) Juss. ex. Schult.

for 2 min, and subsequently used for micropropagation studies.

### 2.3. Culture Medium and Conditions

*In vitro* propagation of *A. lanata* was conducted using the Murashige and Skoog (1962) method with certain modifications. To optimise callus formation, Murashige and Skoog (MS) medium was supplemented with various growth hormones, including indole acetic acid (IAA),  $\alpha$ -naphthalene acetic acid (NAA), indole-3-butyric acid (IBA), benzyl adenine (BAP), kinetin (KIN), and 2,4-dichlorophenoxyacetic acid (2,4-D), at different concentrations and combinations. Surface-sterilised nodal explants were inoculated onto MS medium and incubated at  $25 \pm 2^\circ\text{C}$  under a 16/8 h (light/dark) photoperiod with cool white light at an intensity of 2000 lx. The percentage of callus formation was then recorded.

### 2.4. Preparation of extracts

A total of 100 g of *A. lanata* aerial parts were collected, thoroughly washed with tap water followed by distilled water, and dried in the shade. The dried plant material was ground into a fine powder using a mechanical pulveriser and extracted with methanol at a 1:4 (w/v) ratio. The extracts were filtered using Whatman No. 1 filter paper and evaporated to dryness. The dried extracts were screened for antibacterial activity against human pathogenic bacteria.

### 2.5. Assessment of antibacterial potential

Methanol extracts at varying concentrations were evaluated for antibacterial activity against human pathogens, including *B. subtilis*, *S. aureus*, *K. pneumoniae*, and *P. aeruginosa*, using the well-diffusion method (Deniz et al., 2025). The antibacterial activity

of the crude extracts was compared with that of the standard antibiotic tetracycline. All microbial cultures used in this study were obtained from the Department of Plant Biology and Plant Biotechnology, Guru Nanak College, Chennai.

### 2.6. Statistical analysis

Statistical analysis of each experiment (conducted in triplicates) was performed. The results are presented as mean  $\pm$  standard deviation (SD) using Microsoft Excel.

## 3. Results and Discussion

### 3.1. Callus formation from nodal explants

Surface-sterilised nodal explants were cultured in MS medium supplemented with various plant growth regulators (PGRs), including 2,4-D, IAA, NAA, BAP, and KIN. Callus induction was observed from the 15th day onwards, with organogenic callus obtained through repeated subculturing. The highest callus formation (92%) was achieved with MS medium supplemented with 1.0 mg/L 2,4-D and 1.0 mg/L BAP, while 1.0 mg/L IAA combined with 1.0 mg/L BAP resulted in 86% callus formation. Similar levels of callus formation were observed with different concentrations of 2,4-D and IAA (0.5, 1.0, and 1.5 mg/L). By the 45th day, well-developed calli from the nodal region (Fig. 2 and 2a) were obtained on the same medium. Consistent with these findings, Sahu et al. (2012) reported successful callus induction at both cut ends of nodal segments using MS media supplemented with BA and KN, achieving callus formation within 10 d. The BAP combination was particularly effective in inducing callus formation in the nodal segments of *A. lanata*.

Furthermore, Boobalan and Kamalanathan (2020) found that MS medium amended with 2.0 mg/L BAP and 1.0 mg/L 2,4-D promoted extensive callus formation from nodal explants.

### 3.2. Direct shoot formation

Cytokinins stimulate cell division but require externally supplied auxins to initiate the process. They also influence auxin-induced organogenesis by regulating efflux-dependent intracellular auxin distribution (Pernisova et al., 2009). In a study on shoot induction in *A. lanata* using various growth hormones, the highest shoot induction rate in nodal explants (90%) was observed with 2,4-D (1.0 mg/L) + BAP (1.0 mg/L), followed by 2,4-D (0.5 mg/L) + BAP (1.5 mg/L) at 86%. Significant shoot elongation was observed on the 45th day when the MS medium was supplemented with the 2,4-D + BAP combination (Fig. 3 and 3a). Similarly, Sahu et al. (2012) reported the highest number of shoots ( $10.66 \pm 1.15$ ) on MS medium supplemented with BA (3.0 mg/L), KN (3.0 mg/L), and NAA (1.0 or 1.5 mg/L). Likewise, Shekhawat et al. (2016) found that the maximum number of shoots ( $8.7 \pm 0.21$ ) from the nodal region was achieved when the MS medium was supplemented with 1.5 mg/L BAP and additives. In contrast, Varutharaju et al. (2021) observed that direct shoot formation from nodal segments of *A. lanata* reached its highest rate (83%) on MS medium supplemented with 0.6 mg/L TDZ and 0.6 mg/L BAP. Further research by Varutharaju et al. (2025) supported these findings, reporting a maximum of  $3.55 \pm 0.22$  shoots from nodal explants when the MS medium was augmented with 1.0 mg/L BAP.

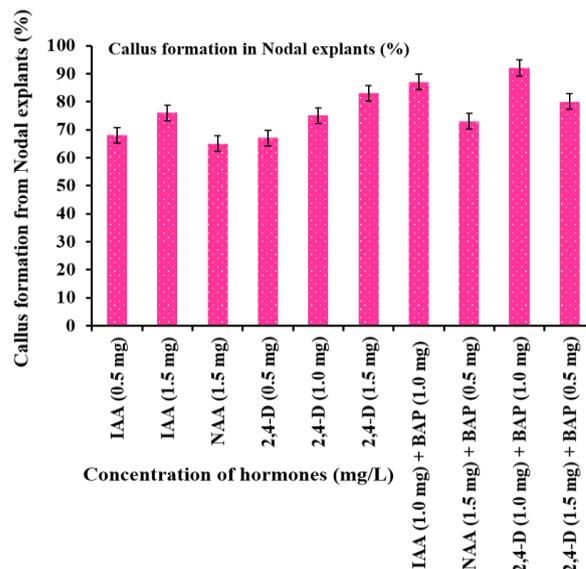


Fig. 2a. Effect of different plant growth hormones on callus formation from nodal explants of *Aerva lanata*.

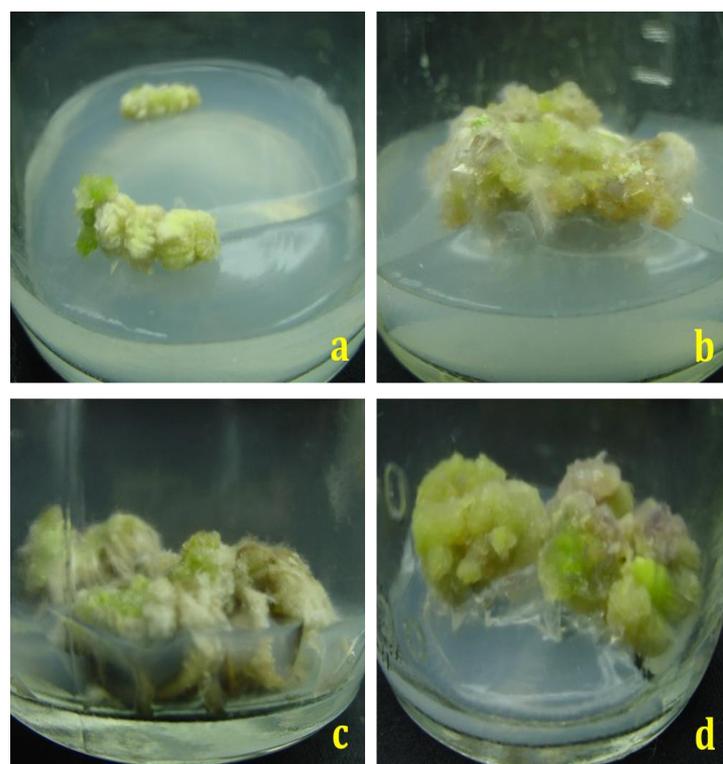


Fig. 2. Effect of different plant growth hormones on callus formation from nodal explants of *Aerva lanata*.

- Callus induction in nodal explants of *A. lanata* (15 days)
- Callus formation in nodal explants of *A. lanata* (25 days)
- Callus development in nodal explants of *A. lanata* (30 days)
- Callus development of nodal explants of *A. lanata* (45 days)

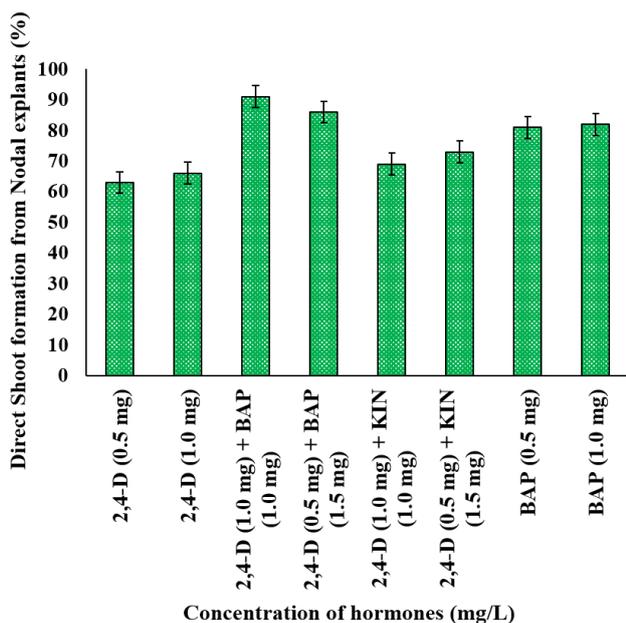


Fig. 3a. Effect of different plant growth hormones on direct shoot formation from nodal explants of *Aerva lanata*.

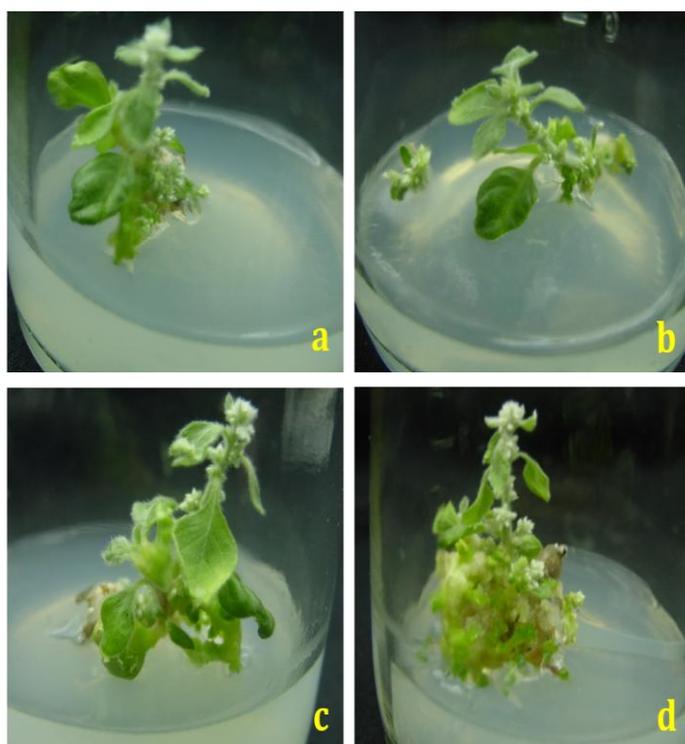


Fig. 3. Effect of different plant growth hormones on direct shoot formation from nodal explants of *Aerva lanata*.

- Direct shoot formation in nodal explants of *Aerva lanata* (10 days)
- Direct shoot formation in nodal explants of *Aerva lanata* (20 days)
- Shoot elongation from nodal explants of *Aerva lanata* (30 days)
- Shoot elongation from nodal explants of *Aerva lanata* (45 days)

### 3.3. Root formation from callus

High-quality root cultures are essential for successful plant morphological regeneration through indirect organogenesis. Auxins play a crucial role in rooting by regulating cell division, promoting root development and growth, enhancing production, and facilitating cell differentiation (Okello et al. 2021). In this study, nodal callus was treated with various hormones to induce root formation, which was observed on the 20th day of culture period. The highest root formation rate (approximately 81%) was achieved with IAA (1.0 mg) + GA<sub>3</sub> (1.0 mg), while IAA (0.5 mg) + GA<sub>3</sub> (1.5 mg) resulted in a 76% root formation rate. However, the individual auxins (IAA and NAA) did not significantly promote root formation (Fig. 4 and 4a). Several studies have identified IAA as the most effective auxin for rooting. In contrast, Shekhawat et al. (2016) reported that in vitro root regeneration occurred in 30 days when cultured in ½ strength MS medium supplemented with 2.0 mg L<sup>-1</sup> IBA. Similarly, Varutharaju et al. (2025) found that MS medium containing 1.0 mg L<sup>-1</sup> IBA induced root formation in microshoots. Additionally, microshoots cultured in medium with 1.0 mg L<sup>-1</sup> NAA also developed roots, although callus formation was observed alongside root development.

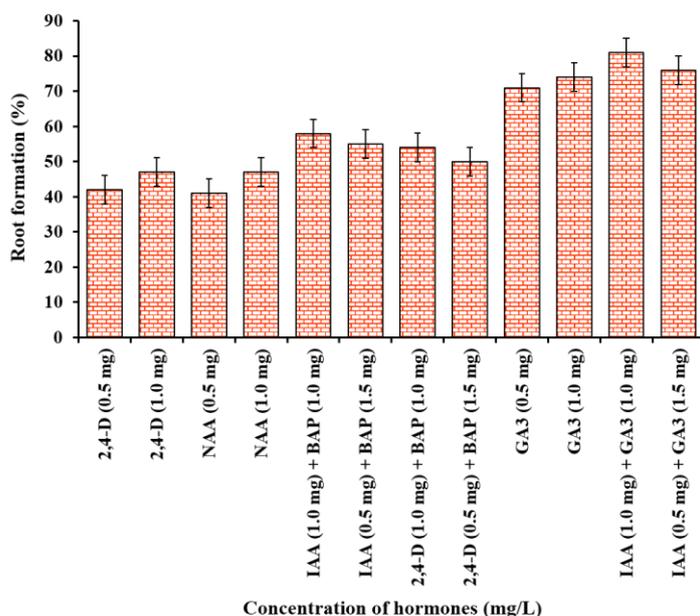


Fig. 4a. Effect of different plant growth hormones on root formation in nodal explants of *Aerva lanata*

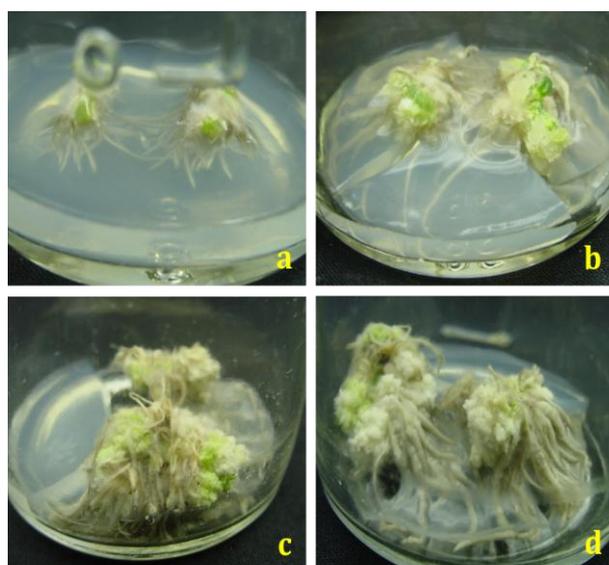


Fig. 4. Effect of different plant growth hormones on root formation from callus of nodal explants of *Aerva lanata*.

- Root formation from callus of nodal explants of *Aerva lanata* (20 days)
- Root formation from callus of nodal explants of *Aerva lanata* (30 days)
- Root development from nodal callus of *Aerva lanata* (48 days)
- Root development from nodal callus of *Aerva lanata* (55 days)

#### 4. Antibacterial activity

Herbal plants produce a wide array of secondary metabolites, primarily aromatic compounds and phenol derivatives, which help protect them from pathogens (Chassagne et al., 2020). The methanolic leaf extract of *A. lanata* exhibited strong antibacterial activity against various pathogens, likely due to its chemical composition. The results showed significant inhibitory effects at a concentration of 150  $\mu\text{g}$  dissolved in 10% DMSO, with the highest zone of inhibition observed against *P. aeruginosa* (26.7%), followed by *K. pneumoniae* (24.4%) at the same concentration. Notable inhibition was also observed against *S. aureus* and *B. subtilis* at 150  $\mu\text{g}/\mu\text{L}$ , indicating the susceptibility of these pathogens to the extract (Fig.5 and 5a). Similarly, Shilpika et al. (2020) reported that methanolic extracts of both *Momordica charantia* and *A. lanata* exhibited the largest inhibition zones against *Escherichia coli* and *B. subtilis*. In contrast, Jayatha (2023) found that among petroleum ether, ethanol, and methanol extracts of *A. lanata*, the petroleum ether extract exhibited the most significant activity against *E. coli*. Additionally, Shanmuganathan et al. (2024) reported that the acetone extract of *A. lanata* (30 mg/mL) exhibited considerable antibacterial activity against *S. aureus*, *E. coli*, *K. pneumoniae*, *P. aeruginosa*, and *B. subtilis*.

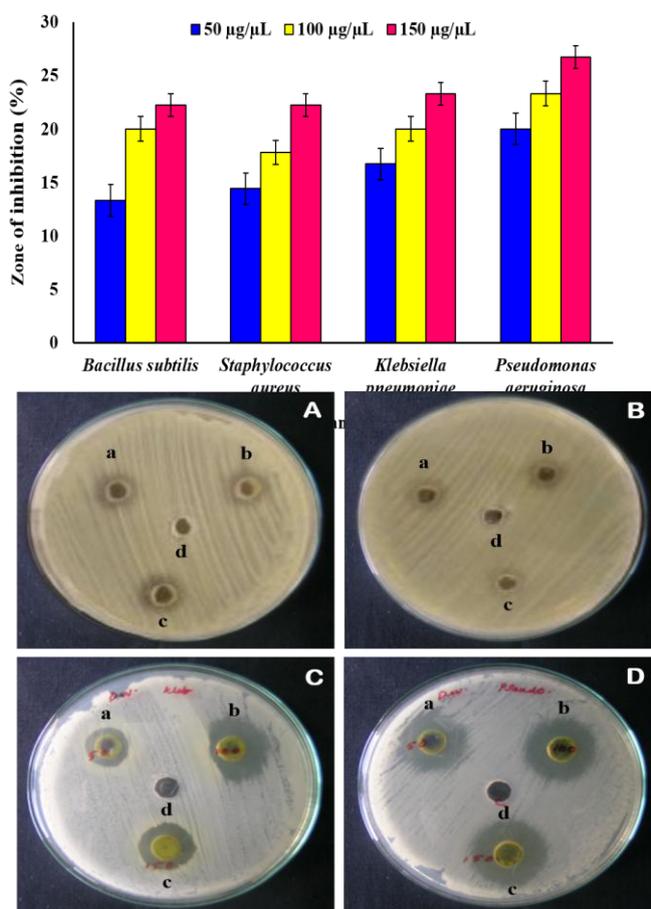


Fig.5. Antibacterial activity of methanolic leaf extract of *Aerva lanata*.  
A. *Bacillus subtilis*; B. *Staphylococcus aureus*; C. *Klebsiella pneumoniae*;  
D. *Pseudomonas aeruginosa*.

a. - 50 µg/mL; b. - 100 µg/mL; c. - 150 µg/mL; d. - Control.

## Conclusion

*In vitro* propagation of *A. lanata* was successfully achieved using nodal segments as the explants. The explants were initiated on MS medium supplemented with varying concentrations of growth regulators, with 1.0 mg/L 2,4-D and 1.0 mg/L BAP yielding the highest callus induction and direct shoot formation rates. The best-initiated shoots were then transferred to MS medium with different concentrations of BAP for multiplication and growth. For root induction, MS medium supplemented with 1.0 mg/L IAA and 1.0 mg/L GA<sub>3</sub> produced the maximum number of roots. This study highlights the potential of plant regeneration from *A. lanata* nodal explants for agricultural and medicinal

applications in the future. Additionally, the methanolic leaf extract of *A. lanata* demonstrated significant inhibitory activity against *P. aeruginosa* and *K. pneumoniae*. This approach can facilitate the large-scale multiplication of *A. lanata* in a short period, meeting the demands of the herbal industry and aiding in the isolation of bioactive constituents.

## Conflict of interest

The authors declare no conflicts of interest.

## Acknowledgments

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## Synthesis of MgCo<sub>2</sub>O<sub>4</sub>/Graphene Oxide composite for Supercapacitor application

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### Abstract

A nanocomposite of AB<sub>2</sub>O<sub>4</sub> structured binary metal Oxide and Graphene Oxide was synthesized by an easy and cost-effective procedure to achieve higher specific capacitance for suitable application as electrode in supercapacitor. The synthesis procedures for preparation of chosen MgCo<sub>2</sub>O<sub>4</sub> was solution combustion method and the composite MgCo<sub>2</sub>O<sub>4</sub>/GO was physical blending. The procedure involved is very simple, speedy and inexpensive. The XRD analysis was conducted to confirm the phase. The morphological aspects examined through HR-SEM has shown that the changes occurred have facilitated more conductivity in the composite MgCo<sub>2</sub>O<sub>4</sub>/GO. The electro chemical analyses, CV by a three-electrode assemblage with 6 M KOH as electrolyte have supported the above findings by confirming higher specific capacitance and low resistance in the nanocomposite material synthesized. The maximum specific capacitance of the MgCo<sub>2</sub>O<sub>4</sub>/GO nanocomposite was 709 F/g and, the pure MgCo<sub>2</sub>O<sub>4</sub> was 623 F/g at the scan rate 5 mV s<sup>-1</sup>.

### Introduction

In a highly energy dependent technological advancements (1) and futuristic aspirations of humanity, supercapacitors in recent decades have been the breakthrough (2) innovation in the field of energy storage devices (3). In a scenario of fast depleting energy reserves across the world (4), high energy storage devices (5)

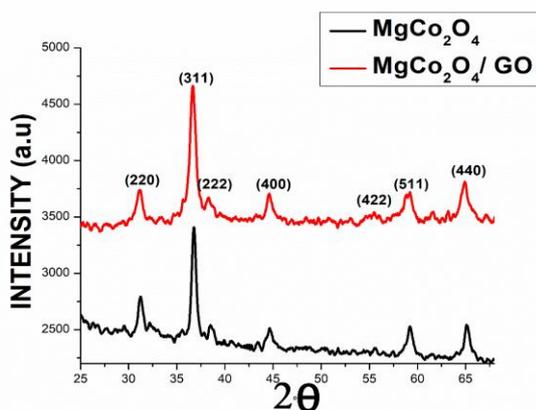
should offer a technological solution. In spite of fulfilling the needs of the energy driven technocentric societies for a great period of time, the batteries and capacitors are losing their grip as storage devices for their own shortcomings. Batteries offering good energy density fall short of power density and capacitors providing good power density fall short of energy density. Inheriting the combined advantages of both and succeeding over the challenges, supercapacitor proves its significance by unique capabilities (6, 7). They have extraordinarily fast charge/discharge process bringing down to just milliseconds compared to hours of time in batteries (8). The ability to store more energy and deliver very high capacitance than ordinary capacitors, long life with high cyclic stability, enormous power density (9) are their special features (10). Exploring highly efficient materials (11) with excellent electro chemical potential for suitable use as electrodes (12) in the supercapacitors with feasible, simple (13) and economical (14) synthesis process has been a central focus of researches in energy storage field (15). This work aims an enhanced material for pseudocapacitance type supercapacitor that works by the faradic process, storing charge by redox reactions. In this case, binary metal oxides, such as FeCo<sub>2</sub>O<sub>4</sub>, MnCo<sub>2</sub>O<sub>4</sub>, ZnCo<sub>2</sub>O<sub>4</sub>, CuCo<sub>2</sub>O<sub>4</sub>, MgCo<sub>2</sub>O<sub>4</sub> come as good alternative for its binary spinel structure (AB<sub>2</sub>O<sub>4</sub>), possessing several potential oxidation states. By results and observations, it was confirmed that the nanocomposite MgCo<sub>2</sub>O<sub>4</sub> /GO revealed

improved performance than the pure  $\text{MgCo}_2\text{O}_4$ . The outcome of Maximum capacitance in the composite was 709 F/g, higher than in the pure 623 F/g

### Materials

The source materials chosen for material synthesis in this work were all AR grade and utilized as it is with no further purification. The synthesis was carried out choosing **Magnesium Nitrate Hexahydrate** purified ( $\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ ) (extra pure AR) and cobalt nitrate as source, urea as fuel material.

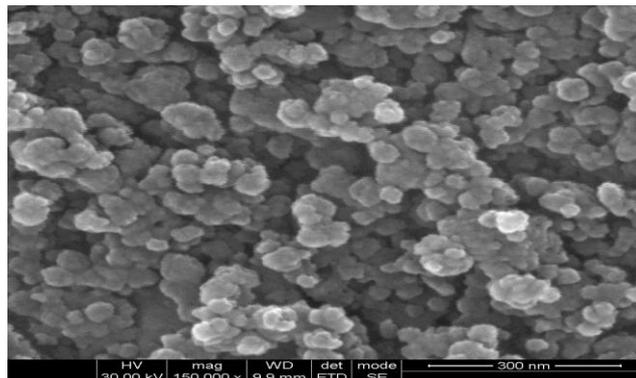
### X-RAY POWDER DIFFRACTION STUDIES



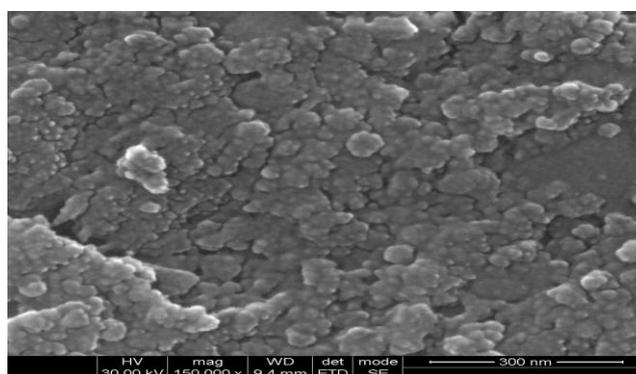
**Figure 5.1. XRD pattern of  $\text{MgCo}_2\text{O}_4$  synthesized using the solution combustion technique.**

The XRD analysis was conducted to confirm the phase, crystalline structure, and purity of the synthesized materials. The XRD patterns are shown in Figure 1. The indexed diffraction peaks correspond to the planes (220), (311), (222), (400), (422), (511), and (440), indicating that the  $\text{MgCo}_2\text{O}_4$  nanomaterial adopts a cubic spinel structure, which is consistent with JCPDS No. 002-1073. The absence of any impurity peaks in the XRD pattern further confirms the material's purity. The broadening of the peaks suggests a reduction in crystallite size.

### HR-SEM STUDIES:



**Figure. 2a SEM micrograph for  $\text{MgCo}_2\text{O}_4$**



**Figure. (2b) SEM micrograph for  $\text{MgCo}_2\text{O}_4/\text{GO}$  Composite**

HR-SEM was utilized to characterize the surface morphology of  $\text{MgCo}_2\text{O}_4$  and  $\text{MgCo}_2\text{O}_4/\text{GO}$ . As shown in Figure 2A, the particles were agglomerated and exhibited a spherical shape, with a uniform distribution of particles observed.

To further analyze the morphological features of the composite materials, High-Resolution SEM images were obtained. Figure 2B illustrates that Graphene Oxide materials were physically blended, with the spherical particles of  $\text{MgCo}_2\text{O}_4$  embedded on the graphene sheets. These morphological changes play a significant role in determining the electrochemical properties of the nanomaterials. The HR-SEM images are shown in Figures 2a and 2b.

## ELECTROCHEMICAL ANALYSIS

Figure 3(a) CV graph for MgCo<sub>2</sub>O<sub>4</sub>

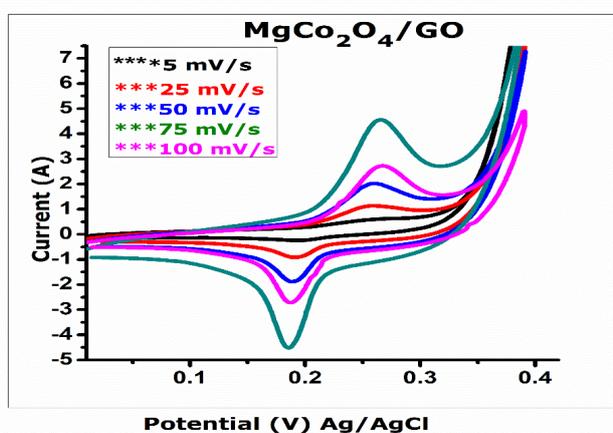
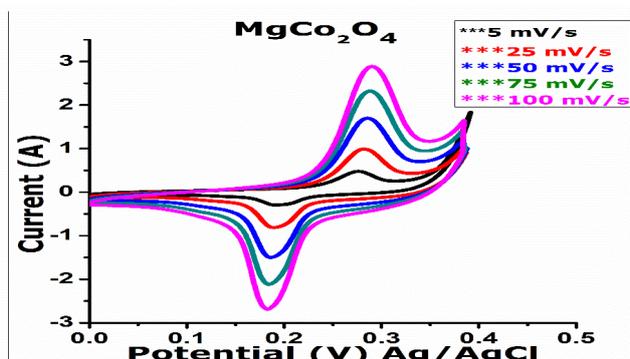


Figure 3(b) CV graph for MgCo<sub>2</sub>O<sub>4</sub>/GO

The electrochemical properties of materials for their performance as electrodes in supercapacitors were evaluated through Cyclic Voltammetry (CV). The tests were conducted using a 6M KOH electrolyte solution, with a potential range of 0 to 0.4V, and varying scan rates from 5 to 100 mV/s. The resulting CV curves are shown in Fig (3a). At the lowest scan rate (5 mV/s), a pair of redox peaks was observed, as illustrated in the graph. Clear redox peaks are observed for both materials, MgCo<sub>2</sub>O<sub>4</sub> and MgCo<sub>2</sub>O<sub>4</sub>/GO.

The composite material exhibited a higher specific capacitance compared to the pure material, with maximum specific capacitance values of 623 F/g and 709 F/g for MgCo<sub>2</sub>O<sub>4</sub> and

MgCo<sub>2</sub>O<sub>4</sub>/GO, respectively, at a scan rate of 5 mV/s. It was observed that the specific capacitance increases at lower scan rates and decreases at higher scan rates.

### Conclusion.

To sum up, an economical, simpler and less time-consuming solution combustion- physical blending method synthesized nanocomposite MgCo<sub>2</sub>O<sub>4</sub>/GO is presented here with achieved super capacitive enhancement. The pure MgCo<sub>2</sub>O<sub>4</sub> and composite MgCo<sub>2</sub>O<sub>4</sub>/GO were thoroughly examined for their characteristics by relevant studies. From the results and discussion higher performance of the nanocomposite as a supercapacitive electrode material is evident. From the observations, the changes in crystallite size, strain, dislocation density, lattice constant, bond length, charge density and shape had been influencing factors in determining the higher super capacitive features of the composite nanomaterial MgCo<sub>2</sub>O<sub>4</sub>/GO in comparison to pure. The results from various studies are well matching. The maximum specific capacitance achieved for MgCo<sub>2</sub>O<sub>4</sub>/GO was 709 F/g and for the pure MgCo<sub>2</sub>O<sub>4</sub> was 623 at 5 mV s<sup>-1</sup> scan rate. The nanocomposite has showed higher capacitance and lower resistance proving to be a relevant electrode material for use in supercapacitor.

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## Significance of big data visualization and their tools

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### Abstract

Big Data is essential to changing how businesses function, make choices, and provide value. It improves operational efficiency, innovation and competitive advantage, scalable growth, personalization, and decision-making, among other things. Large and complicated datasets can be represented graphically using big data visualization, which helps users spot trends, patterns, and insights that would be difficult to spot in raw data. The importance of big data visualization is found in its ability to simplify complex data, improve decision-making, spot trends and patterns, and promote proactive analysis, among other benefits.

**Keywords:** Big data, Visualization, visualization tools.

### Introduction

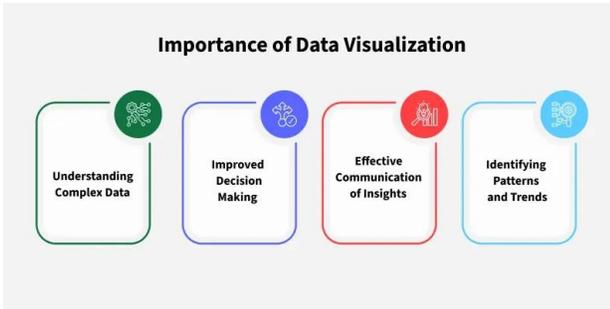
In the era of Big Data, extracting meaningful insights from vast amounts of information has become a critical challenge. Data visualization plays a crucial role in transforming raw data into graphical representations that are easier to analyze and interpret. By leveraging visualization techniques, businesses, researchers, and analysts can identify patterns, trends, and correlations that might otherwise go unnoticed in numerical data.

Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools make it easier to

analyze complex datasets and uncover meaningful insights. It helps businesses, researchers, and decision-makers interpret vast amounts of information quickly and effectively.

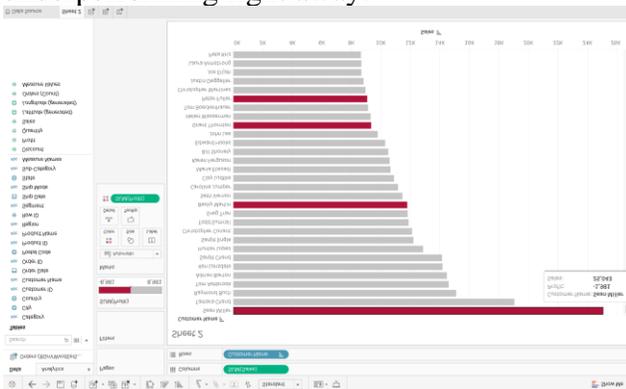
One tool of data literacy is data visualization, which is defined as "the graphical representation of information and data." Data visualization tools make it easy to identify and comprehend trends, outliers, and patterns in data by utilizing visual components like charts, graphs, and maps (CitationTableau.com 2019, online). Data visualization improves a presentation in the same way as a thousand words while consuming less space and aids the researcher in finding relationships in the data (Hennessey Citation 2014). Nonetheless, there are comparatively few, albeit increasing, instances of modules with activities targeted at fostering data literacy abilities for undergraduate economics courses that have been published in the literature on economic education. Four such exercises—discussed below—that do not make use of Tableau were found during our search of the literature on economic education.

## Importance of Data Visualization



### 1. Data Visualization Simplifies the Complex Data

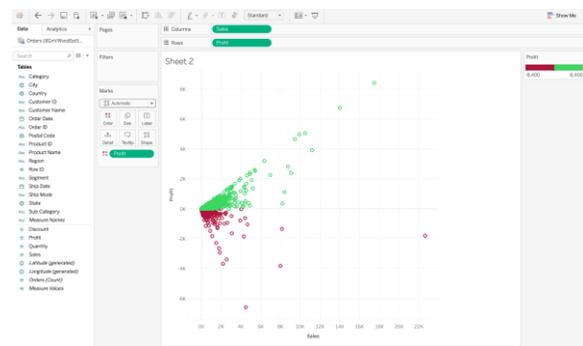
Large and complex data sets can be challenging to understand. Data visualization simplifies complex information into visual formats, making it easier for the audience to understand. For example, when a Tableau heat map is used to represent sales data, states that have suffered a net loss are indicated in red. This chart makes it evident which states are underperforming right away.



Humans are naturally inclined to process visual information more efficiently than raw numbers or text. Charts, graphs, and interactive dashboards make complex datasets comprehensible, enabling faster and more informed decision-making. In fields such as business intelligence, healthcare, finance, and scientific research, data visualization helps translate large volumes of data into actionable insights.

### 2. Improves the Interpretation of Data

Patterns, trends, and correlations in data that would go unnoticed in raw form are brought to light through visualization. Making educated decisions is aided by this improved interpretation. Take a look at another Tableau graphic that illustrates the connection between profit and sales. It may demonstrate that greater sales may not always translate into greater profits—a pattern that may be challenging to identify with only raw statistics. This viewpoint assists companies in modifying their tactics to prioritize profitability over sales volume.



### 3. Data Visualization Saves Time

Using data visualization to get some insights from the data is undoubtedly quicker than merely looking at a chart. The Tableau screenshot below makes it very simple to determine whether states have experienced a net loss as opposed to a profit. This is because it is clear that states have incurred a loss because, when utilizing a heat map, all the cells with a loss are colored red. Contrast this with a typical table, where a loss would be determined by looking at each cell to see if it has a negative value. In this case, data visualization can save a great deal of time.

**Significance of big data visualization and their tools**



### ***Types of Data Visualization Tools***

Several data visualization tools are available, each catering to different needs based on complexity, scalability, and usability.

Tableau - It is a popular and strong tool for producing visual analytics and interactive dashboards with little to no coding knowledge.

- Power BI - It is a Microsoft's business intelligence application, easily connects with other Microsoft products to enable efficient data analysis.
  - Google Data Studio - It is a free tool that lets users access data sources from Google to build dashboards and reports in real time.
  - Matplotlib & Seaborn - Two Python-based tools for static, animated, and interactive data visualizations that are frequently used in data science are Matplotlib and Seaborn.
  - Plotly - It is a flexible visualization tool for Python, R, and JavaScript that facilitates interactive graphs and dashboards.
  - Tableau - It is a popular and strong tool for producing visual analytics and interactive dashboards with little to no coding knowledge.
  - Tableau is an interactive data visualization tool with an emphasis on business intelligence. Tableau provides a wide range of visualization options. It provides the capability of creating original visualizations. It is flexible and fast. It can connect to a wide range of servers, such as Salesforce, Cloudera Hadoop, and Amazon Aurora, and it supports nearly all data types. The user interface is simple to use, and a wide variety of charts are available. Basic calculations and statistics don't require any coding skills, but more intricate analysis may involve running models in R and importing the results into Tableau. This requires a great deal of programming knowledge given the quantity of work we have to complete.

#### **Power BI**

Power BI is among the most powerful cloud-based corporate analytics products. It makes use of interactive and rich graphics. Power BI

is comprised of three parts: Power BI Desktop, Service (SaaS), and Apps. Because we have access to all services, Power BI is flexible and persuasive. The integration of more than 60 different types of sources allows you to start creating visualizations in just a few minutes. Power BI is a combination of the popular Microsoft products Office, SharePoint, and SQL Server. It is different from other tools since it lets you use natural language to query the data.

#### **Plotly**

Plotly is also known as Plot.Ly is built with Python and the Django framework. Among its strengths are data analysis and visualization. Although users can use it without charge, its features are limited; a professional membership is required to access them completely. Although it may be used offline in Panda, Jupyter Notebook, and Ipython Notebook, it also creates dashboards and charts online. Dashboards, multiple axes, scientific charts, statistical charts, and 3D charts are just a few of the numerous varieties of charts. Plotly uses a tool named "Web Plot Digitizer(WPD)" to automatically extract the data from the static image.

#### **Gephi**

Gephi is an open-source network analysis tool that was created using OpenGL and Java. It is employed to manage extremely big and intricate datasets. Biological network analysis, link analysis, and social network analysis are all included in the network analysis.

It distinguishes itself from the rest of its graph analysis competitors with its dynamic data exploration. Running thin tools doesn't require any programming experience, but it does demand a solid understanding of graphs. It provides real-time analysis and speeds up performance by using a GPU 3D render engine.

#### **Google Data Studio**

Google Data Studio is a web-based data visualization tool that helps users create

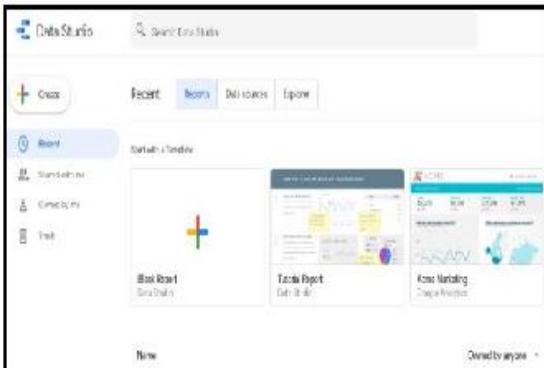
**Significance of big data visualization and their tools**

customized dashboards and understandable reports. It makes it easier to visualize trends, compare performance over time, and track key performance indicators for consumers.

**Advantages of Google Data Studio**

- Simple reporting makes setup easier.
- Produces interesting and personalized reports.
- Creates a single report by combining data from several sources.
- Simplifies collaboration and sharing.
- Generates a maximum of five free customized reports.
- Facilitates the user's access to more than 150 data sources.
- Effectively keeps an eye on campaigns.
- Cuts down on reporting turnaround time.

**Data Studio Dashboard**

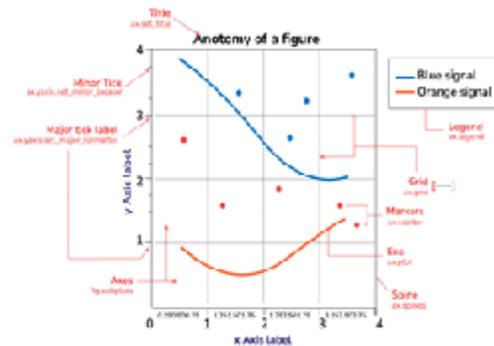


**Matplotlib**

A robust and flexible open-source charting package for Python, Matplotlib was created to assist users in visualizing data in a range of formats. It was created in 2003 by John D. Hunter and allows users to visually depict data, making analysis and comprehension simpler. if you wish to create interactive plots and graphs out of your dull data.

**Elements of Matplotlib**

The main elements of a Matplotlib plot, including as figures, axes, titles, and legends, are examined in detail in this section. These elements are necessary for efficient data presentation.



A.

As seen in the above picture, the components of a Matplotlib figure are as follows:

**Figure:** The main container that houses every plot point and serves as the visualization canvas.

**Axis:** Defines boundaries, tick positions, and labels for data interpretation, representing the x and y axes.

**Markers and Lines:** In plots such as scatter plots, markers indicate individual data points, while lines link data points to demonstrate patterns.

**Title and Labels:** While the axis labels explain the data being depicted on each axis, the title gives the plot meaning.

**Seaborn**

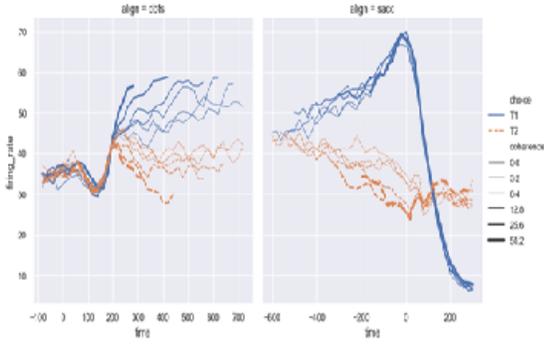
Seaborn is a matplotlib-based Python data visualization package. It offers a sophisticated interface for creating visually appealing and educational statistical visuals.

Statistical visualizations are created using the Seaborn Python program. It builds on matplotlib and has a close relationship with pandas data structures. Seaborn makes it easier to explore and understand data. Its charting techniques use dataframes and arrays, which include whole datasets, to produce pertinent visualizations. They do the necessary semantic mapping and statistical aggregation internally. Because of its declarative, dataset-oriented API, you can

**Significance of big data visualization and their tools**

focus on the significance of your plots rather than the finer points of drawing them. The below diagram shows the model for statistical graphics in seaborn.

Observe how the size and style parameters are applied to both the scatter plot and the line plot, but they have different effects on the two visualisations: altering the scatter plot's marker area and symbol versus the line plot's line width and dashing. We could concentrate on the plot's general framework and the message we wanted to get across because we didn't have to worry about those specifics.



### Characteristics of Visualization Methods

Method	Name	Large Data	Volume
Treemap	Y	N	N
Sunburst	Y	N	Y
Parallel coordinate	Y	Y	Y
Stream graph	Y	N	Y
Circular network diagram	Y	Y	N

### Comparisons of Big Data Visualization Tools

	Open Source	Integration with popular sources	Interactive Visualization	Desktop Client	Online Client	Mobile Application	MOOCS	API
Tableau	N	Y	Y	Y	Y	Y	Y	Y
Power BI	N	Y	Y	Y	Y	Y	Y	Y
Plotly	Y	N	Y	N	Y	N	Y	Y
Gephi	Y	N	Y	Y	N	N	Y	N
Excel 2016	N	Y	Y	Y	Y	Y	Y	Y

Significance of big data visualization and their tools

## Conclusion

Data visualization is a powerful technique for making sense of complex information. Whether for business intelligence, scientific research, or social analytics, effective data visualization helps turn raw data into actionable insights. As data continues to grow exponentially, mastering visualization techniques will be essential for professionals across all industries.

We rely on the visual information to identify helpful patterns in the big data era, where every piece of information is essential in one way or another. However, conventional visualisation techniques cannot keep up with the volume and speed of data; therefore, we need tools that handle all the features of big data and provide results without sacrificing speed or response time. In this work, we outlined the significance of large data visualization as well as the associated problems and difficulties. Additionally, we pointed out that interactive visualization is crucial and that high-quality visualization technologies ought to generate interactive visualization. We also looked at how new systems are being proposed to address these issues. We looked at the advantages and disadvantages of a few of the most often used visualization tools. These tools are quite promising; they provide interactive and rich visualizations, and the majority of them can handle large amounts of data and respond in a reasonable amount of time. The study of these tools makes it evident that there isn't a single winner. One ought to select them based on their needs. For instance, Tableau's high pricing may deter small businesses from using it. Businesses want to analyse all of their requirements and determine which tool or tools best fit their needs before selecting any visualisation tools. This document will assist them in selecting their preferred tool.

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5. <https://www.simplilearn.com/tutorials/digital-marketing-tutorial/google-data-studio>
6. <https://www.geeksforgeeks.org/python-introduction-matplotlib/>
7. <https://seaborn.pydata.org/>

## The Impact of 5G Network

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### Abstract

The advent of 5G technology represents a significant breakthrough in mobile communication and has the potential to completely transform a variety of sectors. With its high speed, low latency, and enhanced connection, this next-generation network is set to transform industries by facilitating unprecedented data transfer rates and fostering new applications. 5G in telecoms supports greater bandwidths and better user experiences, enabling better mobile broadband experiences. The Internet of Things (IoT) stands to benefit greatly from 5G, as its low latency and high reliability will enable seamless integration of smart devices, thus advancing smart cities and automated industries. Additionally, 5G is expected to drive innovations in fields such as healthcare, with telemedicine and remote surgery becoming more feasible due to real-time data exchange. However, the deployment of 5G also presents challenges, including significant infrastructure investments, potential cyber security threats, and the need for comprehensive regulatory frameworks. In order to fully profit from 5G and guarantee its beneficial social effect, it will be essential to address these issues while utilizing its potential.

### Introduction on 5g network:

5G refers to the fifth generation of mobile networks. It is a new global wireless standard that works with 1G, 2G, 3G, and 4G networks. A new kind of network, made possible by 5G, is designed to connect practically everyone and

everything, including machines, gadgets, and things. The goal of 5G wireless technology is to provide more users with a more consistent user experience, faster multi-Gbps peak data rates, ultra-low latency, increased dependability, huge network capacity, and increased availability. Improved efficiency and performance enable new user experiences and link new sectors. 5G surpasses connectivity by providing consumers with linked experiences from the cloud, whereas previous cellular technology generations (such as 4G LTE) concentrated on guaranteeing connectivity. 5G networks take advantage of cloud technology and are software-driven and virtualized. As the technology is deployed, 5G is anticipated to produce a wide range of new applications, uses, and business cases.





FEATURES	4G	5G
Full form	Fourth-generation Technology	Fifth generation technology
Speed	Upto 100 Mbps	10 Gbps (20 – 30 times more than 4G)
Latency	50 milliseconds	1 millisecond
Range	Lower frequencies result in a longer range.	Higher frequencies have a shorter range.
Bandwidth	600 MHz – 2.5GHz	28-39 GHz
Device Connectivity	Mostly tablets and smartphones	Mostly tablets and smartphones, devices that include industrial machinery, smartphones, and Internet of Things devices.
Application	Mobile apps, fast browsing, and HD video streaming	Smart Cities, AR/VR, Telemedicine, and Autonomous Vehicles

**Live Events:**

Enhanced connectivity allows for real-time broadcasting and interactive experiences at live events such as concerts and sports games

**6. Economic Growth:**

**Job Creation:**

New career opportunities in engineering, network administration, and technology

development are brought about by the installation and upkeep of 5G infrastructure.

**7. Environmental Impact:**

**Energy Efficiency:**

5G networks are designed to be more energy-efficient than previous generations, reducing the overall carbon footprint of mobile communications.

**Smart Agriculture:**

With 5G, precision agriculture becomes more viable, optimizing resource usage.

**8. Education:**

By enabling students in remote locations to engage in online learning and access digital resources, 5G's high-speed internet access can help close the digital divide.



**Comparison on 4G and 5G Network :**

**The Cons of 5G Technology:**

**1. Limited Coverage:**

Given that 5G technology is a more recent advancement in connectivity, 5G networks

**The Impact of 5G Network**

continue to grow. As a result, 5G networks might not be available everywhere, so it's crucial to confirm that the area where you want service is equipped with 5G technology.

## **2. Cost:**

Given that 5G technology is a more recent advancement in connectivity, 5G networks continue to grow. As a result, 5G networks might not be available everywhere, so it's crucial to confirm that the area where you want service is equipped with 5G technology. Compared to earlier cellular network generations, 5G technology necessitates a more sophisticated infrastructure, which can be costly to construct and maintain. In addition to 5G devices being more costly than their 4G counterparts, 5G plans may also be more costly.

## **3. Device Battery drain:**

The batteries of 5G-enabled cellular devices appear to be unable to run for extended periods of time. To enable this improved connectivity, where a single charge can power a cellphone for an entire day, battery technology must progress. In addition to exhausted batteries, consumers are complaining that when using 5G, their phones are becoming hotter.

## **4. Network security:**

5G networks face security risks just like older networks. But the dangers are bigger because of how many devices will connect and the sensitive info they'll handle. People worry about keeping data private and safe, and about possible attacks on important systems.

## **5. Cybersecurity risks:**

Like other new technologies, 5G networks have new cybersecurity threats. Hackers might

find it easier to break into the software that runs the network. Also, as more devices connect, cybercriminals have more chances to attack.

## **6. Health concerns:**

Certain individuals have voiced worries about how 5G radiation might affect health. Yet, scientists haven't found proof to back up these worries.

## **7. Device Compatible:**

Users must have compatible devices in order to access 5G networks. Even though more and more smartphones with 5G capabilities are being released by manufacturers, older models might not work with them. Users may have to pay more to upgrade to 5G-compatible devices.

## **Conclusion:**

To sum up, 5G technology is expected to have a significant impact on society by enabling faster and more dependable communication, revolutionizing entertainment, transforming the Internet of Things, altering how we work, and enhancing healthcare.

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3. <https://www.javatpoint.com/advantages-and-disadvantages-of-5g>

## Designing a Self-Regulated Flipped Learning Approach to Promote Students' Learning Performance

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### Abstract

This study explores a self-regulated flipped learning approach to enhance student's learning performance. Traditional flipped learning shifts direct instruction outside the classroom, but students often struggle with self-regulation. To address this, we integrate self-regulated learning (SRL) strategies into the flipped model, guiding students in goal setting, self-monitoring, and reflection. The study examines the impact of this approach on student engagement, motivation, and academic achievement. Findings indicate that students with stronger SRL skills perform better, demonstrating increased autonomy and deeper learning. This research provides insights for educators on fostering self-regulation in flipped learning environments to enhance the general performance of students.

To improve students' learning results, this study aims to create and evaluate a self-regulated flipped learning approach. This study investigates the impact of a self-regulated flipped learning approach on students' learning performance. Using a mixed-methods research design, 120 students from an institution participated. A quasi-experimental design was employed, involving 120 students from two classes. The findings demonstrated that the self-regulated flipped learning strategy greatly enhanced students' motivation, self-regulation, and learning performance. The study offers guidance for creating and executing successful

flipped learning settings that support students' self-control and academic achievement. Finally, the results show that students in the self-regulated flipped learning group outperformed those in the traditional flipped learning group in terms of learning achievement and self-regulation skills.

**Keywords:** Self-regulated learning (SRL), flipped learning, learning performance, student engagement, academic achievement

### Introduction

Recently, flipped learning has drawn a lot of attention as a cutting-edge teaching strategy that moves direct instruction outside of the classroom. Bergmann and Sams (2012) claim that flipped learning frees up in-class time for active learning activities by enabling students to interact with the material at their own pace prior to class. This method is thought to improve students' critical thinking, engagement, and general academic performance (Bishop & Verleger, 2013).

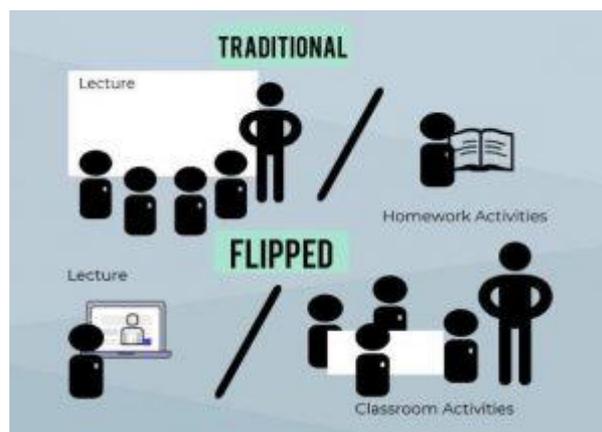
Flipped learning has grown in popularity in recent years due to its capacity to improve student learning results. One of the numerous factors influencing how successful flipped learning is is student self-regulation. Because it can improve student learning results, flipped learning has become more and more popular in recent years. However, a number of variables, including students' capacity for self-regulation, affect how effective flipped learning is.

### Flipped Learning Model Description

**Conventional Flipped Learning:** In class, students participate in interactive exercises while studying foundational ideas at home.

**Self-Regulated Flipped Learning:** Students practice self-regulation skills in class, participate in interactive activities, and study fundamental ideas at home.

**Figure 1: Self-Regulated Learning**



**Figure 2: Traditional Learning versus Flipped Learning**

A teaching method called "flipped learning" reverses the traditional lecture-homework paradigm. In a flipped classroom, students work at home to learn basic concepts through recorded movies or texts. They engage in debates, problem-solving, and participatory exercises in class. Flipped learning has been shown to increase student engagement, improve learning outcomes, and improve teacher-student interaction.

However, a variety of factors influence the effectiveness of flipped learning, including student self-regulation. Self-regulation refers to students' capacity to manage their own learning, including goal-setting, progress monitoring, and strategy variation. The academic performance of self-regulated kids is often higher since they have the ability to direct their own education.

### Literature Review

- ❖ Flipped learning in conjunction with SRL promotes deeper comprehension and critical thinking, according to Van Alten et al. (2020).
- ❖ According to recent studies, in order to maximize learning results, SRL methods should be integrated into flipped learning contexts (Sun et al., 2018).
- ❖ Additionally, offering scaffolding resources like progress tracking and guided questioning improves academic achievement and self-regulation (Broadbent, 2017).
- ❖ Students' differing degrees of self-discipline and access to technology are among the obstacles that still exist despite these advantages (Lai & Hwang, 2016).
- ❖ Tseng and Kang (2014), for example, discovered that students who were

stronger at self-regulation were able to effectively manage their time and cognitive resources, which contributed to their improved performance in flipped environments.

- ❖ According to Bergmann and Sams (2012), flipped learning is a pedagogical technique that promotes active learning by moving direct instruction to pre-class activities.
- ❖ SRL strategies that help students efficiently control their learning pace, such as goal-setting, self-monitoring, and self-reflection, improve student engagement and academic achievement (Pintrich, 2004).
- ❖ In flipped classrooms, self-regulated learning (SRL) is essential for improving students' learning outcomes because it fosters motivation, autonomy, and metacognitive abilities (Zimmerman, 2002).
- ❖ According to Zimmerman (2000), self-regulation is the capacity to manage one's own learning procedures, such as goal-setting, planning, monitoring, and assessing.
- ❖ Pupils with strong self-control typically do better in school and are more eager to study (Schunk, 1990).

For flipped learning to be as effective as possible, future studies should investigate adaptive interventions that help students with poorer SRL skills.

### **Methodology**

#### **1) The Role of Self-Regulated Learning in Flipped Learning**

Since students are required to take charge of their education outside of the classroom, self-regulated learning (SRL) is essential to the success of flipped learning. SRL, according to

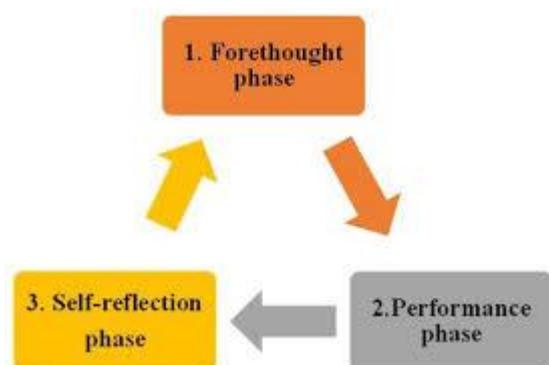
Zimmerman (2002), is the capacity to organize, track, and evaluate one's own learning. Students that lack sufficient self-regulation may find it difficult to manage their time and stay motivated, which would reduce the efficiency of flipped learning (Pintrich, 2004). According to research, using SRL techniques into flipped classrooms greatly improves students' understanding and engagement (Broadbent & Poon, 2015). It has been determined that a number of SRL techniques are advantageous for flipped learning settings. These consist of introspection, goal-setting, and self-monitoring (Schunk & Zimmerman, 2008).

- **Setting Goals:** Studies indicate that students who establish clear, difficult goals are more motivated and get greater learning results (Locke & Latham, 2002).
- **Self-Monitoring:** Students can maintain attention and enhance their performance by regularly evaluating themselves and monitoring their progress (Winne & Hadwin, 1998).
- **Reflection:** Students gain a deeper understanding and develop themselves when they are encouraged to reflect on their educational experiences (Kolb, 1984).

A quasi-experimental methodology was used in this investigation, which included 120 students from two classes. One class was placed in the typical flipped learning group, and the other class was placed in the self-regulated flipped learning group.

The study employed a mixed-methods research strategy, incorporating both quantitative and qualitative data collection and analytic methodologies. Participating in the study were 120 students from an institution that offered flipped learning courses.

#### **Figure 3: The process of self-regulation**



Improving students' self-regulation and learning performance was the aim of the self-regulated flipped learning approach. The following components were part of the strategy:

- Students had to complete pre-class assignments, such as watching lectures on video and taking tests, before they could attend class.
- Students engaged in debates, problem-solving, and interactive activities during class.
- Among the self-regulation skills that students learned were goal-setting, self-monitoring, and self-evaluation.
- Apart from getting feedback from their peers and the teacher, students were supposed to consider what they had learned.

## 2) Impact of Self-Regulated Flipped Learning on Student Performance

Research has shown that incorporating SRL into flipped learning has a beneficial effect. According to a study by van Alten et al. (2019), for example, students who used SRL methods in a flipped classroom had higher levels of engagement and improved academic performance. According to a different study by Sun et al. (2018), students who possess good self-regulation abilities have a higher chance of succeeding in flipped learning situations than those who do not.

## Results and Discussion

The results showed that the self-regulated flipped learning approach significantly improved students' motivation, self-regulation, and learning performance.

1. \* Learning performance: The report states that students who used the self-regulated flipped learning technique showed a significant improvement in their learning performance when compared to those who did not.

2. \* Self-regulation: Students who participated in the self-regulated flipped learning approach shown significant improvements in self-regulation, including the capacity to establish objectives, keep track of, and assess oneself.

**Table 1: Self-regulated verses Traditional flipped learning**

Group	Learning Achievement	Self-Regulation Skills
Self-Regulated Flipped Learning	85%	80%
Traditional flipped Learning	70%	60%

\***Sources of inspiration:** Students that used the self-regulated flipped learning technique showed a significant improvement in both intrinsic and extrinsic motivation.

## Conclusion

To maximize student learning performance, self-regulated learning practices must be incorporated into flipped learning settings. In order to promote student autonomy and academic performance, research continuously emphasizes the value of goal-setting, self-monitoring, and reflection. Even if there are still obstacles to overcome, future research should look into creative ways to help students gain self-regulation abilities, which will eventually result in more inclusive and successful flipped learning environments.

According to the study's findings, students' learning performance and self-regulation abilities can be improved by introducing self-regulation skills training into flipped learning contexts.

**Figure 4:** *The process of self-regulation learning strategy*



The design and application of self-regulated flipped learning strategies are clarified by this study. The results emphasize how crucial it is to support students' self-regulation abilities in flipped learning settings.

The self-regulated flipped learning approach used in this study improves students' motivation, self-regulation, and learning performance. The study provides recommendations for designing and implementing effective flipped learning environments that enhance students' academic performance and self-control. The study's findings should be noted by researchers, educators, and legislators who are interested in improving student learning outcomes through innovative teaching techniques.

### 3) Challenges and Future Directions

Even with its benefits, self-regulated flipped learning has drawbacks. According to Broadbent (2017), some students have trouble managing their time and staying motivated, which can interfere with their learning. According to Dabbagh and Kitsantas (2012), future studies should concentrate on creating focused treatments, such scaffolding and individualized learning pathways, to help

children who struggle with self-regulation. According to Ifenthaler and Widanapathirana (2014), adopting digital technologies and learning analytics could also improve the efficacy of self-regulated flipped learning.

Challenges including student preparation, teacher role transition, and unequal access to digital resources are all part of designing a self-regulated flipped learning strategy. Furthermore, it's still challenging to innovate evaluation techniques and match pre-class material with in-class activities. In addition to improving teacher professional development, future directions call for utilizing AI and learning analytics to provide tailored feedback and adaptive learning. To measure long-term impact, researchers should investigate strong longitudinal studies, creative collaboration tools, and inclusive hybrid models. Scalable techniques and institutional backing are essential for implementing this strategy. Resolving these issues will encourage better learning outcomes, accountability, and student engagement. Success still depends critically on ongoing innovation.

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## **A Case study on Optimization Operations & supply Chain with AI**

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### **Abstract:**

This paper mainly deals with how supply chain management gives the optimizing operations in business organizations. In today's scenario, optimizing supply chain plays a vital role in the entire aspect of business while addressing it, increasing the efficiency and effectiveness of the entire supply chain process. It includes how the input converts as finished products to ultimate customers. Optimization involves the strategic application of updated technology, individual automation, digital infrastructure energy transition, turning data into insights and action to enhance user experiences, leveraging data analytics for retail marketing and healthcare, and using AI to improve interactions, understand data management, and address challenges and sustainability in innovation. There is research conducted in a few companies, namely Walmart, Tyson Foods, Koch Industries, Maersk, Siemens, and Unilever, that revealed how these global companies are using advanced AI technologies to plan for and adapt to supply-chain optimization. In this study, findings reveal that there exists a contextual and methodological gap relating to the impact of artificial intelligence on supply chain optimization. Preliminary empirical review revealed that AI significantly improved various aspects of supply chain management, including forecasting, inventory management, logistics, and risk management. It

was found that AI technologies enhanced operational efficiency by providing more accurate demand predictions, optimizing logistics operations, and improving risk management operations.

**Key words: Optimization, Efficiency & Effectiveness, Digital Infrastructure.**

### **Introduction**

AI-enabled supply chain optimization leverages artificial intelligence technologies such as machine learning, data analytics, and automation to enhance supply chain efficiency, responsiveness, and resilience. By integrating AI into supply chain processes, businesses can gain deeper insights, predict demand patterns, optimize inventory management, improve logistics, and reduce operational costs. AI-driven solutions help in identifying potential disruptions, streamlining decision-making, and enabling real-time adaptability to market fluctuations. As a result, companies can achieve greater agility, sustainability, and customer satisfaction in today's competitive and dynamic business environment

#### **1.1 Introduction about Supply Chain & AI:**

In the ever-evolving global economy, supply chains have become increasingly complex and dynamic. Businesses face challenges such as fluctuating consumer demands, supply chain disruptions, and the need for greater transparency and speed. Traditional supply chain management methodologies often fall short in addressing these intricacies. To meet these demands, organizations are turning to advanced technologies, with

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artificial intelligence (AI) emerging as a pivotal solution.

Artificial intelligence encompasses a suite of technologies, including machine learning (ML), natural language processing (NLP), and robotics, enabling systems to process vast amounts of data, identify patterns, and make informed decisions. Within the realm of supply chain management, AI offers innovative tools for analysing real-time data, optimizing logistics, improving demand forecasting, and enhancing overall operational efficiency.

The integration of AI not only facilitates agility and resilience but also positions businesses to thrive in a competitive landscape. This chapter explores the foundational aspects of AI in supply chains, shedding light on its transformative potential.

### 1.2 Significance of AI in Supply Chains

The strategic adoption of AI in supply chain management is driven by its potential to address critical pain points. AI contributes to:

1. **Enhanced Decision-Making:** AI leverages predictive analytics to deliver actionable insights by analysing historical and real-time data, predict demand patterns, refine inventory planning, and streamline logistics operations.
2. **Operational Efficiency:** Automation powered by machine learning reduces the need for manual interventions, significantly lowering error rates and increasing output quality.
3. **Supply Chain Visibility:** AI-driven platforms offer unparalleled real-time visibility into supply chain operations. Organizations can monitor product movements, inventory levels, and supplier performance from end to end.
4. **Cost Reduction:** By optimizing demand forecasts and ensuring efficient allocation of resources, AI minimizes excess inventory and reduces the risk of stockout

#### Objectives of the Study

The detailed objectives include:

- To understand the Comprehensive Analysis of AI Technologies

- To Evaluate the Benefits and Challenges in Real world For example analysing case analysis on Wal-Mart & Unilever company.
- To Identify the Strategic Recommendations and Contribute to Academic and Real Scenario.

#### Scope and Limitations

While this study offers a detailed examination of how AI impacts supply chains, it is essential to recognize certain limitations to ensure a fair and balanced understanding:

1. **Industry-Specific Focus:** The findings and recommendations presented in this study are primarily based on data from specific industries such as retail, manufacturing, and logistics..
2. **Data Reliability:** A significant portion of the study relies on self-reported data obtained from surveys and interviews with professionals.
3. **Rapid Technological Advancements:** AI technology evolves at an exceptionally fast pace, with new tools, methodologies, and applications emerging frequently

#### Role of Supply Chain Management and Logistics: A Walmart Case Study

Supply chain management (SCM) and logistics are critical components of business operations that ensure the smooth flow of goods and services from suppliers to end customers. Walmart, one of the world's largest retailers, has set the benchmark for supply chain efficiency by leveraging technology, strategic supplier partnerships, and innovative logistics solutions to deliver value to customers globally.

#### Walmart's Supply Chain Strategy

Walmart's supply chain strategy revolves around cost leadership, operational efficiency, and customer satisfaction.. Key elements of Walmart's supply chain strategy include:

1. **Global Sourcing and Procurement:** Walmart sources products from a diverse network of suppliers across the globe, negotiating bulk

purchasing agreements to secure the lowest possible prices.

**2. Vendor-Managed Inventory (VMI):** Walmart collaborates closely with its suppliers through Vendor-Managed Inventory systems, where suppliers have real-time access to Walmart's inventory data.

**3. Advanced Inventory Management:** The company employs sophisticated demand forecasting tools powered by AI and big data analytics. These tools analyse customer purchasing patterns, seasonal trends, and external factors to optimize inventory levels across its stores and distribution centres.

**4. Technology Integration:** Walmart uses cutting-edge technologies such as Internet of Things (IoT), blockchain, and AI to enhance supply chain visibility and efficiency. **Walmart's Logistics and Distribution Network**

Efficient logistics and distribution are vital to Walmart's ability to provide low-cost products while ensuring rapid delivery to customers. Walmart's logistics operations are characterized by:

**1. Strategic Distribution Centres (DCs):** Walmart operates a vast network of strategically located distribution centres that serve as key nodes in its supply chain..

**2. Fleet Management and Transportation Optimization:** Walmart owns and operates one of the largest private trucking fleets in the U.S..

**3. Automation and Robotics:** In recent years, Walmart has invested heavily in automation and robotics within its warehouses and fulfillment centres. Automated storage and retrieval systems (ASRS), robotic picking solutions, and conveyor systems have helped enhance efficiency and reduce human error.

**4. Last-Mile Delivery Innovations:** Walmart continuously explores innovative last-mile delivery solutions to meet evolving customer demands. Initiatives such as drone delivery, autonomous vehicles, and partnerships with third-party logistics providers (3PLs) aim to improve delivery speed and customer convenience.

### **Technology-Driven Supply Chain Optimization**

To remain competitive in an evolving retail landscape, Walmart has embraced various AI-driven solutions for supply chain optimization, including:

- 1. Predictive Analytics:** Walmart uses AI-powered predictive analytics to forecast demand, optimize inventory levels, and reduce waste.
- 2. Blockchain for Transparency:** Walmart has implemented blockchain technology to enhance transparency and traceability within its supply chain.
- 3. IoT-Enabled Tracking:** The integration of IoT sensors in transportation and warehousing helps Walmart monitor the condition and location of goods in real time.

### **Challenges and Continuous Improvement**

- 1. Sustainability Initiatives:** Walmart is committed to reducing its environmental impact through initiatives such as energy-efficient logistics operations, sustainable sourcing, and waste reduction programs.
- 2. Resilience Building:** Walmart has since focused on building resilience by diversifying its supplier base and enhancing its digital capabilities to respond swiftly to disruptions.
- 3. Customer-Centric Approaches:** Walmart continues to refine its supply chain processes to provide seamless omnichannel experiences, ensuring that customers receive products through their preferred channels, whether online or in-store.

### **Unilever's AI-Driven Transformation in Supply Chain and Logistics:**

- 1. Sustainability and Traceability** Unilever has prioritized sustainability by leveraging AI-powered satellite imaging and machine learning to track and monitor farms, landscapes, and raw material sources.
- 2. Deforestation-Free Supply Chain:** AI identifies and predicts deforestation risks by analysing satellite data and real-time

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environmental patterns, aligning with Unilever's commitment to a zero-deforestation supply chain.

3. Sustainable Agriculture: AI helps assess soil health, water usage, and crop yield predictions, enabling Unilever to support farmers in implementing eco-friendly agricultural practices.

4. Blockchain for Traceability: AI-driven blockchain solutions improve the traceability of raw materials, ensuring ethical sourcing and compliance with sustainability goals.

5. AI-Enabled Inventory Management: Unilever integrates AI technology into inventory management to enhance efficiency and reduce waste.

6. Smart Freezers for Real-Time Inventory: Over 100,000 Unilever freezers worldwide use image recognition.

7. Improved Demand Forecasting: AI analyses past sales data, weather patterns, and seasonal demand fluctuations to optimize inventory levels, ensuring consistent product availability.

8. Waste Reduction: By predicting demand fluctuations and preventing unnecessary stockpiling,

9. AI for Manufacturing Plants: Unilever's factories utilize AI algorithms to optimize energy use in production lines, minimizing carbon footprints.

10. Smart Power Management: AI monitors real-time energy consumption and suggests energy-saving measures in warehouses, footprint. Product Reformulation Using Machine Learning AI has revolutionized product innovation and reformulation in Unilever's research and development.

11. Sustainable Ingredients Identification: AI helps scientists find alternative, eco-friendly ingredients while preserving product quality.

12. Health-Conscious Product Development: AI-powered analytics assess customer preferences and health trends .

13. Faster and More Efficient R&D: AI accelerates the product development process by predicting ingredient interactions, reducing trial-and-error testing. For example, Unilever has successfully reformulated Cornetto ice creams to use more sustainable packaging and ingredients while maintaining their taste and texture. .

14. AI-Enabled Environmental Monitoring: Google Cloud's AI tools analyse environmental data, helping Unilever track deforestation risks and ensure sustainable sourcing of palm oil, tea, and soy.

15. Supplier Risk Assessment & Automated Demand Forecasting:

16. Optimized Logistics and Routing & Warehouse Automation:

17. AI-Based Candidate Screening & 'Unabot' –

18. Bias-Free Hiring Decisions:

19. Sales Growth:

20. Improved Energy Efficiency & Greater Transparency and Traceability:

21. Data Quality and Integration: Managing and integrating large volumes of AI-generated data remains complex.

**Change Management:** Employees require training and upskilling to adapt to AI-powered processes. Ethical and Regulatory Compliance: AI-driven recruitment and supply chain decisions must comply with global labour and environmental laws. Unilever is actively addressing these challenges by investing in data governance, employee training, and ethical

**AI frameworks. Future Outlook:** AI's Role in Unilever's Growth Unilever continues to expand its AI-driven initiatives to maintain its leadership in sustainability and efficiency. AI for Personalized Consumer Engagement: Unilever's commitment to AI-driven sustainability and efficiency positions it for long-term success in the global market. Areas for Improvement in Unilever and Walmart's AI Integration:

### **Unilever: Areas for Improvement:**

- **Overcoming Data Silos for Better AI Integration Issue:** Unilever's AI initiatives are spread across multiple departments (supply chain, R&D, HR, sustainability, etc.), leading to data silos that reduce AI's full potential.
- **AI-Powered Consumer Insights for Personalized Marketing Issue:** Unilever has focused AI on supply chain and sustainability but lacks AI-driven personalized marketing strategies compared to companies like Nestlé.
- **Expanding AI in Retail Operations Issue:** Unilever's AI initiatives are mostly supply chain-focused, with limited application in direct-to-consumer retail.
- **Ethical AI and Consumer Trust Issue:** While Unilever uses AI in hiring (via Pymetrics), AI bias concerns could affect diversity and hiring fairness.

### **Findings of the Study:**

#### **Walmart: Areas for Improvement**

**1) Balancing AI-Driven Personalization with Customer Privacy Issue:** Walmart's AI-powered personalized shopping and dynamic pricing models could raise privacy concerns.

**2) Reducing AI Bias in Supplier Negotiations Issue:** AI-powered supplier negotiations (via Pactum) can unintentionally favour large suppliers over smaller vendors.

**3) Increasing AI Adoption in Rural and Developing Markets Issue:** Walmart's AI-driven logistics mainly benefit urban supply chains, while rural store operations still rely on traditional methods.

**Improvement Expanding AI-Powered Sustainability Initiatives Issue:** Walmart uses AI for logistics optimization, but there's room for more sustainability-focused AI (e.g., waste reduction in stores).

**Improvement:** Invest in AI-driven energy management in retail locations and AI-powered food waste tracking to minimize environmental impact. **Final Recommendation** Both companies are leading in AI adoption, but to stay ahead, they

should: Unilever: Focus on AI-driven consumer engagement and ethical AI integration. Walmart: Improve AI fairness in negotiations, rural adoption, and sustainability efforts. This approach ensures business growth, improved consumer trust

### **Conclusion**

Walmart's and Unilever's supply chain management and logistics strategies have been instrumental in establishing the company as a global leader in retail. By leveraging technology, optimizing logistics operations, and fostering strong supplier relationships, Walmart has achieved high levels of efficiency, cost savings, and customer satisfaction. The company's focus on continuous improvement and innovation ensures that it remains at the forefront of supply chain excellence in an increasingly competitive and dynamic marketplace.

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## **A Study on the Evolution of Marketing Strategies of Netflix: Adaptive to Digital Era**

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### **Abstract**

In this research paper “A Study on the evolution of marketing strategies of Netflix: Adaptive to digital era explains the various strategies and modern tools adopted by Netflix in order to become the leading OTT platform in the digital space, also the study explains in detail the digital marketing techniques such as data analytics, artificial intelligence and machine learning. This paper also explains about the market space available where the Netflix is not having an upper hand and not performing well in certain aspects. The study concludes, on the market space available in the OTT platforms where the major player like Netflix is not performing well around the globe. The scenarios where Netflix is not able to make much impact this paper will also give suggestions over the grey area and also how to utilize this grey area and build a successful company on top of it.

**Keywords:** Data Analytics, Machine learning, Netflix, Digital Marketing strategy, Regional OTT.s

### **Introduction:**

Netflix was initially founded in 1997 as a movie rental company over the internet. The time when it was started all it had was 1000 titles, soon there various digital marketing strategies over the period of time was tremendously grew the market size of Netflix. Today, the Netflix has 50 million subscribers with world wide presence. Netflix marketing strategies are considered to be one of the pioneers in the world of digital marketing. This research paper will briefly explain various strategies which actually helped Netflix to become

one of the leading OTT (Over-The-Top) company in the world.

### **Digital Marketing:**

We all know the marketing is about creating a demand among the customers and fulfilling the demand among the customers. Target audience plays a vital role when it comes to marketing. The current era is all about going digital. Digital marketing is a platform where the target audience is huge due to the discovery of mobiles and tablets. In the current era if the business has to be successful it must have its presence online and it should be digitally marketed in order to be successful. In this paper we will discuss what are the various trends in digital marketing.

### **Objectives of the study:**

- To understand various modern digital marketing techniques ruling the current market.
- To understand and implement how data analytics play an important role in digital marketing strategies adopted by Netflix.

### **Need for the study:**

This study will help all the start-ups and the mid-sized companies to display themselves very well on a digital world and also to make their firm an established one in the highly competitive market space.

### **Target Audience Strategy by Netflix:**

Netflix has a very detailed and much precise target audience strategy. Since, Netflix being a digital platform the majority audience of Netflix are: Tech-Savvy users also people with digital connectivity i.e., the younger generation who have more presence on digital platform.

Netflix personalizes the content based on user's gender, age, preferences, Nationality. So, majority of the users available in Netflix are the people who are present everywhere in various digital platforms.

#### **Customer Centricity:**

Once, the user logs-in, into the Netflix based upon the details entered the other parameters such as age, gender etc., the user will only be seeing the results based upon his parameters. This creates a connection between the user and the Netflix as we all know the connected user is always a loyal user so the customer centricity is the key for Netflix's successful, loyal subscribers.

#### **Innovation:**

Data analytics is a important modern tool which will benefit the art of digital marketing in an very immense way. Data Analytics on a higher level is nothing but understanding the customer's preference and taste using his own data just like how Instagram functions.

#### **Data Analytics in Social Platform:**

If we deep analyse into multiple Netflix amount, we will not be able to find any similarities in any of the accounts, the reason behind is Data analytics. There is no one standard for everyone in Netflix.

Netflix use Data analytics in personalizing the customer's experience. The suggestion shown to the user is tailor made.

This creates customer engagement with Netflix. The user's line to spend more time watching the content which very well engages and attracts them.

#### **Data Analytics in Marketing:**

It's high time that we should start mixing marketing along with modern tools. Data analytics is very strong tool for marketing. Because with Data analytics along with user data we can personalise marketing techniques based on the users taste and preference. The most effective marketing is always the one where the

customer/user relates to it, only then the user might prefer it.

#### **Netflix Agile Model:**

Netflix is a complete agile based model. To explain agile method of development in a much simpler way. Agile is a process in which if an issue/any feature is no longer benefitting the user experience, Netflix identifies it, then and there rather than working in a waterfall model, in which a set of rules and procedures has to be followed for fixing any concern which is more time consuming than agile. Agile is the most fastest way of correcting issues, then and there without having major impacts.

#### **Machine Learning in Netflix:**

In the era of Artificial Intelligence every individual out there is trying to get benefitted from artificial Intelligence. Meanwhile, Netflix also uses artificial intelligence in a wide range of functionalities present in Netflix. One of the leading and the most important machine learning method is used in customizing the preferences of the user. The AI/ML algorithms present in the Netflix continuously learns the users likes and preferences and gives relevant suggestion to the user which keeps the user engaged with Netflix.

#### **Findings of the Study:**

Netflix is not so good, when it comes to the regional movies, throughout the world there is ample market space for OTT with regional collection. If we login to Netflix we won't be able to find much of regional or regional content available. So, there are s group of OTT platforms available which focuses on regional content. But the concern with regional OTT's is that they lack user engagement in other modern techniques just like what Netflix has.

Out of 100%, 60% of the content available in Netflix is English content and 40% of other contents put together.

The price of the Netflix is high so the developing countries such as India, Sri Lanka etc., is very

sensitive buying the premium packages offered by Netflix.

As, we discussed, regional OTT with fascinating technologies and affordable pricing will dominate the OTT market space.

### **Suggestions:**

With the right modern technologies such as advanced data science, artificial intelligence and machine learning focusing regional content will become a great hit. This place is still not filled.

Once, this becomes a hit not only the regional OTT space will develop along with that there is ample amount of market space for media industries to develop along with it.

Broadcasting on Netflix is still an expensive thing for many of them. So, a regional OTT with affordable prices will create a boom in the digital content space.

### **Conclusion:**

Based on the research done the result was clearly explaining that the majority Indian mindset is not to spend just save ideology. So, most Indians have a fixed mindset of not spending unless and until it is necessary. Indians save most of their income and do not spend on not so relevant things. This mindset contradicts the Netflix pricing strategy in India. Any company which comes with a competitive and affordable price with advanced technology and user engagement just like how the Netflix has it will be a great success in India.

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## Assessing the Impact of Departmental Service Offerings on Customer Satisfaction in Star Hotels: A Study of Madurai District

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### Abstract

The aim of this study is to evaluate the effect of departmental services on customers satisfaction with star hotels located in the Madurai district in Tamil Nadu amid a significant increase in the arrival of tourists in 2023. Madurai understands the factors that contribute its emergence as a major tourist destination. A positive guest experience is important to maintain the hospitality industry's development. A structured questionnaire was focused on three large departments for 200 tourists living at various star hotels in the region: Front Office, cleaning, and food and drinking services. The information gathered were analyzed using regression to establish the connection between the quality of service in these departments and overall customer satisfaction. The findings indicate that good front office services, prompt and proper cleaning, and quality foods enhance customers' satisfaction. Specifically, the front office services were found to be the most efficient factor in molding the guests' first income. The research also indicates that ongoing staff training, one-to-one guest contact, and creativity in complimentary food can build guest loyalty and repeat patronage. On this basis, the research suggests steps to enhance the service delivery of hotel managers, create high customers, and achieve long-term success in Madurai's competitive hospitality industry.

**Keywords:** Customer Satisfaction, Departmental Service Offerings, Star Hotels, Front Office, Housekeeping, Food & Beverage, Madurai, Tourism Industry, Service Quality, Hospitality Management.

### I. Introduction

Madurai is a prominent cultural and pilgrimage site in India, often referred to as “Athens of the East.” According to the Tamil Nadu tourism department, the number of tourists coming to the city increased by 15% in 2023, surpassing 2.5 million visitors. Due to the increasing growth of tourism in Madurai, there is an increasing need for quality hospitality services in the star hotels in Madurai. According to records of the Tamil Nadu Tourism Department, there are almost more than 25 companies furnishing services in Madurai with various levels of luxury, including Taj Gateway, Marriott, Heritage Madurai, etc. Due to increases in visitation, it is thus imperative to understand how the quality of service in star hotels affects the level of satisfaction of their customers so as to stay ahead in this lucrative market.

In this environment, customer satisfaction has become one of the most important success factors for the hospitality industry. Expectations from modern times: passengers are more than ever looking for personal, talented, and simple service experiences with guests. The hotel must focus on skill in many areas to ensure that guests have a memorable and comfortable stay. A key to achieving this is the quality of service in various departments at the hotel, including front office, cleaning, and food and drink (F&B) services. These departments are directly involved in the design of the guests' overall experience, and their performance has a permanent effect on guest satisfaction.

• **Front Office Services:** Front Office is actually the nervous center of any hotel; This is the first point of contact for guests and becomes a very prominent feature of any experience. From the reservation process to check -in and check -out, the efficiency and friendship of the reception personnel can increase the hotel guests' concept. Together with total privatization, management of questions and requests from guests will create an invited environment.

• **House Keeping services:** Cleanliness is in a primary position in hospitality. The assessment of the guest of cleanliness spreads to space hygiene. It focuses on expansion, time in cleanliness and availability of facilities. Relaxation of hotel rooms is therefore closely linked to the guest's welfare, and any errors in this can lead to a bad impression. In addition, cleaning efficiency enables the development of a better environment for guest comfort, and increases the quality of the experience for guests.

• **Food & Beverage Services:** F&B department defines the quality of guest experiences with regard to dining while at the hotel. Quality of food, variety of food, and presentation are aspects measured against speed of service and attentiveness. Dining experience for many guests is their total stay; diverse, high-quality, and culturally-relevant menu offerings would certainly remain imprinted as positive experiences from the hotel. Further, the ambience, service speed, and personalized recommendations also go a long way in satisfying the guest in terms of his dining experience with the hotel. The relationship between these departments actually suggests how well an establishment has fulfilled the expectations of its guests and thus has satisfied and returned. As the hospitality business increases in Madurai, it will be necessary for hotel managers to appreciate and understand the quality of the service and how well each department works in contributing to the satisfaction of the total customers.

Considering these departments and the relative competition in the area, this study will assess the relationship of service provision by departments (front office, housekeeping, and food and beverage) to customer satisfaction in Madurai's star hotels. The study would provide actionable insights to hotel management on how to improve their offerings through an analysis of feedback from customers on what delivery areas most affected guest satisfaction. It will be a very valuable source of information for hotel managers in Madurai to tweak service strategies to improve operation efficiencies, thereby improving the guest experience. As tourism continues to grow in Madurai, customer satisfaction will remain important in ensuring long-term loyalty and competitive advantage in today's changing hospitality market.

## II. Literature Review

### Hospitality Customer Satisfaction

Numerous researches have determined the factors that influence customer happiness, which is crucial for success in the hotel industry. Customer happiness in hotels is mostly determined by the cleanliness of the facilities, personnel conduct, and service quality, as highlighted by Gupta and Sharma (2020). Polite and prompt service is highly appreciated by clients and considerably affects their overall experience, as presented in their study. Kindness, promptness in service, and politeness are crucial conditions expected by clients in their studies. Likewise, Kumar and Singh (2021) concluded that specific services such as calling guests by name and remembering their preferences matter greatly to the level of satisfaction. Their study also cited the emotional bond formed between guests and employees as another factor in loyalty development. The most recent study of Chen et al. (2022) found an intersection where technology is relevant to the level of satisfaction achieved by the customers.

### Departmental Services

Department services were another area of interest in hospitality research. In their study, Mehta and Chavan (2022) found that the satisfaction of customers was strongly influenced by the sanitation of the rooms, timely

cleaning and towels, the facilities of the room, and the similar presentation that was emphasised as the need to recruit and train personnel to achieve uniform service delivery. Park et al. (2021) studied the concept and found that cleaning practices in an environmentally friendly manner affected the quality of service in terms of guest satisfaction. The modern guest insists that the impermanent functions, such as biodegradable cleaning and energy practices, be fast-tracked for their implementation. The other primary parameter for guest satisfaction is food and beverage services, which have been given a greater role in cultural places such as Madurai. According to Sundaram et al., guest satisfaction is much linked with the quality of food items, variety, and presentation. They stated that the menu should provide for local cuisines to pave the way for cultural experiences among tourists. Wang et al. (2022) studied the food morpheme's effect on guest beliefs and service effect; they found that when food is provided in an attractive atmosphere and timely service, it will increase the guest experience.

### **Tourism in Madurai**

The city has become one of the important tourist centres in South India due to its enthralling milieu capable of attracting both foreign and local tourists to Madurai. The tourist arrivals to the city in 2023 registered an increase of 15% with over 2.5 million tourists, as reported by Tamil Nadu Tourism Development Corporation (2023). That tourism had spectacular growth due to the city's cultural heritage, like that of Meenakshi Amman Temple, but improved infrastructure, If, like connectivity accommodation, has been an equal factor." Ramesh and Devi (2021) conducted a study that probed into the factors leading to the growth of tourism in Madurai. The study revealed that ural tourism, pilgrimage tourism, an heritage tourism are the leading factors that boost tourist arrivals. The study also pointed out the positive intervention by the campaign of the government was, in this context, the "Incredible India campaign," in promoting Madurai as a place worth visiting." The FHRAI, in its 2022 report, equally corroborated the phenomena by suggesting that star hotels adjust their

operational services to meet the expectations of tourists from various cultures.

Although existent studies have dwelt on customer satisfaction and departmental services in hospitality, the literature contains some gaps. First, most of the studies are metropolitan or international in scope and consider tier-two cities like Madurai in contempt. Second, no research has looked at the interrelationship between departmental services and customer satisfaction concerning cultural tourism. Third, although plenty of literature underlies sustainability in hospitality, hardly any study has attempted to relate it with guest satisfaction in star hotels.

Thus, this will fill these gaps by taking into account how departmental service delivery affects customer satisfaction in star hotels in Madurai District. In doing so, useful insights will be gained for the hotel managers, and a voice will be given for the hospitality management scholarly discourse

### **3.1 Research Design**

The research design used for this study was quantitative since the goal was to assess the effects of departmental service offerings on the satisfaction of clients in star hotels in Madurai District. The research design is, therefore, able to quantify how the quantity of service quality in various departments of a hotel (Front Office, Housekeeping, and Food & Beverage) is related to customer satisfaction levels. This design can, by numerical data and other statistical analyses, produce an objective measure of the perceptions of the quality of service and its direct impact on guest satisfaction.

### **3.2 Data Collection**

• **Population and Sample Selection:** The focus of this study rests mainly on tourists who take in major starred hotels in Madurai District, where the starred hotels are a vital component of the local hospitality set-up. The data was drawn from 200 tourists of major starred hotels like Taj Gateway, Courtyard by Marriott, Heritage Madurai, etc. Select the above hotels with regard to their esteem in the area and their good reputation for quality of service. The target

population includes tourists staying in those hotels in 2023.

• **Tourism Arrival Data:** Since tourism has been on the increase in Madurai, 2023 also serves as a good backdrop for selecting this topic. Tourist arrivals into the city saw a surge of 15% with more than 2.5 million impressions, as per the Tamil Nadu Tourism Department. With the rising numbers of visitors, the hotel industry considers customers' satisfaction to be more eminent than before. The escalation of demand made it necessary to provide quality services in as much as these star hotels are concerned; customer satisfaction is the subject.

• **Sample and Sampling Technique:** The sample, however, comprised a total of 200 respondents who were selected using convenience sampling. These respondents represented domestic as well as international tourists who stayed at the selected star hotels in Madurai in 2023. Convenience sampling was used due to its ease and practicality and would allow the researchers to easily collect data from tourists willing to participate.

• **Tool:** A structured questionnaire was used to collect the data. The questionnaire included a series of Likert scale questions (ranging from 1 = Strongly Disagree to 5 = Strongly Agree), which were aimed at measuring the perception of service quality by the respondents towards the Front Office, Housekeeping, and Food & Beverage departments. Other questions were aimed at overall customer satisfaction with the hotel.

### 3.3 Variables

#### Independent Variables:

**Front Office Services:** Effectiveness in the entry and exit processes, the practicality of personnel with guests.

**Housekeeping Services:** Level of neatness, timely bedroom cleaning, and quality of amenities.

**Food and Beverage Services:** The quality of foods as well as their variety, speeds of service, and the dining experience.

#### Dependent Variable:

**Customer Satisfaction:** Overall satisfaction from the hotel stays as per perception of quality of service, safety and comfort, as well as value for money.

### 3.4 Data Analysis

- **Descriptive Statistics:** Descriptive analysis was employed to summarise the data and provide a general evaluation of the perception regarding the departmental services perceived by respondents. It calculated the mean and the standard deviations for each question and service category to find out the general trend in the satisfaction of customers.
- **Regression Analysis:** In this regard, hypotheses about departmental service offerings affecting customer satisfaction were tested through regression analysis. Using this particular statistical method, the quality and direction of the impact can be determined arising from Front Office, Housekeeping, and Food & Beverage services on customer satisfaction. These services were evaluated using multiple regression to explain the significance of each independent variable in predicting total customer satisfaction.

## IV. Results and Discussion

### 4.1 Descriptive Statistics

**Table 1: Gender of Respondents**

Gender	Frequency	Percentage (%)
Male	120	60%
Female	80	40%

Males therefore statistically represent the majority of respondents (60%), while surprisingly, 40% of respondents are females. This marks a rather evenly distributed sample according to gender distribution, confirming as well that the sample seems to represent the general population of tourists who visit Madurai.

**Table 2: Age Group of the Respondents**

Age Group	Frequency	Percentage (%)
18–25 years	40	20%
26–35 years	75	37.5%
36–45 years	55	27.5%
46–60 years	20	10%
Above 60 years	10	5%

The majority of respondents were between the ages of 26 and 35 years (37.5%), followed by the 36–45 years age group (27.5%). This indicates that the first and foremost type of persons visiting star hotels in Madurai are working professionals or middle-aged tourists who mostly come for business or cultural tours...

**Table 3: Educational Qualification of the Respondents**

Qualification	Frequency	Percentage (%)
High School	10	5%
Undergraduate Degree	80	40%
Postgraduate Degree	85	42.5%
Professional Degree	25	12.5%

Among them responded, those who had postgraduate qualifications account for 42.5 percent, followed by undergraduate from a university institution, to 40 percent. From this, it clearly indicates that majority of visitors entering hotels hold a large degree of education, which, in turn, can show higher expectations towards the quality of services and professionalism.

**Table 4: Income Level of the Respondents**

Income Level	Frequency	Percentage (%)
Less than 3 Lakh	30	15%
3 Lakh - 6 Lakh	60	30%
6 Lakh - 10 Lakh	70	35%
Above 10 Lakh	40	20%

Most of the respondents earn around, or even above, 3 and 6 lakhs per year (30 percent), or about 6 and 10 lakhs (35 percent). It means most of the respondents belong to the middle or top middle class and can afford to stay in star category hotels that fit the criteria for such hotels.

**Table 5: Occupation of the respondents**

Business	Frequency	Percentage (%)
Student	20	10%
Professional	100	50%
Business Owner	40	20%
Retired/Other	40	20%

Most respondents were followed by professionals (50%) after professional (20%). It can reflect demand for trade and holidays in the region, creating a large part of the customer with professionals and entrepreneurs.

**Table 6: Responses for various hotel services**

Various department Service Preference	Frequency	Percentage (%)
Front Office	160	80%
House keeping	170	85%
Food and Beverage	150	75%
Wellness/Spa	50	25%
Entertainment	30	15%

The majority of respondents preferred Housekeeping services (85 percent), followed by Front Office services (80 percent) and food and drink services (75 percent). It reflects the role of cleanliness, interaction with guests and dining experiences in the customer's happiness. Meanwhile, wellness/spa services and entertainment services are less preferred, focusing on business or cultural tourism instead of a holiday.

#### 4.2 Hypothesis test

The hypotheses related to the effect of department services on customers' satisfaction were tested using regression analysis. The summary of the test results is as follows:

**Table 7: Perform the results of the hypothesis test**

Hypothesis	$\beta$ Value	p-Value	Conclusion
<b>H1:</b> Front Office Services has a major positive impact on customer satisfaction	0.45	< 0.05	Supported
<b>H2:</b> House keeping cleaning services have a great positive effect on customers' satisfaction.	0.52	< 0.05	Supported
<b>H3:</b> Food and beverage services have a positive effect on customers' satisfaction.	0.48	< 0.05	Supported

**Front Office Services:** Regression analysis indicates that the Front Office services affect customer satisfaction significantly ( $\beta = 0.45$ ,  $p < 0.05$ ). The friendly conversation of front office employees is important to increase the general satisfaction of guests with their stay. It supports Rajendran's ALS approach. (2019), emphasising the importance of the first impression of hospitality.

**Housekeeping Services:** Housekeeping has the highest positive effect of all services on customer satisfaction ( $\beta = 0.52$ ,  $p < 0.05$ ). Cleanliness, participating in the room in time, and the quality of the goods given to the guests actually affected the general guest satisfaction. The discovery is in line with Mehta and Chavan (2022), who found that the sanitation in the room contributes a lot to the guest satisfaction.

**Food and beverage services:** Food and drink services also had a significant positive impact on customers' satisfaction ( $\beta = 0.48$ ,  $p < 0.05$ ). The quality of food, variety, and dining experience has been the most important contributor to satisfaction, especially for tourists

seeking authentic local food. This claim is with Sundaram and Kumar (2023), who advocated for the Pakistani experience with cultural tourism.

### 4.3 Geographical Comparison

A geographical comparison of customer levels was conducted to identify whether the customer has varied hotel surroundings in Madurai district as illustrated below:

**Table 8: Geographic Comparison of Customer Satisfaction Across Hotel Zones**

Hotel Grading	% Satisfaction Assessment	average Rating (Out of 5)
Central Madurai	80%	4.2
Southern Madurai	70%	4.0
Northern Madurai	65%	3.8

**Central Madurai:** This had the highest level of satisfaction (80%), which could have probably been due to nearness to most tourist attractions like the Meenakshi Amman temple and also better infrastructure.

**Southern Madurai:** Satisfaction is at a moderate level (70%), probably due to fewer luxury offerings than Central Madurai.

**North Madurai:** This area had the least satisfaction levels (65%), possibly due to tourist attraction and limited access to low-end hotels.

### 4.4 Discussion

The findings of the current study highlight the importance of departmental services in the construction of customer satisfaction with the Star Hotels in the Madurai district. The most preference for household services clearly reflects the importance that is responsible for cleanliness and maintenance in relation to guest satisfaction and in line with global trends in hospitality (Mehta and Chavan, 2022). Similarly, the significant impact of front office services underlines the need for highly efficient

and personalised guest interactions, a trend that is especially important in a culturally rich destination like Madurai. The service delivery of food and beverages has a very strong influence, reflecting the growing need of tourists for authentic experiences in food travel. This becomes quite evident in Madurai, where traditional food is really part of the tourist experience. Much lower preference is shown for wellness and recreation services, which infers that tourists come primarily for cultural and business activities in Madurai rather than for leisure purposes. Geographic comparison brings out the differences in the levels and profiles of satisfaction across different zones, thus pointing out the necessity of targeted improvement in the areas where they are rated lower. For instance, hotels in Northern Madurai could better serve guests by improving access and upgrading their facilities to tourist attractions.

#### 4.5 Implications for Practice

- **Housekeeping:** Provide sufficient cleanliness and maintenance with staff training to provide good standards.
- **Front Office:** Install and train staff in technology systems (e.g., mobile check-in) so guests can take advantage of these developments in service.
- **Food & Beverage:** The introduction of local cuisine and a variety of offerings on the menu will increase the experience in dining.
- **Area Difference:** The hotels in the less satisfied areas should aim to improve on infrastructure and promote proximity to cultural shrines.

#### V. Recommendations

To improve customer satisfaction, star hotels in Madurai must concentrate on improving service quality in the key departments, namely, front office, housekeeping, and F&B.

##### Front Office Services

Regular staff training on interpersonal and communication skills is a key priority for hotel management to ensure that the front office staff makes the guests feel welcome and at home from the moment they step in. Introducing self-check-in kiosks or mobile check-ins would

minimize waiting times and improve operational efficiency as well as add convenience for guests. Furthermore, personalization of guest services should be among the prime recommendations, ensuring training is done to make the staff remember guest preferences and make customized suggestions. These things would elevate the experience of the guests, hence creating much higher satisfaction levels.

##### Housekeeping Services

To guest satisfaction, high cleanliness standards should be kept; hotel staff should ensure both rooms and areas are clean and well-maintained at all times. Prompt and thorough attention of the housekeeping staff has to be given to any guest's needs. Staff should undergo training regularly regarding cleaning practices, maintenance of different amenities, and customer services. It also requires these eco-friendly and sustainable methods of cleaning to be able to attract a more eco-conscious clientele. Timely room service serves well on the concept because room servicing according to the guest's availability or demand is more convenient and satisfying, especially for business and international travelers.

##### Food & Beverage Service

Having a huge menu comprising food from every corner of the world and offering an appropriate selection of Madurai's foods and enjoying relishing a cuisine would suffice for what another what another important factor could really be achieving. Rigorous hygiene and display standards would mean that food could be eaten and looked at before it is safe to consume. The quality of cleanliness in food preparation, food storage, and serving areas will make the guest feel confident about the quality of food. Offer personalized dining options for dietary restrictions such as vegetarian or vegan, gluten-free foods, etc. At this point in time, one better be available for all guests, whether it is food enjoyment or nutritious elements in overall importance to them, thereby enhancing guest satisfaction.

## VI. Conclusion

This has significantly underscored the relevance that services offered by departments have on the satisfaction experienced by the customers at star hotels in the Madurai District. The burgeoning tourism potential in 2023 that the city is witnessing makes it important for hotels to remain focused on the standards pertaining to service quality in areas like front office, housekeeping, and food and beverage services. Results suggest that the aforementioned departments have a measurable direct impact upon the satisfaction of guests, thus becoming pivotal for hotels wishing to contend in a competitive and growing market. The research has shown that front office services, housekeeping, and food and beverage offerings are some of the key touchpoints of hotel guests, cleanliness, and interaction between guest and hotel staff among them as key drivers of satisfaction. Data were mainly obtained from the findings based on tourism and the year 2023, but that would almost always provide insights of enormous importance to hotel managers as they endeavour to improve service offerings. Future studies may focus on the effects of technology integration (like AI-driven customer services) on customer satisfaction and sustainability practices in the hospitality industry. The research may also include studies on the role of wellness and recreation services to find out whether such less preferred areas in this study could become growth areas in the future.

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