Hybrid International Student Conference 2025

Transforming Education for Well-being:

International Perspectives and Collaborative Endeavors

Dates: March 13-14, 2025

Venue: Hybrid (in person &zoom conference)

Organizer:

Master's and Doctoral Programs in Education
Graduate School of Comprehensive Human Sciences,
University of Tsukuba, Japan

Hybrid International Student Conference

“Transforming Education for Well-being:

International Perspectives and Collaborative Endeavors”

Contents

Foreword

It is with great pleasure that we welcome you to the Hybrid International Students Conference 2025. This conference brings together graduate students from ten leading universities worldwide, fostering a dynamic exchange of ideas in the field of education.

Originally launched in 2021 as the Online International Student Conference in response to the challenges posed by the COVID-19 pandemic, this forum has continued to thrive through 2022, 2023, and 2024. Its success is a testament to the unwavering enthusiasm of all participants, the steadfast support of the University of Tsukuba, and the collaborative spirit of our nine partner institutions. The sustained commitment to this initiative reflects the power of transnational cooperation in advancing academic discourse.

With the easing of travel restrictions in many countries, including Japan, we embraced a new format in March 2024: the Hybrid International Students Conference, integrating both online and in-person interactions to enhance engagement and inclusivity.

As Chair of the Master's and Doctoral Programs in Education, I am delighted to extend a warm welcome to the graduate students who have traveled from China, Kazakhstan, Korea, Poland, and Thailand to join us in Japan. I also express my sincere appreciation to those participating remotely—your contributions are invaluable, and this hybrid format would not be possible without your active involvement.

Building on the tradition of our previous online conferences, the core program on the first day (March 13) will feature presentations by representative teams from each university. On the second day (March 14), we will hold a hybrid symposium, where a doctoral student from the University of Tsukuba, who participated in last year's conference, will deliver an Invited Talk to initiate discussion. This will be followed by presentations from the 15 participants gathered in person at the University of Tsukuba, addressing three key topics, with discussions enriched by the engagement of online participants.

The theme of this year's Hybrid Conference, "**Transforming Education for Well-being: International Perspectives and Collaborative Endeavors**," invites us to critically examine the profound impact of growing global inequality and ongoing

conflicts. Economic disparities continue to hinder access to fundamental services such as education, healthcare, and nutrition, leaving millions of children vulnerable. Wars and conflicts displace families, disrupt education, and expose children to violence, psychological trauma, and recruitment into armed groups. Refugee and internally displaced children often lack even the most basic protections.

In this context, we must ask ourselves:
What role can education play in addressing these urgent challenges?
How can academic collaboration contribute to solutions that promote well-being and social equity?

Through the diverse perspectives and expertise of our participants, we anticipate rich discussions that will illuminate both the opportunities and challenges in shaping the future of education. It is our hope that this conference will inspire meaningful dialogue, foster new collaborations, and contribute to the ongoing global effort to transform education for the betterment of society.

As we embark on this intellectual exchange, I eagerly look forward to the insightful discussions and innovative ideas that will emerge, reinforcing the power of education as a catalyst for change.

Teruyuki FUJITA, Ph.D.
Chair, Master's and Doctoral Programs in Education,
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Programme

Transforming Education for Well-being: International Perspectives and Collaborative Endeavors

Building on the success of the 2024 Hybrid International Student Conference (HISC), where participants explored educational innovation in the context of Industry 5.0, the 2025 conference focuses on the transformation of education to promote well-being on a global scale. This theme reflects the growing recognition of education's role in achieving sustainable well-being, aligning with Sustainable Development Goal (SDG) 3, "Good Health and Well-being." By emphasizing international perspectives and collaborative endeavors, the conference seeks to address global challenges related to well-being through education.

This year, the conference will continue in its hybrid format, welcoming students to the University of Tsukuba for in-person discussions and presentations while engaging a global audience online. The conference serves as a platform for students from diverse cultural and academic backgrounds to exchange ideas, share research findings, and develop actionable strategies for integrating well-being into educational practices worldwide. We aspire to cultivate a network of future leaders committed to advancing education research as a means of fostering sustainable well-being across communities and nations.

- Dates: March 13th (Thursday) and 14th (Friday), 2025
- Time: 15:30-19:00 JST (15:30-19:00 in Cheongju, 14:30-18:00 in Changchun, 13:30-17:00 in Khon Kaen, 11:30-15:00 in Almaty, 09:30:00-13:00 in Moscow, 07:30-11:00 in Krakow, 19:30 – 23:00 in Christchurch)
- Venue: Hybrid (in person & zoom conference)
- Organizer: The University of Tsukuba, Graduate School of Comprehensive Human Sciences, Degree Programs in Education
- Support: University of Tsukuba, Center for Research on International Cooperation in Educational Development (CRICED)
- Participating universities: University of Tsukuba (Japan), Korea National University of Education (South Korea), Northeast Normal University (China), Khon Kaen University (Thailand), Srinakharinwirot University (Thailand), Abai Kazakh National Pedagogical University (Kazakhstan), Moscow City University (Russia), Humanitas University (Poland), University of the National Education Commission, Krakow (Poland), University of Canterbury (New Zealand)

Day1 March 13th, 15:30-19:00 JST

Openings

15:30 - 15:35 Opening greetings from UT

15:35 - 15:40 Explanation of conference schedule, presentation rules

Presentations

15:40 - 18:15 Presentations by students from each university

--Presentation 15min, Q&A 5min, 20min in total per one

1. 15:40 - 16:00 University of Tsukuba (Japan)
2. 16:00 - 16:20 Korean National University of Education (South Korea)
3. 16:20 - 16:40 Northeast Normal University (China)
4. 16:40 - 17:00 University of Canterbury (New Zealand)

17:00-17:15 Break time

5. 17:15 - 17:35 Khon Kaen University (Thailand)
6. 17:35 - 17:55 Srinakharinwirot University (Thailand)
7. 17:55 - 18:15 Abai Kazakh National Pedagogical University (Kazakhstan)
8. 18:15 - 18:35 Humanitas University & University of the National Education Commission, Krakow (Poland)
9. 18:35 – 18:55 Moscow City University (Russia)

Wrap-up & Concluding Remarks

18:55 - 19:05 Concluding remarks by organizing side and explanation for the next day

Day 2 March 14th, 15:30 – 19:00 JST

15:30 - 15:35 Greetings from UT, explanation of today's schedule

Part I 15:35 - 17:05 Symposium (delivered by UT)

15:35 - 15:55 Invited Talk: Yukashi Asato (doctoral student at University of Tsukuba)

15:55 - 16:15 Group 1 presentation (by a mix of students participating face-to-face)

16:15 – 16:35 Group 2 presentation (by a mix of students participating face-to-face)

16:35 – 16:55 Group 3 presentation (by a mix of students participating face-to-face)

16:55 - 17:05 Discussant's comments (faculty member)

17:05 - 17:15 Break time

Part II Discussion in break-out sessions

17:15-17:45 Discussion 1(discussion on the conference theme)

17:45-18:15 Discussion 2 (discussion on possible international collaboration& networking)

General discussion in the major meeting room

18:15-18:20 The time it takes to move between rooms.

18:20-18:35 Sharing of discussion points from each session (3min each, 5 sessions)

18:35-18:45 Comments from faculty representatives of each university

18:45-18:50 Closing address from the organizing side

18:50-19:00 Photography

University of Tsukuba

University of Tsukuba

Well-being in Japanese Policy: Focusing on the 4th Basic Plan for the Promotion of Education

TSUCHIYA, Urara
SUZUKI, Nami
SUGIYAMA, Rin

1. Well-being as a Policy in Japan

When the Kan Cabinet was inaugurated in September 2020, the ruling party's project team was upgraded to the Special Mission Committee for the Promotion of Japan Well-being Plan. Well-being was disussed in the Diet, and there was a growing awareness of the need to create a society in which all people can achieve well-being and happiness, not just GDP growth.

In response to this trend, the 6th Science, Technology and Innovation Basic Plan clarified the policy on well-being in March 2021. The Basic Plan aims to create a future society that is "a society that is sustainable and resilient against threats and unpredictable and uncertain situations, that ensures the safety and security of the people, and that individual to realize diverse well-being"(Government of Japan 2021: 11). Well-being is also focused in the section on education and human resource development. The issues of good grades but lack of curiosity of learning in school education and lack of opportunities to lifelong learning in society are identified as challenges, and the major goals and targets are addressed as follows.

[Major goal]
・To transform Japan as a whole into Society 5.0, we will develop human resourses who will pursue happiness and face challenges.
[Targets]
・By learning based on curiousity with the participation of various social entities, the inquiring ability is strengthened.
・Individuals find out what they want to do, and hone their abilities and qualifications.

In addition, specific initiatives include: 1. strengthening the ability to explore by promoting STEAM education; 2. participation and utilization of external human resources in learning; 3. promotion of DX in the education field; 4. promotion of human resourse mobility and reinforcement of learning for career change and career advancement; 5. fostering an environment and culture that encourages society and companies to continue to learn; 6. provision of diverse curricula and programs at universities and national institutes of technology; and 7. joint creation of knowledge and strengthening of science and technology communications through participation of various entities such as citizen participation

(Government of Japan 2021: 77-80).

In July 2021, Inter-ministry Liaison Meeting on Well-being was held, and it was confirmed that well-being would be included in 32 basic plans under each ministry and agency in September. One of these plans is the 4th Basic Plan for the Promotion of Education, which would concretise well-being initiatives in education.

2. The 4th Basic Plan for the Promotion of Education

The Basic Plan for the Promotion of Education (BPPE) is Japan's five-year national education policy plan, covering all education sectors. The third BPPE (2018–2022) focused on "maximizing each individual's lifelong potential," while the fourth BPPE (2023–2027) aims to "foster a sustainable society for 2040 and beyond" and "enhance well-being rooted in Japanese society."

Japan's education system has maintained high academic performance in international assessments such as PISA, and the GIGA School concept has successfully promoted digital learning. However, challenges such as decreased study-abroad opportunities due to COVID-19, a rise in serious bullying cases, school absenteeism, student suicides, and long working hours for teachers have been highlighted. The fourth BPPE marks a significant shift by explicitly setting well-being as an educational goal, introducing the concept of "Japanese-style well-being."

An international comparative study found that Western cultures emphasize well-being through self-esteem and self-efficacy, focusing on personal achievements and abilities. In contrast, Asian cultures, including Japan, prioritize well-being through human connections, emphasizing cooperation, altruism, and social contribution. Based on this distinction, the fourth BPPE proposes a unique Japanese model of well-being that balances both "acquisitive" and "cooperative" factors, known as "Balance and Harmony.

This Japanese-style well-being emphasizes relationships and mutual recognition over individual self-realization or social change driven by personal power (Ohkura 2023). Key elements include a sense of well-being in both present and future, strong connections in schools and communities, collaboration, altruism, diversity awareness, a supportive environment, social contribution, self-affirmation, self-realization, physical and mental health, and a safe environment. The plan aims to improve these aspects through education and gather evidence on changes in children's subjective well-being.

Regarding cooperative well-being, the plan clarifies that it does not mean closed cooperation based on organizational conformity, which can lead to peer pressure. Instead, it promotes collaboration as a foundation for co-creation, fostering meaningful connections and involvement with others. By integrating well-being into education, Japan aims to develop a holistic approach that nurtures both individual growth and collective harmony.

3. Practice and Evaluation

In schools and educational settings, it is important to realize the diverse well-being of each individual through daily educational activities. As an example of the educational activities which is related with the key elements, Hirota (2024) shows 6 kinds of educational activities:

・Integrated enhancement of personalized and self-regulated learning and collaborative learning.

・Respond to diverse educational needs and social inclusion for promoting learning to realize a coexisting society and student guidance.

・Create an environment where people learn together in the community and at home.

・Promotion of career and vocational education, and problem-based learning.

・Forstering richness in both mental and physical health, safety and security.

・International exchanges activities in the global society.

As a result of these practices, it is particularly important to collect evidence on whether students' subjective perceptions have changed. For this purpose, in the 2023 National Survey of Academic Performance and Learning, new items such as "I can feel happy" and "I am satisfied with my friendships" were added to the traditionally used item "I have good qualities" to measure a wide range of well-being.

The analysis of the students' challenging spirit, sense of self-efficiency, and sense of happiness have shown a correlation between the questions on independent, interactive, deep learning, and individually optimized learning and the questions on students' sense of self-efficiency are suggesting that proactive, interactive, and authentic learning and personalized and self-reulated learning may have an impact on students' senses. The possibility to the deep independent and interactive learning and individually-optimized learning has an impact on students' sense of self-utilization has been suggested (Hirota 2024).

4. Discussions

One point to be noted when considering well-being is the inclusion of minority children. This is one of the 6 activities mentioned above, "respond to diverse educational needs and social inclusion for promoting learning to realize a coexisting society and student guidance."

In this section, we will discuss children with foreign roots in particular. Since the revision of the Immigration Control and Refugee Act in 1989, the number of foreign residents in Japan and the number of children with foreign connections have kept increasing. This is partly due to a shortage of workers caused by a declining birthrate and an aging population in Japan.

According to a survey conducted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) on "children in need of Japanese language instruction," the number of enrolled students has been increasing year by year, reaching 47,627 in 2021. The backgrounds of these students are extremely diverse, including nationality, language, and lifestyle, and

identity crisis (Nukaga 2021). Furthermore, it has been pointed out that they face stereotypes and prejdices on a daily basis, which can cause them to the lack of self-confidence (Tokunaga et al. 2021). This is considered to be a condition in which mental and physical health and self-affirmation, which have been listed as key elements including a sense of well-being, are not achieved.

The Expert Committee on the Improvement of Education for Foreign Students (2020) presented a clear direction of "no one is left behind" and concrete ways to provide support. Not only comprehensive support such as Japanese language and career education, but also support for learning one's mother tongue and culture, and opportunities to take advantage of the experience of being born and raised in multiple languages and cultures, as well as to utilize one's strength, are considered important. Therefore, it can be pointed out that among the key elements including a sense of well-being, self-affirmation, strong connections in schools and communities, and a sense of social contribution are important.

Relatedly, Kanai (2020) states that the discrepancy between the "culture" of family and cultural roots and school culture and curriculum is seen as problematic.

Kodama (2021) also notes that what is prominient in Japanese schools is the supposed adaptation and assimilation to the majority norms of Japanese language and its school culture, such as Japanese language instruction and adaptive instruction. In contrast, school culture and curriculum should be based on respect for diversity.

In response to the increasing number of students requiring educational needs from diverse backgrounds, educational policies emphasize the creation of schools that respect and embrace diversity. However, it is difficult to say that sufficient efforts have been made to promote this in practice. One of the factors contributing to this, according to Yamada (2024), is the "facade" nature of educational policy and the existence of a "hidden curriculum" in school cultures that tend to favor monoculturalism. The Central Education Council in 2021 explicitly mentioned "individualized optimal learning" to ensure educational rights for children with foreign backgrounds, but school education is not primarily defined as the main entity for promoting native language and culture education. Additionally, there are no human or financial resources allocated for the proper placement for teachers, so the concept of emphasizing the individuality of children connected to foreign countries remains merely a "facade" (Yamada 2024). In school cultures where it is not possible to create an environment that recognizes and considers differences in ethnicity and culture (Ishikawa 2008), teachers tend not to question the privileges held by the majority in the school and instead tend to demand that ethnic minorities comply with the "rules" embedded in the school (Takahashi 2021). The issue of respecting and embracing diversity in school education is also tied to the conscious question of who is considered "Japanese," and addressing this deep-seated awareness is something that school education must confront. One aspect of this is the need for a review of citizenship education. Minei (2010) points out that in Japan, the concept of "national character ≒ Japanese identity"

has been emphasized, and citizenship is not perceived as a concept that emcompasses the plurality and multiplicity of human existence. This is a notable point, especially from the perspective of citizenship education (Nishino 2024), which is said to contribute to the enhancement of well-being. Moreover, Matsuo (2023) advocates for the need to incorporate perspectives that question "Japanese identity," the majority concept in Japan's multicultural education, and proposes creating lessons that critically engage with textbooks and materials and build a new narrative of multiculturalism in Japan.

As discussed above, the concept of well-being is still on the way in Japan.

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AI in Education for Well-being: Global Perspectives and Collaborative Efforts

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Noh, Youjeng
Yoo, Seoyeon

Introduction

1.1 The Role of AI in Education and Mental Health for Well-being

In recent years, mental health and well-being have become critical concerns in the educational landscape. Education should not only enhance academic achievement but also foster an environment that supports students' emotional stability and psychological well-being.
In particular, Sustainable Development Goal (SDG) 3, "Good Health and Well-being," emphasizes ensuring healthy lives and promoting well-being for individuals of all ages (United Nations, 2015). Given its significance, this goal should be actively incorporated into educational policies and practices.

The rapid advancement of artificial intelligence (AI) has opened new opportunities in education, with AI-driven learning environments not only improving students' learning experiences but also positively impacting their mental health and well-being. AI-powered personalized learning systems analyze individual learning patterns to provide optimized learning pathways, helping to reduce academic stress, enhance motivation, and foster self-regulated learning, all of which contribute to students' overall well-being. Moreover, studies have shown that AI chatbots and social robots can effectively support students' emotional stability and psychological well-being.

In South Korea, AI digital textbooks will be fully implemented starting in 2025, potentially transforming students' learning experiences and influencing their overall well-being. These digital textbooks aim to analyze each student’s learning level, provide personalized feedback, and encourage more active and engaged learning. However, despite the increasing integration of AI in education, discussions remain limited on how AI technology directly influences students' mental health and well-being, as well as what policy approaches are necessary to maximize its benefits.
This study investigates how AI-based learning environments contribute to students' well-being and explores policy directions for ensuring the sustainable development of AI-driven education.

AI education must evolve from being a supplementary learning tool into an innovative educational model that safeguards students' mental health and promotes their well-being. Therefore, research and policy initiatives must focus on integrating AI effectively into education while addressing its implications for student well-being.

1.2 Key Research Questions

AI education technologies have the potential not only to transform individual learning experiences but also to alleviate academic stress, enhance learning motivation, and support emotional stability. This study aims to examine the impact of AI-based education on students' well-being and explore how AI technologies can be utilized to promote mental health within educational settings.

Specifically, this study addresses the following key research questions:

1. How do AI-driven learning services contribute to students' mental health and overall well-being?
2. What are the potential effects of implementing AI digital textbooks in South Korea on the well-being of both students and teachers?
3. What policy measures are necessary to ensure that AI-based education functions as an effective tool for mental health support?

By addressing these questions, this study seeks to explore the potential of AI technology in fostering well-being in education and to propose effective policy strategies for its sustainable implementation.

2. AI-based Learning Environments and Well-being Enhancement

2.1 The Psychological Benefits of Personalized Learning

The integration of AI technology in education is rapidly transforming learning environments. Unlike traditional one-size-fits-all teaching methods, AI-based learning systems personalize education by adapting to individual students' learning pace and comprehension levels. This shift not only improves students' learning experiences but also alleviates academic stress and enhances motivation, ultimately contributing positively to their mental health and well-being. Particularly, AI-driven learning environments that empower students to regulate their own learning pathways and receive immediate, tailored feedback. This fosters self-directed learning, strengthens their sense of academic achievement, and enhances confidence in their abilities.

1) Enhancing Learning Motivation and Engagement

A growing body of research supports the notion that AI-driven personalized learning systems significantly enhance students' motivation and engagement. Adaptive learning systems analyze students' learning patterns, present appropriately challenging content, and assist them in setting personalized learning goals. As a result, students engage with material at a level suited to their abilities, reducing stress while maintaining high levels of engagement.
Empirical studies indicate that students exposed to AI-driven personalized learning demonstrate significantly higher engagement levels, which, in turn, positively impact their academic performance and emotional well-being (KCI, 2024). Additionally, AI-driven feedback mechanisms provide students with a clearer understanding of their learning progress, reinforcing self-efficacy and fostering persistence in learning.

2) Improving Academic Achievement and Confidence

Numerous studies have shown that AI-based learning environments contribute to improved academic achievement. By analyzing students' progress in real time, AI systems can adjust the difficulty of learning materials, ensuring that students are neither overwhelmed nor under-challenged. For example, a study conducted at Soonchunhyang University found that students using the AI-powered adaptive learning system ALEKSnot only achieved higher academic performance but also reported increased confidence in their learning abilities compared to those who did not use such systems (Soonchunhyang University, 2023). These findings suggest that personalized feedback and targeted learning support provided by AI systems enhance students' self-efficacy and foster a more proactive attitude toward learning

3) Reducing Learning-Related Stress

AI-driven learning environments also show promise in alleviating academic stress. Traditional education models often burden students with standardized learning paces and rigid assessment structures, causing anxiety for those struggling to keep up. Conversely, AI-based personalized learning allows students to progress at their own pace and provides additional learning opportunities when needed, mitigating feelings of academic pressure. Research from the U.S. Institute for Educational Research (2024) reported that students using AI-powered adaptive learning systems experienced a 30% reduction in academic stress and a 40% increase in learning confidence. These findings underscore the potential of AI-driven education to foster both academic success and emotional well-being.

In sum, AI-based learning environments enhance personalized learning experiences by catering to individual needs, thereby fostering higher motivation, academic achievement, and stress reduction. As AI technology continues to advance, further research is required to deepen our

understanding of its effects on students' psychological well-being and optimize its implementation in education. To ensure AI-driven learning promotes well-being, continuous educational policy support and strategic implementation plans are essential.

2.2 AI-based Mental Health Support in Education

Beyond personalized learning, AI technology plays an increasing role in mental health support. AI-driven psychological counseling tools such as AI chatbots and social robots have been identified as effective interventions for promoting students' emotional well-being. This section explores empirical cases demonstrating how AI technology contributes to students' psychological health.

1) AI Chatbots for Mental Health Support

AI-powered chatbots are emerging as scalable solutions to address the shortage of human counselors while providing real-time emotional supportto students. Equipped with natural language processing (NLP)and sentiment analysis algorithms, these chatbots are capable of detecting signs of emotional distress and delivering personalized psychological support.

Recent research has explored the effectiveness of such tools in school settings. Lee and Lee (2023) developed an AI chatbot designed to reduce anxiety among elementary school students. By analyzing students' emotions through NLP technology and offering tailored feedback, the chatbot helped students experience a statistically significant reduction in anxiety levels ($p < .05$)over a four-week period, particularly in areas of physical and social anxiety. Similarly, a study by An and Jeong (2021) at Gachon Universityevaluated an AI-powered counseling chatbot that utilized GPT-2and Electramodels for emotion analysis and anxiety classification. Their findings showed that students who used the AI chatbot demonstrated higher counseling retention ratesand were more willing to express their feelings compared to those who used traditional counseling applications.

2) AI-based Social Robots for Positive Psychology Coaching

In addition to chatbots, AI-powered social robots are being used to strengthen students' emotional resilience through continuous feedback and interactive support. Jeong et al. (2023) introduced a positive psychology intervention (PPI)program at MIT, employing social robots to assist students with stress management, emotional regulation, and goal settingthrough daily interactions. The study reported a 19% decrease in depression levelsand a 25% increase in

learning motivationamong students who engaged with the social robots, demonstrating the potential of AI-powered interventions in fostering both emotional well-being and academic engagement.

These studies illustrate the growing potential of AI-driven psychological support systems in promoting students' emotional stability and mental health, positioning AI as an essential component of modern educational well-being initiatives.

3. The Implementation of AI Digital Textbooks and Well-being in South Korea

3.1 Key Features of AI Digital Textbooks

As AI continues to integrate into education, personalized learning has gained significant attention. The South Korean government has announced the full-scale adoption of AI digital textbooks by 2025 (Ministry of Education, 2023). These AI-powered textbooks are designed to analyze students' individual learning patterns and provide personalized feedback, shifting the focus from traditional teacher-led instruction to learner-centered education. This transition is expected to have profound implications not only for instructional methodologies but also for the well-being of students and teachers.

AI digital textbooks differ fundamentally from conventional digital versions of printed textbooks (Kim,S.M., 2024). They enable AI-driven learning diagnosis and analysis, allowing students to access optimized learning content tailored to their individual pace. As a result, students can experience academic success, enhance their intrinsic motivation, and build higher self-esteem (Kim,S.M., 2024).

Moreover, AI digital textbooks offer distinct benefits for the three key stakeholders in education—teachers, students, and parents (KERIS, 2023).

- For teachers, AI digital textbooks support the monitoring of students' learning progress and provide data-driven insights into students' knowledge levels. This allows teachers to design interactive, participatory lessons, such as discussions, collaborative projects, and problem-solving activities. Additionally, AI-powered teaching assistants help teachers assess student performance and offer tailored learning support.
- For students, AI digital textbooks facilitate self-paced learning, helping to reduce academic pressure while promoting a sense of achievement. This process enhances

intrinsic motivation and self-confidence. AI's real-time emotional and cognitive feedback helps students maintain emotional stability and academic persistence.

- For parents, AI digital textbooks offer data-driven insights into their child's strengths, weaknesses, and learning progress. This information enables parents to provide more effective support for career exploration and emotional encouragement tailored to their child's individual needs.

Ultimately, the holistic impact of AI digital textbooks extends beyond personalized instruction. By enhancing engagement, motivation, and confidence, these tools contribute directly to students' emotional and psychological well-being, supporting a healthier and more sustainable learning environment.

3.2 The Impact of AI Digital Textbooks on Well-being

The adoption of AI digital textbooks is expected to have a positive impact on the well-being of both students and teachers.

For students, personalized learning helps reduce academic stress and promotes self-directed learning. Through individualized feedback, students can better understand their learning progress and strengths, set realistic goals, and gradually build self-efficacy. Furthermore, AI's real-time emotional assessment tools monitor cognitive load and stress levels, recommending appropriate breaks and adjustments to help maintain a healthy balance between study and rest.

For teachers, AI digital textbooks help alleviate instructional workload by automating tasks such as student progress tracking and performance assessment. With AI-assisted data visualization, teachers can engage in more effective instructional planning, reducing the emotional burden caused by excessive administrative work. This shift allows teachers to devote more attention to interactive teaching and student engagement, contributing to a more fulfilling and rewarding teaching experience.

Ultimately, AI digital textbooks enhance both the flexibility and personalization of education while supporting the well-being of students and educators alike. Their implementation marks a paradigm shift toward a holistic, data-driven, and student-centered learning environment.

4. Policy Approaches for AI-based Education and Well-being

4.1 Integrating AI-driven Mental Health Support Systems in Public Education

To maximize the positive impact of AI on students' mental health and well-being, AI-powered psychological support systemsshould be systematically integrated into the public education

system. As students experience varying levels of academic stress and emotional challenges, comprehensive interventions are necessary to promote their well-being.

AI-driven chatbots can provide real-time emotional monitoring and facilitate timely mental health support. In addition, AI-based sentiment analysis tools can assess students' stress levels and offer personalized recommendations, such as workload adjustments and relaxation strategies. By embedding AI within mental health support frameworks, schools can take proactive measures to safeguard students' emotional well-being, contributing to a more stable and inclusive learning environment.

4.2 Establishing Ethical Guidelines and International Collaboration for AI Digital Textbooks

While AI digital textbooks enhance students' learning experiences, they also raise important concerns regarding data protection and algorithmic transparency. As these systems continuously collect and analyze personal information, it is essential to establish clear ethical guidelines to address privacy issues and ensure the responsible use of AI in education.

Developing such guidelines requires international collaboration among policymakers, educators, and researchers to create globally accepted standards for ethical AI use in schools. With the global expansion of AI in education, fundamental principles—such as data privacy, algorithmic fairness, and equitable data use—must be reinforced through sustained international cooperation to guarantee fair and ethical implementation.

To protect students' data privacy, the scope of AI-driven data collection should be clearly defined, ensuring that information is gathered and processed transparently. Strong cybersecurity measures must also be in place to safeguard sensitive student data from potential breaches. Furthermore, regular auditing and validation of AI algorithms are necessary to minimize bias and ensure that learning recommendations remain fair and accurate.

Establishing an international collaboration network would promote the sharing of best practices in AI education across countries, supporting the continuous refinement and improvement of AI-driven learning systems. Through these efforts, AI-based education can be implemented in ways that are both secure and equitable, protecting students' rights while enhancing their learning experiences.

4.3 Strengthening Collaboration Between AI, Psychology, and International Educational Partnerships

To fully harness the potential of AI-driven education and mental health support, it is essential to foster interdisciplinary collaboration among AI researchers, psychologists, and educators.

AI-based learning systems must be designed with a deep understanding of students' emotional and cognitive development, integrating insights from psychological and educational theories to ensure that learning environments not only optimize academic performance but also support emotional well-being.

For adaptive AI learning models to be truly effective, they must incorporate evidence-based strategies that enhance motivation and promote self-regulated learning. Educational psychology offers valuable insights into how students learn, what influences their engagement, and how feedback mechanisms can strengthen persistence and confidence. By embedding these psychological principles into AI-powered platforms, educational technologies can better address both the cognitive and emotional needs of students, fostering a more holistic and supportive learning experience.

International collaboration is also crucial for refining AI-driven educational models and ensuring their effectiveness across diverse educational and cultural contexts. Countries have adopted AI-based learning technologies in different ways—some emphasizing personalized learning, others focusing on mental health support. Establishing global research networks allows policymakers, educators, and researchers to share best practices, address common challenges, and develop effective strategies for AI integration in education. Such collaboration can help resolve ethical and technical concerns, including data privacy, algorithmic bias, and equitable access to AI-powered learning resources.

Achieving responsible, well-being-centered AI education requires stronger global cooperation among educational institutions, technology developers, and policymakers. Through multidisciplinary and international partnerships, AI-driven education can evolve into a model that not only improves learning outcomes but also prioritizes students' psychological well-being, advancing inclusive, equitable, and sustainable education.

Conclusion

This study explored how AI-driven education can enhance the well-being of both students and teachers, with a particular focus on the implementation of AI digital textbooks and the corresponding policy implications. The findings suggest that AI technologies have significant potential to reduce academic stress, increase learning motivation, and support mental health in educational settings.

AI digital textbooks provide various benefits for students, including personalized learning experiences, the promotion of self-regulated learning, and emotional stability. For teachers, AI contributes to more efficient assessment practices and reduces administrative workload,

leading to improved job satisfaction. However, to ensure that AI effectively supports mental health and well-being, comprehensive research and targeted policy interventions are essential.

Future studies should prioritize the quantitative assessment of AI's mental health benefits and evaluate the real-world effectiveness of AI digital textbooks in promoting well-being. Furthermore, expanding international collaboration in AI education research will be crucial to identifying strategies for optimizing AI applications across diverse educational contexts.

Achieving sustainable and inclusive AI-driven education will require robust governmental and institutional support, the establishment of standardized ethical guidelines, and ongoing international cooperation. Developing global policy frameworks and ensuring accountability in AI systems are critical steps toward building a fair, transparent, and well-being-centered educational landscape.

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Northeast Normal University

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Transforming Education for Well-being:Exploring Educational Theory and Practice in China and Japan"

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Heading 1 How to Respond to the Issue of Happiness: The Conceptual Logic and Practical Exploration of Moral Education in Japan

In recent years, Japan has been pursuing policies aimed at building a society that harmonizes individual and social happiness. However, realizing this vision of happiness requires addressing three key dilemmas: First, what exactly constitutes happiness for an individual? Second, how can happiness be understood within the dynamic interplay between individuals and society? Third, how can individuals be motivated to take action toward achieving the happiness they envision? Aligning with the OECD's emphasis on "student agency" as a pivotal mechanism for unifying personal and social happiness, Japanese moral education also places significant emphasis on the concept of "agency."

In response to the issue of happiness, Japanese moral education is grounded in the following conceptual logic: It focuses on "building an agentic lifestyle" to guide students in achieving personal happiness; it emphasizes "moral value guidance and relational cultivation" and "developing students' moral judgment and reflective capacities" to foster the integration of personal and social happiness. Through the "existential turn in moral learning" as a procedural safeguard, "moral cognition and emotional drive for moral practice and attitudes" as internal motivation, and a socially open curriculum to connect with broader society, it enhances the practical capacity to pursue happiness.

In practice, Japanese moral education prioritizes "dialogue-based" activities, exploring various teaching methods rooted in "deep reflection on one's way of being" to achieve both personal and social happiness. However, the realization of happiness ultimately depends on

action, which requires not only internal cognitive support but also the cultivation of moral practice skills and a supportive social environment. The challenges in Japanese moral education's response to the issue of happiness lie in two areas: First, there is a tendency to treat "action" as a natural extension of "knowledge, emotion, and will," overlooking the need for deliberate cultivation of action and the societal conditions that enable it. Second, the assumption of innate human goodness leads to an oversimplified view of real-world complexities, resulting in an idealistic approach to addressing happiness in moral education.

Heading 2 Child Well-being and Human Capital Formation: Evidence from a Poverty Alleviation Program in China

Early Childhood Language Acquisition and Human Capital Formation: An Evidence from a Poverty Alleviation Program in China Promoting universalization of national common language education at the preschool level helps lay a good foundation of language communication for preschool children in rural and ethnic areas to enter compulsory education, and is an effective way to accumulate human capital. In recent years, China's "universal preschool learning" program has achieved remarkable results with the support of relevant policies, and has become a successful case of promoting educational equity and children's comprehensive development, as well as enhancing educational well-being. James J. Heckman put forward the value of the human capital curve for early childhood investment, and found that high-quality early childhood development has a serious impact on the health, economic and social outcomes of individuals and society as a whole. Moreover, public policies on education that focus on early intervention can improve the lives of disadvantaged children, contribute to the development of children's cognitive and socio-emotional abilities, and help children to receive more schooling, which in turn reduces crime rates and improves their ability to work, among other things.

Based on the background and starting point of this study, which is based on the intuitive educational status quo, embarrassing educational dilemmas, and a new education campaign in Liangshan Prefecture, Sichuan Province, China, this study explores the impact of the "Pre-school Learning" campaign on the promotion of young children's cognitive abilities, pro-social tendencies, and parental education concepts and methods. The study found that the following aspects are specifically reflected: First, at the individual level, the learning of

Putonghua helps to lay a good language foundation for the subsequent education of young children, and enhances their cognitive and social abilities and other aspects of their overall development; second, at the family level, the "Learning Putonghua in Preschool" program helps to form a good language environment for young children at home, and promotes the development of good living habits for them, Secondly, at the family level, the "Preschool Popularization" program helps to form a good family language environment for young children, promotes the formation of good living habits, cultivates scientific concepts of family education, and increases the family's economic income through the use of Putonghua as a vehicle; thirdly, at the social level, through the steady promotion of the "Preschool Popularization" program in the style of "Little Hands Pulling Big Hands," it will enhance the overall quality development of preschool education and promote the development of the whole society. Thirdly, at the social level, through the steady promotion of the "pre-school education" program in the form of "small hands pulling big hands", the overall quality of pre-school education will be improved at a macro level, which will promote the development of modern civilized lifestyles of the local residents, and at the same time, promote the unity of the nationalities as well as the economic and cultural sustainability.

In conclusion, as a successful case of educational poverty alleviation in China, the "Pre-school Learning for All" initiative and the "Tongyi Tongyi" program have provided useful Chinese experience in further promoting economic development and educational equity in relatively poor and disadvantaged regions of the world, and are of great significance to the sustainable development of education and the well-being of students. They are of great significance to the sustainable development of education and the well-being of students.

Heading 3 Research on Policies to Enhance Teachers' Professional Well-Being in China: Theory and Practice

In addition to focusing on the well-being of students, it is also important to focus on the other dimension of "teaching" and "learning" - the teacher. Enhancing teachers' professional well-being is of far-reaching importance in the field of pedagogy, which not only concerns the psychological health and professional development of individual teachers, but also directly affects the overall effectiveness of the education system and the growth and development of

students. It is specifically reflected in the promotion of teachers' psychological health, the improvement of teaching quality and effectiveness, the construction of a positive campus culture, the promotion of teachers' professional growth and development, and the influence of students' socio-emotional development. A happy teacher can be a positive role model for students, influencing their socio-emotional development through teaching and learning, boosting their self-confidence, fostering empathy, and stimulating their motivation to learn, which has a profound impact on their overall development.

In China, the following policies have been enacted to ensure the status and social security of teachers. First, through the Draft Revised Teachers' Law (2021), the State has established the legal standard that "the average salary of teachers in compulsory education shall not be lower than that of civil servants," in order to "rigidly constrain" the economic status of teachers. First, through the Draft Revision of the Teachers' Law (2021), the State established the statutory standard that "the average salary of compulsory education teachers shall not be lower than that of civil servants", thereby "rigidly constraining" teachers' economic status. Secondly, the General Office of the State Council has promulgated the Rural Teacher Support Program (2015-2020), which proposes to improve the living standards of rural teachers, unify urban and rural staffing standards, and tilt the appraisal of titles (positions) toward rural schools in order to enhance the sense of well-being of rural teachers. Typical examples: Zhejiang Province has implemented a gradient subsidy policy of "the higher the grassroots, the higher the treatment", which has resulted in a 30% increase in the income of rural teachers, and empirical research has shown that their burnout rate has dropped by 12%. Third, the "Double Reduction" policy supporting measures (2021): the Opinions on Further Reducing the Burden of Homework and Out-of-School Training for Students in Compulsory Education were adopted, and a compensation mechanism for teachers' flexible working hours and after-school services was set up to alleviate the non-teaching burden on teachers. Data from the Ministry of Education show that the average daily working hours of teachers have shrunk by 1.2 hours since the implementation of the policy, and the burnout rate has dropped by 8.3%.

Specifically in educational practice, the first is to strengthen the "dual-mentorship" professional development, such as Longgang District, Shenzhen, the implementation of the "university experts + teaching masters" joint guidance model, so that teachers' sense of teaching efficacy increased by 22.4%. At the same time, the construction of teacher learning

communities has been strengthened, such as the creation of the “Teacher Happiness Development Center” in Qingyang District, Chengdu City, which promotes the flow of cross-school experiences through the action learning method, and the level of professional commitment of community members is 17.8% higher than the regional average. Through a series of measures, we have built a dynamic monitoring system for teacher well-being and integrated big data to track the long-tail effect of policies; further deepened and intensified comparative education research, and refined China's experience in global teacher governance; and, with the help of technological empowerment and digitalization transformation, we have explored AI-assisted teaching tools, which can reduce the transactional work of teachers, such as the intelligent homework correction system, and free up more time for instructional design. At the same time, further promote home-school-society collaboration, such as through parent schools to reduce non-educational disputes among teachers and enhance social respect for the teaching profession.

Therefore, advocating a global focus on the well-being of the teaching profession is a key initiative to ensure sustained improvement in the quality of education, promote innovation and equity in education, as well as maintain the stability and healthy development of the teaching force. Educational institutions and all sectors of society should take effective measures, such as improving working conditions, providing career development opportunities, and establishing a reasonable evaluation system, to jointly create an environment conducive to the enhancement of teachers' professional well-being.

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An Aesthetic Impact of Coloring Idea Activities on Students' Well-Being in the Mathematics Classroom

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ABSTRACT

The purpose of this study was to explore the aesthetic impact of Coloring Idea Activities on students' well-being while solving problems in the classroom using the Open Approach. Coloring books highlight the power of simplicity in conveying mathematical concepts effectively, enhancing both visual appeal and learner engagement by integrating art and enjoyable activities (Araya & Isoda, 2023). According to Sinclair (2009), an aesthetic approach to teaching mathematics influences classroom instruction by exposing students to the nature and significance of mathematics in their lives. This approach boosts motivation, reduces mathematics anxiety, and fosters a love of learning.

The study targeted 12th-grade students from a public school in Northeastern Thailand that implements the Open Approach in the mathematics classrooms. A qualitative research method was employed, with data collected through (1) two lesson plans, (2) classroom observation forms, (3) student worksheets, and (4) post-lesson reports. Data analysis followed the conceptual framework of the SEAMEO Basic Education Standards (SEA-BES): Common Core Regional Learning Standards (CCRLS) in Mathematics (Isoda, Teh & Gan, 2024).

The study's findings revealed three key aspects of the aesthetic impact of Coloring Idea Activities on students' well-being:

1. Creating a realistic look – Students expressed creativity through coloring, making mathematical ideas more tangible.
2. Appreciation for others' ideas – Classroom discussions encouraged respect for peers' perspectives.
3. Pride in themself – Students felt a sense of accomplishment and confidence in their learning.

Additionally, students enjoyed their Open Approach mathematics classroom, feeling relaxed, engaged, and independent in their learning, which positively influenced their mental well-being. Students discovered mathematical concepts through these activities, including pattern recognition, number sense, ordering, sequences, and series.

Keywords: Mathematical aesthetics, Well-being, Open Approach

1. Introduction

Universal Health Coverage (UHC) is based on the principle that everyone, regardless of their background, should have access to essential, high-quality healthcare services across all levels of care without facing financial difficulties. This not only enhances health outcomes (SDG 3) but also significantly supports the achievement of other Sustainable Development Goals (SDGs) including economic growth and job creation (SDG 8), gender equality (SDG 5), education (SDG 4), nutrition (SDG 2) and poverty reduction (SDG 1) (WHO, 2024). SDG 4 focuses on providing inclusive, equitable, and quality education while ensuring lifelong learning opportunities, especially for vulnerable populations. Quality education is essential for sustainable development, empowering individuals to reach their full potential, contribute to their communities, and break the cycle of poverty (UNICEF, n.d.). Education has the ability to change the lives of children and youth, beginning with students who are healthy, happy, and safe (UNESCO and UNICEF, 2024). Student stress is a big deal in today's fast-paced academic world. Students deal with a lot, including difficult tests, financial concerns, and expectations related to their future careers (Bouchrika, 2025). Students in secondary and tertiary education settings face a wide range of ongoing stressors related to academic demands (Pascoe, Hetrick, & Parker, 2020). The impact of school stress on mental health cannot be overlooked. Finding a balance using positive strategies to manage school and life is essential for teens to have a healthy well-being (Arwine, 2024).

Inprasitha (2002, 2003) saw that in the context of Thailand, most teachers still teach by emphasizing on transferring knowledge to students. Thailand has implemented the classroom study method for teacher professional development since 2002, initiated by Inprasitha (2003), who adjusted the steps of the Japanese Lesson Study to only 3 steps as follows: 1) Co-Plan: Creating a collaborative learning management plan by the classroom study team jointly creating a learning management plan by trying to take the content to be taught in the form of an open-ended problem situation and make the situation into a mathematical activity. 2) Co-Do: Observing teaching together, one teacher from the classroom study team who jointly created the plan will be the one to implement the learning management plan in the classroom by teaching according to the open method and 3) Co-See: Reflecting on the lesson after teaching together is a very important step for collaborative learning. In order to improve the lesson, it was presented through the lesson plan to give all parties an opportunity to understand the students' learning process (Inprasitha & Loipha, 2007). Inprasitha (2014) presented an educational innovation with "Open Approach" as a teaching approach using open-ended problem situations in mathematical activities. Students learn by themselves through solving problems from mathematical activities, emphasizing on thinking about how to along with studying the classroom (Lesson Study), which is an approach to develop the efficiency of teacher collaboration and the quality of mathematics classrooms. The TLSOA (Transformative Lesson Study incorporated Open Approach) model is a systematic approach to teacher

professional learning community (PLC) that combines the ideas of Japanese Lesson Study (LS) and Open Approach (OA). Created with the goal of assimilating and maintaining LS and OA in the Thai educational context. Research indicates that the TLSOA model positively influences both teaching effectiveness and student learning behaviors. Recognized as a key strategy for comprehensive school improvement, it has garnered support from educational leaders, policymakers, and stakeholders at national, APEC, and CLMV regional levels (Inprasitha, 2022).

Teaching must be open to students' minds (Nodha, 2000), in which "incomplete" problems are presented first, and then the lesson proceeds by using the correct answer to the given problem to create an experience of discovery. This can be done by integrating students' previously learned knowledge, skills, or ways of thinking (Becker & Shimada, 1997) and considering what they would like to do next in a similar situation. Even if students have difficulty calculating, if they recognize the mathematical beauty of the number pattern, it will allow them to appreciate the beauty of mathematics beyond calculation (Isoda & Katagiri, 2012). The most obvious sources of beauty in mathematics are patterns, structures, and symmetry (Ernest, 2015). Describe beauty from the perspective of invariant patterns and symmetry, and appreciate the way others explain (Somsaman, Isoda, Araya, 2024). Seeing beautifulness of mathematic helps to inspire, have fun, and enjoy learning mathematics (NTCM, 2000). When students appreciate their friends' ideas, including classroom discussions Some students are able to use others' ideas to improve their own ideas (Changsri, Inprasitha, Araya, and Isoda, 2024). Coloring activities focused on the beauty and simplicity of ideas and arguments. It also reduced stress and increased relaxation (Ashdown, 2018; Mantzios et al., 2018; Kaimal et al., 2017). And coloring helps relieve stress by promoting physical relaxation and mental calmness. It can also reduce pain, heart rate, anxiety, and fatigue, improving overall well-being (Bobby, 2022). Recognizing the beauty of patterns is learned through appreciating mathematical experiences. Appreciating others' ideas includes understanding plausible ideas (SEAMEO RECSAM, 2017). Therefore, the researcher was interested in exploring well being through Coloring idea Activities while solving the problem in classroom using Open Approach in mathematics classroom**.**

2. Methods

2.1 Target group

The target group was thirty three 12th grade students from a school in the northeastern region of Thailand. The purposive selection was a class that had been using the open approach for one academic year.

2.2 *Data Collection*

Data collected from 1) two lesson plans based on the coloring activities from the Guidebook for Unplugged Computational Thinking (2023) by using open approach and based on

Changsri (2024) pseudo coding with coloring at the 17th National Open Class, Khon Kaen 2) classroom observation forms 3) student work sheets and 4) post lesson reports.

2.3 Data Analysis

This study was qualitative research. Researcher used coloring idea activities that applied from Guidebook for Unplugged Computational Thinking (2023) and based on Changsri (2024) pseudo coding with coloring [Mathematics Class] at the 17th National Open Class in classroom using Open approach. Data were analyzed according to the conceptual framework of SEAMEO Basic Education Standards (SEA-BES): Common Core Regional Learning Standards (CCRLS) in Mathematics (Isoda, Teh & Gan, 2024). In this study, well-being will be defined in terms of mathematical aesthetic feelings, which refer to the feelings that students have when they discover mathematical concepts on their own and admire the concepts of others.

3. Result

The results of the study found that an aesthetic impact to the students' well being through coloring idea activities in classroom using OA occurred as:

1) Ducklings' activities

Figure 1: set of Ducklings students' worksheet

While observing the group of mother ducks and their ducklings, students identified the rightmost position and counted the number of ducklings beneath each mother duck, coloring them accordingly. With extra time, some students chose to paint the other mother ducks black. The emerging ideas aligned with key mathematical concepts. As anticipated by the classroom study team, students developed an understanding of numbers, comparisons, and ordering.

Figure 2: Ducklings students' worksheet and while they are coloring by themself

The aesthetic ideas that appeared in the classroom demonstrated that students enjoyed coloring and that, when it came to presentations, they confidently explained why they were coloring. Other students in the class provided particular attention to their friends' ideas and recognized that they were different from their own because they had different points of view.

Figure 3: Students create instructions Ducklings (B)

Students engaged in group discussions and made predictions about whether the other groups would comprehend their instructions while working on the Ducklings (B) task, which asked them to create their own instructions collectively. Some groups wrote the instructions first, then colored them; others colored the instructions first, then wrote them; still others wrote the instructions, colored them, and made revisions as they went.

Figure 4: Students' worksheets are compared with those of their peers.

In the Ducklings Activity (B), students formulated a numerical condition in Statement 1 and a left-right turn condition in Statement 2. This demonstrated their understanding of number concepts and directional ordering, as they applied ideas from the Ducklings Task (A) to construct logical conditionals.

Through this activity, students developed a sense of comfort in the mathematics classroom, gained the flexibility to think and act independently, and learned to collaborate effectively. They also demonstrated the ability to accept and understand differing perspectives with reasoning and openness

2) Many faces' activities

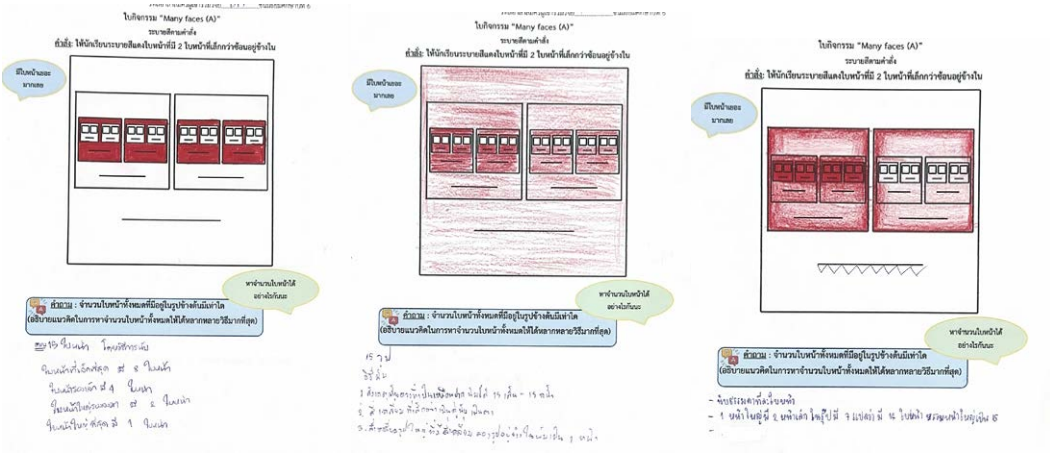

Figure 5: A set of Many Faces student' worksheets.

Students engaged in a discussion about creating an art project that incorporated the number '2' as a design element. They explored arranging objects in pairs or drawing two related figures. Through the face-coloring exercise, students learned to distinguish two small faces from various angles. Some progressed to identifying the largest face, which was composed of two smaller faces nested inside. They recognized the smallest face as a combination of two small squares and a single straight line, gradually building up to more complex structures.

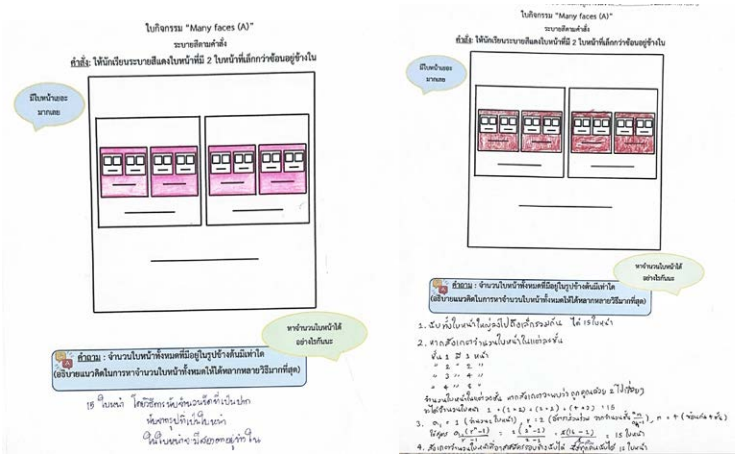

Figure 6: set of Many faces' students' worksheet

Additionally, students discovered that the sequence of faces, arranged from largest to smallest, could be represented as a geometric sequence. Some even applied their prior knowledge to calculate the sum of all faces using geometric series. The rest of the class enjoyed their classmates' presentations and were amazed by their insights, especially when one student confidently stepped forward to present.

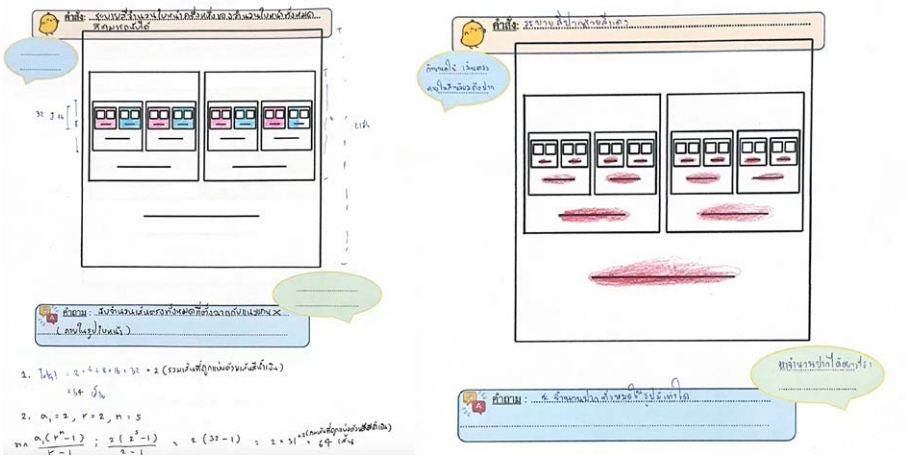

Figure 7: set of Many faces(B) students' worksheet

One group applied the concept of identifying geometric series in the Many Faces (B) activity. In addition to the mathematical concepts that emerged, the activity's creatively designed instructions highlighted the enjoyment of creating colorful faces—for example, guiding another group on how to paint lips.

4. Conclusion

This research explores the aesthetic impact of coloring idea activities on students' well-being. Drawing from Changsri's (2024) work on coloring idea activities and the Guidebook for Unplugged Computational Thinking (2023), it examines the aesthetic elements of an open mathematics classroom. Observations revealed that students found joy in their studies, developed a sense of self-appreciation, and embraced diverse viewpoints shared within the

classroom. Students' well-being was evident in their growing understanding of diversity and respect for differing opinions. Additionally, they encountered mathematical concepts—represented through numbers and rankings—without experiencing pressure in their learning process. The students also learned how to coexist with others, predict and understand what others might think, whether similar or different. These skills help foster their readiness to grow and integrate into society, enabling them to live happily and gain a deeper understanding of the world around them.

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Artificial Intelligence-based Symptom Checkers for Disease Diagnosis: A Systematic Review

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Abstract

Background: Artificial intelligence (AI)-based symptom checkers represent a promising frontier in healthcare technology, potentially transforming preliminary diagnostic information access and patient triage management. This systematic review evaluates current evidence on AI-based symptom checkers for disease diagnosis across multiple dimensions of their effectiveness.

Methods: A comprehensive search was conducted across PubMed, SCOPUS, and Sage Journals databases for studies published between January 2020 and January 2025. Selection criteria included peer-reviewed studies evaluating AI-based symptom checkers with quantitative assessment of diagnostic accuracy, triage accuracy, user satisfaction, or clinical utility. From 1,010 initially identified publications, 12 studies met inclusion criteria and were assessed using the Joanna Briggs Institute critical appraisal checklist.

Results: Studies spanned multiple countries and medical specialties including cardiovascular, dermatological, ophthalmological, neurological, and respiratory applications. Findings demonstrated improvements in diagnostic precision, with some AI systems achieving comparable performance to specialists under specific conditions. Notable implementations included AI-guided screening for atrial fibrillation, melanoma detection, diabetic retinopathy assessment, headache diagnosis, and hypertension identification. Most studies reported high sensitivity and specificity metrics, with several demonstrating cost-effectiveness advantages.

Discussion: AI symptom checkers show potential for advancing universal health coverage by optimizing resource allocation, enhancing cost-effectiveness, and addressing healthcare workforce constraints. However, implementation challenges include the need for validation across diverse settings, algorithmic refinement, workflow integration, and mitigation of potential biases in training datasets.

Conclusions: AI-based symptom checkers demonstrate considerable promise for enhancing diagnostic capabilities across medical specialties while improving healthcare accessibility. However, these technologies require further validation in diverse clinical settings, careful integration with existing workflows, and attention to potential algorithmic biases before widespread implementation. The

trajectory suggests measured optimism for AI diagnostic technologies contingent upon addressing identified constraints through rigorous investigation and thoughtful implementation science.
Keywords: Artificial intelligence, Symptom checkers, Disease diagnosis, Systematic review.

Introduction

The global healthcare landscape is rapidly evolving with technological advancements, particularly in artificial intelligence (AI) applications for disease diagnosis. As highlighted in the UNESCO Science Report on SDG 3, health research accounted for 33.9% of global scientific publications in 2019, demonstrating the significant attention devoted to improving health outcomes worldwide (UNESCO, 2021). Among these innovations, AI-based symptom checkers represent a promising frontier in healthcare technology, potentially transforming how patients access preliminary diagnostic information and how healthcare systems manage patient triage.

Symptom checkers are digital tools that use algorithms to analyze user-reported symptoms and provide potential diagnoses or triage recommendations. These tools have gained prominence in recent years as healthcare systems globally face challenges including physician shortages, accessibility barriers, and the need for efficient patient flow management. The COVID-19 pandemic further accelerated the adoption of digital health technologies, as highlighted in the UNESCO report, which noted that 58% of health innovations developed in Africa during the pandemic involved digital solutions (UNESCO, 2021).

The integration of artificial intelligence into symptom checkers represents a significant advancement over earlier rule-based systems. AI-powered symptom checkers utilize machine learning algorithms, natural language processing, and neural networks to process complex symptom patterns and generate diagnostic possibilities with associated probabilities (Hill et al., 2022). These systems can potentially improve with continued use through iterative learning from new data, allowing for more accurate assessments over time.

Despite their potential benefits, questions remain about the diagnostic accuracy, clinical utility, and implementation challenges of AI-based symptom checkers. Concerns include the risk of misdiagnosis, limitations in handling complex or rare conditions, and variations in performance across different demographic groups. Additionally, as with other healthcare technologies, there are important considerations regarding data privacy, accessibility for underserved populations, and integration with existing healthcare delivery systems (Katsuki et al. 2023).

This systematic review aims to evaluate the current evidence on AI-based symptom checkers for disease diagnosis, addressing four key research questions: (1) diagnostic accuracy and performance in preliminary disease diagnosis; (2) comparative performance against healthcare professionals; (3) impact on healthcare accessibility and service utilization; and (4) user satisfaction in healthcare settings. By synthesizing findings from existing studies, this review seeks to provide a comprehensive assessment of the current state of AI symptom checkers and their potential role in healthcare delivery.

Method

Search Strategy

The researcher conducted a systematic search across the PubMed, SCOPUS, and Sage Journals databases to identify articles published between January 2020 and January 2025. Search terms were formulated through a combination of keywords, utilizing the PICO framework (Population, Intervention, Comparison, Outcome). The specified population included patient; adult participants (≥18 years), with the intervention focusing on Artificial Intelligence-based Symptom Checkers intervention. Comparison was made with a control or comparison group, while the outcome of interest was Disease Diagnosis.

The search strategy incorporated the following terms: Population terms such as "patient"; Intervention terms "Artificial Intelligence" "AI" "Machine Learning" "ML" "Deep Learning" "Neural Network"; and Outcome term "Digital Health" "eHealth" "Telemedicine" "Telehealth" "Primary Care" "Remote Diagnosis"

The studies were excluded from the literature review if any of the conditions pertaining to subjects, intervention, comparison, or study design deviated from the specified criteria.

Selection Criteria

The selection criteria for this systematic review encompassed studies published in peer-reviewed journals or conference proceedings in English that specifically evaluated artificial intelligence-based symptom checkers for disease diagnosis. Eligible studies employed experimental, quasi-experimental, or observational designs with quantitative assessment of diagnostic accuracy, triage accuracy, user satisfaction, or clinical utility. Studies were required to evaluate symptom checkers utilizing AI technologies (machine learning, natural language processing, or deep learning) with adequate documentation of algorithms, training datasets, and validation methods. The review included studies published between January 2020 and January 2025 involving adult participants (≥18 years), with preference given to those comparing AI tools with standard clinical practice or human clinicians. Studies were excluded if they focused solely on AI applications outside symptom checking without a symptom-based diagnostic component, and all included research demonstrated appropriate ethical approvals regarding data privacy and patient confidentiality.

Data collection and analysis

A comprehensive search strategy was implemented across multiple electronic databases including PubMed, SCOPUS, and Sage Journals. Quantitative research articles evaluating AI-based symptom checkers for disease diagnosis were selected for inclusion in the study. The researchers prioritized the examination of various outcome measures including diagnostic accuracy, sensitivity, specificity, and user experience rather than conducting a detailed statistical meta-analysis. The primary focus of the investigation pertained to two aspects: the performance of AI-based symptom checkers compared to clinical standards and the technical approaches underpinning these systems. Data extraction was conducted independently by two reviewers using a standardized form to capture study characteristics, AI methodologies, evaluation metrics, and key findings. Within the results section, the

articles were succinctly summarized based on their objectives, methodological approaches, and further organized according to their principal findings related to diagnostic performance, algorithmic innovations, and clinical implications.

Results

Researcher identified 1,010 publications in the SCOPUS, Education Research Complete, and ERIC databases to identify articles published between January 2020 and January 2025. Following this, the titles and abstracts with duplicates were removed, 601 articles were identified as being potentially eligible for inclusion. From these, were removed because they were found to have Non-Specific AI Applications. This left 291 articles potentially eligible for inclusion. Finally, 279 were removed because they were found to be not available in full text, irrelevant technology applications, non-diagnostic focus, and not adult participant (<18 years). Therefore, 12 articles were included in the synthesis. All of the selected article as given in Figure 1.

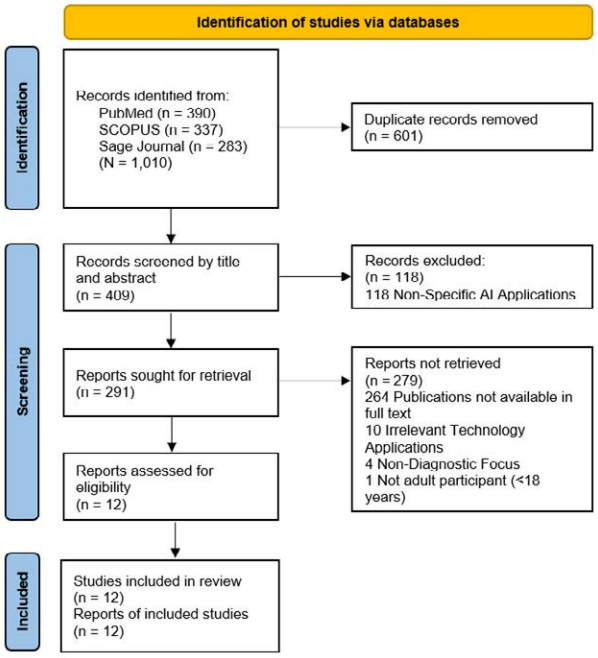

Figure 1 Flow diagram of article selection.

(This figure is adapted from Page MJ et al., 2020)

The characteristics of the 12 studies published during the 2020-2025 period, encompassing a broad geographical distribution that provided international perspectives on the research question. The dataset included contributions from multiple countries with varying representation: Japan contributed the largest proportion with four studies, followed by Spain with two studies, while England, the United States, Canada, Sri Lanka, Germany, and China each contributed one study. This diverse geographic sampling enhanced the review's comprehensiveness and facilitated cross-cultural comparisons, although the disproportionate representation from East Asia, particularly Japan, should be considered when interpreting the findings within a global context. The quality assessment of the studies, conducted using the Joanna Briggs Institute (JBI) critical appraisal checklist, yielded ratings ranging from high to medium quality.

The methodological framework of the reviewed literature featured predominantly observational research designs, encompassing a spectrum of approaches including prospective randomized controlled trials, retrospective observational analyses, prospective multicentre investigations, single-centre observational inquiries, cross-sectional examinations, secondary data analyses, and feasibility studies. Sample sizes demonstrated substantial heterogeneity across the included studies, with participant enrollment ranging from a minimum of 100 subjects in a skin disease diagnostic investigation to a maximum of 51,485 individuals in a spondyloarthritis (SpA) diagnostic model development study, yielding an approximate median sample size of 2,243 participants. The research populations were characterized by considerable diversity, primarily situated within primary care contexts and encompassing patients with specific clinical conditions including diabetes, dermatological lesions, and cephalalgic presentations, while also representing varied demographic profiles across multiple age cohorts, thus enhancing the generalizability of findings within defined clinical parameters.

The reviewed investigations implemented a diverse array of artificial intelligence and computational methodologies to address their respective research objectives, encompassing sophisticated machine learning risk prediction algorithms, multilayered deep learning neural networks, advanced large language models specifically utilizing GPT-4 architecture, specialized convolutional neural networks optimized for image recognition, multiple concurrent machine learning paradigms including logistic regression and support vector machines for comparative analysis, and parameter-efficient fine-tuning approaches such as low-rank adaptation (LoRA) to enhance model performance with domain-specific data. This methodological heterogeneity reflects the evolving landscape of AI applications in the research domain, with techniques selected based on their appropriateness for specific clinical contexts, data modalities, and predictive tasks, though such diversity potentially complicates direct cross-study comparisons and necessitates careful consideration of the technical foundations when interpreting the collective findings across the systematic review.

The reviewed investigations encompassed artificial intelligence diagnostic applications across a diverse spectrum of medical specialties, representing the multifaceted implementation of computational methodologies within contemporary clinical practice. Within the cardiovascular domain, the applications focused on atrial fibrillation screening and hypertension detection, while dermatological implementations addressed skin lesion and melanoma detection alongside pigmented lesion analysis. Ophthalmological applications concentrated on diabetic retinopathy screening, whereas neurological implementations targeted headache diagnosis and orofacial pain classification. The respiratory specialty was represented through asthma prediction models, and additional clinical domains were addressed through applications including clinical vignette generation and point-of-care ultrasound guidance. This broad disciplinary distribution reflects the versatility of AI diagnostic tools across medical specialties, though the heterogeneity in implementation contexts necessitates careful consideration when formulating generalizable conclusions regarding diagnostic efficacy across distinct physiological systems and pathological presentations.

The evaluation framework employed across the reviewed studies utilized a comprehensive array of quantitative outcome metrics to assess diagnostic performance and clinical utility. These assessment parameters predominantly included diagnostic accuracy as a fundamental measure of correct classifications, sensitivity and specificity to characterize true positive and true negative rates respectively, Area Under the Receiver Operating Characteristic Curve (AUROC) to evaluate discriminative capability across varying threshold values, positive and negative predictive values to determine the probability of disease presence or absence given test results, quality-adjusted life years (QALYs) to quantify health outcomes incorporating both quality and quantity of life, and cost-effectiveness ratios to assess economic efficiency of diagnostic interventions. This multidimensional approach to outcome measurement facilitated nuanced evaluation of artificial intelligence diagnostic tools, enabling robust comparison against conventional methodologies while simultaneously addressing both technical performance characteristics and broader healthcare system implications regarding resource allocation and patient-centered outcomes.

The aggregated empirical evidence across the reviewed investigations demonstrated substantial promise for artificial intelligence applications in clinical diagnostics, with key findings indicating improvements in diagnostic precision parameters, enhanced decision support capabilities for healthcare practitioners, potential reductions in diagnostic error rates, cost-efficient screening methodologies, and facilitation of early pathology detection. However, these encouraging outcomes were consistently tempered by researcher acknowledgments regarding significant methodological constraints, with authors universally emphasizing the necessity for additional validation studies across diverse clinical environments, continued algorithmic refinement to address performance limitations, comprehensive integration strategies compatible with established clinical workflows, and dedicated attention to potential systematic biases inherent in training datasets that could compromise generalizability across demographic subpopulations. This juxtaposition of promising capabilities against acknowledged methodological limitations reflects the current developmental stage of artificial intelligence diagnostic technologies, suggesting a trajectory of cautious optimism conditional upon addressing these identified constraints through rigorous subsequent investigation and implementation science.

Discussion

The findings from this systematic review have significant implications for advancing Sustainable Development Goal 3, which aims to ensure healthy lives and promote well-being for all. The researchers discuss four significant findings from their investigation following;

The Promise of AI in Advancing Universal Health Coverage

The integration of artificial intelligence (AI) in healthcare diagnostics represents a significant technological advancement with potential to address multiple targets under Sustainable Development Goal 3 (SDG3) - ensuring healthy lives and promoting well-being for all at all ages. The empirical evidence assembled from recent studies (2022-2024) demonstrates how AI-based diagnostic tools are being deployed across diverse medical specialties including cardiovascular medicine, dermatology,

ophthalmology, and neurology, addressing a spectrum of conditions that contribute substantially to global disease burden (Hill et al., 2022; Dow et al., 2023; Crawford et al., 2024).

AI applications in preliminary disease diagnosis, as evidenced in the reviewed literature, may directly support SDG3 Target 3.8, which aims to "achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all" (United Nations, 2015). The geographical diversity of the studies—spanning Japan, Spain, England, the United States, Canada, Sri Lanka, Germany, and China—suggests that AI diagnostic tools are being explored globally, though with notable concentration in high and upper-middle-income countries (Wang et al., 2024; Yoshihara et al., 2024; Gunawardana et al., 2024).

Cost-Effectiveness and Resource Optimization

One significant dimension through which AI diagnostic systems may contribute to SDG3 is through enhanced cost-effectiveness of healthcare delivery. Hill et al. (2022) demonstrated that AI-driven screening for atrial fibrillation could improve early detection while optimizing resource allocation through targeted diagnostic testing. Similarly, Nothnagel and Aslam (2024) explored machine learning applications for deep vein thrombosis diagnosis as potentially more cost-efficient than conventional ultrasound approaches. These findings align with SDG3 Target 3.C, which emphasizes the need to "substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries" by potentially enabling more efficient utilization of limited healthcare resources.

The integration of AI in screening programs, as demonstrated by Dow et al. (2023) in the context of diabetic retinopathy, could address SDG3 Target 3.4 by contributing to the reduction of premature mortality from non-communicable diseases through prevention and treatment. By improving follow-up rates and enabling earlier intervention, such technologies may enhance management of chronic conditions that constitute a growing burden in both developing and developed healthcare systems.

Addressing Healthcare Workforce Constraints

The comparative diagnostic accuracy between AI symptom checkers and healthcare professionals, as investigated by Katsuki et al. (2023) in headache diagnosis, suggests potential applications in addressing healthcare workforce shortages—a critical challenge to achieving SDG3. Their finding that AI-based diagnostic models enhanced non-specialists' diagnostic accuracy points to potential applications in task-shifting and capacity-building within constrained healthcare systems. This aligns with SDG3 Target 3.C regarding healthcare workforce strengthening, particularly in settings where specialist care remains inaccessible.

Yanagita et al. (2024) explored an innovative application of AI in generating clinical vignettes for medical education, which could indirectly support SDG3 through improved training of healthcare providers in contexts where educational resources are limited. This educational dimension represents a

novel pathway through which AI may contribute to health system strengthening beyond direct diagnostic applications.

Integration Challenges and Implementation Science

The translation of promising AI diagnostic capabilities into meaningful health impact, as required for SDG3 advancement, necessitates addressing substantial implementation challenges identified across the reviewed studies. Researcher acknowledgments universally emphasized the need for additional validation studies across diverse clinical environments, algorithmic refinement, and comprehensive integration strategies compatible with established clinical workflows.

The study by Crawford et al. (2024) on AI as a melanoma screening tool in self-referred patients highlights both the potential and limitations of patient-facing AI applications. Such tools could enhance accessibility to specialized diagnostic services, particularly in underserved communities, but require careful implementation to avoid unintended consequences such as overdiagnosis or inappropriate reassurance. This tension between accessibility and appropriate use of AI diagnostics represents a critical consideration for SDG3 implementation frameworks.

Suggestion

The intersection of AI diagnostic technologies with SDG3 objectives presents both significant opportunities and substantive challenges. The empirical evidence from recent studies demonstrates considerable promise in enhancing diagnostic precision, supporting healthcare practitioners, reducing error rates, enabling cost-efficient screening, and facilitating early pathology detection—all critical dimensions of health system strengthening as envisioned in SDG3.

However, realizing this potential requires concentrated efforts to address identified limitations, particularly regarding validation across diverse settings, algorithmic refinement, workflow integration, and mitigation of potential biases. Furthermore, explicit attention to equity considerations in both research and implementation is essential to ensure these technologies reduce rather than reinforce health disparities.

Future research directions should include expanded investigation in low-resource settings, greater demographic diversity in validation studies, development of context-appropriate implementation frameworks, and more robust engagement with regulatory and ethical dimensions of AI deployment in healthcare. By addressing these priorities, the scientific and policy communities can help ensure that advances in AI diagnostics translate into meaningful progress toward the health and well-being objectives articulated in SDG3.

Conclusion

Based on the systematic review of 11 studies from 2022-2024 spanning multiple countries and clinical domains, artificial intelligence applications demonstrate considerable promise for enhancing diagnostic capabilities across diverse medical specialties. The evidence indicates improvements in diagnostic precision, decision support functionality, error rate reduction, cost-efficiency, and early pathology detection across cardiovascular, dermatological, ophthalmological, neurological, and respiratory applications. However, these encouraging outcomes must be interpreted with prudent

consideration of methodological limitations consistently acknowledged by researchers, including the need for external validation in diverse clinical settings, algorithmic refinement, workflow integration strategies, and mitigation of potential biases in training datasets that could affect generalizability across demographic subpopulations. The heterogeneity in implementation contexts, methodological approaches—ranging from machine learning algorithms to advanced neural networks and GPT-4 architecture—and evaluation metrics necessitates caution when formulating broad conclusions. This systematic analysis thus suggests a trajectory of measured optimism for AI diagnostic technologies, contingent upon addressing identified constraints through rigorous future investigations and thoughtful implementation science that considers both technical performance and broader healthcare system implications.

Declarations

Author contribution statement

Author have significantly contributed to the development and the writing of this article.

Competing interest statement

The authors declare no conflict of interest.

Additional information

This paper was reviewed for grammatical accuracy by Claude.

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The Role of Project-Based Learning in Fostering Socio-Emotional Skills and Well-being: A Kazakhstani Perspective

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Kulyash Smagulova

In the face of rapid globalization and technological advancements, the contemporary educational landscape demands a paradigm shift that transcends the traditional focus on rote learning and academic achievement. The cultivation of socio-emotional skills, including empathy, critical thinking, communication, and collaboration, has emerged as a critical factor in preparing young people for the challenges of the 21st century. These skills are not merely desirable attributes; they are essential for navigating a complex and interconnected world, fostering innovation, and building a just and equitable society. Recognizing this imperative, Kazakhstan has prioritized the integration of socio-emotional learning (SEL) into its national education framework, with project-based learning (PBL) emerging as a cornerstone of this approach.

The concept of well-being, as articulated in the United Nations Sustainable Development Goals (SDGs), encompasses not only physical health but also mental, emotional, social, and psychological well-being. SDG 3, which emphasizes the importance of ensuring healthy lives and promoting well-being for all at all ages, underscores the critical role of education in shaping holistic human development. PBL, by its very nature, provides a conducive environment for students to develop the knowledge, skills, and attitudes necessary to promote their own well-being and contribute to the well-being of their communities. Through active engagement in projects that address real-world challenges, such as environmental sustainability, social justice, and healthcare, students not only develop critical thinking and problem-solving skills but also cultivate empathy, compassion, and a sense of social responsibility.

Project-based learning, grounded in constructivist and sociocultural learning theories, empowers students to take ownership of their learning by actively engaging in inquiry-based activities. By working collaboratively on authentic projects, students develop essential 21st-century skills, including:

Critical thinking and problem-solving: Analyzing complex issues, identifying solutions, and evaluating the effectiveness of their approaches.

- **Communication and collaboration:** Effectively communicating ideas, negotiating solutions, and working effectively in diverse teams.
- **Creativity and innovation:** Generating novel ideas, exploring alternative approaches, and developing innovative solutions to real-world problems.

- **Self-regulation and resilience:** Managing time, overcoming challenges, and persevering in the face of setbacks.
- **Empathy and social responsibility:** Developing a sense of social awareness, understanding the needs of others, and taking action to address social issues.

The Importance of Project-Based Learning in Education

Project-based learning provides students with the opportunity to apply theoretical knowledge to practice by solving real problems and tasks. This approach not only activates thinking but also fosters the formation of socio-emotional skills through collaboration, active interaction, and sharing experiences. During project work, students learn to work in teams, manage time, communicate, and present, which collectively creates conditions for their personal growth.

Project-based learning encompasses a wide range of areas, including scientific research, social initiatives, startups, and cultural exchanges. Each of these areas is significant and contributes to the formation of various aspects of personal development. However, to achieve effective results, it is necessary to integrate project-based learning into educational processes at both school and higher education levels.

Example from School Education: the "Rukhani Zhangyru" Initiative

The case of the "Rukhani Zhangyru" (Spiritual Renewal) program, launched in Kazakhstan in 2017, serves as an excellent example of implementing project-based learning in educational practice. The aim of this program is to modernize public consciousness and develop the spiritual and cultural identity of Kazakhstanis. The program has become a platform for a variety of projects that focus on youth development and the formation of socio-emotional skills.

Components of the Program:

 Startup Funding : The program provides grants for the realization of youth ideas aimed at solving social problems in their communities. Students working on their projects learn to collaborate, manage tasks, and handle uncontrollable factors, fostering emotional resilience.

 Cultural Exchanges and Integration : The program organizes cultural exchanges between schools in different regions of the country. This helps students develop communication skills, tolerance, and understanding, as well as fosters a better comprehension of their country's cultural diversity.

 Social Initiatives : Students participate in socially-oriented projects, such as helping the elderly or environmental activities, which develop their empathy and sense of responsibility.

Successful Implementation Examples at the School Level

One notable project within the program is "Menin elim – menin maqtańyshim" (My country – my pride). Students from different schools form project groups, each choosing a topic related to Kazakhstan's cultural and historical heritage. Students create documentary films, exhibitions, and photo projects through surveys and research. This not only enhances their research skills but also fosters pride in their heritage and identity.

Key Achievements:

 Self-Awareness : Participation in such projects fosters students' awareness of their cultural identity and the significance of their roots.

 Social Connections : Projects encourage communication and collaboration between students from different schools, strengthening friendships and collective spirit.

 Emotional Support : Working on complex topics allows for open discussions about feelings and caring for others, contributing to the development of emotional intelligence.

Example from Higher Education: the "Digital Kazakhstan" Project

In higher education, notable progress has also been observed in the implementation of project-based learning. The "Digital Kazakhstan" program, an important part of the national strategy, encourages higher educational institutions to implement digital technologies and innovative approaches in education. As a result, numerous projects have been created that not only aid in the professional preparation of students but also foster the development of necessary social and emotional skills.

Examples of Project-Based Activities:

 Startup Incubators : Universities have established startup incubators where students can develop their ideas with support from mentors and investors. This provides students with the opportunity to develop entrepreneurial skills, learn teamwork, and tackle challenges.

 Social Projects and Volunteer Initiatives : Students engage in projects addressing current social issues, such as healthcare, ecology, or human rights. These initiatives promote empathy, the culture of assistance, and engagement in public life.

 Cross-Faculty Collaboration : Some universities implement programs encouraging students to work on joint projects that bring together different faculties, fostering interdisciplinary approaches and collaboration skills.

 Research Projects : Students participate in scientific research, working in teams, which develops critical thinking and analytical skills.

Recent Research

Recent studies highlight the positive impact of project-based learning on the development of socio-emotional skills. For instance, research conducted by Zhanar Kanfinova (2022) shows that involving students in project-based activities significantly enhances their emotional intelligence and conflict resolution abilities. Another study by a team of researchers from al-Farabi Kazakh National University (2023) confirmed that students participating in project initiatives demonstrate higher levels of teamwork and collaboration, directly affecting their academic success and career progression.

Moreover, it is worth noting research conducted by Professor Patrick Levy (2021) from the University of California, which found that project-based learning significantly enhances students' motivation and ability to solve problems creatively. His work emphasizes that collaborative projects foster emotional attachment to learning and improve the quality of material retention. Another study conducted by a group of researchers from the University of

Oxford (2020) confirmed that project-based learning significantly contributes to the development of critical thinking and teamwork among students.

Outcomes and Impact on Students

Participation in project-based learning in higher education achieves the following results:

- **Development of Critical Thinking and Creativity** : Students learn to find unconventional solutions to real problems, which makes them more independent and confident.
- **Strengthening Social Skills** : Interacting with various groups of people helps enhance communication and collaboration skills.
- **Formation of Leadership Qualities** : Participation in project-based learning provides students with opportunities to take initiative and assume responsibility for group outcomes.

Impact on Society as a Whole

The programs implemented in both school and higher education have become a favorable foundation for shaping a new generation capable of not only achieving professional success but also demonstrating social responsibility. Students become active participants in their communities, showing initiative and accountability.

In addition to improving the educational process, this approach to education as a whole promotes:

- **Formation of Civic Engagement** : Youth become more involved in social processes and recognize their role in society.
- **Sustainable Development** : Students acquire skills that prepare them for future challenges, including knowledge of digital technologies and innovative approaches.
- **Creation of an Inclusive Environment** : Program initiatives foster the development of tolerance and respect for differences among people.

Conclusion

Thus, the formation of socio-emotional skills through project-based learning in Kazakhstan represents an essential tool not only for improving educational quality but also for creating a socially active and responsible generation. Integrating project-based learning into the educational process at all levels, from primary school to higher education, makes education in Kazakhstan more relevant and effective.

Programs such as "Rukhani Zhangyru" and "Digital Kazakhstan" serve as exemplary models for other countries seeking to improve their educational systems and prepare youth for the challenges of the modern world. By investing efforts in developing socio-emotional skills, Kazakhstan demonstrates its commitment to creating a society where its citizens can not only work successfully but also exhibit flexibility, adaptability, and a desire to improve their surroundings. This, in turn, contributes significantly to the nation’s development and makes Kazakhstan more competitive on the global stage.

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Analysis of the linguodidactic potential of anime and manga materials as a means of teaching polite style of the Japanese language

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Anime and manga in the aspect of teaching Japanese speech etiquette

Abstract. The complexity of the material of the Japanese polite style system, or «keigo», at the very beginning of the «acquaintance» of students with this system can cause a loss of motivation to learn Japanese. But understanding the rules of the politeness system and their competent application in communicative situations plays an important role in organizing competent, natural communication. It is important to find such material that will help to «acquaint» students with this system in a more exciting way. Such material can be anime videos and manga texts. Japanese manga and anime vividly present reality, the uniqueness of the Japanese language and Japanese culture.

In this report, we will examine the degree of study of the problem of teaching Japanese speech etiquette and highlight the features and difficulties that students face when studying Japanese speech etiquette. We will present an analysis of politeness in the Japanese language and Japanese culture and also present an analysis of existing works on the topic of politeness in the Japanese language and highlight the most interesting ways to remove difficulties in teaching Japanese speech etiquette.

We will reveal the linguodidactic potential of anime and manga materials in teaching the polite style of the Japanese language. We will present an analysis of some works devoted to the study of anime and manga from various angles of consideration and also suggests an option for using these authentic materials in teaching Japanese speech etiquette. We will also present an analysis of some artistic anime and manga in the aspect of teaching Japanese speech etiquette. In the report, we will present some results of the survey of students on the topic of

interest in anime and manga. And we will present some results of the application of these materials in teaching students Japanese speech etiquette.

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Improving the Polish Education System for Enhanced Students' Well-Being; International Perspectives and Effective Practices

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Across the globe, well-being is a central focus of extensive research. Many years ago, the World Health Organization introduced the concept by defining health as "a state of complete physical, mental, and social well-being—not merely the absence of disease." Today, well-being is closely linked to human potential, productivity, opportunities for personal growth, and active social engagement.

In psychology, two key approaches to understanding well-being are distinguished: the hedonic and the eudaimonic perspectives. The hedonic approach equates well-being with the experience of pleasure and subjective happiness, considering both the cognitive aspect (life satisfaction) and the emotional aspect (the predominance of positive emotions over negative ones). In contrast, the eudaimonic perspective defines well-being as the fulfillment of one's potential and the pursuit of meaningful life goals. This approach considers various aspects of human functioning that foster personal growth and overall development. It is worth emphasizing that well-being plays a crucial role in positive psychology, which is one of the subfields of psychology.

Well-being pertains to multiple aspects of human life, known as domains, which shape overall well-being. These include occupational, financial, social and leisure-related well-being. One particularly important area is student well-being at school, as the school environment plays a crucial role in shaping students' identities, skills and potential. Children and adolescents spend a significant amount of their day in school, experiencing both positive and negative situations that directly affect their daily functioning and overall well-being.

Different theoretical approaches define well-being using various criteria. According to Carol D. Ryff (1989), well-being encompasses self-acceptance, personal growth, life purpose, autonomy, environmental mastery and positive relationships with others. Ed Diener (1984) highlights the subjective evaluation of life, satisfaction with different aspects of life and the experience of positive emotions. The PERMA model (Seligman, 2011) identifies five components of happiness: positive emotions, engagement, relationships, meaning and achievement. Meanwhile, the "onion theory of happiness" (Czapiński, 1994) distinguishes three levels of well-being: the will to live, general well-being and situational evaluation.

Adolescence, typically spanning from around 10 to 20 years of age, is a period of dynamic change across physical, cognitive, emotional, and social domains. This phase is generally divided into two stages: early adolescence (approximately 10–15 years) and late adolescence (approximately 16–20 years), each characterized by distinct attitudes toward learning and different strategies for coping with stress. Developmental changes during

adolescence influence self-esteem, leading to mixed emotions, mood swings and increased sensitivity. Relationships with parents undergo transformations, often resulting in conflicts, which is why this period is sometimes perceived as a time of rebellion. Adolescents are shaped by their school environment, family and peer interactions. During late adolescence, emotional stability and independence develop, preparing individuals for adulthood.

Given the dynamic nature of adolescent development, the quality of life and overall satisfaction of young people become key concerns. Schools play a fundamental role in shaping students' mental health and well-being, as they spend a substantial portion of their time there during this critical developmental stage. Therefore, ensuring the well-being of both students and teachers is a crucial aspect of the European educational sphere. This includes promoting a healthy lifestyle in both physical and psychological dimensions, fostering social and emotional competencies, supporting students and teachers in making informed and beneficial health-related decisions and creating an inspiring educational environment where students can form relationships, collaborate and grow.

Overall well-being is a dynamic process in which individuals realize their potential, develop their natural predispositions, refine their competencies and effectively navigate everyday challenges. Student well-being in the school setting involves active and positive participation in school life and social events; a strong sense of identity, emotional and cognitive resilience, self-worth, belief in one's abilities, and a sense of independence; the ability to form and maintain healthy, supportive relationships with teachers and peers; a feeling of safety, respect, and appreciation; and a sense of belonging to the class and school community.

When discussing well-being in schools, it is also important to consider teachers. Among this professional group, declines in well-being are increasingly observed. Burnout is becoming a more widespread phenomenon. Due to a lack of adequate training, support, or sufficient resources, stress levels among teachers are rising. Such challenges can negatively impact their health, undermine their self-confidence, and diminish their belief in the value of their work. As a result, the likelihood of teachers leaving the profession increases.

There are numerous examples of well-implemented educational practices that enhance students' performance and overall development on the international stage. Firstly, in the Finnish education system, the primary focus is on deriving joy from learning and teaching. Both students and teachers are neither overworked nor overstressed. The goal is to create and maintain a cheerful and calm school atmosphere. Students do not take exams until they are sixteen years old. They are occasionally assigned simple tasks to complete at home, but they are never overwhelmed by them. They are also not graded on these tasks; instead, they discuss their work with the teacher and the entire class. In addition to core subjects, students attend practical classes such as cooking and sewing. They also participate in a government program called „Yrityskylä"- "My City and Me," which allows them to explore various professions within their community. As part of the program, they visit specially designed miniature cities where they learn how to perform different jobs and collaborate with others. This initiative helps students prepare for adult life.The Finnish education system also emphasizes students' connection with nature. They frequently go on field trips, allowing them to relax, connect with nature, and develop essential survival skills. Finnish students participate in a program designed to prevent violent behaviors and teach empathy, cooperation skills, and mutual respect. Due to these approaches, the Finnish education system is recognized as one of the best in the world (Stępień-Lampa, 2017).

Secondly, in several countries, including Canada, Great Britain, China, and Australia, the education system incorporates mindfulness practices. Mindfulness consists of a variety of techniques that support mental health and are based on psychological therapy. It involves intentionally directing attention in a way that enhances awareness of one's own mental state and surroundings, focusing specifically on the present moment. It is implemented to improve the overall quality of life. In schools, mindfulness practices are led by teachers who have undergone specialized training. Students learn how to describe and navigate their emotions and thoughts, improving their concentration, patience, and overall mental well-being.

A noteworthy example of good practice can be found in the Netherlands, where students often work on a group project at the end of a semester or school year instead of taking an exam. This approach helps them develop valuable skills such as dedication, teamwork, and creativity (Dębska, Jacennik, 2016).

The Polish education system places too much emphasis on theory and too little on practical skills. There are no mandatory practical classes covering essential topics such as mental health management or preparation for adult life. Students spend long hours in classrooms, from 8 AM to 3 PM, with little or no physical activity. They experience significant pressure related to their education, particularly regarding tests, exams, and grades. The extensive curriculum requires them to cover a vast amount of material, often at the expense of their personal time at home.

Public schools in Poland often lack the necessary resources to support students' development in areas beyond academics. As a result, many concerned parents seek alternative education options, which are becoming increasingly popular. Some schools are shifting away from the traditional grading system based on a scale from 1 to 6. Instead, at predetermined intervals set by each school, students receive descriptive assessments, where teachers provide feedback on their progress and highlight areas for improvement. To prevent overstimulation, some schools have decided to eliminate loud bells signaling breaks and lessons. Instead, they use simple, calming melodies, including those suggested by students. Alternative schools are emerging across Poland, with some adopting the Scandinavian education model. Forest schools, for example, emphasize experiential learning in natural environments. Students spend as much time as possible outdoors, engaging in sensory-based learning by exploring nature.

With the change in the Polish government, several modifications to the education system have already been made or are planned for the near future. Less relevant material will be removed from the curriculum, and the list of mandatory reading books will be updated for the first time in many years. In 2023, the Minister of Education introduced a homework reform, eliminating mandatory and graded homework in primary schools from grades one to eight. While this reform has its advantages and disadvantages, its primary goal was to alleviate students' workload and provide them with more time to rest. However, there is concern that some students may no longer feel motivated to practice and study outside of school. In our opinion, this decision was somewhat rushed. Although well-intended, it should have been carefully planned and implemented following thorough research and consultation with education specialists rather than individuals unfamiliar with the realities of working in the education sector.

International cooperation plays a crucial role in the transformation of educational systems, enabling the exchange of best practices and the adaptation of effective solutions to

local conditions. Poland, continuously striving to modernize its education system can draw inspiration from various models implemented worldwide.

One of the most important and well-known instruments of international educational cooperation is the Erasmus+ program, which has been supporting the mobility of students, teachers, and academic staff for years. Poland can benefit from this program to develop language and intercultural competencies, facilitate experience exchange between educators and implement modern teaching methods. Additionally, funding for educational projects within Erasmus+ allows for the introduction of innovative solutions and the integration of international standards.

Esperanto, created as a neutral international language, has served as a symbol of global communication and equal access to education for decades. Although it has not become widely used, its underlying idea can inspire educational solutions in Poland. In the context of international cooperation, Esperanto can be utilized as a common language in educational projects, enabling the exchange of experiences between students from different countries. Its simplicity makes learning Esperanto a potential gateway to mastering other foreign languages, enhancing young people's linguistic competencies. Moreover, the international Esperanto community organizes numerous educational programs, language camps, and cultural projects, which could inspire Polish initiatives promoting multilingualism and intercultural education. Given Poland's long tradition of Esperanto, the country could actively support its use in education by introducing innovative language teaching methods and promoting values of equality and openness in international educational collaboration.

A valuable source of inspiration for Poland is the Scandinavian education model, particularly the Finnish system, which focuses on individualized learning, curriculum flexibility, and a practical approach to knowledge acquisition. The Scandinavian system promotes interdisciplinary projects that foster creativity and problem-solving skills—elements that could also be implemented in Poland.

Another key model is the German vocational education system, where dual education plays a central role by combining theoretical learning with practical training. Poland could adopt similar solutions by fostering closer cooperation between vocational schools and businesses, thereby increasing graduates' competitiveness in the job market. Expanding access to internships and apprenticeships could effectively prepare young people for professional challenges.

Estonia, as a leader in digital education, offers a modern approach to learning based on e-learning, educational platforms, and the widespread teaching of programming from an early age. Poland could learn from these experiences by developing digital education, introducing mandatory digital competency training, and investing in modern educational tools.

Japan, on the other hand, stands out with an education system centered on discipline, work ethic and a strong connection between education and the labor market. Poland could benefit from the Japanese model by incorporating elements of moral and social education, expanding technological programs and strengthening relationships between schools and businesses.

The Canadian education system is also noteworthy, as it emphasizes diversity, inclusion and individualized learning paths. Poland could implement similar solutions by increasing

support for students with special educational needs, promoting intercultural education and developing bilingual education systems in schools.

In conclusion, international cooperation in education is a crucial component of modernizing Poland's education system. Adopting proven models—such as Erasmus+, Finland's individualized learning approach, Germany's dual vocational education system, Estonia's digitalization strategies, Japan's emphasis on discipline, and Canada's model of educational diversity—can contribute to a more effective and modern educational system that better addresses the global challenges of the 21st century.

Integrating well-being into educational models is essential both globally and within individual countries, as it directly impacts quality of life, mental health and the academic performance of students and teachers. Research indicates that student well-being influences learning effectiveness as well as the development of skills and competencies among young people. In Poland and worldwide, schools play a pivotal role in promoting health-conscious attitudes and supporting personal development. Therefore, it is important to regularly monitor well-being and implement programs that promote the mental health of both students and teachers. Future research in this field should focus on effective ways to introduce these initiatives across different cultural and educational contexts. Equally important is the careful selection of appropriate tools to support these efforts.

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CAPTURING CREATIVITY: INSTAGRAM'S INFLUENCE ON INFORMAL CREATIVE EDUCATION

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The speed at which digital media is developing has never been faster with no exception for social media. These rapid developments create ample research opportunities for future researchers. At the outset of this study, my aim was to explore the role of Instagram in tertiary level creative education in the territory of informal education. I chose Sri Lanka as the preferred geographical location as it is a developing country with a massive potential to develop creative industries. The developments in the higher education system plays a critical role in Sri Lankan economic developments and yet we need to introduce cost effective and efficient strategies for Sri Lankan higher education system. The recent developments in the creative education sector, in particular, have made a significant impact on the Sri Lankan economy as Sri Lankan design graduates started bringing in foreign income. Overall, these caused massive expansion of creative educational institutes and growing numbers of students and academics in the sector. Moreover, design graduate employment markets have become more pronounced in recent decades since the development of mass design education at tertiary level. Therefore, there is a need to diversify the job market for design graduates. The rise of social media has made revolutionary changes in the tertiary design education system. Especially, being a visual based media, Instagram provides a rich and dynamic space for design education. Based on the findings of the present research, the following can be listed as the prominent areas where Instagram has significantly impacted on creative education.

Inspiration and exposure

Instagram is a great source of inspiration where design students and teachers draw inspiration from the accounts they follow and hashtags of popular artists, designers and creators from around the world. More than ever, it exposes everyone to a pool of freely accessible data which evidently broadens one's perspective of the world.

Collaboration and Feedback

Instagram is a great platform that facilitates collaboration among various stakeholders (ex: students, teachers, designers, and industry professionals) in creative industries. They can share their creative work on Instagram and get instant feedback, critiques or initiate collaborative projects.

Support professional development

Instagram is a versatile tool that can be used for professional development in the creative field. Online workshops, Instagram challenges, DITYS are some of the ways that help professional development while also keeping artists up to date on the latest trends.

Promotion and networking

Instagram is also a powerful medium for promoting students' work and allowing them to connect with potential employers. The study revealed that students can get noticed by potential employers which leads to job opportunities or commissions.

Copyrights and ethical issues

Copyrights and ethical issues are major concerns for an Instagram user. Though the copyright policies are constantly updated, still there are grey areas where creators are not fully protected from others stealing their creative ideas. However, increasing awareness of ethical usage of social media and updated community laws can mitigate these issues.

With all of these, Instagram has reconceptualized the boundaries between formal and informal learning by reducing the gap between formal and informal creative education. It can be used as a powerful and effective tool to ensure student retention in higher educational institutes. In fact, this is a wakeup call for policy makers to consider reforms in formal education as well.

Implications and recommendations for practice

The following suggestions are advocated for the benefit of the creative education field. However, many of them can be adopted by other disciplines as well.

Focused reflections and constant inspiration to create an affinity space

When planning to utilize digital platforms as affinity spaces, focus reflections and constant inspiration can be used as top strategies to stimulate students. Being a platform that provides constant inspiration and facilitates focused reflections, Instagram is very popular among youth. Therefore, application of these strategies to digital educational tools would generate better results across any discipline. It can be argued that everybody might not be comfortable with posting their own reflections on an open platform, but anonymity can help in certain circumstances. Due to the anonymity, people can be more open and better express their feelings/ideas which, in turn, helps learning and development. In some scenarios, Instagram user accounts can be integrated to Learning Management Systems (LMS) which helps to count this informal learning experience in the formal classroom as well. It will ensure that students'

creativity will be noticed by classroom facilitators, and help them in shaping the students in a more productive way.

Friendship driven digital spaces support overcoming professional isolation and learning difficulties

The study revealed that a higher level of social integration and bonding with peers can make a positive impact on learning and professional development. However, in a formal classroom setting, the level of support is low, and a poorly designed curriculum does not support students and young professionals to outgrow their solo journeys. Also, though some individuals do not find in-person friendship driven spaces comfortable, but are comfortable navigating digital spaces. Especially the post-millennials being digital natives, the majority finds friendship driven digital spaces more comfortable, efficient, accessible and affordable when connecting with like-minded people.

The importance of transcending set career paths and knowledge

The rise of Web 2.0 technology has changed not only the creative industry but also many other industries. Hence, traditional graduates are being challenged by the changing industry requirements and new high income entrepreneurial occupations, and it is essential for our tertiary level students to be prepared for this. Therefore, bridging the gap between formal and informal learning environments can positively impact tertiary students. Traditionally, there are set career paths and set knowledge offered to tertiary students, and consequently, there are less opportunities for them to explore new pathways. However, as evidenced by the findings of the present study, when the learning process is connected to informal digital platforms, there is abundant new knowledge, experiments and inspirations which create a constant flow of knowledge allowing the students to explore new and flexible career pathways. More importantly, such a fluid and flexible setting helps individuals with different learning paces and career expectations. Also, it does not restrain them from starting a career until they complete their paper qualifications. Rather, it allows them to start their careers from where they are.

Teacherpreneurship as a highly effective way of connecting formal and informal learning spaces

Recognizing the importance of teacherpreneurship in connecting formal and informal learning spaces is essential in modern day education. Today, a teacher is not merely delivering content for students during a limited timeframe but also someone who maintains a constant connection with their students and helps them grow while also benefiting themselves. As millennials are constant attention seekers who prefer to stay connected, teacherpreneurs can easily cater to their learning needs by seamlessly connecting with them via Instagram. The concept of teacherprenurship can also be used as a tool to promote the teaching profession to attract young, talented individuals. The increased awareness of teacherpreneurship among faculty can also

minimize the conflicts among junior and senior academics in using various teaching and learning methodologies in formal classroom.

Instant positive affirmations can be used as a strategy to keep student retention and higher graduation rates

The outcome of this research further evidenced that positive affirmations certainly impact students' success as formal or informal digital platforms can be used to increase instant positive affirmations for students. Yet, most learning platforms are not designed to provide instant feedback/affirmations as they have rigid and less attractive user interfaces. Therefore, having more interactive and user-friendly GUIs in educational platforms is important when dealing with digital native students because it helps student retention and increases graduate rates. Integrating Instagram in formal classroom LMS can be a great solution for this to appreciate these positive affirmations as well as to criticize and understand negative affirmations coming from random people across the world. This will certainly help design students to understand the global design perspectives and also to protect themselves from being neglected.

Encouraging design students to be prosumers rather than passive consumers

One of the prominent advantages of modern-day social media is that they allow users, too, to be content creators, which makes them not just consumers but also producers. Becoming a prosumer poses a certain level of challenge for a student. Creative education at the tertiary level is closely linked to skill competency, and becoming a quality prosumer in their fields makes them gain a set of achievements based on skills, understanding and personal attributes. Formal classroom assessments can be designed to encourage prosumers while learning is made more enjoyable and stress free.

Increasing awareness of copyrights and ethical issues among design students

Traditionally, the assumption on copyright is that the media creator has the authority to control one's access to the media and determine for what purpose it should be used. But in the modern context, our media may not be ours. In digital media, the media creator has often been called a content creator, and compared to a traditional media creator, the creator's control over their own content can be less. The content can be posted on a media with a set of agenda items due to monetization and design features that facilitate commercialization, or due to limitations of the sharing platform which diverge from creator's initial intentions. The parameters in new digital media can impact the creation even before it is made. These parameters can be simple and obvious features like video length, or portrait or landscape orientation. Also, once some content is released to social media, it expands to text comments, and possibly, video responses, ratings, reposting, and sharing as well. They are often associated with certain features (ex: ads, paid partnerships etc.), parameters and algorithms which can cause an inorganic environment on Instagram. Ultimately, there will be a high chance that young users will fall victim to scams

or misinspiration. Therefore, considering the higher-level impact of Instagram on creative education, it is important to increase awareness on copyright and ethical issues among tertiary level design students. It can be part of the formal education curriculum or can be widely applied to any academic stream considering the presence of social media in our daily lives.

Social media literacy for empowering design community

Social media literacy is an essential skill for a contemporary designer when taking a confrontational approach on socio-political aspects. Also, it helps the design community to become a powerful segment in society by presenting their voice in creative ways using visual and textual content. Also, social media literacy helps designers to understand their rights; make sure they are heard; and protect their creative designs from being mis used. Hence, social media literacy can be a part of formal creative design education in becoming a successful designer.

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Specialization

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Research interests

—Cultural Reproduction
—Career Decision-Making
—Paternalism Justification
—Capability Approaches

BIO

O/HISC Participation History

2021: As a Presenter

2022: As a Presenter

2023: As a Staff Member

2024: As a Staff Member

2025: As a Invited Speaker

OUTLINE

01 Definitions of Well-being

02 The Rights of the Child

03 Perspective from the Capability Approach

04 Perspective from Paternalism

Definitions of Well-being

OECD's Framework

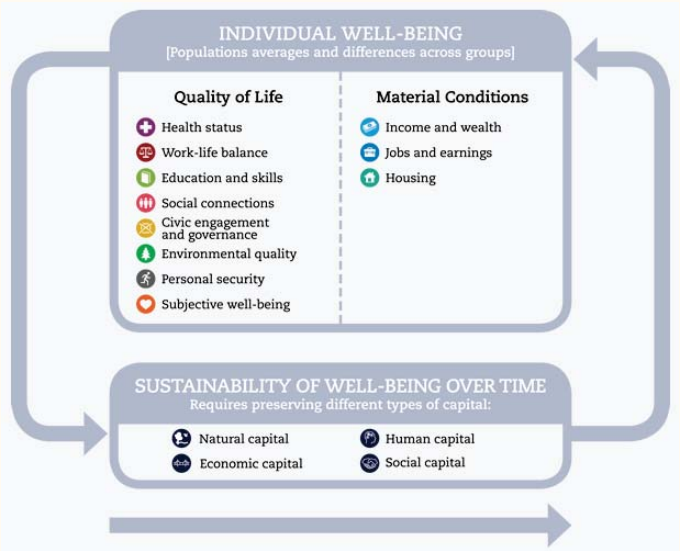

Figure 1. OECD framework for measuring wellbeing and progress
https://www.eif.org.uk/blog/language-wellbeing-and-social-mobility

Definitions of Well-being

Well-being in the context of Japan
—The 4th Basic Plan for the Promotion of Education

Well-being based on the abilities and states that individuals acquire or achieve
—acquisitive factors

Well-being based on connections and relationships with others
—cooperative factors

The Rights of the Child

To Listen to the Child's voice...

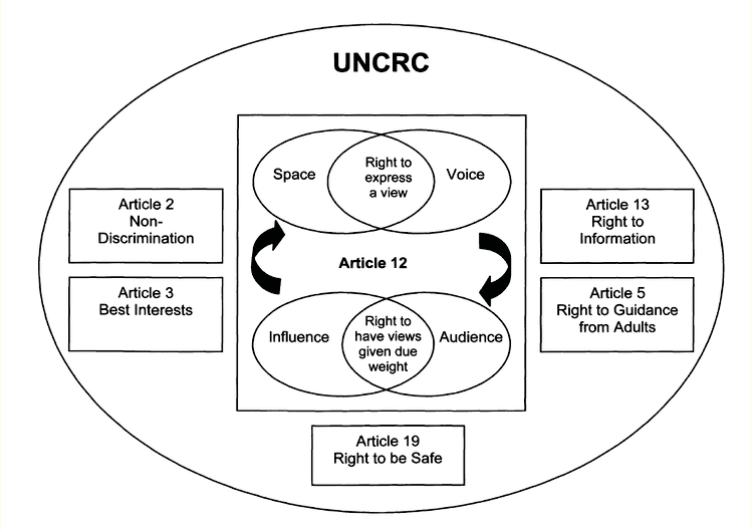

Figure 2. Conceptualising Article 12
Source: Lundy, X. (2007) 'Voice' Is Not Enough: Conceptualising Article 12 of the United Nations Convention on the Rights of the Child, *British Educational Research Journal, 33(6)*

Perspective from the Capability Approach

Distributive justice focusing on freedom to choose

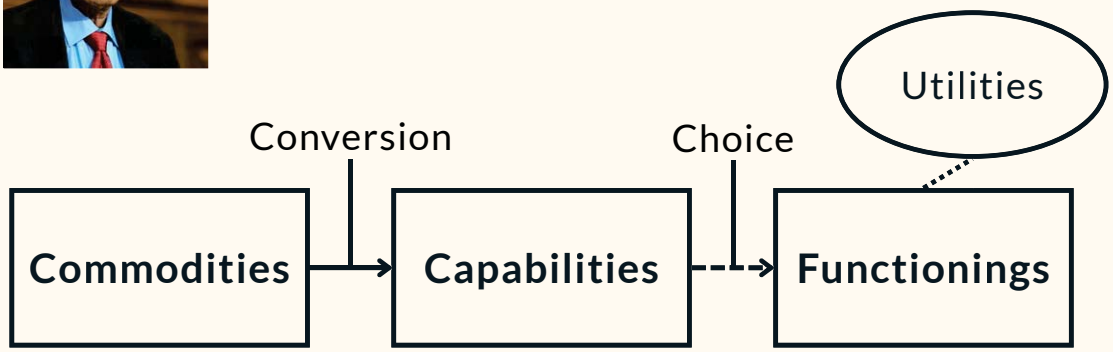

Figure 3. The basic framework of the capability approach.
made based on Sen (1987)

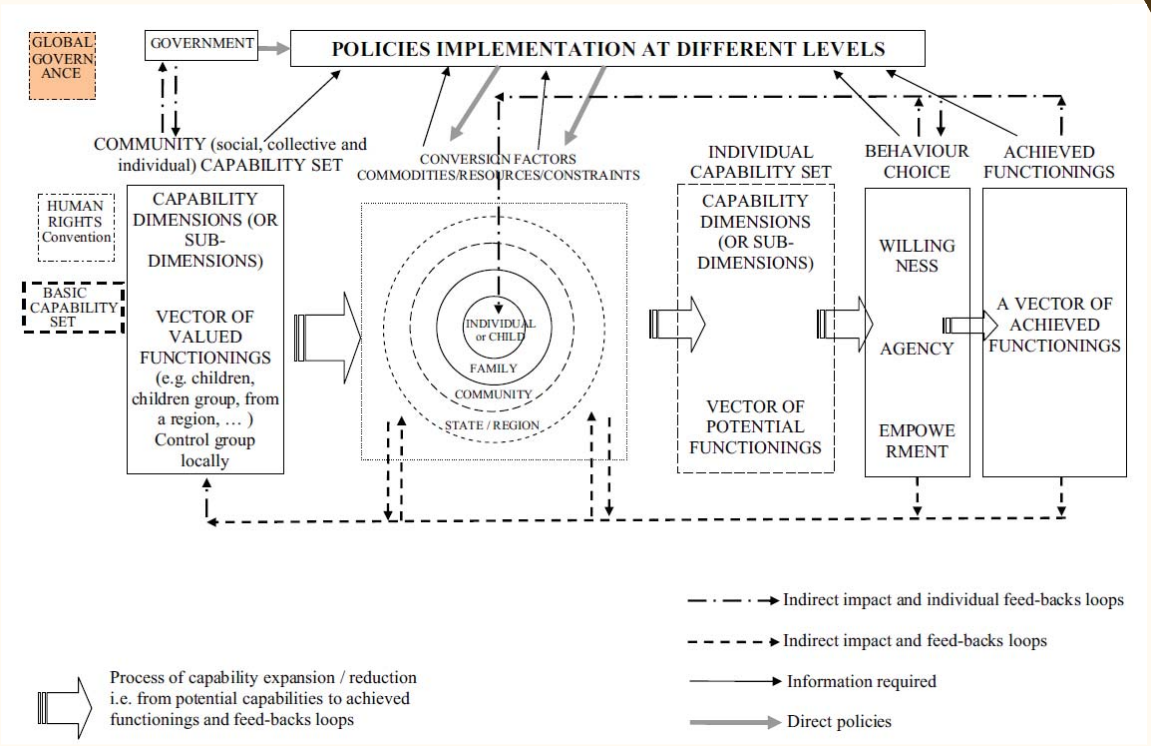

Figure 4. Capability Approach Framework for Public Policies

Trani, J-F. et al. (2011) Disabilities through the Capability Approach lens: Implications for public policies, *European Journal of Disability Research*, 5.

Perspective from Paternalism

- The idea of basic capabilities itself is…
- To prioritize future well-being over the child's present will is…

PATERNALISTIC

X acts paternalistically in regard to Y to the extent that X, in order to secure Y's good, as an end, imposes upon Y.

Kleinig, John. 1983. Paternalism. Manchester: Manchester University Press., p.13

Perspective from Paternalism

Discussion of paternalism

- The idea of *paternalism* questions that self-determination that diminishes his/her own good can be respected

How to avoid paternalism → What is justifiable paternalism

- Personal Integrity Model (Kleinig, 1983)
  - Paternalistic intervention can be justified unless it doesn't violate *personal integrity* of the person concerned but protect it from him- or herself. (Kleinig, 1983:68)
- Future Selves Model (Chosa, 2011)
  - An individual's personality changes over time
  - J. S. Mill's harm principle is applied to the same individual

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