Exploring the Upskilling Engagement: Motivation, Access to Digital Educational Resources and Technological Confidence in Skill Growth – A Daoist perspective

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Abstract: Introduction:

The perspective of Heidegger and Ames is relevant in examining the expansion of digital education in India where the amalgamation of technology has affected the student's digital learning experience, learning motivation, and access to educational resources, technological confidence, skill development and digital literacy. The present study seeks to examine the relationship between learners and technology while examining the digital adoption.

Purpose:

This research paper clarifies the important factors that determine participation in digital learning environments for skill development. Three main factors that influence engagement are motivation, access to resources and technological competence are identified, and their interactions are intricate. Educational institutions, policymakers,

and organizations should consider about a combination of approaches to encourage greater engagement in digital learning.
Research Methodology:
A stratified random sampling technique was used to collect survey data and for the purpose of analysis Structural Equation Modeling technique was used.
Results and Discussion:
Motivation plays significant role than difficulties in shaping perception, educational institutions should design strategies that enhance student interest and engagement to ensure the long-term success of digital learning initiatives. It will help in achievement of UN SDG 4 Goal related with quality education..

Keywords: Daoist, Digital learning, motivation, access, technological confidence, skill development, digital literacy, SDG 4

Introduction

In the Question Concerning Technology Martin Heidegger (1977) contends that technology is the way it frames human beings relationship with the world, thus transforming nature into a resource that can ordered and controlled. So this viewpoint provides a base for our understanding in how modern technology influence human identity and modes of learning. Ames & Hall (2023) highlights Daoist idea that technology is interconnected process of reality over any external force opposing the humanity. Various study from similar literature suggested that Daoist traditions provide innumerable insights into rethinking the relationship between technology, human existence and alternative way of knowing. The perspective of Heidegger and Ames is relevant in examining the expansion of digital education in India where the amalgamation of technology has affected the student's digital learning experience, learning motivation, and access to educational resources, technological confidence, skill development and digital literacy. The present study seeks to examine the relationship between learners and technology while examining the digital adoption.

Rapid development in the arena of technology has brought about a transformational change in the way education is implemented through various teaching learning methods. All this has led to the rise of digital learning. The blend of education and technology is referred to as Edtech and has led to unprecedented opportunities for learners who want to learn new skills and knowledge to keep pace with the rapidly changing world. Just at the click of a mouse, voluminous knowledge resources are accessible to learner's convenience at any time.

This Rapid technological advancement has led the faculty members and students to upskill themselves in their area of specialization so as to get ready for the future needs of the Industry. As the EdTech Industry evolves in future, there is a need for the understanding the engagement of learner's in digital learning platform and the factors that affects the engagement of learner's in these digital learning platform. The research paper purpose is to know about the variables that affect the learners' engagement with digital learning platforms that leads to successful digital skill development.

This research paper clarifies the important factors that determine participation in digital learning environments for skill development. The three main factors that influence engagement— motivation, access to resources, and technological competence are identified and their interactions are intricate. Educational institutions, policymakers, and organizations should consider about a combination of approaches to encourage greater engagement in digital learning.

LITERATURE REVIEW

Integration of Technology in Education and Learning Outcomes

One of the primary objectives of policymakers and educators when trying to improve student

learning and teaching effectiveness is to integrate technology in education. Current trends in education reform involve technology-based projects that improve student engagement, practical knowledge, and academic achievement (Chaln Chavez & Guevara Paredes, 2014). In addition, the usage of knowledge in classrooms is supported by the Common Core Standards, which emphasise critical thinking, problem-solving, and applying what has been learned (Cristen, 2009).

The use of technology in the classroom is now being reconsidered and accepted as a source of higher-order thinking skill development. Kurt (2010) claims that technology enables project-based learning, which is analytical and problem-solving oriented. Likewise, Prensky (2001) argues that the incorporation of technology not only attracts students' attention but also develops their digital skills, thus making them job-ready. Arguments indicates that technology is playing a dual role, contributing to cognitive development as well as to the employability of individuals.

Over recent decades, Technological Integration (TI) in education has become a prominent area of research (Valtonen et al., 2022), highlighting that the quality of instructional integration is more important than the mere frequency of technology use (OECD, 2015). In addition diverse new tools are devised to assess aspects related to quality of TI. (Antonietti et al., 2023; Backfisch et al, 2021;Futterer et al., 2022; Juuti et al., 2022)

Digital Divide, Access, and Socioeconomic Inequality

The Education sector is increasingly dependent on the use of technology, and access issues are still a major problem. Digital divide is not only about the lack of hardware but also about the differences in the use of the technology, the skills that people have and the opportunities that are available for them. According to Van Dijk (2006), the very fact that some people do not have access to technology means that they are left behind in terms of employment and economic opportunities, while Van Deursen and Van Dijk (2019) point out that people with low digital skills are isolated even more from the main population. Socioeconomic factors are the most important cause of the digital divide, affecting access to necessary devices and the development of digital competencies. Overall social and economic conditions around the people determine differences in ICT skills and the freedom to use the internet (Alampay, 2006; Robeyns, 2005). Cannady (2015) argues that meaningful student-instructor interaction and online academic resources are foundation to successful online leaning. Online user-friendly platforms and responsive design reduce technological barriers, increasing engagement and accessibility for diverse learners (Hixon et al., 2016).

Digital Literacy and Technological Confidence

Digital literacy, which may also referred to as technology confidence or digital skill, is the main factor that decides whether a student participates and succeeds in a digital learning environment. Digital literacy is the ability to understand and use information in various formats using computers, especially the internet (Gilster, 1997). For those not accustomed to the digital way of life, mastering these skills is mandatory to engage in technology-based learning in a meaningful way. Several studies have demonstrated that technological confidence is directly associated with motivation, engagement, and persistence in digital learning environments, while low confidence serves as a significant barrier to participation (Shaw, 2023). The process of rooting out poor digital literacy not only opens up the door for learners to effectively utilize available resources but also acts as a countermeasure to the digital divide.

Upskilling, Reskilling, and Workforce Transformation

Emerging technologies have been advancing at a fast pace, and among them artificial

intelligence, automation, and digitization have most greatly influenced global labor markets. Thus upskilling and reskilling are not only important but also necessary for the workforce adaptability of the economy (Li, 2022; Jaiswal et al., 2021). According to world Economic Forum, by 2025, half of the global workforce

is expected to require new skills, with a substantial share of these new skills being technology-driven (Behera et al., 2024).

The curriculums are being changed, and the companies are making their workforces agile and future-ready by more and more digital learning platforms, virtual labs, and AI-supported training modules (Padmaja & Mukul, 2021). The COVID 19 pandemic has been a key driver of the growing reliance on digital upskilling initiatives, particularly during the transition to onsite, hybrid, and remote work arrangements. (Florescu et al., 2023).

Engagement Factors in Digital Upskilling

Recent studies have pointed out three closely interconnected factors that significantly influence engagement in upskilling and reskilling: motivation, access to digital educational resources, and technological confidence. More specifically, intrinsic motivation is such an essential factor that it can even lead to the person's "losing" his or her interest if the skill development of the person does not go in line with the latter's personal and professional goals (Michikyan et al., 2025). In the same vein, the availability of the internet with a good connection, several devices, and high-quality digital resources is main as well because unequal access to resources can restrict the participation of people and even make the skill gap worse (Kashemsanta Na Ayudhya & Plangsorn, 2024).

Tech-savvy individuals feel more confident to experiment with their motivation and the effective use of resources; thus, a positive feedback loop is formed that enables the gradual acquisition of skills continuously (Chauhan & Jain, 2025; Shaw, 2023). Different research works in diverse industries like finance and manufacturing have come to a similar conclusion that the most essential condition for gaining engagement and ensuring that no one is left behind in terms of upskilling, is to create inclusive and supporting learning environments (Kosasih, 2025; Setyanti et al., 2025).

The literature reviewed indicates that education and workforce upskilling through technology are successful only if the factors such as motivation, access, and technological confidence are tackled together in a holistic approach. These three factors act together, thus allowing the learners not only to interact greatly with the digital learning activities but also to be flexible in meeting the technological requirements. Nevertheless, the long-standing digital inequalities that are tied to socioeconomic and environmental factors still represent serious obstacles which need to be overcome so that fair participation can be guaranteed. The planned research of the future, on the other hand, will be focused on context-specific teaching methods, adjustable technologies, and regulations that open up digital learning resources to everyone as the main topics, so that the development of skills in the digital age will be most beneficial.

CONCEPTUAL FRAMEWORK

Literature review was carried out to identify the need of the study. The need identified some variables like motivation for digital learning engagement, difficulty in usage of digital educational resource access, and perception about confidence in utilizing technology. A conceptual framework showing the proposed linkage between motivation for digital learning engagement, difficulty in usage of digital educational resource access, and perception about confidence in utilizing technology is shown

below in Figure 1.Based on the proposed conceptual framework, hypotheses and objectives were laid down.

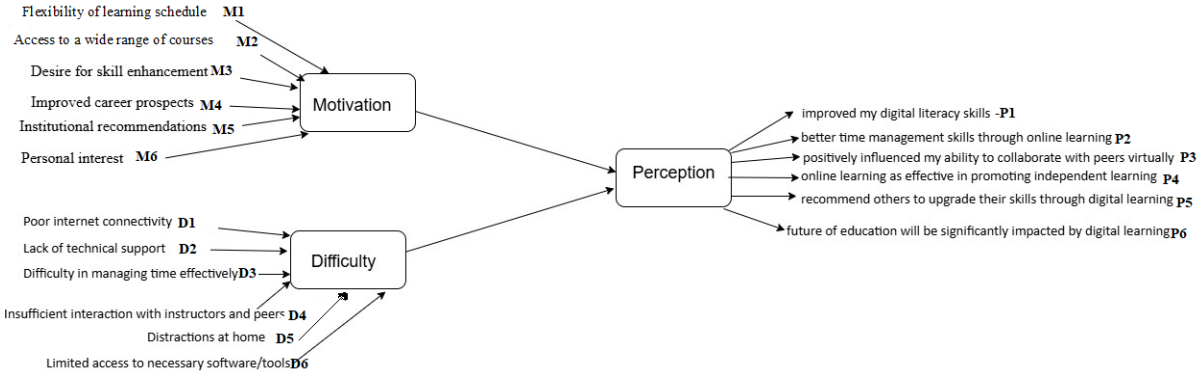

Figure 1: Conceptual Framework

Conceptual Framework will act as groundwork for research, giving an insight into the digital learning learner's engagement for skill development.

RESEARCH METHODOLOGY

A survey was conducted for collection of data from 100 respondents out of which 44 were male and 56 female using a pre structured questionnaire method. Structured Questionnaire was prepared to study learner's engagement in digital learning platform and the factors that affects the learner's engagement. Demographics, motivation for learning, access to technology and technological confidence were all investigated in the survey. The survey examined demographics, motivation for learning, access to technology and technological confidence. Structural Equation Modeling technique was used to examine the quantitative survey data.

B. Hypothesis

Following hypothesis is framed based on conceptual framework:

H01: There is no association between motivators to take part in digital learning for skill development and perception about confidence in utilizing technology.

H02: There is no association between difficulty in usage of digital educational resource access, and perception about confidence in utilizing technology.

C. Objectives:

1. To study the factors that motivators to take part in digital learning for skill development.

2. To explore disablers in usage of digital educational resource access.

ANALYSIS AND INTERPRETATION

The composite reliability and convergent validity was used to assess the quality of measurements models in research. Composite reliability value above 0.70 affirms the constructs reliability. Cronbach's Alpha was used to assess internal consistency and in the study the constructs values are as follows - Difficulty (α= 0.882, CR=0.91), Perception (α= 0.919, CR=0.937) and Motivation (α= 0.842, CR=0.883) indicating high internal consistency and reliability. Further for assess the convergent validity the Average Variance Extracted (AVE) value of 0.50 and higher indicates a good convergent validity. AVE

for Difficulty (0.63), Perception (0.712) and Motivation (0.557) indicates that the measurement items effectively capture their intended constructs, thereby establishing a high convergent validity. Thus indicating the conceptual model is suitable for further analysis.

To confirm the distinct constructs the Discriminant Validity was determined through the square root of the AVE for Difficulty (0.794), Perception (0.264) and Motivation (0.4) indicating Difficulty is distinct from the other constructs. The square root of the AVE for Perception (0.844) is greater than its correlation with Difficulty (0.264) and Motivation (0.388), confirming Discriminant validity. Square Root OF AVE for Motivation (0.746) is greater than its correlation with Difficulty (0.4) and Perception (0.388), confirming it is conceptually separate. This means that Difficulty, Perception and motivations are distinct constructs.

To measure the correlation between the constructs and to determine whether they are distinct from each other Heterotrait –Monotrait (HTMT) ratio was calculated and was found to be below 0.85. Thus indicating that the constructs Difficulty, Perception and motivations don't overlap with each other and confirm the robustness of the Conceptual model.

Interpretation of R-Square and Adjusted R-Square

An R^2 value of 0.765 is considered high, suggesting that the model effectively explains the variation in Perception of digital learning outcomes. Adjusted R2 of 0.748 suggest the vigor of the model, implying that it is not overly influenced by the number of predictors. This supports the reliability of the findings and indicates that the independent variables significantly impact Perception in digital learning.

Estimating Effect Size (f^2) in Structural Equation Modelling

Thus, both Difficulty (Effect Size-f^2 value 0.117) and Motivation (Effect Size-f^2 value 0.214) significantly influence Perception**,** with Motivation playing a more dominant role in shaping students' perception of digital learning.

Model Fit

Standard Root Mean Square Residual (SRMR) and Normed Fit Index (NFI) measure the goodness of fit structural Equation Modeling (SEM). The smaller the value of SRMR the more the model fits with acceptable standard value of SRMR< 0.08. SRMR the saturated and estimated model (value= 0.08) and NFI saturated and estimated model (value= 0.945). SRMR value imply that the model is acceptable but with close to boundary with some room for improvement. NFI value lies between 0 and 1, indicating a good fit to the model and explains the data observed, thus the structural model proposed will explain relationship between variables. Collectively, these findings indicate that the model is strong and well-organized, and it endorses the conceptual framework.

Structural Equation Modelling (SEM) is a multivariate statistical analysis method that is applied to test the complex relationships among observed and latent variables. It is a combination of factor analysis and multiple regression analysis to measure both measurement and structural models at the same time. SEM finds many applications in social sciences, psychology, education, and business research to evaluate theoretical constructs and prove a hypothesis.

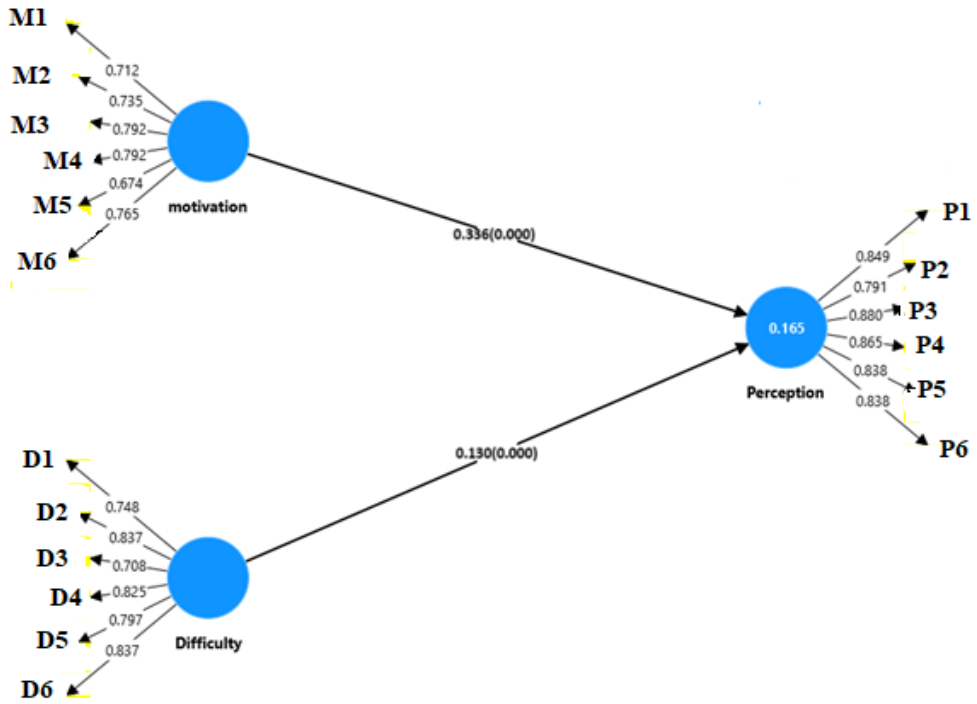

Figure 2: Structural Model

Interpretation of Structural Model Results

As shown in figure 2 Structural model determines the relationship between **Difficulty, Motivation, and Perception of Digital Learning**. The path coefficients give an idea about the importance of these relationships.

Table 1- Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/ STDEV)	P values
Difficulty -> Perception	0.13	0.151	0.104	2.245	0
Motivation -> Perception	0.336	0.36	0.091	3.704	0

The structural model results reveal the impact of Difficulty and Motivation on students' Perception of digital learning outcomes. The path coefficient between Difficulty and Perception is 0.13 which indicates weak but positive relationship. T statistic is 2.245, which is more than critical value 1.96 and p value is 0.000 which shows that relationship is statistically significant. This means that, perception of digital learning by the students is determined in part by such challenges as bad internet connection, absence of technical support and inability to manage time properly.

Conversely, Motivation → Perception exhibits a stronger and very significant impact, with path coefficient (0.336), T-statistic (3.704) and p-value (0.000). This confirms that motivation is major factor

that determine students' perception of digital learning. The flexibility, availability of wide range of courses, opportunities of career progression, and personal interest are some of the factors that boost the perception of the students on the effectiveness and benefits of digital learning. The findings emphasize the importance of fostering motivation in digital learning environments, as it has a more profound impact on students' overall perception and engagement.

CONCLUSION

This research paper clarifies the important factors that determine participation in digital learning environments for skill development. The three main factors that influence engagement—motivation, access to resources, and technological competence—are identified, and their interactions are intricate. While addressing technical difficulties is necessary, institutions should primarily focus on boosting engagement through personalized learning experiences, career-oriented course offerings, and strong institutional support. Given that motivation plays major role than difficulties in shaping perception, educational institutions should design strategies that enhance student interest and engagement to ensure the long-term success of digital learning initiatives**.** Educational Institutions, policymakers, and organizations should think about a combination of approaches to encourage greater engagement in digital learning. In order to increase students and people's participation in digital learning environments for skill development, additional research can be undertaken in future. It will also help in achievement of UN SDG 4 Goal related with quality education

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