

# Integrating Generative AI into ICT Education in Mauritius: A Comparative Analysis of Global Frameworks and UNESCO Perspectives

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## *Abstract*

*This chapter explores the role of Generative Artificial Intelligence (AI) in enhancing ICT (Information and Communication Technology) education in Mauritius. Through a comparative analysis of international frameworks and the UNESCO report, the study aims to identify best practices, challenges, and recommendations for integrating Generative AI into the educational landscape of Mauritius. The paper provides an overview of the significance of ICT education in Mauritius, the concept of Generative AI and its potential applications in education, and a critical examination of international frameworks and the UNESCO report on AI integration in education. The study evaluates the alignment between the recommendations from these sources and the potential application of Generative AI in enhancing ICT education in Mauritius. Additionally, it discusses the ethical considerations associated with the integration of Generative AI and proposes a framework for effectively incorporating it into ICT education in Mauritius. The chapter concludes by summarizing the key findings and suggesting avenues for future research and implementation.*

**Keywords:** *Generative AI, ICT education, Mauritius, International frameworks, UNESCO report, Personalized learning, Interactive simulations, Intelligent tutoring systems, Ethical considerations, Educational enhancement*

## **Introduction**

ICT (Information and Communication Technology) education plays a pivotal role in equipping individuals with the necessary skills and knowledge to thrive in the digital age (Haldorai et al., 2021). In the context of Mauritius, a small island nation in the Indian Ocean, ICT education is widely recognized as a crucial driver for economic growth, employment opportunities, and social development (de Melo, 2020). The government of Mauritius has been proactively advocating for the integration of ICT in education to augment learning outcomes and equip students for the demands of the digital workforce (Madhou et al., 2022).

Generative Artificial Intelligence (AI) is a rapidly advancing field that holds significant potential in transforming various sectors, including education (Yu & Guo, 2023). Generative AI refers to AI systems that can generate new content, such as text, images, or even entire virtual environments (Jo, 2023). According to Fui-Hoon Nah et al. (2023), these systems leverage machine learning algorithms to recognize patterns and generate original outputs that often resemble content created by humans. In the context of ICT education, the integration of generative AI opens

up exciting prospects for personalized learning experiences, interactive simulations, and intelligent tutoring systems (Yu & Guo, 2023).

This chapter seeks to explore the role of Generative AI in enhancing ICT education in Mauritius through a comparative analysis of international frameworks and the UNESCO (United Nations Educational, Scientific and Cultural Organization) report. Through an examination of existing frameworks and reports, the aim is to identify best practices, challenges, and recommendations for the effective integration of Generative AI into the educational landscape of Mauritius.

The research problem addressed in this chapter pertains to the insufficient comprehensive understanding of the potential benefits, limitations, and ethical considerations related to the utilization of Generative AI in ICT education in Mauritius. Through an investigation of international frameworks and the UNESCO report, this study aims to provide insights into the current state of Generative AI adoption in education worldwide and derive valuable knowledge that can guide the development of strategies and policies specifically tailored for Mauritius. The objectives of this chapter are as follows:

1. To provide an overview of the background and significance of ICT education in Mauritius, highlighting its role in economic development and digital transformation.
2. To explore the concept of Generative AI and its potential applications in enhancing ICT education, emphasizing its role in personalized learning, interactive simulations, and intelligent tutoring systems.
3. To present a comparative analysis of international frameworks that address the integration of Generative AI in education, identifying best practices, challenges, and lessons learned from different countries' experiences.
4. To examine the UNESCO report on ICT education and AI integration, analyzing its recommendations and strategies for leveraging Generative AI in educational settings.
5. To evaluate the alignment between the recommendations of international frameworks and the UNESCO report with the potential application of Generative AI in enhancing ICT education in Mauritius.
6. To discuss the ethical considerations associated with the integration of Generative AI in ICT education, including issues of data privacy, algorithmic bias, and student autonomy.
7. To propose a framework for effectively integrating Generative AI in ICT education in Mauritius, considering factors such as teacher training, infrastructure development, and policy changes.
8. To conclude by summarizing the main findings of the chapter, reflecting on the potential impact of Generative AI in enhancing ICT education in Mauritius, and suggesting avenues for future research and implementation.

By addressing these objectives, this chapter aims to contribute to the understanding of the role of Generative AI in enhancing ICT education in Mauritius and provide insights for policymakers, educators, and stakeholders in shaping strategies and policies that leverage the potential of Generative AI to improve educational outcomes in the country.

## Overview of ICT Education in Mauritius

The landscape of ICT education in Mauritius exhibits a complex and multifaceted nature, as elucidated by Obika (2023). On one hand, commendable strides have been achieved in the seamless integration of ICT into the educational curriculum and the facilitation of unfettered access to digital resources. In drawing inspiration from the Singaporean model (Lee & Koh, 2008), the Mauritian government has exhibited astute foresight by actively promoting Mauritius as a cutting-edge "cyber island," positioning it as a regional hub endowed with a diversified economy (Bhowon, 2012). Since the late 1990s, Mauritius has diligently endeavored to foster the proliferation of ICTs within educational institutions, as evidenced by its national ICT policy, which features a dedicated segment specifically catering to education (Soyjaudah et al., 2002; Isaacs, 2007).

The government has implemented various initiatives aimed at equipping schools with indispensable infrastructure, including the provision of computers and internet connectivity within educational premises (Subrun & Subrun, 2015). Noteworthy programs such as the "One Tablet per Child" initiative have been enacted with the objective of furnishing students with personal computing devices, thereby fostering their active engagement with an extensive array of digital learning resources (Appavoo & Koonjal, 2015).

Nonetheless, the implementation of ICT education in Mauritius confronts a multitude of challenges and limitations, as highlighted by Oolun et al. (2012). One significant hurdle pertains to the availability of proficient ICT educators equipped with the requisite technological acumen and pedagogical expertise to effectively integrate technology into instructional practices (Veeraragoo, 2018). The scarcity of adequately trained teachers in the realm of ICT undermines the quality and comprehensiveness of ICT instruction rendered to students, adding to the rapid pace of technological advancements necessitates continuous professional development for educators in order to remain abreast of current trends and adapt teaching methodologies accordingly (Mautadin et al., 2019).

Another significant challenge arises from the existence of a digital divide, notably concerning disparities in technology access and internet connectivity, as discussed by Gopee (2016). Despite ongoing efforts to address this divide, inequities persist, particularly in underserved regions. The constrained availability of digital devices and reliable internet connectivity hampers students' capacity to fully engage with online learning resources and actively participate in digital collaboration (Gopee, 2016).

Addressing these challenges in ICT education assumes paramount importance for enhancing educational outcomes in Mauritius. Subrun and Subrun (2015) assert that the integration of ICT has the potential to facilitate personalized learning, active student engagement, and the cultivation of crucial digital literacy skills. Equipping students with ICT competencies enables them to adapt to the evolving demands of the digital workforce and contribute to the country's economic development (Sooltan et al., 2015).

Furthermore, Santally (2019) posits that a robust ICT education framework has the possibility to enhance creativity, critical thinking, and problem-solving abilities among students. By harnessing technology, educators can create interactive and immersive learning experiences that cater to diverse learning styles and abilities. This, in turn, fosters heightened student motivation, satisfaction, and academic achievement (Santally, 2019).

To harness the full potential of ICT education, Salas Pilco (2013) argues that comprehensive strategies are necessary to address the challenges and limitations that impede effective imple-

mentation, and the same is applicable in the Mauritian context. These strategies encompass professional development initiatives for teachers, ensuring equitable access to technology and internet connectivity, and fostering a supportive policy environment that encourages innovation and collaboration in ICT education. Overcoming these challenges will pave the way for a thriving ICT education ecosystem in Mauritius, empowering students with the requisite digital competencies to thrive in the 21st century.

### **The Concept of Generative AI in Education**

Jaouadi and Maaradji (n.d.) assert that Generative AI has significant potential to enhance ICT education by providing personalized and adaptive learning experiences for students. Through the dynamic generation of educational content, Generative AI can tailor learning materials to the specific needs, learning styles, and progress of each individual student (Fitria, 2021). This adaptability can increase student engagement, motivation, and knowledge retention in ICT-related subjects (Zharmukhanbetov & Singh, 2023).

One key application of Generative AI in ICT education, as posited by Alier et al. (2024), is the creation of interactive simulations and virtual environments. These AI-powered simulations can replicate real-world ICT scenarios, allowing students to gain practical, hands-on experience in a safe and controlled setting (Dai & Ke, 2022). This can be particularly valuable in areas such as programming, cybersecurity, and network administration, where students can explore complex concepts and develop critical skills through immersive, simulation-based learning (Lakshmi et al., 2022).

The extant literature suggests that intelligent tutoring systems powered by Generative AI have shown promise in the domain of ICT education (Ma et al., 2014; Crow et al., 2018). These AI-driven systems have the capability to provide personalized guidance and feedback to students. By analyzing individual learning patterns and identifying areas of difficulty, the intelligent tutoring systems can generate targeted support, such as remedial resources and step-by-step instructions, to help students overcome challenges and deepen their understanding of different ICT-related topics (Erümit & Çetin, 2020).

Existing research and case studies provide evidence of successful implementation of Generative AI in various aspects of ICT education (Hazzan & Erez, 2024). For instance, Okonkwo and Ade-Ibijola (2020) have documented the utilization of Generative AI-powered chatbots, such as Python-Bot, to facilitate interactive language practice for students learning programming languages. Additionally, researchers have explored the use of AI-generated educational content, including interactive coding tutorials and simulations, to enhance the learning experience in ICT-related subjects (Denny et al., 2023).

### **Comparative Analysis**

International frameworks and guidelines serve as influential instruments in shaping the landscape of ICT education and the integration of AI across diverse countries (Voogt, & Roblin, 2012). These frameworks provide essential guidance for policymakers, educators, and stakeholders to develop comprehensive strategies and practices that foster effective implementation. For instance, UNESCO's ICT Competency Framework for Teachers, which was developed in the early 2010s underscored the utmost significance of digital literacy, critical thinking, and creativity in the

realm of ICT education. Similarly, the European Framework for the Digital Competence of Educators emphasizes the integration of digital technologies, including AI and data-driven approaches, into pedagogical practices (Redecker, 2017).

Countries adopt distinct approaches when it comes to integrating Generative AI into their ICT education initiatives. For instance, India's National Education Policy (NEP) 2020 offers a comprehensive blueprint for integrating AI in education. It mandates early exposure to AI and coding from Grade 6 onwards through a flexible 5+3+3+4 curricular structure. This policy aims to overcome rigid academic silos and low digital penetration, especially in rural areas. Its digital strategy is driven by platforms like DIKSHA and SWAYAM, which deliver multilingual AI-enhanced content to support remote and inclusive learning (Aithal & Aithal, 2020; Ambar et al., 2021; Das et al., 2023).

In Finland, the integration of artificial intelligence (AI) education takes a unique and holistic approach by embedding AI concepts as a cross-curricular theme rather than treating AI as a separate, standalone subject. This educational strategy allows students to encounter and explore AI not only in the context of technology and computer science but also through other disciplines such as ethics, language arts, and natural sciences. By weaving AI into multiple subject areas, Finnish education encourages students to understand AI from a broader societal and humanistic perspective, fostering critical thinking about the role and impact of AI in everyday life.

Central to Finland's approach is a strong emphasis on teacher empowerment and professional development. The Finnish government has made significant investments in training and supporting educators to become confident and competent in integrating AI into their teaching practices. This includes comprehensive professional development programs that equip teachers with both the technical knowledge of AI and pedagogical strategies for responsibly guiding students in exploring AI technologies. The focus on teacher preparedness ensures that AI instruction is not only technically sound but also ethically informed and age-appropriate, allowing educators to address complex issues such as data privacy, algorithmic bias, and the societal consequences of AI deployment in a sensitive and effective manner (Haapaniemi et al., 2021).

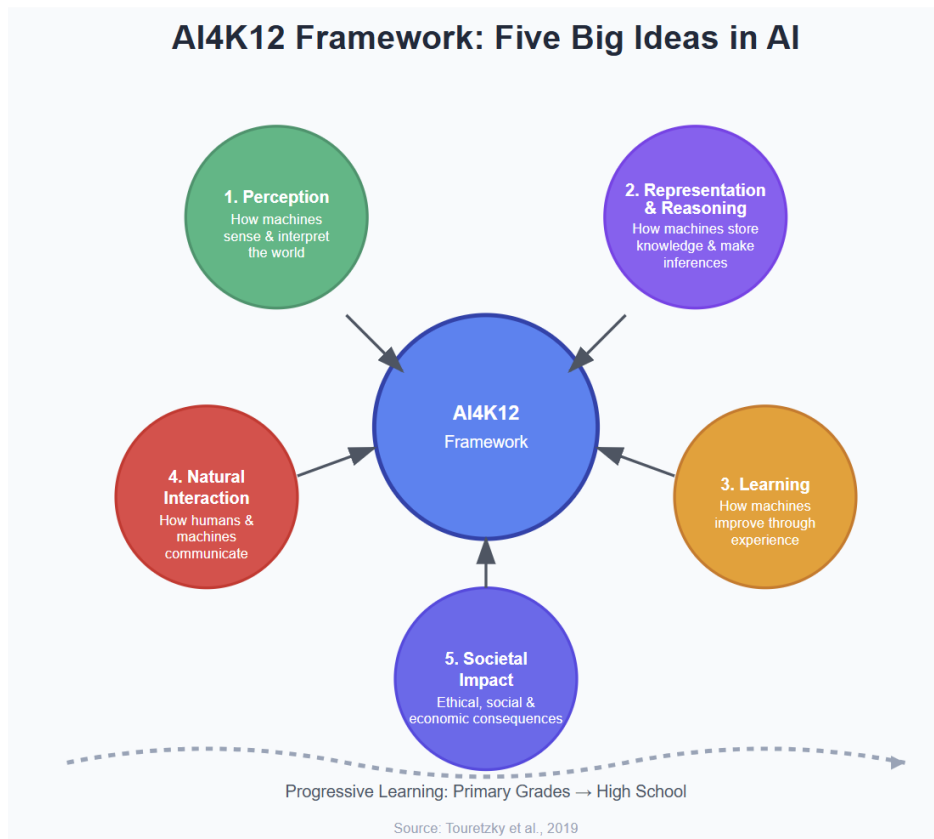
Moreover, the Finnish model prioritizes the ethical and social dimensions of AI education, reflecting the country's broader educational philosophy centered on holistic development, equity, and democratic values. Students are encouraged to critically examine how AI affects human rights, social justice, and decision-making processes, fostering a sense of responsibility and agency. This aligns with Finland's long-standing commitment to cultivating citizens who are not only knowledgeable but also ethically aware and socially conscious, preparing them to navigate and shape an AI-driven future with care and insight (Mertala et al., 2022). By integrating AI education across the curriculum with a focus on ethics and teacher empowerment, Finland exemplifies a forward-thinking model that balances technological literacy with the cultivation of critical, reflective learners.

In the United States, the AI4K12 initiative was created through a collaborative effort involving educators, researchers, and experts in artificial intelligence, with the goal of equipping K-12 students with the foundational knowledge and skills necessary to thrive in a rapidly evolving job market increasingly influenced by AI technologies. Recognizing that artificial intelligence is becoming a transformative force across virtually all industries, the initiative seeks to integrate AI education into the standard school curriculum in a way that is accessible and developmentally appropriate for students at different grade levels.

At the heart of AI4K12 is the framework known as the "Five Big Ideas in AI," which serves as the conceptual backbone for curriculum development and instruction. These big ideas include:

(1) Perception: how machines interpret the world through data; (2) Representation & Reasoning : how machines represent knowledge and draw conclusions; (3) Learning — how machines improve their performance from experience; (4) Natural Interaction : how humans and machines communicate; and (5) Societal Impact : understanding the ethical, social, and economic implications of AI. This structured framework, as illustrated in Figure 1, provides educators with clear learning goals and a progression pathway to scaffold AI concepts from early elementary grades through high school, ensuring that students build a deep and coherent understanding over time (Touretzky et al., 2019).

Figure 8: *AI4K12 Framework—Five Big Ideas*



However, the actual implementation of the AI4K12 curriculum varies widely across different states and school districts. Many states have adopted the framework with the support of targeted grants, industry partnerships, and professional development programs designed to train teachers in AI topics. These resources enable innovation in classroom practices and curriculum design, fostering engaging and relevant learning experiences. At the same time, this decentralized approach has resulted in disparities, where well-funded districts with access to partnerships and technology infrastructure are able to offer more comprehensive AI education. In contrast, under-resourced districts often face challenges such as lack of trained teachers, insufficient technology, and limited funding, which hinder the equitable distribution of AI learning opportunities (Wang et al., 2023; Yue et al., 2022). Addressing these disparities remains a key concern for policymakers and educators aiming to democratize AI literacy and prepare all students for future careers shaped by artificial intelligence.

The Republic of Korea has taken a more centralized and systemic approach. Its 2020 national AI curriculum outlines AI integration in both primary and secondary education, with a strong emphasis on computational thinking and ethical use (Zhou et al., 2022). The country has also established over 500 AI education leader schools, creating innovation hubs to incubate best practices and regional expertise. This reflects Korea's strategic aim to nurture a future-ready workforce capable of driving national innovation.

Each of these examples reflects deliberate choices grounded in national priorities. India's focus is on scale and inclusion; Finland prioritizes ethics and pedagogy; the U.S. seeks workforce readiness through flexible state-led innovation; Korea emphasizes central coordination and excellence. These nuanced implementations highlight that AI-in-education policies are not interchangeable blueprints but context-responsive frameworks. Mauritius, with its trilingual, socioeconomically diverse, and geographically compact education system, must design a localized strategy that draws inspiration from global models while adapting to its unique challenges.

Examining these international frameworks and the incorporation of Generative AI provides valuable insights into best practices, lessons learned, and promising strategies. An emphasis on digital literacy as a foundational competency resonates across these frameworks, highlighting the importance of equipping students with the skills necessary to navigate AI technologies (Long, & Magerko, 2020).

### **UNESCO Reports**

Lewis et al. (2021) have highlighted the significant contributions of UNESCO, a prominent international organization specializing in the domain of education, through its numerous reports and publications centered on information and communication technology (ICT) education and the assimilation of artificial intelligence (AI). These scholarly works offer profound perspectives into UNESCO's prescribed guidelines and approaches pertaining to the effective utilization of AI within educational environments (Holmes & Miao, 2023)

An exemplary report from UNESCO is titled "AI and education: guidance for policy-makers," which offers comprehensive guidance for policymakers aiming to incorporate artificial intelligence (AI) into education systems. The report emphasizes key aspects such as AI literacy, ethical considerations, and the cultivation of critical thinking and creativity among students. It provides specific recommendations concerning curriculum development, teacher training, and the seamless integration of AI across various subjects.

Another notable publication is the report titled "Education in the age of artificial intelligence." This report explores the emergence of EdTech as a significant phenomenon in Africa and examines Estonia as a leading example of a nation that has readily embraced digital technology in its education system. Additionally, the report delves into the case of Argentina, where an algorithm has been developed to address the issue of school dropout rates. In her publication on Education 2030, Shiohira (2021) draws attention to the transformative impact of AI automation on job roles and emphasizes the crucial role of effective policy and governance in the AI era. Shiohira's work emphasizes the profound ethical implications of AI and emphasizes the imperative of acquiring new skills to thrive in this transformative era. She goes as far as to state: "The era of artificial intelligence is young in years but advanced in impact." [pg 3, Shiohira(2021)].

The publication emphasizes the significance of lifelong learning and collaboration between educational institutions and industry stakeholders to enable ongoing upskilling and reskilling efforts (Shiohira, 2021).

When considering the potential application of Generative AI in Mauritius, it is essential to evaluate the alignment between UNESCO's recommendations and the specific context. The integration of Generative AI within educational contexts is in alignment with UNESCO's emphasis on the development of digital literacy, computational thinking, and creativity, as discussed by Tsortanidou (2022).

The emphasis on ethical considerations in artificial intelligence (AI) education by UNESCO is particularly pertinent when assessing the implementation of Generative AI in Mauritius, as articulated by Pedro et al. (2019). It is imperative to ensure that the utilization of Generative AI technologies adheres to ethical principles, such as fairness, transparency, and the protection of privacy (Gupta et al., 2024).

The ethical integration of Generative AI in education is a core focus of UNESCO's recent guidelines, which emphasize four key principles: fairness, transparency, accountability, and privacy. These principles aim to ensure that AI applications in education do not replicate or exacerbate existing societal biases or inequalities.

Fairness entails actively preventing discriminatory outcomes in AI-powered educational tools. For example, if a Generative AI system disproportionately favors English-language learners due to training data biases, it could marginalize Kreol or French-speaking students in Mauritius. Ensuring fairness requires rigorous bias audits, localized training data, and multilingual content.

Transparency involves making AI decision-making processes understandable to educators and students. In practice, this means educational platforms using Generative AI should include explainable AI components—such as dashboards that show how and why a recommendation or grade was produced. This builds trust and allows teachers to override AI-generated decisions when necessary.

Privacy is particularly sensitive in educational settings, where students' data, including behavioral patterns, learning histories, and even biometric data (e.g., facial recognition in e-learning), may be collected. UNESCO stresses the importance of strong data governance frameworks, including data minimization, encryption, and informed consent. In Mauritius, this could involve aligning educational data practices with the Data Protection Act and appointing data protection officers at school levels.

Specific safeguards and guidelines that could be implemented in Mauritius include the development of a National Ethical AI Charter for Education by the Ministry of Education in collaboration with stakeholders, which would outline clear standards for the ethical use of AI in schools. Additionally, mandatory impact assessments should be required before deploying AI systems in classrooms to evaluate potential harms or exclusions. Teacher and student training programs must also be established to build awareness and competence in digital ethics, data privacy, and algorithmic bias, ensuring responsible use and supervision. To support accountability, redress mechanisms should be put in place, allowing students and teachers to challenge or appeal AI-generated decisions, such as automated feedback or assessments. Finally, the creation of localized AI content that reflects Mauritian culture, language, and values is crucial to prevent cultural misrepresentation and ensure the relevance of AI-generated educational materials.

UNESCO also recommends interdisciplinary AI education, where ethical, social, and technical dimensions of AI are explored across subjects—an approach that dovetails with the GAM-Framework's vision to integrate AI ethics into ICT curricula at all levels. By aligning with these guidelines, Mauritius can ensure that its deployment of Generative AI in education is not only innovative but also responsible, inclusive, and equitable.

Therefore, it is essential to establish safeguards and guidelines to mitigate potential biases and ethical challenges associated with the use of Generative AI technologies (Akinrinola et al., 2024). The interdisciplinary learning approach advocated by UNESCO, which emphasizes the integration of AI across various subjects, is well-aligned with the potential application of Generative AI in Mauritius, as noted by Miao and Holmes (2021).

### **Case studies of Successful Implementations**

#### **Case Study 1: AI for K-12, United States**

According to Lee (2020), the integration of artificial intelligence (AI) in K-12 education within the United States is gaining significant attention, with a focus on cultivating computational thinking, creativity, and digital literacy skills among students. This is supported by Wang et al. (2023), who highlight the importance of the AI for K-12 Education initiative, a pivotal framework for AI integration in the United States.

From the perspective of Yue et al. (2022), this framework serves as a valuable example for other countries to consider, as it emphasizes the necessity of aligning AI integration with ethical principles and guidelines, such as fairness, transparency, and respect for privacy.

The successful integration of AI in K-12 education in Mauritius requires careful consideration of the various components of the AI for K-12 Education initiative and the identification of potential gaps and challenges in the local context. As Crompton (2022) notes, these challenges may include the need to invest in infrastructure and technology, build teacher capacity and provide professional development opportunities, and ensure that AI integration is aligned with ethical principles and guidelines.

To address these challenges, Mauritius can draw on the experiences of other countries, such as the United States, and develop a framework for AI integration that is tailored to the specific needs and priorities of the local context. This may involve a range of strategies, such as investing in teacher training programs, developing partnerships with technology companies, and establishing ethical guidelines and standards for AI integration in schools.

#### **Case Study 2: New Education Policy 2020, India**

According to Aithal and Aithal (2020), the National Education Policy (NEP) 2020 of India addresses key challenges in the education sector such as rote learning, rigid academic structures, inequitable access, low learning outcomes, outdated curricula, and inadequate teacher training. It aims to transform the system by promoting conceptual understanding, foundational literacy and numeracy, vocational integration from early grades, and continuous professional development for educators. At the same time, the policy creates new opportunities by encouraging holistic, multi-disciplinary learning; incorporating Early Childhood Care and Education (ECCE); leveraging educational technology and platforms like DIKSHA; promoting instruction in regional languages; internationalizing higher education; and fostering a culture of research and innovation through initiatives such as the National Research Foundation. Collectively, NEP 2020 represents a paradigm shift towards a more inclusive, flexible, and future-ready education system (Das et al., 2023). This policy is a good example for Mauritius to learn from, as it promotes a more holistic and student-centered approach to education, with a focus on developing critical thinking, creativity, and problem-solving skills (Sharma et al., 2022).

One of the key components of NEP 2020 is the implementation of a flexible, multidisciplinary structure through the 5+3+3+4 curricular framework, which replaces the old 10+2 model. This structure aligns with children's cognitive development and allows early exposure to a range of disciplines including arts, sciences, and vocational subjects (Aithal & Aithal, 2020; Sharma et al., 2022). For instance, vocational training, coding, and internships are introduced from Grade 6 to develop practical and future-ready skills (Ambar et al., 2021). In higher education, the policy enables students to select interdisciplinary combinations of majors and minors and adopt a Multiple Entry and Exit System (MEES), promoting greater academic flexibility (Joshi & Somani, 2021). NEP 2020 also emphasizes digital literacy and technology-enhanced learning by leveraging platforms like DIKSHA, SWAYAM, and the proposed National Digital Educational Architecture (NDEAR) to deliver personalized learning and expand access in underserved regions.

### **Case Study 3: AI Integration in National Curriculum, Finland**

Finland's integration of Artificial Intelligence (AI) in their national curriculum is a notable example of how AI can be leveraged to enhance teaching and learning, and it is a good example for Mauritius to learn from. In Finland, AI is integrated into the curriculum as a cross-cutting theme, rather than as a standalone subject. This approach allows students to develop a more holistic understanding of AI, and to apply their knowledge and skills in a variety of contexts (Wittka, 2020).

One of the key strengths of Finland's approach to AI integration is the emphasis on promoting ethical and responsible AI use. The curriculum includes a focus on the ethical and social implications of AI, and on promoting the development of ethical and responsible AI applications (Mertala et al., 2022). This is particularly important as AI systems, including Generative AI, can perpetuate biases and raise privacy concerns if not implemented responsibly.

Another important component of Finland's approach to AI integration is the emphasis on building teacher capacity and providing professional development opportunities (Haapaniemi et al., 2021). The Finnish government has invested heavily in training and development programs for teachers, to ensure that they have the skills and knowledge needed to effectively integrate AI in the classroom. This is crucial, as teachers play a pivotal role in guiding students in the responsible use of AI technologies.

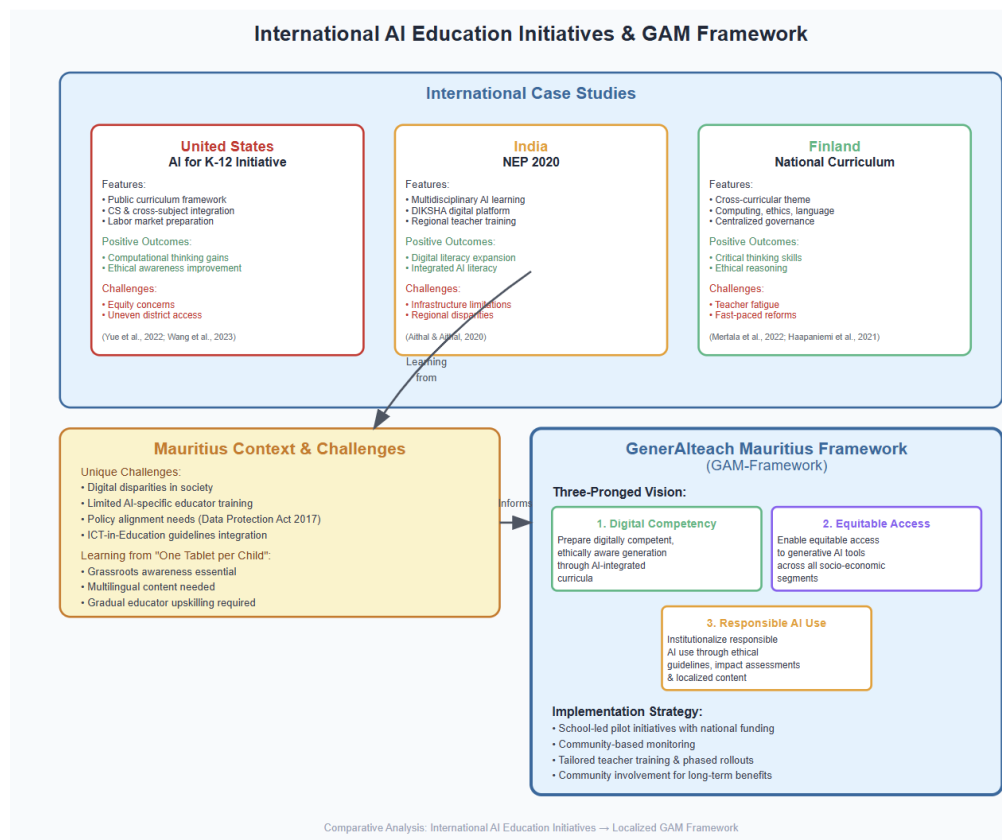
As evidenced in the above three scenarios, the U.S. AI for K-12 Initiative includes a publicly accessible, detailed curriculum framework co-developed by researchers and educators, aimed at embedding AI concepts in computer science and other subjects from early schooling. This policy was driven by the need to prepare students for a labor market increasingly dependent on AI technologies. Early evaluations of this program (Yue et al., 2022; Wang et al., 2023) show promising gains in students' computational thinking and ethical awareness, but also note equity concerns due to uneven access across districts. Similarly, India's NEP 2020 emphasizes multidisciplinary AI learning through digital platforms like DIKSHA and integrates AI literacy through regional teacher training efforts (Aithal & Aithal, 2020). Finland, often considered a benchmark, has integrated AI into its national curriculum as a cross-curricular theme. This means students explore AI concepts not just in computing but in social studies, ethics, and language, with positive feedback on students' critical thinking abilities and ethical reasoning (Mertala et al., 2022). Yet, Finnish researchers have cautioned about teacher fatigue due to fast-paced digital reforms (Haapaniemi et al., 2021).

If contrasted to the local context, it can be asserted that Mauritius faces unique infrastructural and sociocultural challenges, including digital disparities in the society, limited AI-specific training for educators, and the need for policy frameworks aligned with the Data Protection Act (2017) and existing ICT-in-Education guidelines. These differences necessitate a localized adaptation of international strategies. For example, while Finland leverages centralized governance for curriculum alignment, Mauritius would benefit more from school-led pilot initiatives backed by national funding and community-based monitoring. The “One Tablet per Child” policy has shown that Mauritian implementations require grassroots awareness, multilingual content, and gradual upskilling of educators to succeed.

This paper's proposed GenerAIteach Mauritius Framework (GAM-Framework) incorporates these comparative lessons with contextual realities. The phrase "establish a clear vision" has now been operationalized into a three-pronged vision: (1) to prepare a digitally competent, ethically aware generation through AI-integrated curricula, (2) to enable equitable access to generative AI tools across all socio-economic segments, and (3) to institutionalize responsible AI use through clear ethical guidelines, impact assessments, and localized digital content.

By presenting successful international implementations with noted benefits (e.g., increased digital literacy, ethical awareness) and drawbacks (e.g., infrastructure strain, bias propagation), this study offers concrete pathways for Mauritius. It also outlines how local adaptation—through tailored teacher training, community involvement, and phased rollouts—can mitigate risks and incentivize long-term, inclusive benefits.

Figure 9: Comparative Analysis :International AI Education Initiatives



These outcomes, as can be seen in Figure 2 above, highlight the potential benefits of integrating Generative AI in ICT education in Mauritius. However, challenges have emerged, including the need to ensure teachers' competence in AI education, adapt curriculum materials to evolving AI technologies, and address potential biases and ethical considerations associated with Generative AI. These challenges should be taken into account in the Mauritian context to ensure successful implementation.

### **Ethical Considerations in Integrating Generative AI in ICT Education**

According to the research by Farrelly and Baker (2023), the integration of Generative AI in ICT education necessitates a thorough examination of the ethical implications and considerations associated with its use. This discussion aims to explore the multifaceted ethical concerns that arise in educational settings when employing Generative AI, while drawing insights from the attached Mauritius AI Strategy. The responsible integration of Generative AI requires addressing issues such as data privacy, algorithmic bias, and student autonomy, as highlighted by Bozkurt and Sharma (2023).

The research by Arinushkina (2024) suggests that data privacy assumes paramount importance when employing Generative AI in educational settings. As Generative AI systems typically rely on extensive datasets for training, it becomes imperative to ensure that student data utilized in these systems is handled securely and in accordance with relevant data protection regulations. Ajabani and Da Chen (n.d.) emphasize the need to establish robust safeguards to protect the privacy and confidentiality of student information, thereby fostering an environment characterized by responsible data management. This approach aligns with the recommendations put forth by Nguyen et al. (2023).

Ferrara (2023) states that another critical ethical consideration revolves around algorithmic bias inherent in Generative AI systems. Arora et al. (2023) point out that these systems learn from existing datasets, which may inadvertently reflect biases and prejudices. Tanvir and Horrocks (n.d) emphasize that the deployment of Generative AI in educational settings necessitates a proactive approach to address algorithmic bias. Karan and Angadi (2023) suggest achieving this through meticulous curation of training data, regular monitoring and evaluation of system outputs, and active mitigation of any biases that surface. By actively countering bias, educational institutions, as emphasized by RADWAN and MCGINTY (2024), can foster fairness and inclusivity in the utilization of Generative AI.

Preserving student autonomy is a fundamental ethical principle that should be upheld when integrating Generative AI in education (Berendt et al., 2020). Although Generative AI technologies provide valuable opportunities for learning and fostering creativity, it is crucial to find a harmonious equilibrium between harnessing AI tools and nurturing students' abilities for critical thinking, creativity, and independent decision-making (Smyrnaoui et al., n.d). Tang and Su (2024) argue that respecting student autonomy entails ensuring that AI systems enhance and complement students' agency and individuality in the educational process, rather than replacing them.

To address these ethical concerns, the formulation of comprehensive guidelines and recommendations for the responsible use of Generative AI in ICT education in Mauritius is recommended. These guidelines should prioritize transparency, ensuring that educators and institutions are forthcoming about the purpose, functionality, and potential impact of Generative AI systems on student learning experiences. Obtaining informed consent from students and their parents or

guardians before utilizing their data in Generative AI systems is also crucial. This entails providing clear explanations regarding the usage, storage, and protection of student data.

Continuously monitoring and evaluating Generative AI systems is vital to identify and rectify algorithmic biases or unintended consequences. Regular audits should be conducted to ensure fairness, accuracy, and ethical use of AI technologies. Additionally, it is essential to prioritize education and awareness by providing appropriate training and resources to educators and students. This education should encompass an understanding of the ethical implications, limitations, risks, and societal impact of Generative AI, fostering a culture of responsible and ethical AI practices within the educational community.

## **Proposed Framework**

### **GenerAIteach Mauritius Framework (GAM-Framework)**

The GenerAIteach Mauritius Framework (GAM-Framework) is a remarkable blueprint for integrating Generative AI into the heart of ICT education in Mauritius. Drawing inspiration from the successful implementation of AI education frameworks in countries like Japan, India, and the United Kingdom, this conceptual guide has been meticulously tailored to the unique educational landscape of Mauritius.

Visualize it as a thriving tree, its roots firmly grounded in international best practices, yet its branches reaching skyward, adapting to the distinct needs and challenges of the Mauritian context. This framework is not merely a static set of guidelines, but rather a living, breathing entity—one that will grow and evolve alongside the students, educators, and the education system as a whole.

Through this framework, Mauritian students will be empowered to harness the potential of Generative AI, exploring its creative and analytical capabilities while navigating the complex ethical considerations that come with these powerful technologies. It's a blueprint that not only addresses the practical implementation of AI-driven pedagogies but also cultivates a deep understanding of the societal impact and responsible use of these transformative tools.

Metaphorically, the GAM-Framework is a testament to the dynamism and adaptability of Mauritius's educational landscape. It is a living, breathing entity that will continue to evolve and grow, shaping the future of ICT education and empowering the learners of today to become the innovators of tomorrow.

### **Implementation Roadmap**

To translate its vision into practical outcomes, the GAM-Framework proposes a phased, five-year roadmap for implementation. In the first year, priority will be given to broad stakeholder consultations, the co-design of pilot projects, and the development of foundational teacher training modules. The second year will see these pilots launched in selected schools—balancing urban, rural, and island contexts—alongside the first wave of teacher certifications and the early deployment of prototype AI tools adapted for local languages and low-bandwidth environments. By the third year, the revised curriculum incorporating Generative AI concepts will be rolled out nationally, supported by scaled-up teacher development and the introduction of locally trained, multilingual AI applications such as chatbots, simulators, and content creation tools. In the fourth year,

the framework will undergo a rigorous evaluation to measure impact and refine strategies, coinciding with the formal launch of the National AI Ethics Charter for Education. The final year will consolidate these gains, integrating Generative AI fully into the national ICT education policy and setting the stage for continuous improvement based on emerging trends and stakeholder feedback. This phased approach ensures that the integration of Generative AI remains systematic, inclusive, and responsive to Mauritius’s evolving educational landscape( See Illustration of Timeline at Figure 3).

Figure 10: Proposed Timeline

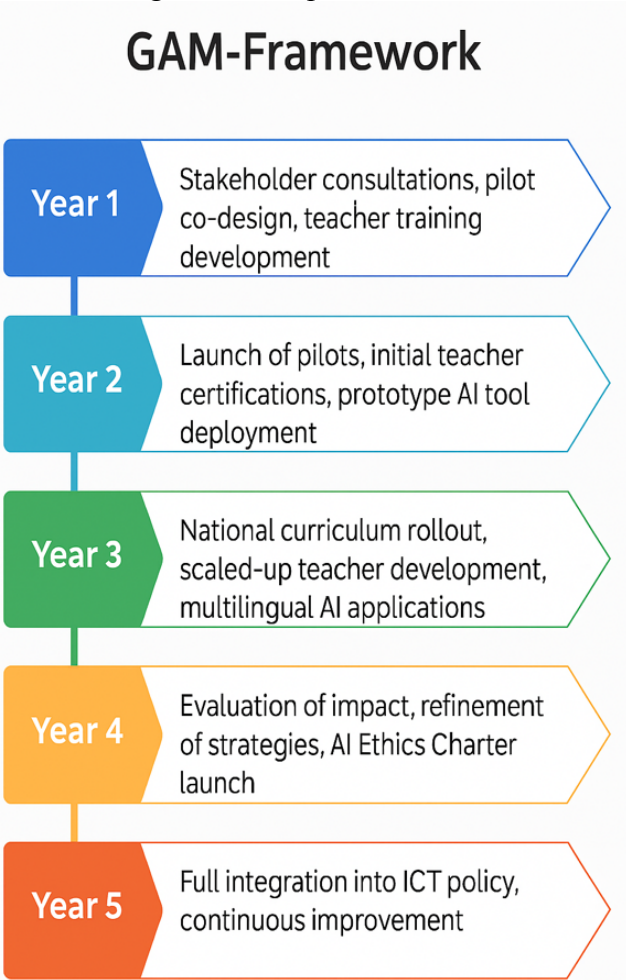


Figure 11: *Tree Representation of the Proposed GAM Framework*

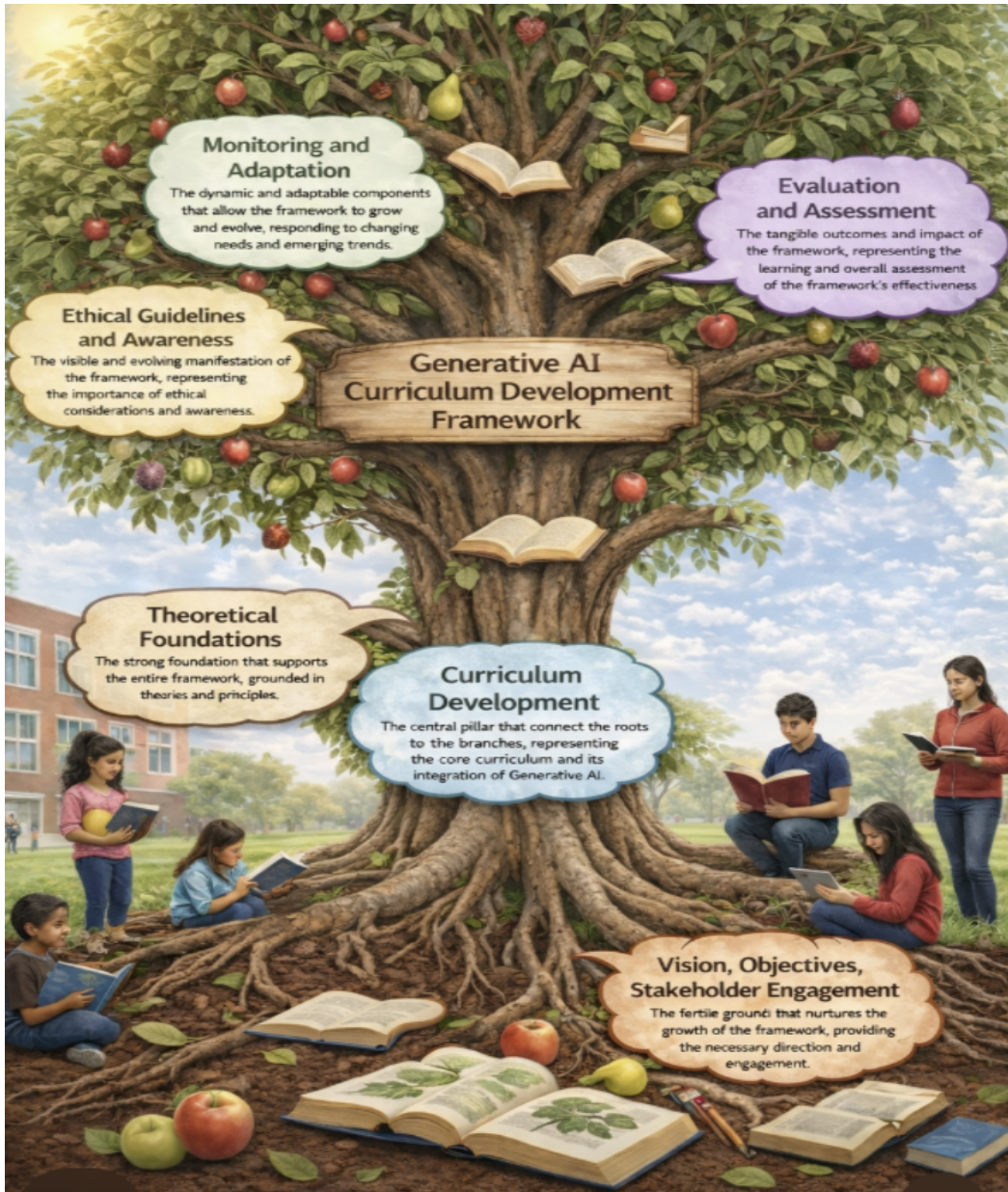


Table 1: *Components of the GAM-Framework*

<p>Vision and Objectives</p>	<ul style="list-style-type: none"> <li>• The vision of the GenerAIteach Mauritius (GAM) Framework is to create an inclusive, future-ready ICT education ecosystem in Mauritius by responsibly integrating Generative AI technologies into teaching and learning. This vision aligns with international frameworks such as the UNESCO AI in Education Guidance for Policymakers,</li> </ul>
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	<p>the European DigCompEdu Framework, and the AI4K12 initiative, while remaining rooted in national priorities defined by Mauritius’s National ICT Policy, Digital Mauritius 2030 Strategic Plan, Data Protection Act 2017, and Ministry of Education’s ICT-in-Education roadmap. The framework envisions:</p> <p>A digitally empowered generation equipped with AI literacy, computational thinking, and ethical reasoning.  Equitable access to <i>AI-powered tools</i> and resources for <i>learners and educators</i> across all regions and socio-economic backgrounds in Mauritius.  The institutionalization of <i>ethical AI practices</i> through robust governance, localized content, and culturally relevant applications of Generative AI.</p> <ul style="list-style-type: none"> <li>● Define objectives that focus on fostering creativity, critical thinking, problem-solving skills, and ethical understanding among students.</li> </ul>
Stakeholder Engagement	<ul style="list-style-type: none"> <li>● Engage educators, policymakers, industry experts, researchers, students, and parents in a collaborative process.</li> <li>● Facilitate discussions, workshops, and forums to gather diverse perspectives and incorporate valuable insights into the framework.</li> </ul>
Policy and Governance	<ul style="list-style-type: none"> <li>● Develop policies and governance frameworks that address ethical considerations, data privacy, and responsible AI use in the Mauritian educational context.</li> <li>● Align the framework with existing national policies such as the Mauritius National ICT Policy and the Digital Mauritius Strategic Plan 2030 (Central Informatics Bureau, n.d.), which includes a dedicated section on education and digital transformation, the Data Protection Act 2017, ensuring ethical and privacy-conscious AI use in schools, and ongoing initiatives such as the “One Tablet per Child” programme, which enhance digital equity.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>● Successful implementation of the GAM-Framework requires collaboration among education authorities, policymakers, schools, and industry partners.</li> <li>● Adequate resources, including funding, infrastructure, and training programs, are essential.</li> </ul>

	<ul style="list-style-type: none"> <li>● Regular monitoring, evaluation, and adaptation ensure the framework remains relevant and effective.</li> </ul>
Curriculum Development	<ul style="list-style-type: none"> <li>● The revised ICT curriculum in Mauritius should incorporate key Generative AI concepts such as machine learning basics, natural language processing, and prompt engineering, alongside essential ethical topics like algorithmic bias, data privacy, and fairness. Applications integrated into the curriculum can include chatbots, AI-powered content creation tools, language translation, simulations, and AI-assisted coding platforms. Students should develop skills in critical thinking, ethical reasoning, creativity, and responsible use of AI tools.</li> <li>● Learning outcomes should focus on understanding how generative AI works, using AI to support digital creativity and collaboration, and evaluating the ethical implications of AI in society. Lesson plans and assessments should be contextually adapted to the Mauritian environment, using localized examples and open-source AI platforms to ensure accessibility and cultural relevance.</li> </ul>
Teacher Training and Professional Development	<ul style="list-style-type: none"> <li>● Provide comprehensive training programs and professional development opportunities for educators in Mauritius.</li> <li>● Equip them with the necessary knowledge, pedagogical strategies, and technical skills to effectively teach Generative AI concepts.</li> </ul>
Infrastructure and Resources	<ul style="list-style-type: none"> <li>● Ensure schools in Mauritius have access to the necessary infrastructure, including hardware, software, and internet connectivity, to support Generative AI integration.</li> <li>● Identify resource requirements and facilitate their procurement.</li> </ul>
Collaboration and Partnerships	<ul style="list-style-type: none"> <li>● Forge partnerships with industry stakeholders, research institutions, and universities in Mauritius to leverage their expertise, resources, and real-world applications of Generative AI.</li> <li>● Encourage collaboration through joint projects, internships, and mentoring programs.</li> </ul>
Ethical Guidelines and Awareness	<ul style="list-style-type: none"> <li>● Develop ethical guidelines specific to Generative AI in the Mauritian context.</li> </ul>

	<ul style="list-style-type: none"> <li>● Raise awareness among educators, students, and parents about ethical considerations, algorithmic bias, and privacy concerns associated with Generative AI.</li> </ul>
Evaluation and Assessment	<ul style="list-style-type: none"> <li>● Implement an evaluation and assessment framework to measure the effectiveness and impact of Generative AI integration in Mauritius.</li> <li>● Regularly assess students' knowledge, skills, and ethical understanding related to Generative AI.</li> </ul>
Monitoring and Adaptation	<ul style="list-style-type: none"> <li>● Establish mechanisms for monitoring the implementation of the framework and gathering feedback from stakeholders.</li> <li>● Continuously evaluate and adapt the framework based on emerging trends, educational needs, and technological advancements.</li> </ul>
Target Audience	<ul style="list-style-type: none"> <li>● The GAM-Framework caters to educators, policymakers, school administrators, and stakeholders involved in ICT education in Mauritius.</li> <li>● It aims to guide their efforts in integrating Generative AI responsibly and effectively.</li> </ul>
Gaps Filled	<ul style="list-style-type: none"> <li>● The GAM-Framework addresses the gaps in Generative AI integration in ICT education in Mauritius.</li> <li>● It provides guidance on policy development, curriculum design, teacher training, infrastructure requirements, ethical considerations, and evaluation mechanisms.</li> </ul>

**Operationalizing the Vision**

To ensure that the vision of the GAM-Framework moves beyond aspiration into actionable reality, this framework commits to concrete, measurable targets grounded in educational technology implementation research. Within the first three years, it aims to ensure that at least 30% of the secondary-level ICT curriculum meaningfully integrates Generative AI concepts and applications. This target is strategically realistic given that while research shows that 48.9% of studies have integrated technology across all knowledge areas, these represent optimal research conditions, and the International Computer and Information Literacy Study (ICILS 2018) found that less than 50% of participating teachers reported frequent technology use for teaching. The 30% figure allows for a quality-over-quantity approach, enabling focused implementation in core ICT subjects first while building expertise and resources for gradual scaling.

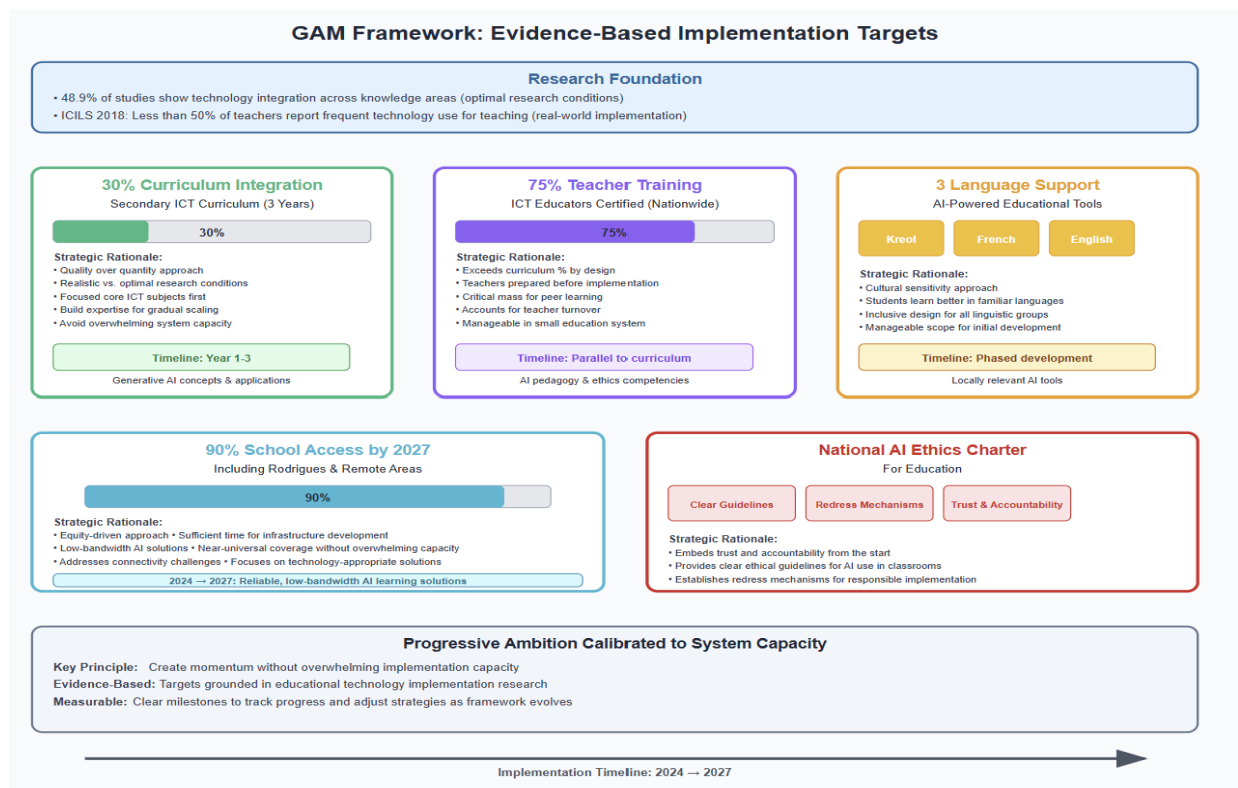
Simultaneously, a nationwide teacher training drive will equip a minimum of 75% of ICT educators with certified competencies in AI pedagogy and ethics. This ambitious target exceeds the curriculum integration percentage by design, ensuring teachers are prepared before implementation and creating the critical mass necessary for peer learning and mentorship. The 75% threshold

accounts for teacher turnover and ensures continuity, while being manageable within Mauritius's relatively small education system.

Recognizing Mauritius's diverse linguistic landscape, the framework prioritizes the development of at least three locally relevant AI-powered educational tools that support Kreol, French, and English. This trilingual approach reflects cultural sensitivity and practical necessity, ensuring students learn better in familiar languages while maintaining manageable scope for initial development.

Equally vital is bridging the digital divide: by 2027, the goal is for 90% of schools, including those in Rodrigues and remote areas, to have access to reliable, low-bandwidth AI learning solutions. This equity-driven target provides sufficient time for infrastructure development while focusing on technology-appropriate solutions suitable for Mauritius's connectivity challenges. The 90% threshold ensures near-universal coverage without overwhelming the system's capacity for change.

Figure 12: *Proposed Implementation Plan*



To embed trust and accountability, a National AI Ethics Charter for Education will also be established, setting clear guidelines and redress mechanisms for the ethical use of AI technologies in Mauritian classrooms. These evidence-based targets provide clear milestones to track progress and adjust strategies as the framework evolves, demonstrating progressive ambition calibrated to create momentum without exceeding the system's implementation capacity.

### Limitations and Considerations

The successful implementation of the GAM-Framework in Mauritius, integrating Generative AI in ICT education, requires careful consideration of various factors. Resource limitations,

including funding for infrastructure, training programs, and curriculum development, need to be assessed to ensure adequate support for the integration process. Access to reliable technology infrastructure, such as hardware, software, and internet connectivity, is essential for effective integration, enabling hands-on learning experiences and practical application of Generative AI concepts in Mauritian schools. Furthermore, the capacity and expertise of teachers are crucial, necessitating the provision of adequate training programs and professional development opportunities to ensure their readiness to effectively teach Generative AI concepts. Ethical considerations, encompassing issues like algorithmic bias, privacy concerns, and responsible AI use, should be addressed through clear ethical guidelines within the framework, fostering students' understanding of the ethical implications of Generative AI.

Developing an evaluation and assessment framework is important to measure the effectiveness and impact of Generative AI integration, considering appropriate assessment methods that evaluate students' knowledge, skills, and ethical understanding in the context of Generative AI.

Given the rapidly evolving nature of AI, regular updates and revisions to the framework are necessary to keep pace with emerging trends and maintain its relevance within the Mauritian educational context. Collaboration among stakeholders, including educators, policymakers, industry partners, and researchers, is vital for the successful implementation, requiring effective communication and engagement strategies to ensure the active involvement of all relevant parties.

By addressing these limitations and considerations, the GAM-Framework can overcome challenges and provide a solid foundation for integrating Generative AI in ICT education in Mauritius.

## **Contextual Situation in Mauritius**

Mauritius can be seen embracing AI as a pivotal force in driving its economic growth and technological advancement. The GAM-Framework will be strategically aligned with the country's vision to prepare its students for the challenges and opportunities of an AI-driven future.

Crucially, this framework addresses the unique needs and obstacles within Mauritius's education system. It goes beyond mere technical skill-building, focusing on cultivating critical thinking, creativity, and a deep ethical understanding of Generative AI technologies. This holistic approach ensures that Mauritian learners are not only proficient in AI-powered tools but also equipped to navigate the complex societal implications of these transformative innovations.

## **Why Mauritius Needs a Localized Approach**

Mauritius's unique cultural, linguistic, and infrastructural context makes a one-size-fits-all adoption of international AI-in-education frameworks impractical. Unlike larger countries with homogeneous populations, Mauritius's trilingual society, where Kreol, French, and English as well as other Asian languages coexist in daily life and classrooms, necessitates AI tools and content that are genuinely multilingual and culturally resonant. While countries like Finland benefit from robust, widespread digital infrastructure, certain schools in Mauritius still face intermittent internet access and bandwidth constraints, especially in outer islands. This reality demands low-bandwidth and offline-friendly AI applications to ensure equitable access. Additionally, any AI-generated educational content must reflect local cultural values, economic activities such as tourism and the sugar industry, and even unique environmental factors tied to the island's ecosystems. By tailoring

the GAM-Framework to these local conditions, Mauritius can avoid the pitfalls of importing external models wholesale and instead build an ICT education ecosystem that is inclusive, practical, and relevant for all Mauritian learners.

As Ge et al. (2024) astutely observed, accounting for cultural and contextual differences is paramount for the successful implementation of the AI frameworks within any local societal landscape:

Yet, how cultures shape people's views of AI and its potential has not received significant empirical attention. This lack of attention to culture in AI theory and design limits the space of the imaginary, and in particular, people's ideas about how humans and artificial agents might interact. (Introduction, p. 2)

Tailoring the framework's content and examples to reflect the Mauritian context and incorporating local cultural values and perspectives can enhance its relevance and effectiveness. Given that Mauritians come from different cultural milieus, it is essential to adapt the framework's content and examples to reflect the unique Mauritian context.

This justifies the inclusion of multilingual chatbots, locally trained language models, and translation apps that empower students to learn and create in their language of choice. Moreover, unlike larger countries with homogeneous school systems, Mauritius must balance equity across all educational institutions, which makes offline-friendly and low-bandwidth AI applications essential—an insight drawn from but adapted beyond India's NEP 2020 and Finland's infrastructure-rich approach. Similarly, AI-integrated learning activities in Mauritius should reflect local realities, such as using environmental data from island ecosystems, generating tourism-related media, or exploring the impact of AI on local industries like sugar, ICT-BPO, and hospitality. Ethical education must also be rooted in Mauritian values, such as community solidarity, cultural pluralism, and environmental stewardship. These contextual needs explain why the GAM-Framework selectively draws from international examples like AI4K12 (U.S.), NEP 2020 (India), and Finland's cross-curricular integration—but filters them through a Mauritian lens. Rather than a copy-paste adoption, this framework can be considered as contextual translation, positioning AI education not just as a tool for skills development but as a culturally embedded driver of national innovation and equity.

### **Future Directions and Final Words**

The potential impact of integrating Generative AI in enhancing ICT education in Mauritius is profound and far-reaching. By harnessing the transformative power of AI-driven technologies, the education system in Mauritius can empower students to develop a truly innovative and future-proof skill set.

At the heart of this integration lies the opportunity to nurture creativity, critical thinking, and problem-solving abilities in students. Generative AI can serve as a catalyst for boundless imagination, challenging students to push the boundaries of what is possible. Through AI-driven projects and challenges, learners can engage in active, dynamic learning experiences, fostering the skills that will be essential for navigating an ever-evolving digital landscape.

Moreover, the integration of Generative AI in ICT education must be accompanied by a deep understanding of the ethical considerations surrounding these technologies. By cultivating a

strong ethical foundation, students can become responsible users and developers of AI, recognizing the societal impact and potential pitfalls of these powerful tools. This holistic approach will equip the next generation of Mauritian leaders and innovators with the wisdom and foresight to shape a future where technology serves the greater good.

Future research in this domain should delve deeper into the practical implementation of Generative AI in the Mauritian education system. This includes the development and refinement of the GAM Framework, a robust and adaptable approach to integrating AI-driven learning experiences. Rigorous piloting and evaluation of these frameworks in real-world educational settings will be crucial, as will addressing any challenges or barriers to implementation.

Equally important is the exploration of the long-term impact of AI integration on students' learning outcomes, employability, and societal development. By tracing the trajectories of students who have benefited from this transformative approach to education, researchers can uncover the true power of Generative AI to shape the future of Mauritius.

Realizing the full potential of Generative AI in ICT education will require a collaborative effort, with educators, policymakers, industry partners, and researchers working in harmony. Continuous engagement and dialogue among these stakeholders will be essential, fostering a shared vision and mutual understanding of the challenges and opportunities that lie ahead. By embedding clear targets, context-driven adaptations, and a phased roadmap, the GAM-Framework transforms its vision from a broad aspiration into a tangible, actionable plan that addresses Mauritius's unique challenges and opportunities in the age of Generative AI.

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