Report on use and education on GenAI tools

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Research Description

Introduction: The field of artificial intelligence (AI) has seen significant advancements in recent years, with the development of new technologies and applications. One such application is GenAI, which has the potential to revolutionize the way we live and work.

Topic Importance: Understanding how Generation Z perceives and utilizes GenAI is crucial for ensuring that this technology is adopted responsibly and ethically. This generation is the first to grow up with access to advanced AI technologies, and their attitudes and behaviors toward these technologies will shape the future of AI.

Existing Knowledge: Previous research has shown that Generation Z is generally positive towards AI and sees it as a tool to improve their lives. However, there is a lack of understanding about how this generation perceives and utilizes GenAI.

Knowledge Gap: Despite GenAI's growing importance, there is a lack of research on how Generation Z perceives and utilizes this technology. This study aims to fill this knowledge gap and provide insights into GenAI adoption among this generation.

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Rationale: This study's purpose is to identify the current possible gap in GenAI adoption among Generation Z and explore ways to increase awareness and accelerate adoption of this technology.

Research Question: What is the current state of GenAI adoption among Generation Z, and what are the possible gaps in adoption? How can we increase awareness and accelerate adoption of GenAI among this generation?

Aim/Objective: This study aims to investigate Generation Z's perceptions and utilization of GenAI, identify ways to increase awareness and adoption of this technology, and develop research tools to explore the current status of the above.

Hypothesis: Generation Z is hypothesized to have a positive attitude towards GenAI and see it as a tool that can improve their lives. However, there may be a need for more understanding and awareness about the specific applications and benefits of GenAI, leading to a gap in adoption.

Literature review

Definition & Classification of GenZ

Generation Z is defined as the demographic cohort following the Millennials, typically born from the mid-1990s to the early 2010s (Schlee et al., 2020). This generation is characterized by its unique behavioral and attitudinal traits as they have come of age during the era of digital technology and social media.

Studies have sought to classify Generation Z into various groups based on different criteria, such as smartphone usage patterns, employer brand attractiveness, environmental consciousness, and attitudes towards group projects. Generation Z is a diverse cohort with various classifications within its range. These classifications are based on factors such as digital engagement, career aspirations, environmental values, and collaborative work preferences. The studies reviewed provide a nuanced understanding of Generation Z, highlighting the importance of recognizing the heterogeneity within this

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demographic group (Roy et al., 2022; Schlee et al., 2020; Su et al., 2019; Yang et al., 2020).

One study classified Generation Z and Millennials according to their smartphone usage patterns, identifying five distinctive groups based on the degree of involvement in activities such as actively producing information, passive searching, social bonding, entertainment, and digital skills (Yang et al., 2020). Another study segmented Indian Generation Z B-School students based on gender, specialization, and work experience to differentiate their perceptions of employer attractiveness (Roy et al., 2022). Environmental consciousness has also been used as a basis for segmentation, with U.S. Gen Z consumers being categorized into groups such as "sustainable activists," "sustainable believers," and "sustainable moderates" based on their ecological awareness and the importance they place on sustainable food attributes (Su et al., 2019). Additionally, attitudes toward group projects have shifted between Millennials and Generation Z, with the latter exhibiting greater anxiety about the contributions of other team members (Schlee et al., 2020).

GenZ's Relation with Technology

Generation Z's relationship with technology is multifaceted, encompassing educational, personal, and professional domains. Generation Z, often referred to as digital natives, has a unique relationship with technology, characterized by their immersion in digital environments from a young age (Gabrielova & Buchko, 2021). This cohort is entering educational and professional landscapes with expectations for technology integration that align with their digitally enhanced daily experiences (Cretu et al., 2020). In educational settings, Gen Z students anticipate and benefit from digitally rich teaching methods, such as flipped classrooms, gamification, and virtual simulations, which cater to their preference for interactive and technology-driven learning environments (Cretu et al., 2020; Vo, 2020).

Interestingly, while GenZ's technological adeptness is well-recognized, their use of technology also extends to areas such as online shopping, where they predominantly use smartphones (Dabija & Lung, 2019), and spiritual self-care,

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where they engage with digital wellness apps to manage mental health and sleep (Park et al., 2023). Moreover, their entry into the workforce influences employer branding, as they prefer organizations that offer growth and learning opportunities, reflecting their desire for continuous development within technologically progressive environments (Roy et al., 2022).

Summing up, GenZ utilizes technology not only as a tool for learning and development but also for personal well-being and as a criterion for employment choices. Their technological fluency is shaping the way educational content is delivered, how they engage in commerce, and the attributes they seek in potential employers (Cretu et al., 2020; Dabija & Lung, 2019; Kunal et al., 2022; Park et al., 2023). This underscores the importance of institutions and organizations adapting to the technological expectations of this generation to foster engagement and productivity.

Adoption of GenAI

The current state of GenAI adoption among Generation Z appears to be characterized by a general optimism and a willingness to embrace the technology for its potential benefits in various sectors, including education and hospitality. GenZ students have shown a positive attitude towards GenAI, recognizing its capacity to enhance productivity, efficiency, and personalized learning (Chan & Lee, 2023). Similarly, GenZ's willingness to use AI devices in hospitality services is influenced by hedonic motivation, with smartphone usage frequency playing a significant role in their engagement with AI (Vitezić & Perić, 2021).

However, there are gaps in GenAI adoption among GenZ. While there is high awareness of AI technologies, the adoption rates vary, with some studies indicating low adoption levels in specific contexts, such as Tanzanian academic libraries (Bakiri et al., 2024). Additionally, there are concerns among educators from Generation X (GenX) and Generation Y (GenY) about the overreliance on GenAI and its ethical and pedagogical implications, suggesting a need for evidence-based guidelines and policies (Chan & Lee, 2023).

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To increase awareness and accelerate the adoption of GenAI among Gen Z, it is essential to address these gaps by developing tailored training and development programs that cater to specific skill gaps (Malang et al., 2023). Educational institutions and policymakers should advance curricula that emphasize the importance of new technologies (Vitezić & Perić, 2021), and integrate emotional intelligence as a determinant of behavioral intention towards AI adoption (Ibrahim et al., 2024). Furthermore, creating a supportive environment for Gen Z to engage with AI technologies, including accessible training and clear ethical guidelines, can facilitate a more comprehensive understanding and preparedness for AI integration (Afolabi, 2024; Malang et al., 2023).

The above findings and comparisons justify that while GenZ is ready to adopt GenAI, there are notable gaps in actual adoption rates and concerns regarding the responsible use of the technology. Addressing these gaps through education, policy development, and the integration of emotional intelligence can enhance GenZ's engagement with GenAI and ensure its responsible and effective use across various sectors (Afolabi, 2024; Bakiri et al., 2024; Malang et al., 2023; Chan & Lee, 2023; Ibrahim et al., 2024; Vitezić & Perić, 2021).

Initiatives to Increase Adoption of GenAI by GenZ

The initiatives to facilitate the adoption of Generative AI (GenAI) for Generation Z (aged 12-27 years old) are multifaceted, addressing educational and practical applications. These initiatives that seek to promote the adoption of GenAI among GenZ include educational programs to enhance AI literacy and critical thinking, practical applications in language learning, and the use of AI in service industries. These efforts are balanced by recognizing the potential risks and the need for responsible use guidelines and policies. The pertinent studies collectively underscore the importance of a multifaceted approach to GenAI adoption that considers both the opportunities and challenges presented by this technology (Baskoro et al., 2023; Chan & Lee, 2023; Ferrara, 2024; Tzirides et al., 2024; Vitezić & Perić, 2021).

In the educational sphere, studies have explored the integration of GenAI into higher education, focusing on fostering AI literacy and critical thinking skills. For

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instance, a case study examined the impact of employing GenAI tools and cyber-social teaching methods on students' AI literacy, revealing that such integration can enhance students' understanding and critical assessment of AI applications in education (Tzirides et al., 2024). Additionally, a model combining the 7E learning cycle with peeragogy learning approach has been suggested to improve critical thinking skills in GenZ, using AI applications as a tool (Baskoro et al., 2023).

Regarding practical applications, initiatives have been taken to incorporate AI into learning environments, such as using AI-based English games to enhance English communication skills among Indonesian GenZ learners. Moreover, the adoption of AI devices in hospitality services has been examined, with findings indicating that hedonic motivation significantly affects Gen Z's willingness to use AI devices, and smartphone usage frequency moderates the relationship between perceived effort and emotions towards AI usage (Vitezić & Perić, 2021).

However, it is important to note the concerns and challenges associated with GenAI adoption. Teachers from older generations have expressed concerns about overreliance and ethical implications, emphasizing the need for guidelines and policies for responsible GenAI use (Chan & Lee, 2023). Furthermore, the potential for misuse of GenAI and Large Language Models (LLMs) in creating deepfakes and misinformation campaigns highlights the darker side of GenAI applications and the need for awareness and preparedness (Ferrara, 2024).

Effective eLearning Approaches to Bridge the Adoption Gap

The effective approaches to eLearning that can bridge the gap for responsible and effective adoption of generative AI (GenAI) and other groundbreaking technologies among individuals aged 12-27 years old (Generation Z) are multifaceted. Firstly, the integration of GenAI into higher education should be accompanied by developing evidence-based guidelines and policies, fostering critical thinking and digital literacy skills and promoting responsible use of technologies (Chan & Lee, 2023). Additionally, using digital language learning

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applications, online language exchange platforms, and authentic communication experiences such as role-plays and debates can enhance English speaking skills, which are crucial for navigating new technologies (Sumartono, 2023).

To effectively bridge the gap for GenZ's adoption of GenAI and similar technologies, it is essential to combine traditional and digital teaching methods, develop comprehensive guidelines for technology use, enhance digital literacy, and address the digital divide between students and educators. These strategies should be implemented in a way that respects the unique characteristics of Gen Z learners, such as their preference for independent yet socially connected learning environments. The goal is to create engaging and responsible learning experiences that prepare GenZ for the technological advancements shaping their future (Chan & Lee, 2023; Sumartono, 2023).

Research Tool Development for Exploring GenAI Adoption

The research tools developed and utilized to explore Generative Artificial Intelligence (GAI) awareness and adoption are diverse, reflecting the multifaceted nature of the inquiry into GAI's impact on various sectors. The research tools developed and utilized across these studies include qualitative case studies, online surveys, interviews, thematic analysis, quantitative surveys, literature reviews, and adapted scales for assessing technological competence. These tools have been instrumental in exploring the awareness and adoption of GAI in higher education, design, and other sectors, providing insights into the benefits, challenges, and readiness for GAI integration (Abdullah & Zaid, 2023; Alammari, 2024; Lai et al., 2023; Zhang & Villanueva, 2023).

In Abdullah & Mohd Zaid (2023), a qualitative case study approach was employed, utilizing online surveys and interviews to gather data from researchers in the social sciences. Thematic analysis was guided by the Technology Acceptance Model (TAM) to identify recurring themes and understand researchers' perceptions of GAI. (Alammari, 2024) combined quantitative and qualitative research approaches, using survey-based quantitative data and in-depth interviews to assess educators' awareness and

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frequency of GAI application. (Lai et al., 2023) adopted a qualitative approach, including literature reviews, lectures, workshops, and interviews with design professionals to explore GAI's impact on the design process. (Zhang & Villanueva, 2023) utilized an adapted computational thinking scale and another instrument assessing technological proficiencies to evaluate teachers' GAI preparedness and technological competence.

Interestingly, while some studies focused on qualitative methods to capture in-depth perspectives (Abdullah & Zaid, 2023; Lai et al., 2023), others integrated quantitative measures to establish correlations and gauge preparedness (Alammari, 2024; Zhang & Villanueva, 2023). This indicates a recognition of the need for both broad and nuanced understanding of GAI's role in various contexts.

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Research Results

1. Questionnaire Development for Online Distribution

Objective: To gather quantitative data from Generation Z (GenZ) across five different European countries about their perceptions, awareness, and adoption of Generative AI (GenAI).

Sections of the Questionnaire:

- Demographics:
  - Age
  - Gender
  - Country of residence
  - Educational background
  - Current occupation (e.g., student, employed, etc.)
- Technology Usage:
  - Frequency of technology use (e.g., smartphone, computer)
  - Types of services used regularly (e.g., social media, educational tools, AI-based apps)
- Awareness of GenAI
  - Awareness of GenAI tools and technologies (Likert scale: 1-5)
  - Sources of information about GenAI (e.g., online articles, social media, educational institutions)
  - Specific GenAI tools known and used (multiple-choice with options)
- Perceptions of GenAI:
  - Perceived benefits of GenAI in daily life (e.g., improving efficiency, personalized learning)
  - Concerns about GenAI (e.g., ethical implications, privacy concerns)
  - Overall attitude towards GenAI (Likert scale: 1-5)
- Adoption of GenAI:

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- Current usage of GenAI tools (e.g., never used, occasionally, frequently)
- Sectors where GenAI is used (e.g., education, entertainment, personal development)
- Barriers to adopting GenAI (e.g., lack of knowledge, trust issues, accessibility)

- Suggestions for Increasing Adoption:
  - Preferred methods for learning about GenAI (e.g., online courses, workshops, social media campaigns)
  - Recommendations for policymakers and educational institutions to enhance GenAI adoption

2. Interview Protocol for In-Depth Research

Objective: To gain deeper insights into the perceptions, concerns, and experiences of GenZ related to GenAI through qualitative data.

Structure of the Interview:

1. Introduction:
   - Explain the purpose of the interview.
   - Ensure confidentiality and obtain consent to record the interview.
2. Warm-up Questions:
   - Could you tell me a bit about your background and how you typically use technology in your daily life?
3. Exploring Awareness and Understanding:
   - How would you describe your familiarity with Generative AI? Can you provide examples of GenAI tools you've heard of or used?
   - Where did you first learn about GenAI? (e.g., online, school, peers)
4. Perceptions and Attitudes:
   - What are your thoughts on the potential benefits of GenAI in your life? Do you see it as more helpful or harmful?

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- Are there any particular aspects of GenAI that excite you? What about those that concern you?

5. Adoption and Usage:
    - Could you describe any experiences you've had using GenAI tools? How did it influence your work/studies/life?
    - What challenges have you faced, if any, when trying to use GenAI?
6. Recommendations for Increasing Adoption:
    - What do you think could be done to make GenAI more accessible or appealing to people your age?
    - How do you think educational institutions and governments could better support GenAI literacy?
7. Conclusion:
    - Is there anything else you would like to add about your experience with or thoughts on GenAI?
    - Thank the participant for their time and insights.

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