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Human-Centered Approach in Digital Education Planning: Building Empathy Amid Technology

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Abstract

The digital era has fundamentally transformed the face of education, from learning methods to interactions between teachers and students. However, the massive development of technology often overlooks human dimensions such as empathy, values, and interpersonal relationships. This article aims to examine a human-centered approach in digital education planning that prioritizes human needs, experiences, and values as the central point. Using a qualitative-conceptual approach, this article concludes that integrating empathy into digital education design not only enhances learning effectiveness but also fosters an inclusive, meaningful, and ethical learning environment.

INTRODYCTION

Digital transformation in education has accelerated innovation and improved access to learning, particularly through online platforms, self-learning applications, and artificial intelligence (AI)-based technologies.[1] However, behind these advancements, many criticisms have emerged, as the digital education system tends to overlook the human affective and ethical dimensions.

The system that has been developed is overly focused on efficiency and automation, causing social relationships and empathy—core elements of the educational process—to become marginalized.[2] This is where the urgency arises to design an educational system that is not only technology-based but also oriented toward human values.

The human-centered design (HCD) approach, which has long been popular in technological product development, is now beginning to be applied in the field of education. The HCD concept emphasizes that all system planning and development must start from a deep understanding of humans as the primary users—in this case, teachers, students, and other stakeholders.[3]

In the context of education, this approach aims to create a system that is not only technically functional but also aligned with the emotional, social, and psychological needs of

[1] Selwyn, N. (2016). *Education and Technology: Key Issues and Debates*. London: Bloomsbury Academic.
[2] Friesen, N. (2011). The Place of the Classroom and the Space of the Screen: Relational Pedagogy and Internet Technology. *Educational Philosophy and Theory, 43*(4), 422–432.
[3] Norman, D. A. (2013). *The Design of Everyday Things*. New York: Basic Books.

learners. Planning digital education with a human-centered approach means integrating technology with the values of empathy, participation, and diversity.[4]

Empathy is a key component of this approach. Without empathy, digital education design will only produce a mechanistic system incapable of addressing the unique needs of individuals, particularly students from diverse backgrounds.[5]

RESEARCH METHODS

This research employs a qualitative-descriptive approach through library research and reflective analysis of relevant literature. The primary sources include international journals on human-centered design, philosophy of education, and educational technology development.

The analysis was conducted using content analysis techniques and a critical reflection approach, in which the researcher examined the integration of human values into technology-based education systems.[6] Digital transformation has revolutionized various sectors of human life, including the field of education. This era is characterized by the increasing utilization of information and communication technology (ICT) in the teaching and learning process, encompassing online learning, digital learning management systems, and the use of artificial intelligence (AI).[7]

Although it offers speed, efficiency, and broad reach, digital education often sacrifices fundamental human values such as empathy, emotional closeness, and appreciation for individual uniqueness. In such circumstances, the teacher–student relationship becomes more functional than relational.[8] The currently dominant model of digital education tends to be machine-driven, focusing on algorithmic control and automation without considering students' emotional and social contexts. As a result, learners often feel alienated within an overly technocratic learning system.[9] This condition raises concerns that the education system will drift away from its true mission as a process of shaping the whole person. Quality education should not only develop cognitive competence but also foster character, empathy, and integrity.[10]

The concept of human-centered design (HCD) offers a relevant alternative to address these issues. HCD is a design approach that places human needs, experiences, and emotions at the center of the technology planning and implementation process.[11] In the context of education, a human-centered approach means developing digital learning systems that take into account learners' psychological conditions, ensure equitable access, and create meaningful and inclusive learning experiences.[12]

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[4] Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning, 12*(3), 80–97.
[5] Rose, D. H., & Meyer, A. (2002). *Teaching Every Student in the Digital Age: Universal Design for Learning*. Alexandria: ASCD.
[6] Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal, 9*(2), 27–40.
[7] Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning, 12*(3), 80–97.
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[9] Selwyn, N. (2016). *Education and Technology: Key Issues and Debates*. London: Bloomsbury Academic.
[10] [10] Fullan, M. (2013). *The New Meaning of Educational Change*. New York: Teachers College Press.
[11] Norman, D. A. (2013). *The Design of Everyday Things*. New York: Basic Books.
[12] Brown, T. (2009). *Change by Design: How Design Thinking Creates New Alternatives for Business and Society*. Boston: Harvard Business Press.

The implementation of HCD in digital education requires a paradigm shift from a system solely oriented toward efficiency to one that prioritizes human interaction, dialogue, and social sensitivity. This is essential to avoid an education that is dry and mechanistic.[13] This approach aligns with the principles of progressive education, which emphasize active learner participation, social engagement, and the contextualization of learning based on real-life experiences. HCD also enables the development of an educational system that is flexible and centered on the individual needs of students.[14] Empathy lies at the core of the human-centered approach. In digital education, empathy means understanding the challenges students face in accessing technology, their psychosocial conditions, and their diverse learning styles. This understanding serves as the foundation for designing a more equitable and adaptive system.[15]

Beyond that, this approach also encourages student involvement in the planning and development of learning systems. This means that students are not merely positioned as policy recipients but as active subjects entitled to voice their needs.[16] The rising mental health crisis among students during the pandemic serves as evidence that digital learning systems have not fully considered students' emotional well-being. This reinforces the urgency of adopting a more empathetic approach in the design of future education. Human-centered design can also address the challenges of inclusive education. Systems that take into account the diversity of students' social, economic, and cultural backgrounds will be better equipped to promote equity and equality in digital education.[17] The growing mental health crisis among students during the pandemic serves as evidence that digital learning systems have not fully taken students' emotional well-being into account. This underscores the urgency of adopting a more empathetic approach in the design of future education.

Human-centered design can also address the challenges of inclusive education. Systems that consider the diversity of students' social, economic, and cultural backgrounds will be better equipped to foster equity and equality in digital education.[18] At the implementation level, HCD encompasses not only the design of learning applications and platforms but also curriculum development, teaching methods, assessment, and teacher training. All of these elements must be examined with consideration for the human dimension.[19] This approach requires cross-sector collaboration, involving technology designers, educators, educational psychologists, and policymakers. Such collaboration aims to design a digital education system that is not only technologically advanced but also socially sensitive.[20]

Human-centered design-based educational planning must also be dynamic and adaptive to change. This means that the system developed should be continuously evaluated based on user

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[13] Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Boston: Center for Curriculum Redesign.
[14] Dewey, J. (1938). *Experience and Education*. New York: Collier Books.
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[17] Lu, M. (2020). Human-centered learning in AI-powered education. *AI & Society, 35*(3), 555–568.
[18] UNESCO. (2021). *Reimagining Our Futures Together: A New Social Contract for Education*. Paris: UNESCO Publishing.
[19] McLuhan, M. (1964). *Understanding Media: The Extensions of Man*. New York: McGraw-Hill.
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feedback, particularly from learners as the owners of the learning experience itself.[21] This study seeks to explore how a human-centered approach can be conceptually applied in digital education planning in Indonesia. The focus of the analysis is directed toward the importance of empathy as a design principle and how human values can be integrated into technology-based learning systems.[22] Thus, this article is expected to contribute to building a more holistic framework, asserting that digital transformation in education is not sufficient with technological innovation alone, but must be accompanied by a profound human awareness.[23]

RESULTS AND DISCUSSION

Why Human-Centered Design Matters in Digital Education

The presence of technology is often regarded as the primary solution for improving the quality of education. However, in reality, many students feel alienated, unmotivated, or even experience psychological stress due to digital learning systems that are insufficiently adaptive and impersonal.[24] The human-centered approach invites education planners to begin with the question: *'What do students truly need?'* This goes beyond academic content to include emotional support, a sense of being valued, and active participation in the learning process.[25] In the process of digitalizing education, there is a tendency to prioritize technological efficiency over the meaning of human interaction. This results in learning systems that are technically sophisticated but relationally and emotionally impoverished. [26]In fact, education is inherently a deeply human activity that requires the touch of values, empathy, and closeness.

The human-centered approach is essential because it restores the position of humans—particularly students and teachers—as the core of the entire digital learning process. A good system is not only one that is fast and accurate, but also one that can respond to the psychological, social, and cognitive needs of learners.[27] One of the main reasons this approach is important is the increasing problem of alienation and fatigue in online learning. Many learners feel emotionally disconnected from the learning process due to the lack of meaningful interaction with teachers and peers.[28] Through a human-centered approach, the learning experience can be designed to be more personal, dialogic, and reflective. In addition, this approach helps accommodate the diversity of learners' learning styles, cultural backgrounds, and socio-economic conditions. A learning system that is too generic will not be able to meet the needs of all individuals fairly, whereas human-centered design emphasizes the importance of understanding users' realities and experiences in building an inclusive system.[29] Human-centered design also enables the creation of learning systems that are adaptive to change. When the world of education faced disruption due to the pandemic, this approach proved to be more resilient as it

[21] Norman, D., & Verganti, R. (2014). Incremental and radical innovation: Design research vs. technology and meaning change. *Design Issues, 30*(1), 78–96.
[22] Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal, 9*(2), 27–40.
[23] Rose, D. H., & Dalton, B. (2009). Learning to Read in the Digital Age. *Mind, Brain, and Education, 3*(2), 74–83.
[24]Lu, M. (2020). Human-centered learning in AI-powered education. *AI & Society, 35*(3), 555–568.
[25] Fullan, M. (2013). *The New Meaning of Educational Change*. New York: Teachers College Press.
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[29] Rose, D. H., & Meyer, A. (2002). *Teaching Every Student in the Digital Age: Universal Design for Learning*. Alexandria: ASCD.

could accommodate dynamic learning experiences based on the real needs of users, rather than solely on technocratic assumptions.[30]

The application of this approach also strengthens the ethical dimension in digital education planning. Education is not merely a tool to meet labor market demands, but a process of humanizing individuals. Therefore, all digital education technologies and policies must be grounded in moral and social principles that respect human dignity.[31] Thus, the human-centered approach is not an optional choice but a necessity in designing a quality digital education system. Technology should be directed not only toward delivering content but also toward building connections, shaping character, and strengthening human relationships within the learning ecosystem.[32]

Integrating Empathy into Learning Design

Empathy is not merely a feeling of pity but the ability to understand learners' perspectives and conditions from their own point of view. In educational design, empathy means providing options for personalized learning, creating safe spaces for discussion, and avoiding rigid evaluation systems.[33] An empathetic digital platform enables two-way communication, humanized interaction, and flexibility. Technologies such as AI and machine learning should be used not to replace teachers but to strengthen social relationships and enhance students' well-being.[34] Empathy is a key component of the human-centered approach, including in the context of digital learning system design. In education, empathy is not merely an emotional attitude but the ability to deeply understand students' needs, aspirations, limitations, and learning experiences.[35]

Empathy-oriented digital learning design acknowledges the reality that each learner has a unique background. Factors such as family circumstances, digital literacy skills, learning preferences, and mental health all need to be considered in designing a meaningful digital learning experience.[36] One tangible form of integrating empathy is providing accessibility and flexibility in learning materials. An empathetic learning platform does not offer only one type of medium but various formats—text, audio, video, and interactive—so that students with different learning styles can still perform optimally.[37] Empathy-based design also takes into account individual learning rhythms. Not all students are comfortable with real-time assessment systems or rigid deadlines. With an empathetic understanding, the system can offer more flexible timing options and even personalized learning plans tailored to each learner's abilities and capacities.[38]

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[30] UNESCO. (2021). *Reimagining Our Futures Together: A New Social Contract for Education*. Paris: UNESCO Publishing.
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Teachers, as designers of digital learning, also need to embed empathy in their interactions and communication. The language used in online discussions, assignment feedback, and even instructions should reflect appreciation and reinforcement of students' learning motivation, rather than merely technical evaluation.[39] Empathy also needs to be embedded in the assessment process. Evaluations that not only assess outcomes but also appreciate the process, perseverance, and the personal context of students will create a more supportive and humanistic learning environment. This is important for maintaining long-term motivation and engagement.[40] The use of technologies such as learning chatbots and AI-based tutors also needs to be developed based on the principle of empathy. AI should not only provide correct or incorrect answers but also guide, encourage, or repeat explanations using simpler language, according to the emotional needs of the students.[41]

Empathy in digital learning design can be cultivated through the direct participation of students in the development process. Satisfaction surveys, learning reflections, and student-teacher discussion forums can serve as spaces to accommodate students' voices and perspectives, enabling the system to be more adaptive to their realities.[42] The principle of empathy also requires teacher training to recognize signs of learning difficulties that are not always apparent in the digital environment. An empathetic teacher will proactively seek to understand their students' conditions holistically and will not immediately equate delays with laziness or lack of seriousness.[43] A curriculum designed with empathy also considers the overall learning burden on students. The integration of empathy encourages an interdisciplinary approach, reduction of overlapping assignments, and emphasis on reflective or collaborative projects that humanize the learning experience.[44] By making empathy a principle in digital learning design, education becomes more than just content delivery. It transforms into a process that considers the human aspects of learners, builds trust, and creates meaningful learning experiences—even through digital screens.[45]

Human-Centered Design (HCD)-based digital education planning is not limited to technology alone but encompasses all aspects of the curriculum, including teaching methods, assessment, and the learning environment. The curriculum must position students as active subjects whose existence is valued, rather than passive objects of the system.[46] HCD strategies in education also involve engaging various stakeholders in decision-making: students, teachers, parents, and the local community. This participation reflects respect for human dignity within the educational process.[47] The curriculum is the primary foundation of the education system, determining the direction, content, methods, and evaluation of learning. In the context of educational digitalization, curricula are often designed based on technological logic, such as data accessibility, speed of

[39] Fullan, M. (2013). *The New Meaning of Educational Change*. New York: Teachers College Press.
[40] Selwyn, N. (2016). *Education and Technology: Key Issues and Debates*. London: Bloomsbury Academic.
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achieving targets, and assessment automation. This results in the curriculum losing its humanistic and participatory elements.[48]

The human-centered design (HCD) approach offers a new perspective in designing curricula that are more adaptive, inclusive, and meaningful. HCD places the needs, feelings, and experiences of learners as the starting point for curriculum development. This means that the curriculum should not be static and uniform but must be contextual and responsive to the realities of students.[49] HCD-based curricula are designed to enable students to actively participate in determining their own learning goals and strategies. They are no longer mere objects of instruction but learning subjects whose voices are valued. This principle creates space for curriculum differentiation tailored to the uniqueness of each individual.[50] In practice, HCD encourages the development of curricula based on project-based learning, portfolio-based assessment, and interdisciplinary learning experiences that foster personal and social meaning. This approach emphasizes the relevance of the material to students' real lives and involves them in the process of discovering value.[51]

The implementation of HCD in the curriculum also requires the involvement of various stakeholders—teachers, students, parents, local communities, and technology designers—in the planning process. This process reflects the democratization of education and serves as a means to foster shared ownership of the learning process.[52] Furthermore, HCD in the curriculum can bridge the gap between 21st-century technical skills and human values such as empathy, collaboration, and self-reflection. The curriculum not only pursues digital competencies but also shapes students' character and social sensitivity amid the complexities of the digital world.[53] Furthermore, human-centered curricula tend to position evaluation as part of the growth process, rather than merely judgment. Assessments are formative, personalized, and support self-development, rather than comparing individuals or promoting unhealthy competition.[54] By adopting HCD as a curriculum strategy, educational institutions will be better prepared to face future challenges that require not only technologically proficient individuals but also those who are emotionally and socially mature. In an increasingly digitalized world, education that prioritizes humanity becomes an imperative.[55]

CONCLUSION

The human-centered approach in digital education planning is highly relevant amid the rapid advancement of technology that often overlooks human aspects. Education is not only about information transfer but also involves relationships, empathy, and social values that shape the

[48] Selwyn, N. (2016). *Education and Technology: Key Issues and Debates*. London: Bloomsbury Academic.
[49] Rose, D. H., & Meyer, A. (2002). *Teaching Every Student in the Digital Age: Universal Design for Learning*. Alexandria: ASCD.
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[55] UNESCO. (2021). *Reimagining Our Futures Together: A New Social Contract for Education*. Paris: UNESCO Publishing.

whole person. Therefore, human-centered digital education design offers a more ethical, inclusive, and meaningful alternative.

Empathy, as a core principle in human-centered design, must be integrated into every aspect of the education system: from platform development, curriculum, learning methods, to evaluation systems. By placing learners' experiences and needs as the starting point, digital learning systems will be able to address contemporary challenges while maintaining the quality of human interaction. Thus, the transformation of digital education requires not only technological inn hovation but also must be grounded in human awareness. Human-centered design creates space for education that is not only digitally competent but also wise in responding to the diversity and complexity of humans as the primary subjects of education.

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