The Framework of Innovation in Curricula for 21st Century: Building Nations

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Abstract

This paper offers the framework of innovation in curricula for the 21st Century, visioning towards the building of nations by promoting and involving all the citizens towards the enhancement of required skills, essential for the 21st Century. It serves as the national written curricula that works for every person living in a country, looking towards a unified goal. This research purely focused on reviewing literature, identifying independent, dependent, and moderating variables, and offering a comprehensive framework that integrated Artificial Intelligence (AI) linked to the fifth industrial revolution (Industry 5.0) while incorporating 21st Century Skills, encompassing literacy skills, learning skills, and life skills. The framework included four types of curricula: Explicit (existing written curriculum of any educational institution), Social (social media applications) curriculum [unwritten], Phantom (print, electronic and voice media) curriculum [unwritten], and Concomitant (based on families) curriculum [unwritten]. There were two steps for the development of the framework. Step number 1 focused on revising the Explicit curriculum for all the educational institutions in the country using the Magic Triangle that is a learning design framework consisting of objectives, learning activities, and assessments, utilized to integrate AI-powered tools with the Explicit curriculum. As a sample, AI-powered tools were integrated to the subjects of English (writing and speaking skills) and Information Technology (Microsoft Excel). Collaboration among teachers, students, administrators, and technical personnel was crucial in finding, purchasing, and integrating AI tools. The framework suggested that if budget constraints arose, in-house solutions such as prompts from ChatGPT's free version could be developed and used. Overall, the processes of national written curriculum were monitored and controlled by 'National Authority of Innovation in Curricula' that also worked as a communication channel between different institutions of the country. The framework recommended that the authority could collaborate with specialized tertiary institution(s) for the formulation of policies and procedures towards curriculum innovation or proceed independently, and collaborate with all the private and public preschools, schools, colleges, and universities to integrate AI into curricula, while educational institutions could also independently adopt AI tools in line with global standards and inform the authority accordingly; revision of curricula for all the educational institutions with AI-powered tools was paramount. Step number 2 involved the national authority with private and public preschools, schools, colleges, universities and other educational institutions towards innovation in curricula through the inclusion of 21st Century skills within their educational materials, develop written curricula, policies, procedures, strategies and guide lines for social media, print, electronic and voice media, and families across the country focusing on 21st Century skills, promoting awareness and involving all the citizens towards its implementation. During step number 2, the revised AI-integrated Explicit curriculum was aligned with the other three types of curricula (Social, Phantom and Concomitant) along with 21st Century Skills including critical thinking, creativity, collaboration, communication, information and media literacy, technological literacy, flexibility, leadership and social skills. The framework was named AIESPC21 derived from the first letter of each component where 'AI' stands for Artificial Intelligence, 'E' for Explicit, 'S' for Social, 'P' for Phantom, 'C' for Concomitant, and '21' for 21st Century Skills. Therefore the AIESPC21 framework offered a solution to foster national development and well-being of citizens through unified teamwork directed towards a shared goal.

Keywords: 21st Century Skills, Artificial Intelligence, AI Tools, Concomitant Curriculum, Explicit Curriculum, Industry 5.0, Innovation in Curricula, Magic Triangle, Phantom Curriculum, Social Curriculum

1. Introduction

The 21st Century requires the development of innovative curricula to equip students and citizens with the skills required for national development and overall success as a nation. These skills include future readiness, holistic development, global competitiveness, and the promotion of innovation. By embracing these benefits, the nation can effectively prepare learners and citizens to thrive in the 21st Century and contribute to the inclusive development and accomplishment.

Innovation plays a critical role in the development and progress of nations, encompassing both developed and developing economies. Existing research has identified some of the key factors influencing innovation for national development, such as green growth, natural resources, urbanization, economic recovery, and public policy promoting collaboration between industries in research and development. These studies have emphasized diverse areas that target specific capacities, but there is a need to consider the entire populace as inclusive stakeholders.

The 21st Century's technological advancements have brought about significant transformations in the global landscape, introducing novel hi-tech skills and job requirements. Artificial Intelligence (AI) has become an integral part of daily life, altering the way people operate. Integrating AI in education has become essential to prepare students for future job opportunities in the AI-driven world. Different countries have begun implementing AI programs in their education systems, with Singapore, Hong Kong, Japan, and Korea leading the way. However, previous research reveals that the integration of AI within curricula remains a challenge, and educators need to comprehend AI's impact on education to effectively equip students for a future dominated by AI technologies towards 21st Century.

Research Questions:

a) What are independent, dependent and moderating variables that can contribute to the development of a framework towards innovation in curricula for 21st Century, keeping in view 21st Century skills?
b) How can a structured technological integration (AI integration with curricula) be implemented within the existing curricula of educational institutions to address the challenge highlighted in previous research, pointing towards the integration of AI into curricula?
c) What could be the strategies of integrating AI tools across various subjects with in an educational institution; such as English (writing and speaking skills) and Information Technology (Microsoft Excel) as samples?
d) How can all citizens of a country be involved as stakeholders towards innovation in curricula through 21st Century Skills?

Therefore, this paper aims to explore the development of an innovative curricular framework for the 21st Century, with a focus on 21st Century skills. It seeks to identify independent, dependent, and moderating variables that contribute to this framework's formulation. Additionally, the research aims to investigate the implementation of structured technological integration, specifically AI integration, within existing educational institution curricula to address challenges highlighted in prior research related to AI integration. It also intends to examine strategies for integrating AI tools into various subjects within an educational institution, using English (writing and speaking skills) and Information Technology (Microsoft Excel) as samples. Lastly, it aims to explore inclusive approaches to involve all citizens of a country as stakeholders, promoting innovation in curricula through the use of 21st Century Skills.

Next parts of the paper are providing the details of 'Literature Review', 'Methodology', 'Independent, Dependent and Moderating Variables of the AIESPC21 Framework', 'The

AIESPC21 Framework of Innovation in Curricula for 21st Century', 'Findings and Discussion', 'Conclusions and Future Work' and 'References'.

2. Literature Review

2.1. Curriculum/Curricula

In the field of education, a curriculum is commonly termed as the complete range of student experiences that take place within the educational journey (Kelly, 2009).

The term curriculum is used for an organized order of teaching and structured engagement of students with instructional information, resources used to assess the intended learning outcomes of educational goals (Adams, 2003). Therefore, a curriculum is what an educational intuition attempts to teach; curricula is the plural form of the word curriculum.

2.2. Explicit Curriculum

The major type of curriculum is explicit curriculum. It is also known as overt or written curriculum. The explicit curriculum relates to the formal instructional elements that are explicitly selected and integrated into the educational process. This includes written instructional papers, handouts, textbooks, videos, and additional teaching materials that are deliberately selected to support the objectives of an educational organization (Srivastava, 2005).

2.3. Social Curriculum

According to Cortes (1981) Societal or Social Curriculum is an informal curriculum collectively linked to family members, neighbours, peers and people or entities those are connected with the learners (people) socially. Today, YouTube, Facebook, and WhatsApp are the examples of social curriculum.

2.4. Phantom and Concomitant Curriculum

Other types of curriculum stated by Srivastava (2005) are as follows:

- Phantom curriculum: This type of curriculum is linked to print, electronic and voice media.
- Concomitant curriculum: refers to what is communicated or emphasized within the home environment or through experiences that are connected to the family. These experiences are either a direct part of the family's interactions or are approved by the family.

2.5. 21st Century Skills

In today's rapidly changing world, it is important to possess a various range of skills for success and adaptability. These skills, known as 21st Century skills, extend beyond conventional academic knowledge and encompass a wide range of abilities. According to Educart (2022) there are three major areas of 21st Century Skills, including learning skills (4Cs: critical thinking, creativity, collaboration and communication), literacy skills (information, media, and technology) and life skills (flexibility, leadership and social skills). The detailed areas of 21st Century skills are universally known and utilized in different areas of life, and requires a logical categorization, such as, for learning skills, logical classification can be as follows for four areas (Greenstein, 2012; Team, 2022; Buckle, n.d.):

(I). Critical thinking (thought-provoking content, puzzles or logic problems, multiple perspectives). (II). Creativity skills (creative ideas, feedback and support, brainstorming sessions). (III). Collaboration skills (Group and subgroup assignments, problem-solving, support and exchange of ideas). (IV). Communication skills (open and respectful communications, discussions for expression, active listening and feedback).

Likewise, following are three areas of literacy skills:

(I). Information literacy skills (information sharing, fact-checking discussions, research, evaluation of information, critical thinking challenges, media literacy). (II). Media literacy skills (media analysis, fact-checking, understanding of media bias, critical viewing of images and videos, knowledge about privacy and digital footprint, collaboration on media projects). (III). Technology literacy skills (technology news, knowledge of digital tools, and troubleshooting, online safety and security, digital skills, technology trends and knowledge of future trends, taking benefits from online courses and learning resources).

In addition, following are three areas of life skills:

(I). Flexibility in life skills (adaptability in communication, time management and organization, problem-solving and decision-making, learning and skill development, emotional resilience and support, networking and collaboration). (II). Leadership literacy skills (communication and influence, collaboration and delegation, decision-making and problem-solving, coaching and mentorship, emotional intelligence and empathy). (III). Social literacy skills (communication and active listening, building and maintaining relationships, conflict resolution and negotiation, social planning and organization, empathy and emotional support, cultural exchange and understanding).

2.6. Artificial Intelligence (AI) and Fifth Industrial Revolution

Artificial intelligence refers to a system of computer programs implemented on machines that replicate or simulate human intelligence. These programs operate based on algorithms, enabling them to perform tasks and make decisions similar to how a human would do (Sharma & Bhargav, 2022). Artificial intelligence has the remarkable ability to perform transformative changes, and playing a pivotal role in driving the fifth industrial revolution and improving all aspects of organizational processes (Kassir, 2023).

The industry is undergoing a transition from the fourth industrial revolution to the fifth industrial revolution, which is commonly known as Industry 5.0. This new phase will involve a seamless integration of humans and machines working together to achieve professional, commercial and organizational objectives. Artificial intelligence will play a critical role in driving and facilitating the advancements of the Fifth Industrial Revolution (Göcke, Soltanifar, Hughes, 2020). Industry 5.0 can benefit from the adoption of intelligent tools and automated systems empowered by artificial intelligence, leading to enhanced productivity and seamless integration of human workers with intelligent machines. (Bryndin, 2020).

2.7. Technological Innovations through Artificial Intelligence, Innovation in Curricula and Building Nations

Innovation plays a vital role in fostering the growth and advancement of nations, encompassing both developed and developing countries, therefore, it is crucial to focus on priority factors of innovation for the development of nations (Barrichello et al., 2020). Green growth and innovation (Herman, 2021), natural resources, urbanization and economic recovery towards innovation (Xin et al., 2023), public policy and innovation based on promoting collaboration between industries in research and development, encouraging government procurement of advanced technology products, and addressing related areas towards the development of nations (Barrichello et al., 2020) are some of the examples from existing research pointing towards the areas separately, related to the growth of nations, centred on innovation. However, existing research does not provide any reference where all the citizens of a country get involved in a process, working together towards a common goal, based on industry 5.0 and 21st Century skills, leading towards building of the country, collectively.

The technological innovations during the 21st Century have brought a significant shift in how the world functions. These technological breakthroughs have also given rise to novel hi-tech skills and job requirements that were not present before (Cantú-Ortiz et al., 2020; St. Louis et al., 2021). AI is becoming an essential part of our daily lives, changing how we do things (Cantú-Ortiz et al., 2020; Dai et al., 2020). As AI becomes more common at work, people who

know how to work with it will have an advantage over those who do not. That is why adding AI to education is crucial. It helps students get ready for jobs and businesses in the 21st Century (Cantú-Ortiz et al., 2020; Ng et al., 2021).

Different countries have started using AI in education more in recent years (Cantú-Ortiz et al., 2020). Singapore, for example, has special AI programs for both students and teachers. They help students learn AI in school, and train teachers to teach AI to younger students. In 2018, Singapore also made "AI Singapore" to help students with AI skills (Su et al., 2022). Hong Kong, Japan, and Korea also started AI programs in schools between 2017 and 2019. But some of these focus more on tech skills and less on the whole idea of AI (Xia et al., 2022).

Even though countries are making efforts, there is still a deficiency of stable methodologies, which is a continuous challenge on how to integrate AI with curricula (Dai et al., 2020; Ng et al., 2021; Su et al., 2022; Xia et al., 2022). It is responsibility of teachers to understand how AI affects education and get students ready for a world where AI is everywhere (Zimmerman, 2018).

2.8. Adaptive Learning and Adaptive Testing or Computer Adaptive Testing (CAT)

Adaptive learning, alternatively referred to as adaptive teaching, is an educational technique that leverages computer algorithms and artificial intelligence to facilitate interactions with learners, providing personalized resources and tailored learning activities to cater to the specific requirements of each individual student that is beneficial (Kaplan, 2021).

Adaptive testing or computerized adaptive testing (CAT) represents a contemporary approach to assessment delivery, employing artificial intelligence algorithms to customize the test experience for each individual test taker (Thompson, 2019).

2.9. Same Test

The term "same test" refers to a standardized assessment where an identical set of test items is administered to all students simultaneously, and they take the test under uniform testing conditions. In this scenario, all test-takers receive the exact same questions, allowing for a consistent and fair evaluation of their knowledge and skills (Berman et al., 2020).

2.10. ChatGPT, significant features and Voice Control for ChatGPT extension

According to West (2023), ChatGPT is derived from GPT (Generative Pre-trained Transformer) and specifically designed for Chatbot solutions. It leverages an extensive dataset of humanoid conversations and dialogues to deliver human-like responses. Notably, one of its significant attributes is context awareness, which allows it to grasp conversation context and generate relevant and effective replies. ChatGPT commands (prompts) are required to direct and acquire the required result from it.

Additionally, as stated by Steven (2023), there exists a functionality called "Voice Control for ChatGPT." This feature serves as a Google Chrome extension enabling users to provide voice input to ChatGPT and receive audible responses. Figure 1 illustrates icon of the extension. This particular feature makes ChatGPT accessible and beneficial for students with upper limb disabilities, as well as visually impaired and blind students engaging in a conversation with ChatGPT using voice input and utilizing the read-aloud options.

Figure 1. Voice Control for ChatGPT – A Google Chrome Extension

2.11. AI Programs for education

2.11.1. Grammarly

Grammarly is AI-powered writing tool to support English learning. Grammarly for education is specially designed for educational institutions (Grammarly, n.d.).

2.11.2. EnglshiCentral

According to Support (2022) EnglishCentral is an English learning platform that utilizes the power of artificial intelligence (AI) to support spoken English advancement. It offers a unique learning experience through interactive videos that integrate human-machine learning.

2.11.3. SmallTalke2Me

SmallTalk2Me is an artificial intelligent tool that offers a solution for speaking practices. It is an AI EFL teaching assistant called SmallTalk2Me Teaching Assistant for Schools (smalltalk, n.d.).

2.11.4. Microsoft 365 Copilot

Microsoft 365 Copilot is a smart digital helper that uses AI technology. It combines large language models with data from Microsoft Graph, which includes things like calendars, emails, chats, documents, and meetings. Copilot is built into Microsoft 365 apps like Word, Excel, PowerPoint, Outlook, and Teams. It helps to be more productive by turning words into powerful tools while keeping the data safe and private in business settings (Stallbaumer, 2023).

2.11.5. Linguaskill

Linguaskill employs AI technology to deliver an online evaluation of English language competency for individuals and groups. It provides a comprehensive assessment of speaking, writing, reading, and listening skills. The assessment results align with the universally recognized Common European Framework of Reference (CEFR), which serves as the standard for describing language proficiency (Linguaskill, n.d.).

To ensure broad accessibility, authorized agents are responsible for distributing and administering Linguaskill. This enables educational institutions to utilize the assessment for evaluating English proficiency levels for purposes such as admissions, progress tracking, and graduation requirements (Linguaskill, n.d.). Linguaskill is an adaptive test designed to modify subsequent assessment questions based on the answers provided by students. This adaptive nature allows the test to dynamically adjust the difficulty level and content according to the individual's responses (Linguaskill Practice Materials | Cambridge English, n.d.).

2.11.6. Knewton Alta

Knewton has introduced "Alta," its latest product designed for higher education. Alta serves as a complete courseware solution, blending Knewton's sophisticated adaptive learning technology with high-quality openly available content. This unique unification enables Alta to provide a truly personalized learning experience, emphasizing affordability, accessibility, and improved student achievements. Currently, students can access Alta across multiple courses, including math, statistics, economics, and chemistry (Knewton - Achievement Within Reach, n.d.).

2.11.7. Khanmigo

Khan Academy's latest creation, Khanmigo, is an AI-powered learning guide utilizing GPT-4 technology, and operates as a tutor and guide, offering valuable support to educators and students in their learning activities (Ofgang, 2023). Similar to Knewton Alta and Khanmigo, there are several AI-powered tools available in the market those could be searched and integrated with the curricula according to the requirements of the educational institutions.

2.11.8. AI-Professor at Harvard University

Das (2023) reported that Harvard University intends to introduce an AI bot with similarities to ChatGPT (3.5 and 4 models) as an instructor for one of its Computer Science courses. Human professors involved in the course have articulated their goal of achieving a teacher-to-student ratio of 1:1 through the use of this AI-based teaching assistant.

2.12. Policy, Procedure, Strategy and Guideline

A policy refers to a collection of guidelines established by an authoritative body, which must be adhered to by relevant stakeholders. On the other hand, a procedure outlines the specific steps or processes through which a policy is implemented and followed during various stages or phases (Ahmad2022a; Ahmad 2023b).

A strategy is a plan or approach designed to achieve a specific goal or objective. It involves making decisions and taking actions in a thoughtful and organized manner to reach a desired outcome (Johnson et al., 2009).

A guideline is a helpful rule, statement, piece of advice or suggestion that tells how to do something (Nieschlag et al., 2012).

2.13. Magic Triangle of Education (a Learning Design Framework)

According to Rauf, Rajab, and Nashruddin (2023), there is a learning design framework used by instructional designers called the Magic Triangle that consists of three crucial elements: learning objectives, learning activities, and assessments. Learning objectives establish the desired skills or knowledge that students should gain after completing the topic/course, which then influence the selection of appropriate learning activities. These objectives also shape the types and level of difficulty for assessments used to measure student progress. When these three factors are in harmony, it paves the way for effective learning outcomes to be achieved. Figure 2 shows the Magic Triangle.

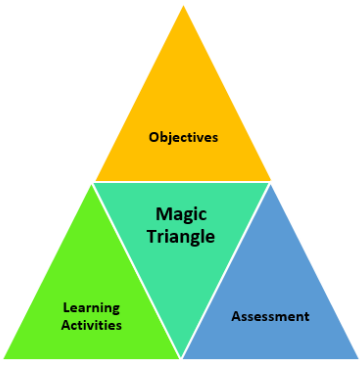


Figure 2. Magic Triangle – A Learning Design Framework

2.14. Micro Learning, Blended Learning and Flipped Learning

Micro learning is a process of dividing the learning content in small chunks and providing the chunks to learners in small steps (Ahmad, 2016; Ahmad, 2017; Ahmad, 2018a; Ahmad, 2018b; Ahmad, 2019; Ahmad, 2023a).

Blended learning is an educational methodology of teaching that integrates traditional face-to-face teaching with online and electronic media to create a more flexible and interactive learning experience for students (Ahmad, 2021a) that leaves positive impact on their learning (Ahmad, 2021a; Ahmad, 2022b). Assessment plays a crucial role in evaluating the understanding and abilities of learners (Ahmad, 2021b).

Flipped Learning is an educational methodology of teaching where students' access learning content through electronic media outside of class, and face-to-face time is reserved for classroom discussions and collaborative activities on the targeted content (Ahmad, 2021a).

3. Methodology

This research has offered the framework named AIESPC21 to support countries in fostering innovation in curricula (national written curricula) during the 5th industrial revolution through the integration of artificial intelligence tools, while considering the 21st Century skills required for this era, including written and unwritten types of curricula. The study began with a literature review to identify challenges and determined the dependent, independent, and moderating variables (Figure 3). Subsequently, the framework was developed.

Based on the literature review, a comprehensive framework was designed that included four types of curricula: Explicit (written), Social (unwritten), Phantom (unwritten), and Concomitant (unwritten). The Magic Triangle learning design framework, consisting of objectives, learning activities, and assessments, was used to revise the existing Explicit curriculum. Step number 1 (Figure 4) involved the integration of AI tools into all the subjects

required by an educational institution [sample subjects like English (writing and speaking skills) and Information Technology (Microsoft Excel)]. The framework enlightened that collaboration among all stakeholders in the educational institution was crucial for successful implementation. Teachers, students, administrators, technical personnel, including those from the Information System/Technology department, and/or the Centre for Educational Technology responsible for the learning management system of the educational institution, as well as other relevant stakeholders, were required to be involved in finding, purchasing, and integrating AI tools into the curriculum. In cases where budget constraints existed, in-house solutions such as prompts from ChatGPT's free version (GPT-3.5) were offered to be utilized. Policies and procedures were required to be established to guide the integration, use, and assessment of these AI tools/prompts together with existing curriculum materials. A National Authority was responsible for monitoring, control, guidance and collaboration towards the innovation in national curricula through the integration of 21st Century skills. Initially, the framework recommended the establishment of 'National Authority for Curriculum Innovation'. This authority could seek help from any tertiary educational institution that specializes in formulating policies and procedures for curriculum innovation, if required; or start working independently. The authority would then have to communicate with government and private preschools, schools, colleges, universities, and other educational institutions to request the revision of their curricula, incorporating AI tools, based on their respective requirements. Alternatively, considering the prevailing global standards, these educational institutions could independently initiate curriculum revisions aimed at integrating Artificial Intelligence tools, and inform the authority about the AI-based revisions.

Step number 2 (Figure 5) integrated 21st Century skills into the revised Explicit curriculum (revised existing curriculum with AI-integration), Social curriculum, Phantom curriculum, and Concomitant curriculum, under the supervision of the national authority. The authority had identified, integrated and jotted down the policies, procedures, guidelines and strategies required for the written national curriculum.

The AIESPC21 framework illuminates; when all citizens (inclusive stakeholders) of the country, including teachers, students, and other educational stakeholders (for AI-integrated Explicit curriculum), guided YouTube, Facebook, WhatsApp admins, and users (for Social curriculum), and guided print, electronic, and voice media linked to private and public industries/businesses/employers/employees (for Phantom curriculum), as well as the guided rules and teachings within families in the home environment (for Concomitant curriculum), understand their roles and work towards a shared goal, following the given policies, procedures, strategies, and guidelines, and actively strive to achieve the best outcomes in developing and enhancing 21st Century skills through the implementation of the framework; it would undoubtedly result in the building, sustainable development and advancement of the country.

4. Independent, Dependent and Moderating Variables of the Framework

Figure 3 shows independent, dependent and moderating variables of the framework, based on literature review. Explicit curriculum, Social, Phantom and Concomitant curriculum are independent variables. Integration of artificial intelligent tools and 21st Century skills (written curricula [policies, procedures, guidelines and strategies]) are moderating variables; innovation in curricula (national curricula) is dependent variable.

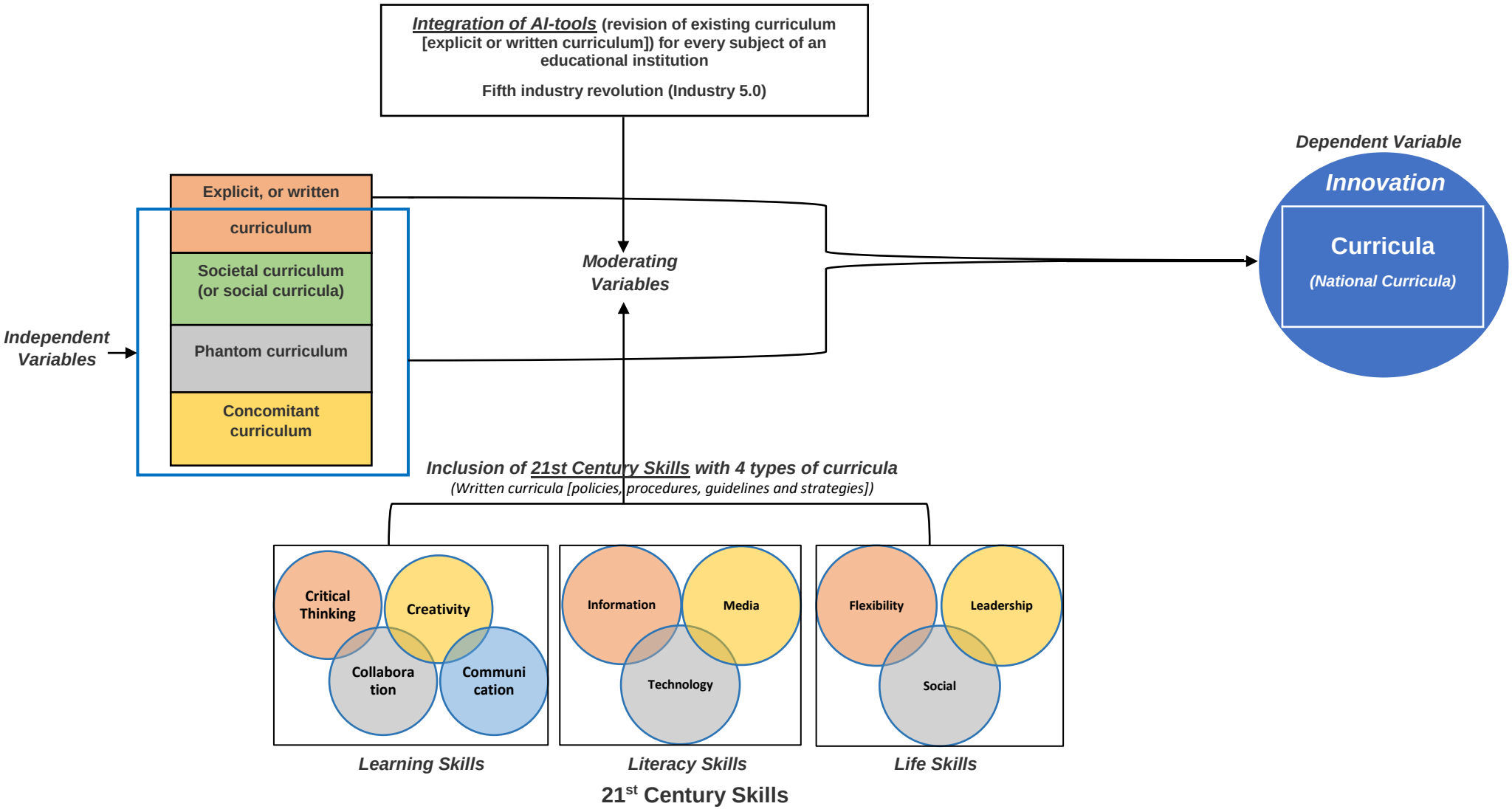


Figure 3. Independent, Dependent and Moderating Variables of the Framework

5. The AIESPC21 Framework of Innovation in Curricula for 21st Century

This research paper introduces a framework referred to as AIESPC21, where each letter represents a variable within the framework: 'AI' represents Artificial Intelligence (tools integration), 'E' corresponds to Explicit curriculum, 'S' represents Social curriculum, 'P' corresponds to Phantom curriculum, 'C' denotes Concomitant curriculum, and '21' represents 21st Century skills. Figure 4 illustrates the AIESPC21 framework of innovation in curriculum for 21st Century. Figure 5 has the details of step 2 (available in figure 4 of the framework), where 21st Century skills are getting integrated with the curricula.

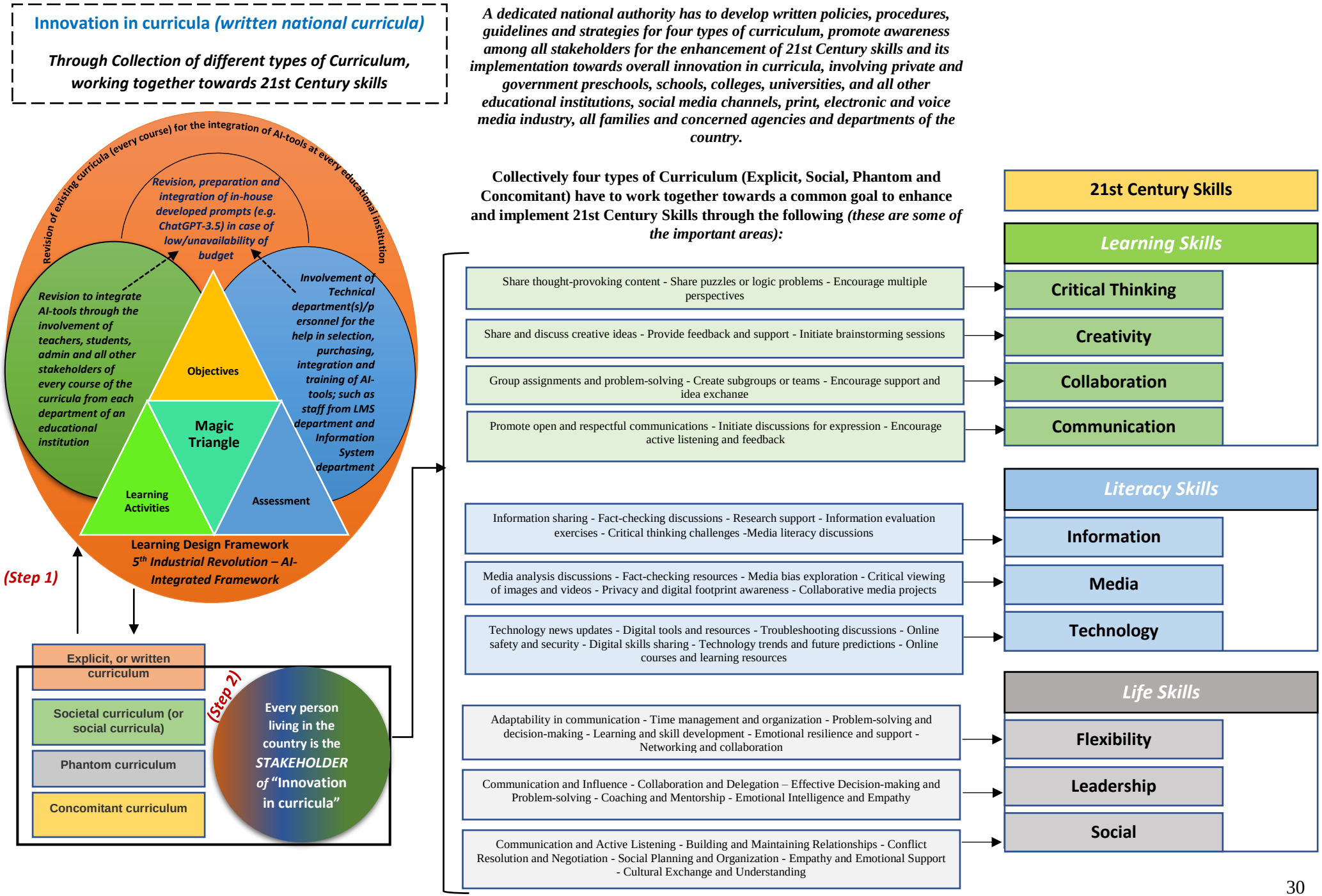
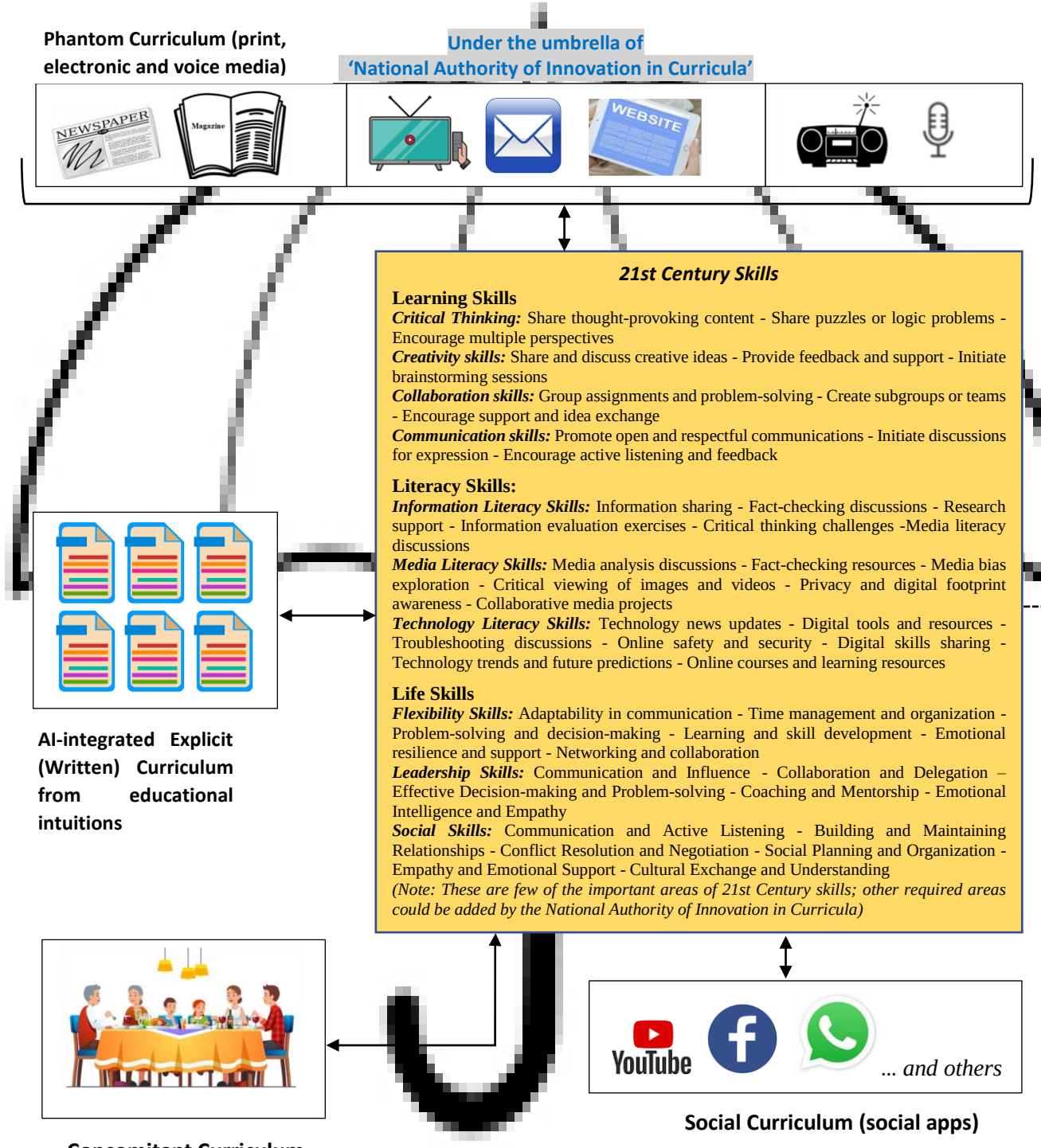


Figure 4. The AIESPC21 Framework of innovation in curricula for 21st Century



The dedicated national authority ('National Authority of Innovation in Curricula') has to develop written policies, procedures, guidelines and strategies for all the four types of curriculum (revised Explicit, Social, Phantom and Concomitant), promote awareness among all stakeholders for the inclusion, and enhancement of 21st Century Skills and its implementation towards overall innovation in curricula (national curricula), involving private and government preschools, schools, colleges, universities, and all other educational institutions, social media channels, print, electronic and voice media industry, all families, citizens and all concerned departments and agencies of the country.

All these stakeholders have to understand and add 21st Century skills with their audio/video/text (printed or electronic) materials. For example preschools, schools, colleges and universities have to revise their curricula according to the agreed contents/ideas/checklists of 21st Century skills, and social media platforms (WhatsApp, Facebook, You tube and others), print, electronic and voice media (of all the organizations, industries, employers, employees), citizens and families should have the contents/ideas/checklists of 21st Century skills that could be added, such as sharing of thought-provoking contents and discussions, sharing logical problems and solutions, sharing of creative ideas, forums for exchanging of ideas towards group assignments and problem-solving, open and respectful communications, information sharing after fact-checking, content leading towards research work, troubleshooting of problems, emotional resilience, opportunities of networking and collaboration, effective decision making, emotional intelligence and empathy related content (messages, short video clips), active listening, conflict resolution, cultural exchange and understanding. Parents could receive text/voice/video messages through communication channels (telecom authorities), such as theme of the week to be discussed and focused at home, and many more.

Collectively four types of Curriculum (revised Explicit, Social, Phantom and Concomitant) have to work together towards a common goal to enhance and implement 21st Century Skills. National authority should work towards motivation and engagement strategies (keeping in view their national requirements *[cultural and others]*) to involve the whole country concerning these four areas of curriculum.

Figure 5. Step 2 of the AIESPC21 Framework of innovation in curricula for 21st Century

6. Findings and Discussion

Based on the existing literature and centred on independent, dependent, and moderating variables, the AIESPC21 framework suggests revising the Explicit curriculum in step number 1 (Figure 4) using the Magic Triangle, a learning design framework comprising objectives, learning activities, and assessment. To exemplify, the integration of AI tools with the subjects of English (writing and speaking skills) and Information Technology (Microsoft Excel) are presented as a sample.

After the establishment of the 'National Authority of Innovation in Curricula', it would work as an organizing, controlling and collaborating authority towards innovation in curricula for the whole nation. Initially, the authority could collaborate with a specialized educational institution for the preparation of policies, procedures, guidelines and strategies related to curricula, if needed, or else, could start working without any assistance. The authority contacts and assists government and private preschools, schools, colleges, universities and other educational institutions for curriculum revisions through the addition of AI tools as per their needs. Alternatively, institutions could autonomously integrate AI tools, informing the authority. Then, the authority partners with various curriculum aspects to identify and integrate necessary elements into the national curriculum.

Achieving successful integration of AI with curriculum requires collaboration among teachers, students, administrators, and technical personnel (staff from a learning management system [LMS] and/or technical team members of the information technology/information system department(s)) to develop policies and procedures and identify, acquire, and incorporate AI tools effectively (like, paid [ChatGPT 4.0 Model] and/or its free version). The Magic Triangle serves as a guide for revising the existing curriculum (Explicit curriculum) with clear learning objectives, suitable learning activities, and appropriate assessments while integrating AI tools.

Preschools are also recommended to use this framework for the revision of their exiting curricula (Waldorf, Reggio Emilia, Montessori or any other well-known program) and start using and introducing the AI terminologies to prepare their students for the future.

If an educational institution (preschool, school, college, university or others) faces budget constraints, the framework suggests exploring in-house solutions like creating and utilizing prompts for well-known ChatGPT's free version (GPT 3.5 Model)/Google Bard/Microsoft Bing Chat, along with the establishment of relevant policies and procedures for their integration and assessment within the existing curriculum.

Similar to Knewton Alta, an AI-powered tool for math, statistics, economics, and chemistry, and Khanmigo (GPT4 technology), Portakal (2023) highlighted various other AI-driven language learning platforms available, such as Duolingo, Memrise, Mondly, and Andy; these apps enable users to enhance language skills, covering grammar, vocabulary, sentence construction, and daily conversation. Furthermore, Portakal (2023) also mentioned Zeno Assistant, which focuses on improving writing skills and supporting language learning. Hence, connected stakeholders (committees/teams) of different subjects have to search for the required AI-tools and integrate them into existing curriculum based on educational institutions' requirements.

Therefore, the AIESPC21 framework suggests revising the existing study materials using the Magic Triangle and integrating these teaching materials with AI-powered technologies for teaching and learning. The following are a few samples for teachers, students, administrative staff, and other stakeholders of educational institutions (preschools, schools, colleges, universities and other educational institutions) regarding the revision of the existing (Explicit) curricula using the Magic Triangle, integration of AI tools, teaching methodologies, and training of staff and students. It is recommended that top management and each department of every educational institution in a country form teams/committees of associated stakeholders,

follow these steps, and revise the existing curricula. They should also find available AI-powered tools for adaptive learning (like Knewton Alta, Khanmigo or others), adopt teaching methodologies, and provide training for staff and students according to the requirements of each subject, learning level of students, and institutional needs.

6.1. Revision of Existing Learning Objectives, Activities and Assessments according to Magic Triangle: Examples; Writing and Speaking Modules of English Language and Microsoft Excel of Information Technology

Schools, colleges, universities and other educational institutions have to:

- Analyse the existing teaching materials and identify specific learning objectives for each component (examples: writing and speaking modules of English learning and Microsoft Excel of Information Technology).

Magic Triangle has three components, including objectives, activities and assessment. Adopting SMART objectives is a famous practice that ensures that learning goals are specific, measurable, achievable, relevant, and time-bound (SMART), while the activities and assessments provide opportunities for students to actively engage and demonstrate their progress.

Following are some examples of SMART learning objectives, learning activities, and learning assessments for the two components (writing and speaking) using Magic Triangle:

6.1.1. Writing:

***1) Learning Objective* (*For example objective 'W1' is for writing a persuasive paragraph*):**

- Specific: Write a persuasive paragraph using appropriate sentence structure and vocabulary.
- Measurable: Demonstrate the use of persuasive language and correct grammar in the paragraph.
- Achievable: Practice writing persuasive paragraphs through guided exercises and peer feedback.
- Relevant: Develop effective written communication skills for expressing opinions and persuading others.
- Time-bound: Complete the task within one week of instruction.

2) Learning Activity:

- Learn persuasive writing techniques through examples and discussions.
- Brainstorm ideas for a persuasive paragraph topic.
- Write a persuasive paragraph individually or in pairs.
- Provide peer feedback and revise the paragraph accordingly.

3) Learning Assessment:

- Evaluate the use of persuasive language and grammar in the written paragraph.
- Peer or self-assessment rubric for the persuasive paragraph.
- Teacher feedback and suggestions for improvement.

6.1.2. Speaking:

***1) Learning Objective* (*For example objective 'S1' is for speaking practice on a familiar topic)*:**

- Specific: Engage in a conversation by asking and answering questions on a familiar topic.
- Measurable: Participate actively in a conversation by asking and answering at least three questions.

- Achievable: Practice conversational skills through guided role-plays and class discussions.
- Relevant: Develop oral communication skills for effective conversations and interactions.
- Time-bound: Demonstrate proficiency within one week of instruction.

2) Learning Activity:

- Engage in pair or group conversations on familiar topics.
- Take turns asking and answering questions related to the topic.
- Use prompts or visual aids to guide the conversation.
- Provide constructive feedback to peers during the conversations.

3) Learning Assessment:

- Observe and assess students' participation and engagement in the conversations.
- Peer or self-assessment checklist for conversational skills.
- Teacher feedback on language usage, fluency, and interactional skills.

6.1.3. Information Technology

Microsoft Excel

Following is an example of the subject Information Technology through SMART learning objective, learning activity, and learning assessment for Microsoft Excel using Magic Triangle:

1) Learning Objective (for example objective 'EXL1' is for sorting data):

- Specific: Understand the concept of sorting data in Microsoft Excel by Sale Price.
- Measurable: Successfully sort a column of data by Sale Price in ascending order.
- Achievable: Follow step-by-step instructions to sort data with guidance.
- Relevant: Develop data management skills to organize and analyse information effectively.
- Time-bound: Demonstrate proficiency in sorting data by Sale Price within the session of instruction.

2) Learning Activity:

- Provide an overview of the importance of data sorting and its applications.
- Demonstrate step-by-step instructions for sorting data by Sale Price in Microsoft Excel.
- Assign practice exercises where students sort sample datasets by Sale Price.
- Encourage students to experiment with different sorting options and refine their skills.
- Facilitate group discussions to share experiences and best practices for data sorting.

3) Learning Assessment:

- Hands-on task: Ask students to sort a given dataset by Sale Price using Microsoft Excel.
- Written reflection: Have students explain the benefits and potential challenges of sorting data by Sale Price.
- Peer review: Pair students to review and provide feedback on each other's sorted datasets.
- Q&A session: Conduct a class discussion to address any questions or difficulties faced during the activity.

6.2. Integration of AI-tools (Adaptive Learning), Teaching Methodologies, and Training of Staff and Students

6.2.1. Integration of Artificial Intelligent Tools (Adaptive Learning):

Writing (for the objective 'W1' and other objectives):

- Incorporate AI-based writing assistant like "Grammarly for Education" to provide real-time feedback on grammar, spelling, punctuation, and style *(such as for the objective*

'W1' linked to writing a persuasive paragraph, and for other objectives). This tool allows students to receive feedback as they work on their writing assignments using existing materials. This tool is just an example; other AI-powered tools could be searched and integrated according to the requirements *(or in-house developed ChatGPT prompts [free version] could be used).*

Speaking (for the objective 'S1' and other objectives):

- Integrate AI-powered speech recognition tool like "EnglishCentral" or "SmallTalk2ME" into speaking activities. These tools allow students to practice pronunciation, receive immediate feedback, and engage in interactive speaking exercises *(such as for the objective 'S1' linked to speaking practice on a familiar topic, and for other objectives).* Students could utilize existing speaking materials along with integrated AI-tools for practice and assessment. These tools are just examples; other AI-powered tools could be searched and integrated according to the requirements *(or in-house developed ChatGPT prompts [free version] could be used).*

Microsoft Excel (for the objective 'EXL1' and other objectives)

- Integrate AI-Powered tool "Microsoft 365 Copilot" into Microsoft Excel's activities. This tool allows students to practice Excel activities using power of artificial intelligence. Students could use this tool with existing materials of Microsoft Excel *(such as for the objective 'EXL1' for sorting data, and for other objectives)*, and other Microsoft Office applications. This tool is just an example; other AI-powered tools could be searched and integrated according to the requirements *(or in-house developed ChatGPT prompts [free version] could be used).*

It is important to highlight that students should first acquire their skills in a topic(s) through traditional classroom's teaching and learning methods (for concept building and initial understanding of the content(s)). Afterward, they should be asked to utilize AI-based tool(s) for their practice (adaptive learning), AI-based skill(s) development and skill(s) assessment (formative assessment), as a blended learning approach; these utilizations of AI-powered tool(s) could be after covering a single topic, a combination of several topics, or even more, depending on the specific requirements of the skill(s). Moreover, the use of AI-Powered tools could also be adjusted according to the teaching methodology (ies), such as flipped classroom approach or others.

Educational institutions could develop their rubrics, policies, procedures, strategies and guidelines for the solution of assignments, homework, projects, formative assessments and others (excluding summative assessments) for the students, and preparation and use of AI-generated materials for the teachers, towards academic integrity for AI-integrated framework, keeping in view the requirements of each topic/group of topics/course(s)/subject(s).

6.2.2. Teaching Methodologies

Following are some of the well-known methodologies of teaching those could be used by the teachers for AI-integrated framework:

1) Blended Learning Approach:

- Combine traditional classroom instruction with AI-powered language learning platforms for interactive and personalized learning experiences.

2) Flipped Classroom Approach:

- Assign speaking and writing (or reading and listening) exercises through AI-integrated platforms as homework.
- Use class time for interactive activities, discussions, and collaborative projects related to the speaking and writing (or reading and listening) materials.
- Provide guidance and support during class to reinforce comprehension, vocabulary, and language skills.

3) Task-Based Learning:

- Create tasks or projects that combine speaking and writing (or reading and listening) skills.
- Offer real-life situations or issues for students to solve, encouraging critical thinking and communication.
- Use AI-tools to aid tasks, like offering writing feedback, pronunciation practice, or interactive listening exercises.

4) Peer Collaboration and Feedback:

- Promote students to work in pairs or small groups for speaking and writing (or reading and listening) tasks.
- Use AI-tools for peer feedback, providing writing suggestions or assessing pronunciation.
- Promote a collaborative environment where students can learn from each other and share knowledge.

5) Use of Authentic Materials and Real-World Contexts:

- Use real materials like newspaper articles or online resources to expose students to authentic language usage.
- Assign writing tasks for producing real written pieces, like emails, reports, or opinion essays.
- Use AI-tools to help students understand and analyse authentic materials and offer writing and speaking feedback.

6) Multimedia and Technology Integration:

- Integrate multimedia resources like videos or podcasts to speaking and writing (or reading and listening) activities.
- Employ AI-supported platforms with interactive exercises, quizzes, and multimedia content to engage students in learning.

7) Reflective Practice and Self-Assessment:

- Incorporate regular reflection activities where students can evaluate their progress, identify strengths and areas for improvement, and set goals.
- Encourage students to utilize AI-tools for self-assessment, such as reviewing automated writing feedback or practicing pronunciation with speech recognition tools.
- Provide guidance and support for students to develop self-directed learning skills and become independent learners.

It is strongly recommended to combine different teaching methodologies to foster active learning and to achieve improved learning outcomes.

6.2.3. Trainings

Following are some of the famous methods used for the purpose of teachers and students training, those could be used by the educational institutions towards the implementation of the AI-integrated framework:

A). Training of Teaching Staff:

1) Orientation and Awareness:

- Conduct orientation sessions to introduce teaching staff to the AI-integrated framework, its objectives, and benefits.
- Provide an overview of the AI-tools being used, their features, and how they align with the framework and existing teaching materials.
- Educate teachers to encourage students towards the development of strong ethics, and to be a part of an atmosphere where learning is paramount as compared to obtaining high academic grades.
- Inform teachers about the use of different teaching and assessment methods (for assignments, homework, projects, formative assessments and others; excluding summative assessments), rubrics, policies, procedures and guidelines about AI-based assignments, academic integrity, dealing with academic dishonesty, regular monitoring of suspicious activities, investigations, and finally, comparison of overall performance of each individual, obtained from different assessment methods (formal or blended) to bring suspicious performance of any assignment/homework/project component in spotlight.
- Educate teachers to have equity while asking the students to apply AI-integrated tasks; such as they should be aware of students those do not have access to resources such as the possessions of computers/laptops to apply AI-integrated tasks; consequently, they have to try their best to arrange/obtain these resources, if possible (such as borrowing laptops for the students from their educational institution).
- Involve parents in conversations about academic integrity and provision of their assistance at homes to strengthen these values towards AI-integration.

2) Hands-on Workshops:

- Organize hands-on workshops where teachers can explore and interact with the AI-tools integrated into the framework.
- Provide step-by-step guidance on how to use the AI-tools within the teaching context, including accessing and navigating the platforms, assigning activities, and interpreting the AI-generated feedback.

3) Collaborative Lesson Planning:

- Encourage teachers to collaborate and share ideas with each other on how to integrate the AI-tools effectively into their lessons.
- Provide dedicated time for teachers to plan and create lesson plans that integrate the AI-integrated framework.

4) Professional Development Sessions:

- Arrange professional development sessions focusing on specific AI-tools or instructional strategies related to the framework.
- Invite experts or trainers to deliver sessions on maximizing the potential of AI-tools for teaching and learning of English language, Information Technology and other subjects.

- Encourage teachers to reflect on their experiences, share best practices, and collaborate on innovative ways to use AI-integration within the framework.

B). Training of Students:

1) Introduction and Purpose:

- Introduce students to the AI-integrated framework, emphasizing on its purpose, advantages, and how it can improve their language and Information Technology learning skills; and for any other subject.
- Describe how AI tools can help with each student's unique learning needs, give personalized feedback, and provide extra chances to practice.
- Educate students about the creation of an atmosphere where learning is valued over shortcuts to achieve high marks, and development of strong ethics. Encourage students to treat AI-powered programs with respect, similar to how they interact with their teachers and class fellows.
- Educate students about academic integrity, provide clear guidelines and expectations for assignments, homework, projects, formative assessments and others (excluding summative assessments), including consequences for academic dishonesty; inform students about the use of different assessment methods, regular monitoring of suspicious activities towards the solution of assignments, investigations, and finally, comparison of overall performance of each individual, obtained from different assessment methods (formal or blended) that easily bring suspicious performance of any assignment/homework/project in spotlight.

2) Tool Familiarization:

- Arrange engaging and interactive sessions to introduce students to the AI tools connected to the framework.
- Demonstrate how to access and use the AI-tools within the online platforms (Moodle, Google Classroom) or dedicated applications according to the requirements of institutions.
- Provide guidelines on navigating the AI-tools, accessing assigned activities, and interpreting the feedback provided by the AI-tools.

3) Guided Practice:

- Assign specific tasks or activities that require students to utilize the AI-tools within the framework.
- Provide guidance and support during the initial stages of using the AI-tools, offering clear instructions and modelling how to benefit from the AI-generated feedback.

4) Ongoing Support and Feedback:

- Offer ongoing support to students, including opportunities for one-on-one consultations or Q&A sessions.
- Regularly provide feedback on students' progress, acknowledging their efforts and guiding them on how to make the most of the AI-integrated tools.

5) Promote Autonomy and Reflection:

- Encourage students to take ownership of their learning process by reflecting on their experiences with the AI-tools.
- Foster self-assessment skills by guiding students to evaluate their strengths and areas for improvement based on AI-generated feedback.

- Promote independent exploration of the AI-tools for additional practice outside the classroom for homework, projects and others (excluding summative assessments); getting the benefits keeping in view the academic integrity.

6.3. Learning Assessment

The literature demonstrates the advantages of adaptive learning, primarily due to its personalized approach. Adaptive testing, driven by artificial intelligence, tailors the assessment experience for each individual test taker by determining their skill level through AI algorithms and adjusting the questions accordingly. On the other hand, the concept of the 'same test' refers to standardized assessments where all students take an identical set of test items simultaneously under uniform conditions. Consequently, AI-based assessments, like Linguaskill adaptive testing, are well-suited for identifying individual skill levels, making them suitable as placement tests (as an entrance exam for an institution to know the skills level of students). However, they may not be ideal for use as summative assessments, where standardized tests are necessary for evaluating all students uniformly. Therefore, the integration of AI-powered tools is recommended for teaching and learning in the form of formative assessments; nevertheless, traditional methods of assessment are recommended for summative evaluations because of its standardized testing.

The future possibilities of AI-based adaptive assessments rely on two important factors. First of all, educational institutions should use level-based summative assessments for each subject. This means defining different skill levels for learners within each subject level. For example, if a subject has two levels like level 1 and level 2, then level 1 should have sublevels, such as six sublevels of skills. To pass level 1, a learner must meet the standard set at subskill level 4, and the same applies to level 2 of the subject.

Secondly, software development companies must actively offer AI-powered tools on a large scale in the market to stay competitive. However, it is crucial to maintain the human element in AI-based adapted assessments. Finding the right balance between technology and human involvement will be essential to fully utilize AI in assessments and promote effective and fair learning outcomes in the future.

6.4. Integration of revised AI-Integrated Curricula, plus Social Curricula, Phantom Curricula and Concomitant Curricula with 21st Century Skills

Step number 2 of the framework (Figure 4 and Figure 5) combines the revised AI-integrated existing (Explicit) curriculum, along with the other three types of curriculum with 21st Century skills.

The specialized national authority, known as the 'National Authority of Innovation in Curricula,' is required to collaborate with private and government educational institutions, including preschools, schools, colleges, universities, and other educational institutions, as well as relevant departments and agencies, and concerned stakeholders in the country. The authority should develop comprehensive written curricula including policies, procedures, guidelines, and strategies, raise awareness among all stakeholders (all citizens) about the significance of enhancing 21st Century skills and their role in integrating and implementing these skills for successful and innovative curricula outcomes, implementation of national curricula, and strategies to motivate and engage the whole nation.

To promote awareness and proficiency in 21st Century Skills, various contents, ideas, and checklists could be utilized through thought-provoking discussions, sharing logical problems and solutions, creative ideas, group assignments, problem-solving forums, respectful communications, fact-checked information sharing, research-oriented content, troubleshooting, emotional resilience, networking, collaboration, effective decision making,

emotional intelligence, empathy-related content, active listening, conflict resolution, global citizenship, cultural exchange and environmental stewardship.

The stakeholders need to comprehend and incorporate 21st Century Skills into their audio, video, and text materials. For instance, educational institutions like preschools, schools, colleges, universities and other educational institutions must update their curricula in line with the agreed contents and ideas related to 21st Century skills. Similarly, social media platforms (WhatsApp, Facebook, YouTube, and others), print, electronic and voice media (newspapers, magazines, television channels, emails, websites, blogs, radio programs, podcasts and others) from various government and private organizations, industries, employers and employees, as well as families, should also include the guided contents and ideas pertaining to these skills. YouTubers, bloggers, vloggers, admins of WhatsApp groups, videographers, podcast recorders, podcasters, editors of newspapers, journalists, columnists, industrialists and all the other connected stakeholders should understand, integrate, and promote 21st Century skills.

To further disseminate these skills, parents could receive text/voice/video messages through various channels, such as educational institutions, government or private departments or agencies, highlighting themes of the week/month for discussion, to focus at home. Disable individuals could be involved through different ways. Industries are recommended to disseminate sample interviews, publish articles, and share opinions about the technologies they use, required skills in their employees, tech talent hunt initiatives, necessary software expertise, and future skill development requirements. Specialized (directed) online communities could focus on particular areas. Initiatives aimed at raising awareness could be employed to educate individuals about the importance of verifying information before accepting or sharing it via any platform. The national traffic authorities could use the AIESPC21 framework to enhance the understanding of citizens towards regulations and road safety, healthcare practitioners could extend their reach to assist citizens in recovering from ailments while emphasizing safety and hygiene protocols, and many more; the implementation of national curricula would bring all the citizens on the same page.

Therefore, to achieve these objectives, four types of curriculum, including Explicit, Social, Phantom, and Concomitant should work together, striving towards the common goal of enhancing and implementing 21st Century skills to support innovation in curricula at national level; that would be counted as national curricula of the country. Consequently, overall, this unified effort will foster nationwide development and the well-being of citizens through collaborative teamwork.

7. Conclusions and Future Work

The 21st Century demands innovative curricula that can equip students and citizens with the essential skills necessary for national development and success. This research paper has presented a comprehensive framework, AIESPC21, aimed at fostering national development by integrating the fifth industrial revolution (Industry 5.0) through artificial intelligence (AI) tools while incorporating 21st Century Skills such as critical thinking, creativity, collaboration, communication, and technological literacy. It encompasses four types of curriculum: Explicit, Social, Phantom, and Concomitant curriculum. The Explicit curriculum involves revising existing written curriculum using the Magic Triangle, a learning design framework consisting of objectives, learning activities, and assessments, with AI integration in all the subjects of an educational institution (like English and Information Technology as samples).

The framework focuses on establishing the ‘National Authority of Innovation in Curricula,’ that prepares the national curricula including policies, procedures, guidelines and strategies, involves government and private preschools, schools, colleges, universities, and other educational institutions, and works towards the AI-integrated Explicit curricula along with other curriculum types, all aligned with 21st Century skills. Moreover, this authority promotes

awareness, develops strategies to motivate and engage the citizens, and works towards the implementation of the national curricula.

By addressing all the four research questions listed at the beginning of this paper, and integrating AI-powered tools with existing curricula through a structured learning design framework, the AIESPC21 framework envisions a unified effort towards implementing 21st Century skills, fostering national well-being, and building the nation. The involvement of all citizens as stakeholders is critical to the success of this framework.

In conclusion, the AIESPC21 framework offers a solution to prepare learners and citizens for the challenges and opportunities of the 21st Century. By integrating AI tools and fostering 21st Century skills, the framework aims to contribute to inclusive national development, global competitiveness, and overall success as a nation in the rapidly evolving technological landscape. Embracing innovation in curricula design is essential for meeting the needs of the future and ensuring a thriving and progressive society.

Government and private preschools, schools, colleges, universities and other educational institutions in the Sultanate of Oman, Pakistan, GCC countries, Asian and international countries have to revise their curricula and integrate AI-powered tools. Moreover, educational institutions have the option to begin researching a similar model of AI-professor used by Harvard University (Das, 2023) and work forward according to their findings or to observe the outcomes of this experiment while awaiting the availability of an internationally approved AI-instructor at an international level, and its procurement.

Every country must establish a 'National Authority of Innovation in Curricula' tasked with creating additional divisions that collaborate on the revision of AI-integrated Explicit curriculum in partnership with educational institutions. This collaboration extends to the Social, Phantom, and Concomitant curricula, all aimed at innovating national written curricula. This process involves fostering awareness, motivating and engaging stakeholders, formulating policies, procedures, guidelines, and strategies for integrating 21st Century skills through the AIESPC21 framework. In addition, the authority is also recommended to establish relevant key performance indicators, test curricula innovation effectiveness, and address challenges through national, regional, and international institutional benchmarking, target imports and exports sectors, promote entrepreneurship, nurture citizens' internationally competitive skills, address unemployment concerns, gather surveys and feedback from diverse sources, and adjust policies, procedures, guidelines, and strategies in response to the needs, using the framework. In essence, this paper illuminates that all the citizens of the country would be involved through AIESPC21 framework; therefore, overall, the implementation of this framework would extend to addressing national imperatives such as education, health, trade, energy security, technology, military security, law enforcement, infrastructure, environment, diplomacy, regional dynamics, cultural and social influences and all the other areas according to the requirements of the country.

The future work includes the development of another framework to help regulate the 'National Authority of Innovation in Curricula' with regard to the policies, procedures, strategies and guidelines towards the implementation of national curricula and evaluation of the framework.

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