Integration of Transformational Skills and Digital Literacy in AI-Driven Hybrid Learning

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Abstract:

This study aims to analyze the integration of transformational skills and digital literacy as a strategy for developing human resources (HR) among university students in the era of Artificial Intelligence (AI) and hybrid learning. The research employed a descriptive qualitative approach with data collected through interviews, observations, and documentation involving lecturers, students, and university management. The results show that transformational skills play a role in shaping students' character to be independent, adaptive, and visionary, while digital literacy enhances technological competence to support the learning process and readiness for a technology-based workforce. Although digital facilities on campus are adequate, their utilization remains suboptimal due to limitations in devices, internet access, and training. The integration of these two aspects serves as a strategic step in creating excellent, creative, and globally competitive students. Educational institutions play a crucial role through the strengthening of digital curriculum policies, the provision of cyber laboratories, and technology training. Thus, the synergy between transformational skills and digital literacy becomes the main foundation in shaping adaptive and competitive student human resources in the era of artificial intelligence.

Keywords: *Transformational Skills, Digital Literacy, Student Human Resource Development*

INTRODUCTION

The advancement of technology in the Artificial Intelligence (AI) era has brought significant changes to higher education. Hybrid learning systems demand that students possess strong adaptability and technological mastery (Gudoniene et al., 2025). In this context, the development of student human resources (HR) becomes a strategic priority for producing graduates who are academically excellent, digitally literate, and possess transformational character (Dwivedi et al., 2021). Digital literacy plays an important role in enhancing learning effectiveness and readiness to face a technology-based workforce, while transformational skills shape leadership, creativity, and critical thinking abilities (Sunarso, Ausat, Wanof, Al Hidayat, & Raharjo, 2025). The integration of both will produce students who are innovative, adaptive, and highly competitive in the artificial intelligence era.

Current hybrid learning models offer flexibility in time and place of

study, thus addressing the issue of time constraints. Additionally, the use of technology in hybrid learning can enhance student understanding and retention. Hybrid learning is an educational approach that combines face-to-face learning with online learning using integrated digital technology. This model has developed rapidly in the digital era, leveraging technological advantages to improve flexibility, accessibility, and learning effectiveness (Al-Maroof, Alshurideh, Salloum, AlHamad, & Gaber, 2021).

Furthermore, digital transformation has become the center of change in various sectors, including human resource management. This marks a shift from merely using digital tools toward changing mindsets, organizational culture, and strategies in workforce management (Kraus et al., 2021). Essentially, digital transformation in HR focuses on improving efficiency and effectiveness of HR processes by leveraging technology

In facing the era of artificial intelligence and hybrid learning, mastery of digital skills becomes an important aspect in human resource development, especially among students. This condition demands more transformative and adaptive Human Resource development strategies toward technological advancement. Therefore, integrating transformational skills with digital literacy becomes a strategic step to form students who are ready to compete and contribute productively in digital-based professional environments (Angga, Muhammad, Wilda, Mohammad, & Shinta, 2023)

Although research on digital literacy and transformational skills has grown, existing studies continue to treat these domains separately, leaving limited understanding of how they interact within higher education. Prior work has examined digital literacy mainly as an isolated technological competence and transformational skills apart from technology-rich learning environments (Caton, Kinshuk, & Savenye, 2025). Consequently, three gaps remain: the lack of empirical evidence on how digital literacy develops within hybrid learning ecosystems that merge physical and virtual spaces; the underexplored role of transformational leadership in shaping student self-leadership in technology-mediated learning; and the absence of theoretical and empirical explanations of how digital literacy and transformational skills mutually reinforce each other in enhancing student adaptability and competitiveness.

The novelty of this study lies in its integrative approach, which positions transformational skills and digital literacy as interconnected dimensions of student human resource development in AI-enhanced hybrid learning environments. This research advances a conceptual framework that links technological capability with adaptive and leadership-oriented mindsets and applies a contextualized qualitative lens to Islamic higher education institutions in Indonesia—an underrepresented setting in a literature dominated by Western contexts. Additionally, the study identifies institutional policies, infrastructure constraints, and pedagogical practices that shape the integration of these competencies and proposes actionable strategies to develop graduates equipped with both technological proficiency and

transformational character demanded by Industry 4.0 and Society 5.0.

RESEARCH METHODS

This study employed a descriptive qualitative approach conducted at Cyber Islamic University (*UIN Siber Syekh Nurjati*), West Java, Indonesia. Research participants comprised lecturers, university management, and students representing the campus academic environment.

Data collection utilized triangulation methods: semi-structured interviews with key stakeholders, direct observations of learning activities and campus environments, and documentation analysis of academic policies and institutional documents (Flick, 2022). Thematic analysis was employed to identify patterns and themes related to the integration of transformational skills and digital literacy in student human resource development.

RESULT AND DISCUSSION

The Role of Transformational Skills in Enhancing Quality and Competitiveness of Student Human Resources in the Era of Artificial Intelligence and Hybrid Learning

Research findings indicate that the role of transformational skills in enhancing the quality and competitiveness of student human resources in the era of artificial intelligence and hybrid learning, as perceived by university management, shows that transformational skills are viewed as important elements in character formation and student readiness to face the digital era. The institution assesses that visionary thinking ability, self-leadership, and adaptive attitudes become the foundation for students to adjust to educational system changes now oriented toward technology and flexibility. The shift from conventional systems toward hybrid learning models and artificial intelligence-based learning demands that students not only be academically intelligent but also possess strong character, discipline, and the ability to adapt to new technologies.

From the student perspective, transformational skills are understood as the ability to transform oneself, think far ahead, and lead positive change in the learning process. Students assess that the hybrid system trains them to be more independent and disciplined in managing study time. Additionally, skills such as self-leadership, critical thinking ability, and internal motivation are assessed to develop along with the demands of flexible and technology-based learning. Through this integration, students become more creative and able to manage their learning process effectively, both in classrooms and on online platforms.

Meanwhile, the university also emphasizes that the development of transformational skills is not carried out solely through formal coursework, but also through training and external collaborations, such as professional certification programs in partnership with the National Professional Certification Agency (BNSP). These efforts aim to ensure that students not only possess theoretical capabilities but also obtain nationally recognized professional competency

credentials. Thus, transformational skills play a crucial role in enhancing the quality and competitiveness of student human resources in the era of AI and hybrid learning.

Level of Implementation and Understanding of Student Digital Literacy in the Human Resource Development Process in Higher Education Environments.

Interview results show that the level of understanding and implementation of student digital literacy still varies. Lecturers and management assess that although the campus has provided various digital facilities such as academic portals, Learning Management System (LMS), and e-books, their utilization is not yet optimal because not all students actively access and utilize these digital resources. Factors such as device limitations, internet networks, and lack of awareness about the importance of digital literacy become the main obstacles in the process of strengthening student digital capabilities.

From the student side, digital literacy is interpreted as the ability to access, understand, and utilize various technology platforms to support learning activities. Students use various media such as Google Classroom, Zoom, Microsoft Word, Grammarly, ChatGPT, and Canva to support academic activities. However, some students acknowledge that their mastery of these technologies is not yet maximal due to limited experience and lack of formal training from the campus. Challenges that often arise include network disruptions, device limitations, and lack of understanding of available digital learning features

Nevertheless, most students realize that digital literacy plays a major role in learning effectiveness and readiness to face the now technology-based workforce. With digital literacy capabilities, students can more quickly adapt to learning technology developments and optimize digital resources in completing academic assignments and course projects. Therefore, improving digital literacy becomes one of the important strategies in strengthening student HR competitiveness.

Integration of Transformational Skills and Digital Literacy as a Strategy for Student Human Resource Development in the Era of Artificial Intelligence and Hybrid Learning

Based on findings from various informants, the integration between transformational skills and digital literacy is viewed as a strategic approach in developing student HR in the modern era. The campus has made efforts to integrate both aspects through curriculum policies containing digitalization-based courses and encouraging collaboration among lecturers, students, and management. Through this approach, the formation of leadership character, critical thinking ability, and technology adaptation can proceed in balance.

Lecturers and students assess that transformational skills provide a strong character foundation such as independence, self-leadership, and readiness to face change, while digital literacy provides technological tools and capabilities to realize that change. Both complement each other and contribute to creating excellent, creative student HR capable of competing globally. In this

context, students are not only required to master technology but also able to use it ethically and productively

The institution has also designed various support mechanisms such as digital training, provision of cyber laboratory facilities, adequate internet networks, and development of interactive e-learning systems. These steps are expected to strengthen the integration between transformational skills and digital literacy so as to produce graduates who are not only academically intelligent but also adaptive to Artificial Intelligence (AI) developments and ready to contribute in the modern workforce

DISCUSSION
The Role of Transformational Skills in Enhancing Quality and Competitiveness of Student Human Resources in the Era of Artificial Intelligence and Hybrid Learning.

Transformational skills play an important role in forming student character and readiness to face the digital era. The university institutions assess that visionary thinking ability, self-leadership, and adaptability become keys to adjusting to technology-based learning systems and hybrid models (Ashkanasy, 2004). The shift toward Artificial Intelligence (AI)-based learning demands that students not only excel academically but also be tough, disciplined, and able to adapt to technological changes. Digital transformation is the process of integrating digital technology into all operational aspects of business and organizations, with the aim of improving efficiency, innovation, and competitiveness (Verhoef et al., 2021). Technologies such as artificial intelligence (AI), Internet of Things (IoT), cloud computing, and big data become the main drivers of this change (Iswandi & Kuswinarno, 2024; Kraus et al., 2021)

The hybrid system trains students to be more independent and disciplined in managing study time. Additionally, skills such as self-leadership, critical thinking ability, and internal motivation are assessed to develop along with the demands of flexible and technology-based learning (Satar, Alharthi, Omeish, Alshibani, & Saqib, 2024). Through this integration, students become more creative and able to manage their learning process effectively, both in classrooms and on online platforms. The hybrid model provides opportunities for lecturers to directly assess student abilities and understanding during face-to-face sessions, while strengthening material understanding through online and offline interaction and discussion (Niyomves, Kunacheva, & Sutadarat, 2024).

Research by (Karnawati, 2020) shows that the hybrid learning model is effective in improving student learning outcomes with gain values reaching 49.50%. However, this effectiveness depends on technology readiness and lecturer ability in utilizing digital facilities that support the learning process. Thus, the integration between transformational skills and hybrid learning becomes key in creating students who are adaptive, creative, and competitive in the Artificial Intelligence era.

Level of Implementation and Understanding of Student Digital Literacy in the Human Resource Development Process in Higher Education Environments.

The level of student digital literacy implementation is still diverse and not yet optimal, although campuses have provided various digital facilities such as academic portals, LMS, and e-books. Digital literacy is the ability to search, organize, understand, evaluate, and package information using digital technology involving knowledge about technology, namely skills related to mastering digital devices and critical thinking processes toward information found through digital media (Nikou, De Reuver, & Mahboob Kanafi, 2022)

Nevertheless, the implementation and understanding of student digital literacy face main obstacles, namely lack of technology utilization, device and network limitations, and minimal training and digital awareness. Students generally understand digital literacy as the ability to access and use various platforms such as Zoom, Google Classroom, Canva, Grammarly, and ChatGPT, but their mastery is still limited.

The development of the world toward digital makes humans need and demand the presence of information quickly and easily accessible, causing increasingly aggressive development of internet usage. The more the digital era develops, the higher digital literacy must be, but survey results conducted by the Ministry of Communication and Information in the Digital Literacy Status of Indonesia 2020 (Survey results in 34 Provinces) show that Indonesian society's digital literacy is at a "moderate" position. The level of digital literacy is influenced by education. Higher education tends to have higher literacy levels and vice versa (Dhita, Nurdiansyah, & Sejarah, 2022).

Even so, students realize that digital literacy is very important to support learning effectiveness and prepare themselves to face the technology-based workforce (Caton et al., 2025). Therefore, improving digital literacy becomes a strategic step to develop adaptive and competitive student HR in the AI era and hybrid learning.

Integration of Transformational Skills and Digital Literacy as a Strategy for Student Human Resource Development in the Era of Artificial Intelligence and Hybrid Learning

The integration between transformational skills and digital literacy becomes the main strategy in student HR development in the Artificial Intelligence and hybrid learning era (Zakir et al., 2025). Campus plays an active role in creating strategies by implementing digital-based curriculum policies, providing supporting facilities such as cyber laboratories, training, and interactive e-learning systems.

This aligns with research findings stating digital literacy as a component capable of improving education quality through developing information access and work readiness (Caton et al., 2025). Meanwhile, statements from other researchers emphasize that the integration of digital media in blended learning models encourages the creation of interactive learning and improves student academic quality (Mulenga & Shilongo, 2025).

From the implementation side, transformational skills form independent,

adaptive, and visionary student character, while digital literacy provides technological capabilities that enable students to utilize technology effectively and ethically. Both aspects complement each other and contribute to creating excellent, creative students with global competitiveness, who are not only ready to face technological change but also able to adapt and innovate in academic and professional environments (Yi & Wang Siqian, 2025). This aligns with research showing that digital literacy mastery is not only about technical ability but also simultaneously strengthens students' soft skills or transformational skills.

CONCLUSION

The conclusion of this study is that the integration between transformational skills and digital literacy is an important strategy in developing student human resources in the Artificial Intelligence and hybrid learning era. Transformational skills form independent, adaptive, and visionary student character, while digital literacy strengthens technological capabilities needed in the learning process and digital-based workforce. Although the level of student digital literacy implementation still varies due to device, network, and training limitations, awareness of the importance of digital capabilities continues to increase. Institutional support through digital curriculum policies, training, and technology-based learning facilities becomes an important factor in optimizing the integration of both. Thus, the synergy between transformational skills and digital literacy contributes to the formation of intelligent, characterized, creative students with global competitiveness amid increasingly rapid technological change

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