

Digital transformation in Cambodian higher education: Current trends and future directions

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Abstract: This paper delves into stakeholder perspectives on the current state and future of digital transformation in higher education institutions (HEIs) in Cambodia. Through online surveys, data were collected from academic staff, management, support personnel, and students across both private and public HEIs. The findings reveal generally positive assessments of the extent and effectiveness of digital transformations in Cambodian higher education. Respondents expressed a collective aspiration for enhanced digital infrastructure, training, and leadership support, while also highlighting persistent disparities in access and digital competence among students. The study underscores the need for a coherent, socially responsive digital strategy that addresses Cambodia's unique socio-economic factors. Participants recognize the transformative potential of technologies such as AI, gamification, and blended learning in enhancing educational experiences. However, concerns regarding equity must be prioritized to prevent exacerbating existing divides. The findings emphasize the importance of ongoing stakeholder collaboration and strategic leadership from governmental and educational authorities to foster a comprehensive digital ecosystem that promotes equitable access to education. Ultimately, this research offers critical insights for policy-making, institutional planning, and educational practices. It advocates for a balanced approach between technological integration and maintaining essential human elements in learning environments. Further research is recommended to capture a wider range of voices and experiences from diverse educational contexts within Cambodia, enabling a more nuanced understanding of the challenges and prospects of digital transformation in higher education.

Keywords: Cambodia, Digital transformation, Higher education institutions, Stakeholder perspectives.

1. Introduction

Digital transformation (DT) in higher education is a multifaceted process that integrates digital technologies into all aspects of university operations, teaching, and learning. This transformation is driven by the need to adapt to rapid technological advancements and challenges posed by global phenomena such as the COVID-19 pandemic. Key trends include sustainability and innovation, where digital technologies promote sustainable curriculums and enhance student performance [1, 2]. Technological advancements, such as AI, IoT, blockchain, big data analytics, and virtual reality, are transforming traditional educational processes, making them more innovative and cost-effective [3]. The COVID-19 pandemic has further accelerated this digital shift, highlighting the need for universities to develop digital competencies and adapt to new teaching methodologies [4, 5]. However, several challenges and barriers exist. Successful DT heavily relies on effective leadership and strategic management within institutions [6, 7]. There is a significant need for investment in both technological infrastructure and human capacity to fully leverage DT benefits [8]. Additionally, a more holistic approach is required to address all dimensions of HEIs, as many current initiatives lack comprehensive development [9].

Looking ahead, the future of DT in higher education is expected to advance the concept of "Education 4.0," which includes increased gamification, data-driven decision-making, and AI integration to reform educational practices [2]. Effective policy and governance frameworks are essential to

support this transformation [8]. Ongoing research is crucial to explore new models and frameworks, focusing on comprehensive DT strategies and enhancing leadership capabilities to navigate the evolving educational landscape [10]. Cambodian higher education institutions (HEIs) face significant challenges in terms of infrastructure and technological readiness. The rapid DT necessitated by the COVID-19 pandemic has exposed gaps in the availability and quality of technological resources essential for effective digital learning environments [11, 12]. Additionally, the disparity in technological advancement and infrastructure support compared to other countries complicates the adoption of digital education [12]. The shift to digital learning platforms has also highlighted varying levels of digital competence and resilience among students and educators. Many students struggle with adapting to new digital tools, which can hinder their learning experience and academic performance [12]. Furthermore, the lack of digital literacy among educators can impede the effective integration of ICT in teaching practices [11]. Leadership and strategic implementation are crucial for successful DT, yet Cambodian HEIs may face challenges in adopting appropriate strategies due to limited experience and resources [6, 13]. Additionally, DT can exacerbate existing inequalities in access to education, particularly for students from rural or low-income backgrounds who may have limited access to necessary digital devices and reliable internet connections [11, 12].

On the other hand, DT offers several opportunities for Cambodian HEIs. Implementing blended learning models, which combine traditional face-to-face instruction with online learning, can enhance the flexibility and accessibility of education, allowing students to learn at their own pace and from various locations [11]. The integration of ICT in education can significantly improve the quality of teaching and learning by facilitating interactive and engaging learning experiences, promoting collaborative learning, and providing access to a wealth of information and educational content [14, 15]. DT can also foster greater opportunities for collaboration between institutions, both locally and internationally, through joint research projects, shared digital resources, and exchange programs [11]. Finally, the ongoing DT presents numerous opportunities for research and development, including investigating the impact of digital tools on learning outcomes, exploring new pedagogical approaches, and developing innovative digital solutions to continuously improve the education sector [11].

This study aims to examine the stakeholder perspectives on the future of DT in Cambodian HEIs. It also investigates the perceived extent and effectiveness of DT within Cambodian HEIs. Data are gathered through online surveys with academic staff, management, support personnel, and students from private and public HEIs in Cambodia. The significance of the study lies in emphasizing the need for a coherent strategy for DT that accommodates the unique socio-economic landscape of Cambodia and discussing potential implications for policy-making, institutional planning, and educational practices.

2. Literature Review

2.1. Stakeholder Perspectives on Digital Transformation in Higher Education

DT in higher education involves the comprehensive integration of digital technologies into all aspects of HEIs, fundamentally changing how these institutions operate and deliver education. This complex process impacts faculty roles, perceptions, and professional development needs, requiring faculty members to integrate pedagogical and technological skills to meet the evolving demands of digital education. Driven by demographic, economic, and pedagogical factors, as well as global trends in digital technologies, this shift emphasizes the need for continuous self-improvement and lifelong learning, with faculty development programs focusing on enhancing digital competencies [16, 17].

Faculty perceptions of DT vary, with some expressing concerns about their diminishing roles due to the rise of digital education, while others see opportunities for blended learning that combines traditional and innovative methods [18]. Effective faculty development programs must address specific digital competencies required for modern teaching, providing training in digital tools, pedagogical strategies for online learning, and continuous support [16, 19]. HEIs play a crucial role in supporting faculty through DT by establishing Teaching and Learning Centers that offer structured professional development activities and resources [17].

Students enter higher education with specific expectations regarding the use of digital technologies, anticipating that these tools will enhance their learning experiences by providing greater access to information, facilitating communication, and supporting various learning activities. They expect digital technologies to provide easy and broad access to educational resources, particularly through Institutional Learning Management Systems (LMS) [20]. There is a strong expectation for technologies that support communication with peers and instructors, with tools that enable interpersonal communication and content sharing being highly preferred [21].

The actual experiences of students with digital technologies in higher education reveal a mix of positive outcomes and challenges. While digital technologies generally promote active engagement and participation, technical difficulties and the need for adequate resources can hinder their effective use. Additionally, there is often a lack of alignment between students' personal, academic, and professional digital spaces, complicating their overall digital experience [22, 23]. The level of digital literacy among students significantly impacts their ability to effectively use digital technologies [24].

Leadership styles significantly influence the success of DT in HEIs. Transformational leadership, which focuses on inspiring and motivating staff and students, is often highlighted as effective in driving digital change [25]. However, the effectiveness of different leadership styles can vary depending on the specific context of the institution. Research suggests that a combination of leadership styles may be necessary to address the diverse challenges of DT [13]. Despite the critical role of leadership, there is a surprising lack of research on DT processes in HEIs compared to other fields [26].

Effective digital leaders must possess a vision and the ability to make collective decisions that involve all stakeholders [27]. Additionally, leaders need to enhance their skills in technology and emotional intelligence to support their teams and improve institutional performance [28]. The DT of higher education is linked to broader trends such as the fourth industrial revolution, which emphasizes the integration of advanced technologies like AI and data analytics. This transformation drives the development of sustainable curriculums and enhances innovation and student performance [2]. As such, leaders in higher education must be equipped with the tools and knowledge to guide their institutions through these changes effectively.

2.2. The Future of Digital Transformation in HEIs in Developed and Developing Countries

In developed countries, the future of DT in HEIs is poised to be transformative. One prominent concept is Education 4.0, which integrates advanced technologies such as AI, AR, and data analytics into the educational process [2, 29]. This is expected to lead to more personalized and adaptive learning experiences, enhancing student engagement and performance. Additionally, the use of gamification in education is anticipated to rise, making learning more interactive and enjoyable.

Datafication, or the extensive use of data to inform decision-making processes, will become more integral in managing educational institutions and tailoring educational content to meet individual student needs [2]. AI and augmented intelligence will play a significant role in reforming higher education by providing intelligent tutoring systems, automating administrative tasks, and offering predictive analytics to improve student outcomes and institutional efficiency [2, 29].

As digital skills become increasingly important in the workplace, HEIs will focus more on equipping students with these skills, including fostering information literacy, which is essential for navigating and utilizing digital resources effectively [30, 31]. The COVID-19 pandemic has accelerated the adoption of online and blended learning models, which are likely to continue evolving, offering flexible and accessible education options that cater to diverse student populations [30, 32, 33].

DT will be closely linked with sustainable development goals. HEIs will need to adopt sustainable management practices and leverage digital tools to promote innovation and sustainability within their operations and curricula [1, 33]. However, DT poses several challenges, including digital divides, ethical considerations, and the need for continuous digital training. HEIs must develop strategic management practices to address these challenges and ensure that DT efforts are inclusive and equitable [7, 9, 31].

Developing countries face unique challenges in the DT process. These include a lack of expertise, inadequate facilities, and economic instability, which can limit the ability of institutions to invest in

necessary technologies and infrastructure [34]. The digital divide remains a critical issue, with disparities in access to digital technologies affecting students' ability to benefit from DT [30]. HEIs also often face resistance to change, both from faculty and administrative staff, which must be overcome for successful implementation of DT initiatives [5].

To address these challenges, there is a need for comprehensive frameworks that consider the unique challenges and opportunities in developing countries [9]. Providing extensive digital training for both students and faculty is essential, focusing on developing relevant digital skills and competencies [33]. Continued research and international collaboration are vital for advancing DT in higher education, allowing for the sharing of best practices and learning from global experiences [1]. Developing robust policies and strategic plans that support DT, addressing issues such as funding, infrastructure development, and capacity building, is crucial to create a conducive environment for digital education [10].

2.3. Digital Transformation Initiatives and Progress in Higher Education in Cambodia

DT has become a pivotal focus in Cambodian higher education, especially accelerated by the COVID-19 pandemic. This transformation is seen as a significant opportunity to enhance the integration of ICT within the educational sector. The shift towards DT has increased opportunities for blended learning, combining traditional face-to-face instruction with online learning. This hybrid approach can cater to diverse learning needs and preferences, making education more accessible and flexible [11].

There has been a marked improvement in the adoption of ICT in education, including the use of digital tools and platforms that facilitate interactive and engaging learning experiences. The integration of ICT is crucial for modernizing the educational infrastructure and aligning it with global standards [11]. DT also fosters greater opportunities for collaboration among educational institutions, leading to shared resources, joint research initiatives, and a more cohesive educational network that benefits from collective expertise and innovation [11].

However, the transition to digital learning has not been without challenges. A study comparing student perceptions from various countries, including Cambodia, highlights disparities in digital competence, confidence, and resilience among students. These disparities are influenced by differences in technological advancement, infrastructure support, and the pace of digital innovation [12]. Addressing these barriers is essential for enhancing digital competence and resilience among Cambodian students [12].

The future of DT in Cambodian higher education is poised to include several advancements, such as the integration of advanced technologies like AI and augmented intelligence, the increased use of gamification to make learning more engaging and interactive, and the utilization of data analytics in decision-making processes [2]. To build on the momentum of DT, concerted efforts from stakeholders in Cambodian higher education are necessary. Recommendations include investing in ICT infrastructure to support digital learning, providing training and resources for educators to effectively integrate digital tools, encouraging collaboration among institutions to share best practices and resources, and conducting further research to explore the holistic implementation of DT [9, 11].

3. Methodology

This study employs a qualitative research design, utilizing surveys to gain a comprehensive understanding of stakeholder perspectives on the current state and future direction of DT in Cambodian HEIs. By focusing on qualitative methods, the research aims to capture the nuanced views and experiences of various stakeholders involved in the DT process.

The target population encompasses academic staff, management and support personnel, and students from both public and private HEIs in Cambodia. Due to data limitations, the actual population size remains unknown. To determine an appropriate sample size, the study employed [35] methodology for indeterminate population sizes, aiming for a 95% confidence level and a 5% margin of error [35, 36]. Using this method, the minimum required sample size was determined with the following formula:

$$n = (z^2pq)/e^2$$

where (n) represents the sample size, (z) is the z -score for a 95% confidence level (1.96), (p) is the estimated proportion of the population with the characteristic of interest (set to 0.5 for a conservative estimate), (q) is ($1 - p$), and (e) is the desired margin of error (5%). By substituting these values, the minimum sample size needed is calculated to be 385 respondents.

The study engaged 981 respondents, encompassing 54 academic staff, 159 management personnel, 117 support staff, and 651 students. This diverse cohort offers a comprehensive range of perspectives on the current and future landscape of DT in Cambodian HEIs.

Data collection was conducted via a Google Forms questionnaire distributed directly to the target respondents. The data were meticulously analyzed using descriptive focus coding followed by thematic analysis to uncover key themes and patterns. This rigorous approach ensured that the analysis captured the complexity and depth of stakeholder perspectives, yielding valuable insights into the perceived current status and future trajectory of DT in Cambodian higher education.

4. Research Findings

4.1. Profile of Participants

Out of the 981 respondents surveyed, 22 provided comprehensive answers to the question: “How do you envision the future of DT in Cambodian HEIs, and how do you think it will continue to impact teaching and learning outcomes?” Due to personal reasons, many respondents chose not to answer this question. Table 1 shows the profile of these participants. The academic staff from private HEIs includes four individuals, with three aged 56 years and above and one aged 36-45 years. The public HEI academic staff cohort includes one respondent aged 56 years or above. Management perspectives are represented by two respondents from private HEIs, aged 46-55 and 36-45 years. The support staff cohort, entirely from private HEIs, comprises eight respondents, with five aged 18-25 years and three aged 26-35 years. The student perspective, also from private HEIs, includes seven respondents aged 18-25 years. This diverse representation ensures a comprehensive understanding of the various stakeholder perspectives on DT in Cambodian higher education.

Table 1.
Profile of participants.

Respondent	Role	Type of HEI	Age
1	Academic staff	Public	56 years and above
2	Academic staff	Private	56 years and above
3	Academic staff	Private	36-45 years
4	Academic staff	Private	56 years and above
5	Academic staff	Private	36-45 years
6	Management	Private	46-55 years
7	Management	Private	36-45 years
8	Support staff	Private	18-25 years
9	Support staff	Private	18-25 years
10	Support staff	Private	18-25 years
11	Support staff	Private	26-35 years
12	Support staff	Private	18-25 years
13	Support staff	Private	18-25 years
14	Support staff	Private	26-35 years
15	Support staff	Private	26-35 years
16	Student	Private	18-25 years
17	Student	Private	18-25 years
18	Student	Private	18-25 years
19	Student	Private	18-25 years
20	Student	Private	18-25 years
21	Student	Private	18-25 years
22	Student	Private	18-25 years

The age distribution highlights a predominance of younger respondents, particularly in the 18-25 age group, which includes support staff and students. In contrast, academic staff tend to be older, with a significant number aged 56 years and above. The study reveals a diverse representation of roles, with a notable number of support staff and students, while management roles are less represented. The predominance of respondents from private HEIs suggests that DT efforts may be more concentrated in these institutions, indicating a potential gap in the engagement of public HEIs with DT initiatives.

4.2. Extent of Implementation and Overall Effectives of Digital Transformation in Cambodian HEIs

Respondents were asked to evaluate the extent of DT implementation and its overall effectiveness in their respective HEIs on a scale of 1 to 5. The perception of DT in Cambodian HEIs is generally positive, with high ratings for both the extent and effectiveness of digital initiatives. The average score for the extent of DT is 4.3, while the average score for effectiveness is 4.19. This positive outlook on the extent and effectiveness of DT initiatives is consistent with literature indicating that DT is a key focus area for HEIs in both developed and developing countries [2, 29].

Academic staff perceive the extent of DT in Cambodian HEIs as high, with a mean score of 4.33, and rate its overall effectiveness positively at 4.33. This suggests that digital initiatives are well-received and beneficial in their roles. Similarly, management and support personnel view the extent of DT as high, with a mean score of 4.33, and their rating of overall effectiveness matches that of the academic staff at 4.33, indicating a consensus on the positive impact of DT across different roles within HEIs.

In contrast, students rate the extent of DT slightly lower, with a mean score of 4.28, and their perception of overall effectiveness is also slightly lower at 3.94. This suggests that while students recognize the efforts in DT, they might experience some challenges or areas for improvement in its implementation. This aligns with concerns raised in the literature about the need to address digital divides and ensure inclusive access [30, 31].

The survey results revealed the digital tools utilized by all stakeholder groups in Cambodian HEIs, including Learning Management Systems, video conferencing platforms, and online assessment and feedback tools. Many stakeholders cited the use of mobile learning apps and collaborative platforms like Google Workspace and Microsoft 365. A few respondents mentioned emerging technologies such as Virtual Reality (VR)/Augmented Reality (AR), recognizing their potential for immersive learning experiences. However, the adoption of these technologies will likely depend on factors such as cost, equipment availability, and the creation of relevant educational content.

The use of digital tools reported by Cambodian HEIs aligns with the literature's emphasis on integrating advanced technologies to enhance the educational process [2, 29]. However, the limited adoption of emerging technologies like VR/AR indicates that Cambodian HEIs may still be in the early stages of DT compared to more developed education systems.

4.3. The Future of Digital Transformation in Cambodian HEIs

4.3.1. Perspectives of Academic Staff

The responses from academic staff revealed several key themes regarding the future of DT in Cambodian HEIs. Firstly, there is a recognition of the urgent need to upskill and build capacities among academic staff to adapt to and leverage DT. Proper training on the use of various online tools and new technologies, such as AI, is seen as crucial for the successful integration of digital technologies in teaching and learning.

Secondly, significant investment is required to build the necessary technological infrastructure across Cambodian HEIs. This includes ensuring access to computers, reliable internet connectivity, and a comprehensive suite of digital learning resources, especially in underserved and rural areas that often lack the necessary technological capabilities.

Thirdly, DT has the potential to revolutionize education in Cambodia by improving accessibility, engagement, and the overall effectiveness of teaching and learning processes. The integration of digital technologies and multimedia can enable diverse and innovative teaching and learning styles, thereby enhancing the educational experience for students.

However, there are concerns about the slow pace of DT due to existing socio-economic and digital gaps in the country. These divides may further widen, risking the exclusion of students and institutions from lower-income backgrounds, thereby exacerbating educational inequalities.

The academic staff also highlighted the need for strong leadership and coordination from the Ministry of Education to drive the DT agenda. This includes initiatives such as purchasing software and equipment for underserved schools, introducing parent-school boards to oversee teacher performance, increasing teacher salaries, providing training on digital tools, ensuring access to online resources and library facilities, and addressing corruption to improve the overall education system.

Lastly, while acknowledging the benefits of DT, the academic staff emphasized that technology can never replace the human care and support provided by teachers. Maintaining the human element in teaching and learning is essential, as a balanced approach between technology and the personal touch is crucial for the successful implementation of DT in Cambodian HEIs.

4.3.2. Perspectives of Management and Support Personnel

The responses from management and support personnel revealed several key themes regarding the future of DT in Cambodian HEIs. Firstly, there is a general awareness and acceptance of DT, with HEIs preparing to accommodate a digital system despite the slower pace compared to developed countries.

Secondly, the digitalization of higher education in Cambodia has accelerated post-COVID-19, with the pandemic's decreasing influence seen as a positive factor driving further DT. This rapid digitalization is viewed as a significant development for Cambodian HEIs.

Thirdly, DT is recognized for its potential to enhance teaching and learning experiences. This includes improving the efficiency, sustainability, and reliability of education and examinations, as well as providing more learning resources and opportunities for students.

Fourthly, there is a vision for developing a robust and inclusive digital learning ecosystem. This involves integrating advanced technologies, such as AI, to offer personalized and adaptive learning paths based on student performance, thereby empowering students for the future.

Fifthly, the importance of digital literacy is emphasized, ensuring that both students and academic staff possess the necessary skills to thrive in a digitally transformed educational environment. This is crucial for the successful implementation of digital initiatives.

Sixthly, enhancing human capital is highlighted as essential for the success of DT. This involves improving education and skills to better enable the implementation of digital technologies in Cambodian HEIs.

Lastly, there are equity concerns regarding DT. There is a risk that students from less privileged backgrounds may be left behind, while those with stronger financial backgrounds benefit more. Ensuring equitable access to digital resources and opportunities is a crucial consideration to address these disparities.

4.3.3. Perspectives of Students

The responses from students revealed several key themes regarding the future of DT in Cambodian HEIs. Firstly, students highlighted the need to enhance the efficiency, sustainability, and reliability of the education system. This includes improving examination and assessment methods, providing short courses or events to help students and staff gain practical experience and skills, and encouraging more self-study and continuous learning.

Secondly, students emphasized the importance of integrating digital technologies into the curriculum from the early stages of education. This would involve exposing students to digital tools and platforms to better prepare them for the workforce and career advancement.

Thirdly, students expressed the desire to develop a comprehensive digital learning environment that empowers them and enhances teaching and learning experiences. Ensuring that the DT is inclusive and accessible to all students, regardless of their socioeconomic background, is a crucial concern.

Fourthly, students aspire to improve their access to a wider range of digital resources and sources to support their learning and teaching activities in Cambodian HEIs. This would help in creating a more resourceful and supportive educational environment.

Fifthly, students recognize the potential of leveraging technologies like AI to provide personalized and adaptive learning paths based on individual student performance. They also emphasized the importance of both students and academic staff developing the necessary digital literacy skills to effectively utilize digital tools and platforms.

Sixthly, students expressed the desire to study the DT efforts of other countries in the region, such as Singapore, to inform Cambodia's implementation. They highlighted the importance of building a highly educated and skilled workforce to drive the DT process.

Seventhly, students acknowledged that students from different socioeconomic backgrounds may experience unequal access to digital technologies and resources, which could lead to disparities in learning outcomes. Addressing these digital divides is a significant concern.

Lastly, students emphasized the importance of encouraging more active participation and engagement from the Cambodian people in the education sector, as it is crucial for the country's overall development. This community involvement is seen as essential for driving and sustaining DT efforts.

4.3.4. Triangulation of Perspectives from Different Stakeholder Groups

The triangulation of perspectives from different stakeholder groups revealed key similarities and differences in their views, as well as unique concerns regarding the future of DT in Cambodian HEIs.

Similarities

The urgent need to train academic staff on using online tools and new technologies is a recurring theme. Providing short courses for students to gain practical experience and digital literacy is equally emphasized. Management and support personnel also highlight the importance of digital literacy for

both students and academic staff. This aligns with the literature's emphasis on the importance of digital skills and competencies for navigating the digital landscape [30, 31].

Significant investment is needed to improve computers and internet connectivity, especially for academic staff. For students, enhancing access to digital resources is essential. Although not directly mentioned, a robust digital ecosystem is implied for management and support personnel. The need for strong technological infrastructure aligns with the literature's focus on addressing the digital divide and ensuring equitable access to digital technologies [30, 31].

Across the groups, there are concerns about widening digital and socio-economic gaps. Addressing the digital divide and ensuring equity are key considerations, aiming to benefit all students equally from DT. These concerns echo the literature's emphasis on the need for inclusive and equitable DT efforts, particularly in developing countries [30, 31].

Digital technologies are viewed as a way to enhance accessibility, engagement, and teaching effectiveness for academic staff. For students, the emphasis is on integrating digital technologies from early education stages and improving content delivery. Management and support personnel focus on enhancing the overall teaching and learning experiences through digital tools. The potential of DT to improve education quality and student experiences aligns with the literature's emphasis on the transformative impact of digital technologies [2, 29].

There is a consensus on the importance of developing a comprehensive and inclusive digital learning ecosystem, especially for underserved areas. Academic staff recognize the need for extensive digital learning resources, while students desire an inclusive digital learning environment. Management and support personnel prioritize creating a robust and inclusive digital learning ecosystem. This aligns with the literature's focus on strategic management practices and holistic frameworks to address the unique challenges in developing countries [9, 10].

4.3.5. Differences

The role of government and leadership is a significant point of emphasis for academic staff, who see the Ministry of Education and other stakeholders as crucial drivers of DT. In contrast, students place less focus on the government's role, instead highlighting the importance of community engagement. Management and support personnel do not directly address the government's role but acknowledge the leadership's awareness and acceptance of DT.

When it comes to specific tools and technologies, academic staff generally emphasize the importance of AI and various online tools, though they do not provide detailed information. Students, however, specifically mention the use of AI for personalized learning paths and stress the importance of learning from regional best practices. Management and support personnel also recognize the use of AI and other advanced technologies to enhance learning paths.

Balancing technology and human interaction is another critical theme. Academic staff emphasize the need to balance technological advancements with human elements in education. In contrast, students focus largely on technological improvements, with minimal mention of the human touch. Management and support personnel are primarily technology-oriented, with less discussion on balancing technology with human interaction. This emphasis on maintaining the human element in education by academic staff contrasts with the literature's more technology-driven perspective, suggesting the need for a balanced approach that considers the unique context and cultural factors in Cambodian HEIs [5].

4.3.6. Unique Concerns of Each Stakeholder Group

Each stakeholder group has its own distinct concerns and priorities regarding the future of DT in Cambodian HEIs. For the academic staff, there is a specific need for leadership from the Ministry of Education to drive this transformation. They also focus on the socio-economic and digital divides, expressing a fear of exclusion for underserved groups. Additionally, the academic staff emphasize the importance of maintaining a human touch in education alongside technological advancements.

Students, on the other hand, express a need for the early integration of digital technologies in education. They place a particular emphasis on learning from regional best practices, such as those

observed in Singapore. Furthermore, the students desire broader community engagement in the education sector.

The management and support personnel recognize the post-COVID acceleration in DT and generally acknowledge the inevitability and necessity of embracing this change. Their focus is on awareness, acceptance, and the strategic planning required for successful implementation.

5. Conclusion

This study examines stakeholder perspectives on the current state and future of DT in HEIs in Cambodia. The findings provide a comprehensive overview of how various stakeholders perceive DT in Cambodian HEIs. Respondents from diverse roles—academic staff, management, support personnel, and students—demonstrate an optimistic outlook on the extent and effectiveness of digital initiatives within private HEIs, highlighting both shared aspirations and distinct concerns.

The predominance of younger respondents suggests a strong potential for embracing digital tools; however, the significant representation of older academic staff indicates critical gaps in training and readiness to adopt new technologies. The data underscore the urgent need for substantial investment in infrastructure, training, and technological resources, particularly in underserved areas. Academic staff call for leadership and strategic direction from the Ministry of Education, emphasizing the necessity for coordinated efforts at the systemic level to ensure that DT initiatives do not inadvertently exacerbate existing inequalities.

While the study captures general sentiments regarding the potential of digital technologies to enhance accessibility, engagement, and educational quality, it also raises concerns about widening socio-economic divides and unequal access, which resonate across all stakeholder groups. Balancing the integration of digital tools with the essential human elements of teaching and learning is a crucial reflection from this research.

Despite these insights, the study has limitations. The sample is predominantly drawn from private HEIs, which may not fully represent the experiences and challenges faced by public institutions. Additionally, the relatively small sample size may affect the generalizability of the findings. Respondents' perceptions were based on self-reported data, which can introduce bias. The study did not explore the specific challenges faced by students from varied socioeconomic backgrounds, warranting further investigation.

Future research should aim to include a broader range of stakeholders, particularly from public HEIs, to obtain a more holistic understanding of DT across Cambodian higher education. Longitudinal studies would provide insights into the evolving nature of digital initiatives over time. Additionally, qualitative research methods, such as interviews or focus groups, could delve deeper into the nuanced experiences and challenges faced by students, particularly those from disadvantaged backgrounds. Examining regional case studies from other countries can also inform best practices and strategies tailored to Cambodia's unique context.

Ultimately, as Cambodia navigates the complexities of DT, the insights from this research can inform policy, guide institutional strategies, and foster an inclusive digital ecosystem that promotes equitable access to education for all students. The concerted efforts of academic, administrative, and student stakeholders will be pivotal in steering Cambodian HEIs toward a successful, digitally-enabled future that leverages technology to empower learners and enrich the educational landscape.

Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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