Underlying factors of student engagement to E-learning

Pushkar Dubey
Department of Management,
Pandit Sundarlal Sharma (Open) University Chhattisgarh, Bilaspur, India
Resham Lal Pradhan
Department of Computer Science,
Pandit Sundarlal Sharma (Open) University Chhattisgarh, Bilaspur, India, and
Kailash Kumar Sahu
Department of Management,
Pandit Sundarlal Sharma (Open) University Chhattisgarh, Bilaspur, India

Received 17 September 2022
Revised 24 December 2022
Accepted 21 January 2023

Abstract

Purpose – With the advent of the COVID-19 and increased access to Internet technologies, students tend to use e-learning technologies for improved academic results, and since then, improving student engagement in a virtual space became a difficult task for educational institutions globally. The present study aims to examine the effect of key e-learning factors (i.e. perception, hedonic motivation (HM), usefulness, empowerment and attitude) on student engagement among open and distance learners (ODLs) of the central region of India.

Design/methodology/approach – Simple random sampling was applied to collect data from ODLs of Chhattisgarh. ODLs who are using e-learning platforms for at least one year were chosen to be the participant in the study. The authors collected 1,137 responses using both online and offline modes of collection.

Findings – The test results indicated that usefulness, HM and attitude factors were found to have a significant relationship with student engagement in e-learning, while perception and empowerment variables did not contribute to the engagement of students.

Originality/value – The present study is novel in its approach. It clarifies the key factors to student engagement which might increase the students' level of involvement in e-learning technologies, if these factors are addressed tactfully by the educational institutions or concerned administration.

Keywords Student engagement, E-Learning, Perception, Usefulness, Hedonic motivation, Attitude, Empowerment

Paper type Research paper

1. Introduction

Globally, the Internet revolution has made online learning a popular option to face-to-face learning in recent years. Increases in Internet access throughout the world are widely seen as a key factor that fueled the e-learning technology sector. E-learning technology refers to a wide variety of communication, information and associated technologies that enhance teaching, learning and assessment. Computers, mobile devices, online forums and live online

The present study is a part of a minor project funded by the Indian Council of Social Science Research (ICSSR), New Delhi (File No. 02/28/2021–22/ICSSR/RP/MN dated 29.03.2022). The authors acknowledge ICSSR, New Delhi, for providing financial and other necessary support for the accomplishment of the project.

Journal of Research in Innovative Teaching & Learning
Vol. 16 No. 1, 2023
pp. 17-36
Emerald Publishing Limited
2397-7604
DOI 10.1108/JRIT-09-2022-0058

instruction are just a few of the tools that support e-learning (Kotler and Armstromg, 2009). Because of its accessibility and adaptability, online education has been recognized as a major innovation in the field of education (Keller and Cernerud, 2002; LaRose *et al.*, 2006). At present, the success or failure of educational institutions is tied to the use of e-learning tools, which have been shown to significantly improve classroom instruction. Therefore, educators are increasingly using technological tools in the classroom to improve the educational experience for their students. However, the effectiveness of e-learning systems depends on the students' willingness to adopt and engage with them. It has been reported that by 2021, the global e-learning market was worth more than US$ 315bn, and that between 2022 and 2028, it is expected to grow at a CAGR (Compound Annual Growth Rate) of 20% (Global Market Insights, 2022). Additionally, as the telecom and broadband industries develop, more reasonably priced Internet service options have become available to the general public. Evidently, as reported by the International Telecommunication Union (ITU), the number of people using the Internet worldwide has increased to roughly 4.9 billion in 2021 from 4.1 billion in 2019. With more Internet users, more individuals may utilize e-learning platforms for courses or degrees (Global Market Insights, 2022).

Undoubtedly, technology's influence on education has grown in recent years (Almahasees and Jaccomard, 2020). Due to technological advances, teaching methods, approaches and strategies have been updated. EdTech companies have created various online platforms to integrate technology into all aspects of life (Al-Azawei *et al.*, 2017; Englund *et al.*, 2017; Santos *et al.*, 2019). Technology is now embedded in every facet of our lives, from personal interactions to professional endeavours to formal learning. Online classrooms spread information over the Internet (Silva and Cartwright, 2017). Meanwhile, the connection between students' interest and technology for e-learning is another pressing problem in the modern classroom. The increasing popularity of online courses has important implications for classroom practice and student achievement in higher education. Numerous studies have shown a connection between students' level of engagement and performance and their academic success. However, Davies and Graff (2005) discovered that the amount of time spent on e-learning had no significant effect on test scores. It explains that the attitude of the learner is crucial to the success of any e-learning delivery technique (Arbaugh, 2000).

Studies suggest that engagement improves academic productivity by boosting student happiness and learning (Gray and DiLoreto, 2016). Internal elements such as personality, attitude, effort, drive and self-confidence affect students' participation (Barua *et al.*, 2020). Learning online not only fosters the growth of pedagogical subjects' knowledge and the use of digital resources and communication technologies (Stein *et al.*, 2011) but also stimulates the use of technology inside the classroom. This kind of education may effectively assist other kinds of education and makes pedagogical decision-making easier (Gebre *et al.*, 2014; Osborne *et al.*, 2013).

Today's world is changing due to Information and Communication Technology (ICT) innovations, which are continually evolving and renewing. These innovations also affected schooling, allowing for new model designs. Online education is one such approach. In addition to the digital benefits it offers, online education also gives students the flexibility to actively adapt to new situations as they arise. Several empirical research have revealed that the successful implementation of e-learning is not only a technology solution but a process including a wide range of factors, including human backgrounds (Kim and Moore, 2005; Punnoose, 2012). However, there is a lack of information about the significant impact such elements play on student involvement and its use, particularly in the context of developing countries (Tarhini *et al.*, 2013). Most e-learning research had focused on homogenous samples from developed nations (Grandon *et al.*, 2005). Research on e-learning in underdeveloped nations is limited, which limits our understanding of why students in these countries are so enthusiastic about this teaching method. Until COVID-19, e-learning in India was quite

limited. Unpredictably, individuals began using e-learning and have been attached to it owing to the many advantages and conveniences it provides. Developed countries have undertaken various empirical research over the years while emerging nations like India have done less to investigate the elements that interest students in e-learning platforms. Hence, the current research examines the elements (perception, hedonic motivation (HM), usefulness, empowerment and attitude) determining ODLs' engagement in central India.

2. Theoretical grounding and hypotheses development

Online learning is becoming more popular due to the lifetime learning approach. Most institutions provide online learning to satisfy students' learning requirements (Artino, 2009). Many students have engaged in online learning, either completely online or via hybrid modes that combine face-to-face and online instruction (Bradford and Wyatt, 2010). Several factors have contributed to online education's rising popularity, including its perceived efficacy as a learning tool, its low cost, flexibility and the promise of delivering the best education to students worldwide (Jeffcoat Bartley and Golek, 2004; Gratton Lavoie and Stanley, 2009; De La Varre *et al.*, 2010; Dubey and Sahu, 2021, 2022, 2022a). Li and Lalani's (2020) research found that COVID-19 has altered the trajectory of education in the 21st century. From elementary to university level, classroom education has shifted from in-person to online delivery (Strielkowski, 2020).

In order to engage students in online courses, an effective virtual community should be developed. A successful online discussion community requires identifying and supporting student learning leadership (Kim *et al.*, 2020). This kind of learning brings students into more regular engagement with one another and promotes smooth conversations (Oh *et al.*, 2018). It also gives students the opportunity to critically consider their own views (Baran and Correria, 2009; Brooks and Jeong, 2006; Hew and Cheung, 2008; Wang, 2008). As a result of the changes that have taken place, the use of technology in educational settings is now unavoidable for a variety of personal and societal reasons (Usta, 2011).

For online courses to be successful, student-teacher and peer-to-peer communication are essential. Banna *et al.* (2015) emphasized that learners' engagement is the key to addressing the issues of learner isolation, dropout, retention and graduation rate in online learning. Meyer (2014), Banna *et al.* (2015) and Britt (2015) stress the relevance of student participation to online learning since it demonstrates students' cognitive progress and capacity to construct their own knowledge, leading to students' success. Now more than ever, educators are struggling to encourage knowledge creation or create a learning environment that engages students.

2.1 E-learning

Khan (2003) describes e-learning as an accessible, well-designed, student-centered, inexpensive, efficient, flexible and supported learning environment. This learning method offers a fun and engaging way to convey lessons and assignments, making their education a positive experience for the students (Dubey and Sahu, 2022, 2022a; Nyathi and Sibanda, 2022). It was seen that when supported by the institution, e-learning may improve students' scores and learning satisfaction. E-learning facilitates learning engagement, social cooperation and social and cultural factors in the globalization era. Potentially, this method will increase people's sensitivity to the value of incorporating technological advances into classrooms to broaden students' access to educational resources and sharpen their linguistic competence. Govindasamy (2002) claims that e-learning encompasses the Internet, intranets, extranets and hypertext/hypermedia materials. Learning information may be supplied in numerous forms, such as text or video pictures, and electronically transmitted

through the Internet, personal computer, Personal Digital Assistant (PDA) or CD-ROM (Sandars and Langlois, 2005; Dubey and Sahu, 2021, 2022, 2022a).

E-learning, as defined by Katz (2002), is the phenomenon of web-based information and communication employing technological tools to impact students' performance, academic accomplishments and satisfaction. Additionally, the learning was seen as being practical, simple and flexible. Those factors are intertwined with getting students comfortable with technology (Arbaugh, 2000; Paola Torres Maldonado *et al.*, 2011; Nyathi and Sibanda, 2022). Also, face-to-face education requires frequent attendance, whereas interactive sessions rely on worksheets. E-learning is also termed as computer-based learning, web-based learning, virtual classrooms, digital collaborations, online learning, etc. (Urdan and Weggen, 2000).

2.2 Student engagement

The term "engagement" is used to describe the level of commitment shown by students throughout the learning process in pursuit of their stated objectives (Coates, 2006). Student engagement is a complex concept that may be divided into three components, i.e. behavioural, emotional and cognitive (Fredricks *et al.*, 2004). The term "behavioural engagement" is used to characterize the level of interest shown by students in their academics. Emotional involvement relates to students' favourable or negative sentiments towards their teachers, classmates, academics and educational institution. Cognitive engagement displays student effort in studying to grasp and master challenging subjects.

Harper and Quaye (2009) argue that engagement is the result of emotional processing, meaning construction and educational endeavours, and so it encourages more than simple involvement or participation. Education activities that encourage student participation rely heavily on students' emotional responses. Hence, it can be expected that students will use emotion to participate in learning activities. Bloom (1956) mentioned that behavioural, emotional and cognitive engagement are the three dimensions of student engagement. Students' reactions during class illustrate their level of behavioural engagement, which is a measure of how invested they are in learning. Emotional involvement is how pupils respond and includes curiosity, enjoyment and belonging. The term "cognitive engagement" refers to a state of mind in which pupils take pleasure in their studies since they have identified the learning goal and are motivated to get more information about the prerequisites.

Student engagement refers to the student's continuous attachment to successful inside and outside classroom methods and results (Kuh *et al.*, 2008 cited in Trowler, 2010). Krause and Coates (2008) describe the extent to which students engage in high-quality learning activities. When students engage actively in learning activities, favourable learning results can be expected. Student engagement, as defined by Krause and Coates (2008), focuses on students' willingness to participate in a variety of learning activities with the goal of enhancing their educational experience. This remark fits the concept of engagement given by Fadilah (2016), Pace (1995), Checkering and Gammon (1987) and Kuhn (2001), referenced in Krause and Coates (2008). Students' connections to the institution are fundamental to the concept of engagement. Institutions have a duty to provide conducive classroom settings that maximize educational potential (Nyathi and Sibanda, 2022).

2.3 E-learning factors and student engagement

An extensive body of research has been devoted to the study of how best to encourage student participation in online courses. Engagement from students is crucial to the success of any educational endeavour. Teaching and learning cannot function well unless students are actively involved in the process, since this demonstrates their interest in learning and leads to higher levels of academic accomplishment. It was found that changes in teaching methods have resulted in students' becoming self-directed, lifelong learners. This is a benefit since

face-to-face learning is teacher-centred and students learn from their teachers. Students' use of supplemental materials and the discovery of their own learning skills were sparked by their experiences with online education (Roach and Lemasters, 2006). According to Nemetz *et al.* (2017), similar sentiments exist amongst online and face-to-face students towards interactive courses. Results explain comparing in-person versus online delivery of the same interactive course showed no significant difference in student achievement. This leads to the formulation of the following hypotheses.

2.3.1 Perception. Users' perspectives must be considered in any endeavour to improve the efficiency of online education. The pros and cons of online education have both been noted in the studies. Numerous studies highlight the importance of instructor-student communication in shaping students' impressions of online education. Stress about the virtual classroom's security and communication systems was cited as the biggest deterrent to student involvement. This may be connected to the Zoom bombing incidents that occurred in early 2020, in which hackers were able to breach the privacy and security of the platform and entered into active sessions under false identities, displaying pornographic or hateful content (Ling *et al.*, 2021). Students may have developed a pessimistic outlook as a result of these incidents regarding the safety features offered by some online platforms. Therefore, to make online learning successful and productive, developers must address learners' preferences and perceptions. Hence,

H1. Perception would positively influence student engagement in e-learning.

2.3.2 Hedonic motivation. HM, or perceived pleasure, is a major factor in determining whether people would adopt and regularly utilize an e-learning system (El-Masri and Tarhini, 2017; Lahrash *et al.*, 2021). HM in this context refers to the pleasure and delight experienced by students when studying on an e-learning platform. Many studies have shown that student motivation is a key component of online learning success (Cole *et al.*, 2004; Deci *et al.*, 2001). Consequently, students become more invested in their education and contribute more actively. Moreover, the students pay closer attention and exhibit greater self-confidence in their ability to learn. In short, motivation affects students' good learning behaviours. When learners are motivated, they actively participate in their studies (Barua *et al.*, 2020). Hence,

H2. Hedonic motivation would positively influence student engagement in e-learning.

2.3.3 Usefulness. Perceived usefulness refers to the benefits and facilities provided by a certain technology. Liaw *et al.* (2007) identified the following advantages of e-learning. Firstly, it reduces expenses. Secondly, its material is timely and trustworthy. Thirdly, it works on a just-in-time learning strategy. Fourthly, it creates global communities. Lastly, it offers an increasingly vital service for learners to improve their knowledge (Rosenberg, 2001; Nyathi and Sibanda, 2022; Dubey and Sahu, 2021, 2022, 2022a). Govindasamy (2002) asserted e-learning solves learning and performance issues. E-learning also reduces expenses, ensures compliance and meets corporate requirements (Barron, 2000; Gordon, 2003; Harun, 2002; Ismail, 2002). Sandars and Langlois (2005) found that the most stated advantages of e-learning were the availability of up-to-date information, the speed and ease of access to a wide range of resources and the opportunity for learner to work at their own pace. Cantoni *et al.* (2004) stated that e-learning is less expensive to deliver, self-paced (e-learning courses can be taken when needed) and faster (learn in less time).

Students are more invested in the course content and their tasks if they believe or have experienced that the course is well-structured, straightforward and has clear directions and expectations. Previous studies explained that perceived usefulness has a substantial influence on online student engagement (Gray and DiLoreto, 2016; Jung and Lee, 2018; Martin *et al.*, 2018; Zhai *et al.*, 2018). This leads to the possibility that student engagement and their academic performance might be affected by a fully digitalized learning process as the

students spend less time in the physical presence of their teachers and classmates and more time interacting with an online learning system. However, it was found that an important barrier to the success of online education is maintaining students' interest and participation in technologically mediated learning settings (Henrie *et al.*, 2015; Oncu and Cakir, 2011). Hence,

H3. Usefulness would positively influence student engagement in e-learning.

2.3.4 Empowerment. Empowerment, as noted by Ibrahim and Alkire (2007), exists primarily to increase control. Education that empowers students is both a requirement and a result of a prosperous society (Klemenčič, 2016). Even though the rhetoric on student participation has put pressure on educational institutions to alter the ways in which students have an impact on their own learning, determining how much power students really have to shape their own educational experiences involves an assessment of students' power or their ability. Learner autonomy and interactive learning behaviours are at the heart of what makes online learning so effective (Liaw *et al.*, 2007). Teacher-student interaction improves student learning and happiness (Moore, 2002). Zhang *et al.* (2007) found that students require teachers to moderate online discussion forums to offer guidance and make them more comfortable.

Notably, since the beginning of the intensification of higher education, there has been a tremendous increase in the academic community's interest in student roles and their empowerment. However, considerably less study has been done on how to empower students in higher education than in secondary or primary education. This is especially true in connection to the existing literature on curriculum/course design (Chow *et al.*, 2003; Bovill *et al.*, 2011; Jafar, 2016), pedagogy (Naidoo and Jamieson, 2005; Nichols, 2006) and classroom evaluation (Stanier, 1997; Rodrguez-Gómez and IbarraSáiz, 2015; McPhee and D'Esposito, 2018). Furthermore, there is a shift towards offering learners greater control over their education by encouraging them to develop more proactive identities (Bragg, 2007; Bovill *et al.*, 2011; Baron and Corbin, 2012; Van Andel *et al.*, 2012; McPhee and D'Esposito, 2018). Hence,

H4. Empowerment would positively influence student engagement in e-learning.

2.3.5 Attitude. The term "attitude" refers to a notion that includes "cognitive, affective, and behavioural components" (TavúancÖl, 2006). Having the student respond to all the electronic environment's cues, sparking her or his own ideas, energy and drive, and then translating those feelings into action, is crucial to the success of the learning experience online. When students have a positive outlook on the learning process, their actions tend to improve (Arbaugh, 2000, 2010; Bernard *et al.*, 2004). A negative outlook is one factor that might lead to poor results (Sadik and Reisman, 2004). Sun *et al.* (2008) describe learner attitude as a "computer-based e-learning impression". Learners' attitude has a big impact on online learning. Online learning environments enable students to self-organize. Online learning is not teacher-centred; thus, students must be more involved. Online learning lets students manage time and processes (Liaw *et al.*, 2007). Prior research suggests that attitude impacts student engagement and performance in online learning settings (Peng *et al.*, 2006). Sun *et al.* (2008) quoted Piccoli *et al.* (2001) finding that learners are happier and more successful in online learning when they are not frightened of IT complexity (positive attitude).

Barua *et al.* (2020) studied internal and external variables impacting student engagement, such as attitude, motivation and self-confidence. Results show poor lesson design, incorrect teaching resources and lack of instructional effort may hamper participation in virtual classrooms (Baker *et al.*, 2016; Farrell and Brunton, 2020). This leads to what extent someone intends to engage in certain conduct depending on how they feel about engaging in that behaviour (Lee *et al.*, 2007; Ar *et al.*, 2015). In this approach, a person's attitude towards learning might affect their learning (Kara, 2010). Adaptation and success depend on the learner's mindset (Birişçi *et al.*, 2011). Whether learning really occurs in online classrooms is

heavily influenced by students' mental frames (Sanders and Morrison-Shetlar, 2001; Alomyan and Au, 2004). Institutions delivering web-based instruction must address student attitudes (Daniels *et al.*, 2000). Also, it might be challenging for students to experience learning opportunities if their attitudes are not considered in the classroom setting (Küçükahmet, 2017). Given this context, assessing students' attitudes towards online education is essential (Donmuş-Kaya and Akpunar, 2019; Dubey and Sahu, 2021). Hence,

H5. Attitude would positively influence student engagement in e-learning

3. Methodology

3.1 Research design and sampling

A correlational research design is applied in the present study. Simple random sampling was applied to collect data from open and distance learners (ODLs) of Chhattisgarh, i.e. Pandit Sundarlal Sharma (Open) University Chhattisgarh (PSSOU), Bilaspur, Chhattisgarh, India. As per the request of authors, PSSOU provided a list of more than 30,000 learners (containing their e-mail contact) enrolled in the previous session in different bachelor and master's degree programmes covering disciplines like science, management, commerce, education, arts (including economics, political science, psychology, management, history, geography, etc.). ODLs, who are using e-learning platforms for at least one year, were chosen to be the participant in the study.

For a randomized selection of participants, authors used MS Excel and selected 2,000 respondents. The present study used both modes of data collection, i.e. online and offline. During contact or counselling classes, which are held for a limited period, 400 responses were distributed to the selected participants, whereas 1,600 learners were approached to fill the questionnaire via Google form. This online form was created and distributed among distant learners, from which 843 responses were appropriately received. However, only 294 responses were collected out of 400 physically distributed questionnaires, which makes it a total sample size of 1,137 responses.

3.2 Research instrument

The author followed the scientific process of developing a questionnaire for the present study. At first, the authors, as per the present research objective, adapted or modified the previously developed scales for the six constructs, namely, perception, hedonic motivation, usefulness, empowerment, attitude and student engagement to e-learning, and then, converted it into regional language, i.e. Hindi to create a better understanding among ODLs as the most of the learners are from Hindi medium background. Secondly, it was sent further to four experts in the same subject area for correction in the questionnaire and valuable insights. The experts suggested minor changes in the items to increase clarity. Finally, the authors conducted a pilot study taking 50 sample size to check the content validity and comprehensiveness. It was found that respondents asked for no modification in the final version of the questionnaires (see Table 1).

4. Analysis and results

4.1 Measurement statistics

In order to check the data's reliability and validity, confirmatory factor analysis (CFA) was run.

4.1.1 Reliability measures. Cronbach's alpha measures the degree to which test items assess the same concept (Nunnally, 1978). All Cronbach's alpha scores were over 0.7 (see Table 2). The score of 0.7 shows the constructs are internally consistent and reliable (Nunnally, 1978). The reliability metric may also be accessible using Rho A. The value of Rho

Perceived usefulness		Modified from Davis (1989) and Ngai *et al.* (2007)
PU1	Using the e-learning platform improves my learning performance. (ई-लर्निंग प्लेटफॉर्म का उपयोग करने से मेरे पढ़ाई के प्रदर्शन में सुधार होता है।)	
PU2	Using the e-learning platform enhances my learning effectiveness. (ई-लर्निंग प्लेटफॉर्म का उपयोग करने से मेरी सीखने की प्रभावशीलता में वृद्धि होती है।)	
PU3	Using the e-learning platform gives me greater control over learning. (ई-लर्निंग प्लेटफॉर्म का उपयोग करने से मुझे पढ़ाई पर अधिक नियंत्रण मिलता है।)	
PU4	I find the e-learning platform to be useful in my learning. (मुझे लगता है कि ई-लर्निंग प्लेटफॉर्म मेरे सीखने में उपयोगी है।)	
Hedonic motivation		Adapted from Tarhini *et al.* (2017)
HM1	Computers and e-learning services make Learning more interesting. (कंप्यूटर और ई-लर्निंग सेवाएं सीखने को अधिक रोचक बनाती हैं।)	
HM2	Learning using computers and e-learning services is fun. (कंप्यूटर और ई-लर्निंग सेवाओं का उपयोग करके सीखना मजेदार है।)	
HM3	I like using computers. (मुझे कंप्यूटर का उपयोग करना पसंद है।)	
HM4	I look forward to those aspects of my learning activities that require me to use computers. (मैं अपनी सीखने की गतिविधियों के उन पहलुओं के लिए उत्साहित होता/होती हूँ, जिनके लिए मुझे कंप्यूटर का उपयोग करने की आवश्यकता होती हो।)	
Attitude		Adapted from Knowles and Kerkman (2007)
AT1	I like the new form of online teaching. (मुझे ऑनलाइन शिक्षण का नया रूप पसंद है।)	
AT2	I can adapt well to online learning methods. (मैं ऑनलाइन सीखने के तरीकों को अच्छी तरह से अपना सकता/सकती हूँ।)	
AT3	Learning materials can be better accessed in the form of network. (शिक्षण सामग्री को विभिन्न माध्यम से इस्तेमाल किया जा सकता है।)	
Empowerment		Self-Constructed
EMP1	My participation during online class is important. (ऑनलाइन क्लास के दौरान मेरी भागीदारी महत्वपूर्ण है।)	
EMP2	I can well handle the problems and suggests solutions during online class. (मैं समस्याओं को अच्छी तरह से संभाल सकता/सकती हूँ और ऑनलाइन कक्षा के दौरान समाधान सुझा सकता/सकती हूँ।)	
EMP3	My teachers provide me flexibility during online class. (मेरे शिक्षक मुझे ऑनलाइन कक्षा के दौरान सुनते और समझते है और फिर विकल्प प्रदान करते हैं।)	
EMP4	I possess necessary skills to perform during online class. (मेरे पास ऑनलाइन कक्षा के दौरान प्रदर्शन करने के लिए आवश्यक ज्ञान और कौशल हैं।)	
Perception		Adapted from Almahasees *et al.* (2021)
PRC1	Theoretical and practical classes could be learnt without real interaction between teachers and their students. (शिक्षकों और उनके छात्रों के बीच वास्तविक बातचीत के बिना सैद्धांतिक और व्यावहारिक कक्षाओं का अध्ययन किया जा सकता है।)	
PRC2	Lack of interaction between students and their instructors results in low performance. (छात्रों और उनके शिक्षकों के बीच वास्तविक संपर्क की कमी के परिणामस्वरूप अध्ययन प्रभावशीलता कम होती है।)	
PRC3	Students have the facility to ask questions clearly during online lectures. (छात्रों को ऑनलाइन व्याख्यान के दौरान स्पष्ट रूप से प्रश्न पूछने की सुविधा है।)	
PRC4	Students with online learning courses outperform students with face-to-face learning. (ऑनलाइन अध्ययन करने वाले छात्र, वास्तविक शिक्षा प्राप्त करने वाले छात्रों से बेहतर प्रदर्शन करते हैं।)	
PRC5	Students with face-to-face learning outperform students with online learning. (वास्तविक शिक्षा प्राप्त करने वाले छात्र, ऑनलाइन अध्ययन करने वाले छात्रों से बेहतर प्रदर्शन करते हैं।)	
PRC6	Students' participation in online courses reflects their knowledge and performance. (ऑनलाइन पाठ्यक्रमों में छात्रों की भागीदारी से उनके ज्ञान और प्रभावशीलता में वृद्धि होती है।)	
PRC7	Teachers can assess students' progress fairly and know the individual performance among them. (शिक्षक, छात्रों की प्रगति का निष्पक्ष रूप से आकलन कर सकते हैं और उनमें से व्यक्तिगत प्रदर्शन को जान सकते हैं।)	
Student engagement		
Behavioural engagement		Modified from Maroco *et al.* (2016)
BE1	I pay attention in class. (मैं कक्षा में ध्यान देता/देती हूँ।)	
BE2	I follow the rules of my institution. (मैं अपने संस्थान के नियमों का पालन करता/करती हूँ।)	
BE3	I usually complete my assignments on time. (मैं आमतौर पर अपना कार्य समय पर पूरा करता/करती हूँ।)	
BE4	When I have doubts I ask questions and participate in debates in the classroom. (जब मुझे संदेह होता है तो मैं प्रश्न पूछता/पूछती हूँ और कक्षा में वाद-विवाद में भाग लेता/लेती हूँ।)	
BE5	I usually participate actively in group assignments. (मैं आमतौर पर ग्रुप असाइनमेंट में सक्रिय रूप से भाग लेता/लेती हूँ।)	

Table 1. Theoretical construct and measurement items

(*continued*)

Emotional engagement		Modified from Maroco *et al.* (2016)
EE1	I feel very accomplished at the institution. (मैं संस्था को लेकर खुद में सम्पूर्ण महसूस करता/करती हूँ।)	
EE2	I feel excited about the university work. (मैं विश्वविद्यालय के कार्य को लेकर उत्साहित रहता/रहती हूँ।)	
EE3	I like being at my learning place. (मुझे हमेशा सीखते रहना पसंद है।)	
EE4	I am interested in the university/institutional work. (मुझे विश्वविद्यालय/संस्थागत कार्य में रूचि है।)	
EE5	My classroom is an interesting place to be. (मेरी कक्षा एक दिलचस्प और सिखने की अच्छी जगह है।)	
Cognitive engagement		Modified from Maroco *et al.* (2016)
CE1	When I read a book, I question myself to make sure I understand the subject I'm reading about. (जब मैं कोई किताब पढ़ता/पढ़ती हूँ, तो मैं यह सुनिश्चित करने के लिए खुद से सवाल करता/करती हूँ कि मैं जिस विषय के बारे में पढ़ रहा/रही हूँ, उसे समझ रहा/रही हूँ।)	
CE2	I talk to people outside my institution on matters that I learned in class. (मैं अपनी विश्वविद्यालय के बाहर के लोगों से उन मामलों पर बात करता/करती हूँ जो मैंने कक्षा में सीखे हैं।)	
CE3	If I do not understand some concepts taught, I try to solve the problem by consulting with others. (अगर मुझे सिखाई गई कुछ चीज़ें समझ में नहीं आती, तो मैं दूसरों के साथ परामर्श करके समस्या को हल करने का प्रयास करता/करती हैं।)	
CE4	I try to integrate the acquired knowledge in solving new problems. (मैं नई समस्याओं को हल करने के लिए, कक्षा से अर्जित ज्ञान का उपभोग करता/करती हूँ।)	
CE5	I try to integrate subjects from different disciplines into my general knowledge. (मै विभिन्न विषयों की जानकारी को अपने सामान्य समझ में लाने का प्रयास करता/करती हूँ।)	

Table 1.

A greater than or equal to 0.7 is also regarded to be a good measure of reliability, and it is discovered that this value is found more than 0.7 for all of the constructs. Hence, the construct verifies the study's data reliability (see Table 3).

4.1.2 Validity measures. 4.1.2.1 Convergent validity. Convergent validity measures how well many items assess the same notion (Fornell and Bookstein, 1982; Barclay *et al.*, 1995). A composite reliability (CR) score of 0.7 or above indicates high levels of internal consistency reliability (Bagozzi and Yi, 1988; Hair *et al.*, 2010). All the constructs have CR values greater than 0.7 (see Table 2).

The average variance extracted (AVE), often known as AVE, is the factor that determines whether the scale has convergent validity. It represents a construct's variation from each scale. AVE (≥0.5) provides fair evidence for convergent validity measurements for the construct (Hu *et al.*, 2004; Henseler *et al.*, 2009). Table 2 shows AVE is over the necessary value for all constructs. Therefore, the constructs have high levels of convergent validity measures.

Variables	Item code	Item loading	Cronbach's alpha	Rho A	Composite reliability (CR)	Average variance extracted (AVE)
Attitude	AT1	0.818	0.790	0.795	0.877	0.703
	AT2	0.863				
	AT3	0.833				
Behavioural engagement	BE1	0.799	0.865	0.866	0.903	0.650
	BE2	0.832				
	BE3	0.820				
	BE4	0.756				
	BE5	0.820				

(*continued*)

Table 2. Measurement results

Variables	Item code	Item loading	Cronbach's alpha	Rho A	Composite reliability (CR)	Average variance extracted (AVE)
Cognitive engagement	CE1	0.814	0.857	0.859	0.898	0.637
	CE2	0.759				
	CE3	0.818				
	CE4	0.823				
	CE5	0.775				
Emotional engagement	EE1	0.794	0.888	0.890	0.918	0.692
	EE2	0.829				
	EE3	0.824				
	EE4	0.849				
	EE5	0.861				
Empowerment	EMP1	0.811	0.838	0.854	0.891	0.672
	EMP2	0.857				
	EMP3	0.855				
	EMP4	0.751				
Hedonic motivation	HM1	0.870	0.853	0.857	0.901	0.694
	HM2	0.848				
	HM3	0.819				
	HM4	0.794				
Perception	PRC3	0.800	0.778	0.781	0.871	0.693
	PRC6	0.853				
	PRC7	0.843				
Perceived usefulness	PU1	0.879	0.904	0.906	0.933	0.777
	PU2	0.909				
	PU3	0.879				
	PU4	0.859				

Table 2.

4.1.2.2 Discriminant validity. The constructs' independence from one another is what is meant by the term "discriminant validity". A low correlation between the measured target construct and the other constructs in the research is indicative of discriminant validity (Cheung and Lee, 2010; Hair *et al.*, 2010) (see Table 3). It signifies the measures are from self-construct (Fornell and Larcker, 1981). It represents the squared correlation between the construct and the retrieved variance for a construct in partial least squares analysis (Komiak *et al.*, 2004; Henseler and Chin, 2010). Hence, it can be asserted that the measuring model used in this investigation is adequate (Henseler and Chin, 2010).

	A	BE	CE	EE	Emp	HM	PRC	PU
A	*0.839*							
BE	0.596	*0.806*						
CE	0.612	0.718	*0.798*					
EE	0.602	0.787	0.767	*0.832*				
Emp	0.552	0.398	0.531	0.423	*0.820*			
HM	0.731	0.582	0.624	0.615	0.556	*0.833*		
PRC	0.510	0.332	0.438	0.366	0.706	0.500	*0.832*	
PU	0.689	0.598	0.629	0.614	0.555	0.711	0.481	*0.882*

Table 3.
Discriminant validity

Note(s): A = Attitude; BE = Behavioural engagement; CE = Cognitive engagement; EE = Emotional engagement; Emp = Empowerment; HM = Hedonic motivation; PRC = Perception; PU 5 Perceived usefulness

4.2 Hypotheses testing

Path analysis was incorporated to examine the direct effect of e-learning factors (i.e. perception, motivation, empowerment, attitude and usefulness) on student engagement in e-learning among ODLs. In Table 4, path analysis explains that the significant relationship of e-learning factors (i.e. attitude ($\beta = 0.136$, STDEV = 0.041, t = 3.307, $p < 0.01$), hedonic motivation ($\beta = 0.166$, STDEV = 0.048, 3.487, $p < 0.01$) and usefulness ($\beta = 0.146$, STDEV = 0.042, t = 3.459, $p < 0.01$)) on student engagement to e-leaning. However, some variables such as empowerment ($\beta = 0.027$, STDEV = 0.045, t = 0.609, $p > 0.05$), and perception ($\beta = -0.045$, STDEV = 0.034, t = 1.301, $p > 0.05$) did not show a significant connection with student engagement to e-learning.

Hypotheses	Predicted relationship	β	STDEV	t-value	*p*-value
H1	Perception → S Eng	−0.045	0.034	1.301	0.194
H2	Hedonic motivation → S Eng	0.166	0.048	3.487	0.001**
H3	Usefulness → S Eng	0.146	0.042	3.459	0.001**
H4	Empowerment → S Eng	0.027	0.045	0.609	0.543
H5	Attitude → S Eng	0.136	0.041	3.307	0.001**

Note(s): S Eng = Student Engagement; STDEV = Standard Deviation; SEM = Structural equation modelling and ** = significant at $p < 0.01$

Table 4.
SEM results

5. Discussion and implications of the study

Since the advent of COVID-19, educational institutions have been struggling to engage students online (Gurukkal, 2020; Dubey and Sahu, 2021, 2022, 2022a; Nyathi and Sibanda, 2022). The sudden change in the mode of education has put forward a huge challenge for all educational institutes globally. The World Health Organization (WHO) has also stated that COVID-19 will persist for a longer period (Jagannath, 2020). Hence, it becomes imperative to understand the underlying factors of student engagement in e-learning for all educational institutes for sustainable growth and development. The present study attempted to examine the effect of e-learning factors (perception, hedonic motivation, usefulness, empowerment and attitude) on student engagement among ODLs. The results of H2, H3 and H5 explain that the proposed hypotheses were positively accepted.

The results revealed that learners' attitudes to e-learning were consistent and positive because they know its benefits and how it can help their learning and positively change their learning outcomes. Previous experiences and knowledge also emphasized them to be more positive and favourable towards e-learning activities for their learning purposes. Previous studies (Piccoli *et al.*, 2001; Ku *et al.*, 2013; Yang and Lin, 2010; Chandra and Bagdi, 2021) also stated that students with a positive attitude who see online education as a favourable link are more likely to persist in their studies and achieve long-term success.

The results also demonstrated that when it comes to usefulness to e-learning, it positively and completely influences their students' engagement level as because they know it offers e-learning services and how it can positively alter their learning outcomes. They have knowledge about its flexibility in learning in terms of time and space. Also, one can learn at their own pace. Hence, it directly influences students' engagement in e-learning. Burch *et al.* (2017) also suggested that students' opinions of their involvement with online tasks and activities rely on the online learning system's utility. Previous researchers also showed that perceived usefulness has been shown to have a substantial influence on online student

engagement (Gray and DiLoreto, 2016; Jung and Lee, 2018; Martin *et al.*, 2018; Zhai *et al.*, 2018; Chandra and Bagdi, 2021).

Likewise, hedonic motivation also positively impacts student engagement in e-learning. Learners think that e-learning platforms are easy to use and help in their learning with various methods which creates more interest while learning. They get more attracted to learning with joy which makes them more engaged towards e-learning platforms. Similar results were also found by some previous researchers (Raman and Don, 2013; Teo and Noyes, 2014; Ain *et al.*, 2015; Masa'deh *et al.*, 2016). Dubey and Sahu (2022) also noted that high interest in learning will produce positive and considerable curiosity among students to attend online classes.

However, the results of perception and empowerment to e-learning did not contribute to student engagement among ODLs. Hence, the proposed hypotheses (H1 and H4) were rejected. It was found that learners perceive studying online and not interacting with their classmates diminishes their enthusiasm and growth. Their interaction with their teachers in the class for queries is far different from addressing via online. It becomes tough to engage in online devices for a long period of time in an isolated environment. Virtual classrooms are fascinating at first, but later it diminishes interest as well as growth in terms of social skills. Hence, it is not astonishing that students' perception to e-learning is found insignificant to their engagement.

Also, empowerment to e-learning does not provide a connection with students' engagement. Learners as well as the teachers during the online classes are just fulfilling the requisites, it means not making the learning fun, enjoyable and engaging. Also, students get less time to share their thoughts and participation in the discussion. As a result, students' get frustrated when they stopped participating and just listening to their lectures. It also becomes difficult to cope with the instruction while doing practical classes as the students are distant and the network gets fluctuated frequently, it creates a lot of disturbances and loss of the rhythm of learning again. Frymier *et al.* (1996) noted that students in higher education feel empowered when they have choice and freedom, are given a personally meaningful experience, think they can achieve with reasonable effort and know that what they do will result in success.

Inclusively, the present study provides insights into the educational institutions how to engage students in an online space. There could be a number of factors underpinning student engagement, but few significant variables should be taken into consideration based on the present scenario. The present study conducted a study with five key factors underlying student engagement in e-learning. The findings will assist educational institutions to formulate appropriate policies and required strategies to effectively address the needs of the students. Educational institutions will be able to understand to train their teachers for online space and develop a conducive environment for learning. Teachers' interaction in an online space is far different from the physical ones, hence it becomes important to transform their way of interaction and engagement style and provide enough time to respond while learning.

Conclusively, the success of both online and in-person courses depends on the kind of course, the method of instruction used and the percentage of students who finish the programme (Nemetz *et al.*, 2017). COVID-19 outbreak moves face-to-face instruction online during the lockdown. This move lets instructors incorporate modern technical abilities into instruction, benefiting students (Isaeva *et al.*, 2020). However, engaging students online for a longer period has become a tough task. For effective student engagement, Kearsley and Schneiderman (1999) proposed the Engagement Theory as a framework for technology-assisted learning. They said learners must connect with one another and complete desirable activities. Their view is that using new technology in learning activities engages students more than conventional methods. As the study suggests, it is essential to keep pupils engaged throughout the learning process in order to maintain attention, motivate critical thinking abilities and create effective learning. O'Brien and Toms (2008) advise engaging pupils via attentiveness, curiosity and intrinsic

interest. Engaged learners are interested in activities, focused and alert. Instructors should feed these internal sources of student engagement by adopting smart instructional design approaches concentrating on student-centric learning tactics (Lee and Hannafin, 2016). Therefore, e-learning design must accommodate well-managed resources in order to make the lesson available, provide usefulness and react to the students' demands via the provision of user-friendly navigation, engaging content and activities, interactive games (educated games), textual feedback and the promotion of the use of visual and auditory stimuli.

5.1 Limitation

The present study used cross-sectional data to test the formulated research hypotheses. Also, the collected data are from ODLs of Chhattisgarh only. Hence, the results and implications presented in the study cannot be generalized. Future researchers must incorporate longitudinal data, where the transition of student engagement to e-learning can be measured.

5.2 Future research avenues

To measure student engagement and in what ways it can be increased to online learning. Future researchers can conduct experimental studies to investigate this area further by adding more variables (such as information quality, self-efficacy, service quality, etc.) to student engagement.

References

Ain, N., Kaur, K. and Waheed, M. (2015), "The influence of learning value on learning management system use: an extension of UTAUT2", *Information Development*, Vol. 12 No. 5, pp. 1-16.

Al-Azawei, A., Parslow, P. and Lundqvist, K. (2017), "Investigating the effect of learning styles in a blended e-learning system: an extension of the technology acceptance model (TAM)", *Australasian Journal of Educational Technology*, Vol. 33, pp. 1-23, doi: 10.14742/ajet.2741.

Almahasees, Z. and Jaccomard, H. (2020), "Facebook translation service (FTS) usage among jordanians during COVID-19 lockdown", *Advances in Science, Technology, Engineering Systems Journal*, Vol. 5, pp. 514-519, doi: 10.25046/aj050661.

Almahasees, Z., Mohsen, K. and Amin, M.O. (2021), "Faculty's and students' perceptions of online learning during COVID-19", *In Frontiers in Education*, Vol. 6, 638470, doi: 10.3389/feduc.2021.638470.

Alomyan, H. and Au, W. (2004), "Exploration of instructional strategies and individual difference within the context of web-based learning", *International Education Journal*, Vol. 4 No. 4, pp. 86-91.

Ar, E., Yılmaz, V. and Doğan, M. (2015), "Üniversite öğrencilerinin internet üzerinden alışverişlerine ilişkin tutum ve davranışların önerilen bir yapısal eşitlik modeliyle araştırılması", *Yönetim Ve Ekonomi*, Vol. 22 No. 2, pp. 385-399.

Arbaugh, J.B. (2000), "How classroom environment and student engagement affect learning in Internet-based MBA courses", *Business Communication Quarterly*, Vol. 63 No. 4, pp. 9-26.

Arbaugh, J.B. (2010), "Sage, guide, both, or even more? An examination of instructor activity in online MBA courses", *Computers and Education*, Vol. 55 No. 3, pp. 1234-1244.

Artino, A.R. Jr (2009), "Online learning: are subjective perceptions of instructional context related to academic success?", *The Internet and Higher Education*, Vol. 12 Nos. 3-4, pp. 117-125.

Bagozzi, R.P. and Yi, Y. (1988), "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol. 16, pp. 74-94, doi: 10.1007/BF02723327.

Baker, T.L., Wise, J., Gwendolyn, K. and Skiba, R.J. (2016), "Identifying barriers: creating solutions to improve family engagement", *School Community Journal*, Vol. 26 No. 2, pp. 161-184.

Banna, J., Lin, M.-F.G., Stewart, M. and Fialkowski, M.K. (2015), "Interaction matters: strategies to promote engaged learning in an online introductory nutrition course", *Journal of Online Learning and Teaching*, Vol. 11 No. 2, pp. 249-261.

Baran, E. and Correia, A.P. (2009), "Student-led facilitation strategies in online discussions", *Distance Education*, Vol. 30 No. 3, pp. 339-361.

Barclay, D., Higgins, C. and Thompson, R. (1995), "The partial least square (PLS) approach to casual modeling: personal computer adoption and use as an illustration", *Technology Studies*, Vol. 2 No. 2, pp. 285-309.

Baron, P. and Corbin, L. (2012), "Student engagement: rhetoric and reality", *Higher Education Research and Development*, Vol. 31, pp. 759-772.

Barron, T. (2000), "The future of digital learning", *E-learning*, Vol. 1 No. 2, pp. 46-47.

Barua, P.D., Zhou, X., Gururajan, R. and Chan, K.C. (2020), "Determination of factors influencing student engagement using a learning management system in a tertiary setting", *IEEE/WIC/ACM International Conference on Web Intelligence (WI)*, pp. 604-609, doi: 10.1109/WI.2018.00-30.

Bernard, R.M., Abrami, P.C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L., Wallet, P.A., Fiset, M. and Huang, B. (2004), "How does distance education compare with classroom instruction? A meta-analysis of the empirical literature", *Review of Educational Research*, Vol. 74 No. 3, pp. 379-439.

Birişçi, S., Metin, M. and Demiryürek, G. (2011), "İlköğretim öğretmenlerinin bilgisayar ve internet kullanımına yönelik tutumlarının incelenmesi: (Artvin ili örneği)", *Eğitim Teknolojileri Araştırmaları Dergisi*, Vol. 2 No. 4, pp. 1-18.

Bloom, B.S. (1956), *Taxonomy of Educational Objectives: The Classification of Educational Goals*, D McKay & Co. Inc, New York.

Bovill, C., Bulley, C.J. and Morss, K. (2011), "Engaging and empowering first-year students through curriculum design: perspectives from the literature", *Teaching in Higher Education*, Vol. 16, pp. 197-209.

Bradford, G. and Wyatt, S. (2010), "Online learning and student satisfaction: academic standing, ethnicity and their influence on facilitated learning, engagement, and information fluency", *Internet and Higher Education*, Vol. 13, pp. 108-114.

Bragg, S. (2007), "Student voice and governmentality: the production of enterprising subjects?", *Discourse: Studies in the Cultural Politics of Education*, Vol. 28 No. 3, pp. 343-358.

Britt, M. (2015), "How to better engage online students with online strategies", *College Student Journal*, Vol. 49 No. 3, pp. 399-404.

Brooks, C.D. and Jeong, A. (2006), "Effects of pre-structuring discussion threads on group interaction and group performance in computer-supported collaborative argumentation", *Distance Education*, Vol. 27 No. 3, pp. 371-390.

Burch, G.F., Burch, J.J. and Womble, J. (2017), "Student engagement: an empirical analysis of the effects of implementing mandatory web-based learning systems", *Organization Management Journal*, Vol. 14 No. 2, pp. 116-125, doi: 10.1080/15416518.2017.1325349.

Cantoni, V., Cellario, M. and Porta, M. (2004), "Perspectives and challenges in E-learning: towards natural interaction paradigms", *Journal of Visual Languages and Computing*, Vol. 15, pp. 333-345.

Chandra, A. and Bagdi, N. (2021), "Analysis of factors' influencing the adoption of e-teaching methodology of learning by students: an empirical study amidst the present pandemic crisis", *Asian Journal of Economics and Banking*, Vol. 5 No. 1, pp. 15-24.

Checkering, A.W. and Gammon, Z.F. (1987), "Seven principles for good practice in undergraduate education", *AAHE Bulletin*, Vol. 39 No. 7, pp. 3-7.

Cheung, C.M. and Lee, M.K. (2010), "A theoretical model of intentional social action in online social networks", *Decision Support Systems*, Vol. 49 No. 1, pp. 24-30, doi: 10.1016/j.dss.2009.12.006.

Chow, E.N., Fleck, C., Fan, G., Joseph, J. and Lyter, D.M. (2003), "Exploring critical feminist pedagogy: infusing dialogue, participation, and experience in teaching and learning", *Teaching Sociology*, Vol. 31 No. 3, pp. 259-275.

Coates, H. (2006), "Student engagement in campus-based and online education: university connections", Routledge.

Cole, M.S., Feild, H.S. and Harris, S.G. (2004), "Student learning motivation and psychological hardiness: interactive effects on students' reactions to a management class", *Academy of Management Learning and Education*, Vol. 3 No. 1, pp. 64-85, doi: 10.5465/amle.2004.12436819.

Daniels, M., Tyler, J. and Christie, B. (2000), *On-line Instruction in Counselor Education: Possibilities, Implications and Guidelines*, American Counseling Association, VA.

Davies, J. and Graff, M. (2005), "Performance in e-learning: online participation and student grades", *British Journal of Educational Technology*, Vol. 36 No. 4, pp. 657-663, doi: 10.1111/j.1467-8535.2005.00542.x.

Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.

De La Varre, C., Keane, J. and Irvin, M.J. (2010), "Enhancing online distance education in small rural US schools: a hybrid, learner-centered model", *Australasian Journal of Educational Technology*, Vol. 18, pp. 193-205, doi: 10.1080/09687769.2010.529109.

Deci, E. ., Koestner, R. and Ryan, R.M. (2001), "Extrinsic rewards and intrinsic motivation in education: reconsidered once again", *Review of Educational Research*, Vol. 71 No. 1, pp. 1-27, doi: 10.3102/00346543071001001.

Donmuş-Kaya, V. and Akpunar, B. (2019), "Öğretim etkinlikleri modeli'ne dayalı çevrimiçi öğrenme ortamının öğrencilerin çevrimiçi öğrenme ortamına yönelik tutumlarına etkisi", *Fırat Üniversitesi Sosyal Bilimler Dergisi*, Vol. 29 No. 1, pp. 181-191.

Dubey, P. and Sahu, K.K. (2021), "Students' perceived benefits, adoption intention and satisfaction to technology-enhanced learning: examining the relationships", *Journal of Research in Innovative Teaching and Learning*, Vol. 14 No. 3, pp. 310-328, doi: 10.1108/JRIT-01-2021-0008.

Dubey, P. and Sahu, K.K. (2022), "Investigating various factors that affect students' adoption intention to technology-enhanced learning", *Journal of Research in Innovative Teaching and Learning*, Vol. 15 No. 1, pp. 110-131, doi: 10.1108/JRIT-07-2021-0049.

Dubey, P. and Sahu, K.K. (2022a), "Mediation analysis of students' perceived benefits in predicting their satisfaction to technology-enhanced learning", *Journal of Research in Innovative Teaching and Learning*, Vol. ahead-of-print No. ahead-of-print. doi: 10.1108/JRIT-11-2021-0074.

El-Masri, M. and Tarhini, A. (2017), "Factors afecting the adoption of e-learning systems in Qatar and USA: extending the unified theory of acceptance and use of technology 2 (UTAUT2)", *Educational Technology Research and Development*, Vol. 65 No. 3, pp. 743-763, doi: 10.1007/s11423-016-9508-8.

Englund, C., Olofsson, A.D. and Price, L. (2017), "Teaching with technology in higher education: understanding conceptual change and development in practice", *Higher Education Research & Development*, Vol. 36, pp. 73-87, doi: 10.1080/07294360.2016.1171300.

Fadilah, N. (2016), *"Student Engagement in the E-Learning Process and The Impact on Their Grades in English Language Education"*, Unpublished Article, pp. 100-109.

Farrell, O. and Brunton, J. (2020), "A balancing act: a window into online student engagement experiences", *International Journal of Education Technology in High Education*, Vol. 17 No. 25, pp. 1-19, doi: 10.1186/s41239-020-00199-x.

Fornell, C. and Bookstein, F.L. (1982), "Two structural equation models: LISREL and PLS applied to consumer exit-voice theory", *Journal of Marketing Research*, Vol. 19 No. 4, pp. 440-452, doi: 10.2307/3151718.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50, doi: 10.1177/002224378101800104.

Fredricks, J.A., Blumenfeld, P.C. and Paris, A.H. (2004), "School engagement: potential of the concept, state of the evidence", *Review of Educational Research*, Vol. 74 No. 1, pp. 59-109, doi: 10.3102/00346543074001059.

Frymier, A.B., Shulman, G.M. and Houser, M. (1996), "The development of a learner empowerment measure", *Communication Education*, Vol. 45 No. 3, pp. 181-199.

Gebre, E., Saroyan, A. and Bracewell, R. (2014), "Students' engagement in technology rich classrooms and its relationship to professors' conceptions of effective teaching", *British Journal of Educational Technology*, Vol. 45 No. 1, pp. 83-96.

Global Market Insights (2022), "E-learning market size by technology (online E-learning, learning management system (LMS), mobile E-learning, rapid E-learning, virtual classroom), by provider (service, content), by application (academic [K-12, higher education, vocational training], corporate [SMBs, large enterprises], government), COVID-19 impact analysis, regional outlook, growth potential, competitive market share and forecast", 2022-2028, available at: https://www.gminsights.com/industry-analysis/elearning-market-size#:~:text=E%2DLearning%20Market%20size%20surpassed,CAGR%20from%202022%20to%202028 (accessed 20 July 2022).

Gordon, J. (2003), "E-Learning tagged as best corporate IT investment", *E-Learning*, Vol. 4 No. 1, p. 8.

Govindasamy, T. (2002), "Successful Implementation of e-learning pedagogical considerations", *The Internet and Higher Education*, Vol. 4, pp. 287-299.

Grandon, E., Alshare, O. and Kwan, O. (2005), "Factors influencing student intention to adopt online classes: a cross-cultural study", *Journal of Computing Sciences in Colleges*, Vol. 20 No. 4, pp. 46-56.

Gratton-Lavoie, C. and Stanley, D. (2009), "Teaching and learning principles of microeconomics online: an empirical assessment", *The Journal of Economic Education*, Vol. 40, pp. 3-25, doi: 10.3200/JECE.40.1.003-025.

Gray, J.A. and DiLoreto, M. (2016), "The efects of student engagement, student satisfaction, and perceived learning in online learning environments", *International Journal of Educational Leadership Preparation*, Vol. 11 No. 1, pp. 1-20.

Gurukkal, R. (2020), "Will COVID 19 turn higher education into another mode?", *Higher Education for the Future*, Vol. 7, pp. 89-96, doi: 10.1177/2347631120931606.

Hair, J.F., Black, W.C., Balin, B.J. and Anderson, R.E. (2010), *Multivariate Data Analysis*, Maxwell Macmillan International Editions, New York.

Harper, S.R. and Quaye, S.J. (2009), *Student Engagement in Higher Education*, Routledge, New York and London.

Harun, M.H. (2002), "Integrating E-learning into work-place", *Internet and Higher Education*, Vol. 4 Nos. 3-4, pp. 301-310.

Henrie, C.R., Halverson, L.R. and Graham, C.R. (2015), "Measuring student engagement in technology mediated learning: a review", *Computers and Education*, Vol. 90, pp. 36-53, doi: 10.1016/j.compedu.2015.09.005.

Henseler, J. and Chin, W.W. (2010), "A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling", *Structural Equation Modeling*, Vol. 17 No. 1, pp. 82-109.

Henseler, J., Ringle, C.M. and Sinkovics, R.R. (2009), "The use of partial least squares path modeling in international marketing", in Sinkovics, R.R. and Ghauri, P.N. (Eds), *New Challenges to International Marketing (Advances in International Marketing)*, Emerald Group Publishing Limited, Bingley, Vol. 20, pp. 277-319, doi: 10.1108/S1474-7979(2009)0000020014.

Hew, K.F. and Cheung, W.S. (2008), "Attracting student participation in asynchronous online discussions: a case study of peer facilitation", *Computers and Education*, Vol. 51 No. 3, pp. 1111-1124, available at: https://www.heacademy.ac.uk/resources/detail/evidencenet/Student_engagement_literature_review

Hu, X., Lin, Z., Whinston, A.B. and Zhang, H. (2004), "Hope or hype: on the viability of escrow services as trusted third parties in online auction environments", *Information Systems Research*, Vol. 15 No. 3, pp. 236-249.

Ibrahim, S. and Alkire, S. (2007), "Agency and empowerment: a proposal for internationally comparable indicators", *Oxford Development Studies*, Vol. 35 No. 4, pp. 379-403.

Isaeva, R., Eisenschmidt, E., Vanari, K. and Kumpas-Lenk, K. (2020), "Students' views on dialogue: improving student engagement in the quality assurance process", *Quality in Higher Education*, Vol. 26, pp. 80-97, doi: 10.1080/13538322.2020.1729307.

Ismail, J. (2002), "The design of an E-learning system beyond the hype", *Internet and Higher Education*, Vol. 4 Nos. 3-4, pp. 329-336.

Jafar, A. (2016), "Student engagement, accountability, and empowerment: a case study of collaborative course design", *Teaching Sociology*, Vol. 44 No. 3, pp. 221-232.

Jagannath, J. (2020), "Covid-19 will be with us for a long time and be easily ignite: WHO", available at: https://www.livemint.com/news/world/covid-19-will-be-with-us-for-a-long-time-and-can-easilyignite-who-11587572606311.html (accessed 15 July 2022).

Jeffcoat Bartley, S. and Golek, J.H. (2004), "Evaluating the cost effectiveness of online and face-to-face instruction", *Journal of Educational Technology and Society*, Vol. 7, pp. 167-175.

Jung, Y. and Lee, J. (2018), "Learning engagement and persistence in massive open online courses (MOOCS)", *Computers and Education*, Vol. 122, pp. 9-22, doi: 10.1016/j.compedu.2018.02.013.

Kara, A. (2010), "Öğrenmeye ilişkin tutum ölçeğinin geliştirilmesi", *Elektronik Sosyal Bilimler Dergisi*, Vol. 9 No. 32, pp. 49-62.

Katz, Y.J. (2002), "Attitudes affecting college students' preferences for distance learning", *Journal of Computer Assisted Learning*, Vol. 18 No. 1, pp. 2-9, doi: 10.1046/j.0266-4909.2001.00202.x.

Kearsley, G. and Schneiderman, B. (1999), "Engagement theory: a framework for technology-based teaching and learning", *Educational Technology*, Vol. 38 No. 5, pp. 20-23.

Keller, C. and Cernerud, L. (2002), "Students' perception of e-learning in university education", *Journal of Educational Media*, Vol. 27 Nos. 1-2, pp. 55-65, doi: 10.1080/0305498032000045458.

Khan, H.B. (2003), *E-Learning: Planning and Management*, Erickson, Trento.

Kim, K. and Moore, J. (2005), "Web-based learning: factors affecting students' satisfaction and learning experience", *First Monday*, Vol. 10 No. 11, pp. 15-24.

Kim, M.K., Wang, Y. and Ketenci, T. (2020), "Who are online learning leaders? Piloting a leader identification method (LIM)", *Computers in Human Behavior*, Vol. 105, 106205.

Klemenčič, M. (2016), *Towards a New Higher Education Strategy 2016–2025 of the Republic of Armenia*, Report Prepared for UNESCO.

Knowles, E. and Kerkman, D. (2007), "An investigation of students attitude and motivation toward online learning", *InSight: A Collection of Faculty Scholarship*, Vol. 2, pp. 70-80.

Komiak, S.Y.X., Wang, W. and Benbasat, I. (2004), "Trust building in virtual salespersons versus in human salespersons: similarities and differences", *E-Service Journal*, Vol. 3 No. 3, pp. 49-64, doi: 10.2979/esj.2004.3.3.49.

Kotler, P. and Armstromg, G. (2009), *Principles of Marketing*, 9th ed., Pearson Education, London.

Krause, K.L. and Coates, H. (2008), "Students' engagement in first-year university. Assessment and evaluation in higher education", *Assessment and Evaluation in Higher Education*, Vol. 33, pp. 493-505, doi: 10.1080/02602930701698892.

Ku, H.Y., Tseng, H.W. and Akarasriworn, C. (2013), "Collaboration factors, teamwork satisfaction, and student attitudes toward online collaborative learning", *Computers in Human Behavior*, Vol. 29 No. 3, pp. 922-929.

Küçükahmet, L. (2017), *Öğretim Ilke Ve Yöntemleri (27. Baskı)*, Nobel Yayın Dağıtım, Ankara.

Kuh, G.D., Cruce, T.M., Shoup, R., Kinzie, J. and Gonyea, R.M. (2008), "Unmasking the effects of student engagement on first-year college grades and persistence", *The Journal of Higher Education*, Vol. 79 No. 5, pp. 540-563.

Kuhn, D. (2001), "How do people know?", *Psychological Science*, Vol. 12, pp. 1-8.

Lahrash, H.A.E., Elmansori, M.M. and Salama, M. (2021), "Prior research on the adoption of E-learning and UTAUT2 model: critical analysis", *i-Manager's Journal of Educational Technology*, Vol. 18 No. 1, pp. 47-56, doi: 10.26634/jet.18.1.17857.

LaRose, R., Gregg, J. and Eastin, M. (2006), "Audio graphic tele-courses for the Web: an experiment", *Journal of Computer Mediated Communications*, Vol. 4 No. 2, pp. 1-28, doi: 10.1111/j.1083-6101.1998.tb00093.x.

Lee, E. and Hannafin, M.J. (2016), "A design framework for enhancing engagement in student-centered learning: own it, learn it, and share it", *Educational Technology Research and Development*, Vol. 64, pp. 707-734, doi: 10.1007/s11423-015-9422-5.

Lee, H.Y., Qu, H. and Kim, Y.S. (2007), "A study of the impact of personal innovativeness on online travel shopping behavior-A case study of Korean travelers", *Tourism Management*, Vol. 28 No. 3, pp. 886-897.

Li, C. and Lalani, F. (2020), "*The Rise of online learning During the COVID-19 pandemic: World economic forum*", available at: https://www.weforum.org/agenda/2020/04/coronavirus-education-globalcovid19-online-digital-learning/(accessed 1 July 2021).

Liaw, S.S., Huang, H.M. and Chen, G.D. (2007), "Surveying instructor and learner attitudes toward e-learning", *Computer and Education*, Vol. 49, p. 7.

Ling, C., Balci, U., Blackburn, J. and Stringhini, G. (2021), "A first look at zoombombing", *2021 IEEE Symposium on Security and Privacy (SP)*, pp. 1452-1467, doi: 10.1109/SP40001.2021.00061.

Maroco, J., Maroco, A.L., Campos, J.A.D.B. and Fredricks, J.A. (2016), "University student's engagement: development of the university student engagement inventory (USEI)", *Psicologia: Reflexão e Crítica*, Vol. 29, pp. 1-12.

Martin, F., Wang, C. and Sadaf, A. (2018), "Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses", *The Internet and Higher Education*, Vol. 37, pp. 52-65, doi: 10.1016/j.iheduc.2018.01.003.

Masa'deh, R.M.T., Tarhini, A., Bany, M.A. and Maqableh, M. (2016), "Modeling factors affecting student's usage behaviour of E-learning systems in Lebanon", *International Journal of Business and Management*, Vol. 11 No. 2, pp. 299-312.

McPhee, I. and D'Esposito, M.E.W. (2018), "Student assessment in higher education: embargo or empowerment?", *Journal of Applied Research in Higher Education*, Vol. 10 No. 2, pp. 155-169.

Meyer, K.A. (2014), "Student engagement in online learning: what works and why", *ASHE Higher Education Report*, Vol. 40 No. 6, pp. 1-114, doi: 10.1002/aehe.20018.

Moore, M.G. (2002), "What does research say about learners using computer-mediated communication in distance learning", *The American Journal of Distance Education*, Vol. 16 No. 2, pp. 61-64.

Naidoo, R. and Jamieson, I. (2005), "Empowering participants or corroding learning? Towards a research agenda on the impact of student consumerism in higher education", *Journal of Education Policy*, Vol. 20 No. 3, pp. 267-281.

Nemetz, P.L., Eager, W.M. and Limpaphayom, W. (2017), "Comparative effectiveness and student choice for online and face-to-face classwork", *Journal of Education for Business*, Vol. 92, pp. 210-219, doi: 10.1080/08832323.2017.1331990.

Ngai, E.W.T., Poon, J.K.L. and Chan, Y.H.C. (2007), "Empirical examination of the adoption of WebCT using TAM", *Computers and Education*, Vol. 48 No. 2, pp. 250-267.

Nichols, J. (2006), "Empowerment and relationships: a classroom model to enhance student", *Learning Environments Research*, Vol. 9 No. 2, pp. 149-161.

Nunnally, J. (1978), *Psychometric Theory*, McGraw-Hill, New York.

Nyathi, M. and Sibanda, E. (2022), "E-learning: substitutability of learner–learner, and learner–facilitator interactions to enhance learner satisfaction in higher education", *Journal of Research in Innovative Teaching and Learning*, Vol. ahead-of-print ahead-of-print, doi: 10.1108/JRIT-04-2022-0018.

Oh, E.G., Huang, W.H.D., Mehdiabadi, A.H. and Ju, B. (2018), "Facilitating critical thinking in asynchronous online discussion: comparison between peer-and instructor-redirection", *Journal of Computing in Higher Education*, Vol. 30 No. 3, pp. 489-509.

Oncu, S. and Cakir, H. (2011), "Research in online learning environments: priorities and methodologies", *Computers and Education*, Vol. 57 No. 1, pp. 1098-1108, doi: 10.1016/j.compedu.2010.12.009.

Osborne, R., Dunne, E. and Farrand, P. (2013), "Integrating technologies into 'authentic' assessment design: an affordances approach", *Research in Learning Technology*, Vol. 21, pp. 1-18, doi: 10.3402/rlt.v21i0.21986.

O'Brien, H.L. and Toms, E.G. (2008), "What is user engagement? A conceptual framework for defining user engagement with technology", *Journal of the American Society for Information Science and Technology*, Vol. 59 No. 6, pp. 938-955.

Pace, C.R. (1995), *"From Good Practices to Good Products: Relating Good Practices in Undergraduate Education to Student Achievement"*, Paper presented at the 35th Association for Institutional Research Annual Forum. Boston, 28–31 May.

Paola Torres Maldonado, U., Feroz Khan, G., Moon, J. and Jeung Rho, J. (2011), "E-learning motivation and educational portal acceptance in developing countries", *Online Information Review*, Vol. 35 No. 1, pp. 66-85, doi: 10.1108/14684521111113597.

Peng, H., Tsai, C.-C. and Wu, Y.-T. (2006), "University students' self-efficacy and their attitudes toward the Internet: the role of students' perceptions of the Internet", *Educational Studies*, Vol. 32, pp. 73-86.

Piccoli, G., Ahmad, R. and Ives, B. (2001), "Web-based virtual learning environments: a research framework and a preliminary assessment of effectiveness in basic IT skill training", *MIS Quarterly*, Vol. 25 No. 4, pp. 401-426.

Punnoose, A. (2012), "Determinants of intention to use e-learning based on the technology acceptance model", *Journal of Information Technology Education: Research*, Vol. 11, pp. 301-337.

Raman, A. and Don, Y. (2013), "Preservice teachers' acceptance of learning management software: an Application of the UTAUT2 Model", *International Education Studies*, Vol. 6 No. 7, pp. 157-171.

Roach, V. and Lemasters, L. (2006), "Satisfaction with online learning: a comparative descriptive Study", *Journal of Interactive Online Learning*, Vol. 5, pp. 317-332.

Rodríguez-Gómez, G. and Ibarra-Sáiz, M.S. (2015), "Assessment as learning and empowerment: towards sustainable learning in higher education", in Peris-Ortiz, M. and Merigo Lindahl, J.M. (Eds), *Sustainable Learning in Higher Education*, Springer, New York.

Rosenberg, M.J. (2001), *E-Learning Strategies For Delivering Knowledge In the Digital Age*, McGraw-Hill, New York.

Sadik, A. and Reisman, S. (2004), "Design and implementation of a web-based learning environment: lessons learned", *Quarterly Review of Distance Education*, Vol. 5 No. 3, pp. 157-171.

Sandars, J. and Langlois, M. (2005), "E-Learning and the educator in primary care: responding to the challenge", *Education for Primary Care*, Vol. 16, pp. 129-133.

Sanders, D.W. and Morrison-Shetlar, A.I. (2001), "Student attitudes toward web-enhanced instruction in an introductory biology course", *Journal of Research on Computing in Education*, Vol. 33 No. 3, pp. 251-262.

Santos, J., Figueiredo, A.S. and Vieira, M. (2019), "Innovative pedagogical practices in higher education: an integrative literature review", *Nurse Education Today Livingstone, Churchill Livingstone*, Vol. 72, pp. 12-17, doi: 10.1016/j.nedt.2018.10.003.

Silva, M. and Cartwright, G.F. (2017), "The internet as a medium for education and educational research", *Education Libraries*, Vol. 17 No. 7, doi: 10.26443/el.v17i2.44.

Stanier, L. (1997), "Peer assessment and group work as vehicles for student empowerment: a module evaluation", *Journal of Geography in Higher Education*, Vol. 21 No. 1, pp. 95-98.

Stein, S.J., Shephard, K. and Harris, I. (2011), "Conceptions of e-learning and professional development for e-learning held by tertiary educators in New Zealand", *British Journal of Educational Technology*, Vol. 42 No. 1, pp. 145-165.

Strielkowski, W. (2020), "COVID-19 pandemic and the digital revolution in academia and higher education", *Preprints*, article no. 2020040290, doi: 10.20944/preprints202004.0290.v1.

Sun, P.C., Tsai, R.J., Finger, G., Chen, Y.Y. and Yeh, D. (2008), "What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction", *Computers and Education*, Vol. 50 No. 4, pp. 1183-1202.

Tarhini, A., Hone, K. and Liu, X. (2013), "Factors affecting students' acceptance of e-learning environments in developing countries: a structural equation modeling approach", *International Journal of Information and Education Technology*, Vol. 3 No. 1, pp. 54-59.

Tarhini, A., Al-Busaidi, K.A., Mohammed, A.B. and Maqableh, M. (2017), "Factors influencing students' adoption of e-learning: a structural equation modeling approach", *Journal of International Education in Business*, Vol. 10 No. 2, pp. 164-182, doi: 10.1108/JIEB-09-2016-0032.

TavúancÕl, E (2006), *TutumlarÕn ölçülmesi ve SPSS ile veri analizi*, Nobel YayÕn Da÷ÕtÕm, Ankara.

Teo, T. and Noyes, J. (2014), "Explaining the intention to use technology among pre-service teachers: a multi-group analysis of the Unified Theory of Acceptance and Use of Technology", *Interactive Learning Environments*, Vol. 22 No. 1, pp. 51-66.

Trowler, V. (2010), "Student engagement literature review", *The Higher Education Academy*, Vol. 11, pp. 1-15.

Urdan, T.A. and Weggen, C.C. (2000), "Corporate e-learning: exploring a new Frontier", *WR Hambrecht Co*, pp. 1-92.

Usta, E. (2011), "The effect of web-based learning environments on attitudes of students regarding computer and internet", *Procedia-Social and Behavioral Sciences*, Vol. 28, pp. 262-269.

Van Andel, J., Botas, P.P.C. and Huisman, J. (2012), "Consumption values and empowerment of the student as customer: taking a rational look inside higher education's 'pandora's box'", *Higher Education Review*, Vol. 45 No. 1, pp. 62-85.

Wang, Q. (2008), "Student-facilitators' roles in moderating online discussions", *British Journal of Educational Technology*, Vol. 39 No. 5, pp. 859-874.

Yang, Y. and Lin, N.C. (2010), "Internet perceptions, online participation and language learning in Moodle forums: a case study on nursing students in Taiwan", *Procedia-Social and Behavioral Sciences*, Vol. 2 No. 2, pp. 2647-2651.

Zhai, X., Dong, Y. and Yuan, J. (2018), "Investigating learners' technology engagement - a perspective from ubiquitous game-based learning in smart campus", *IEEE Access*, Vol. 6, pp. 10279-10287, doi: 10.1109/ACCESS.2018.2805758.

Zhang, T., Gao, T., Ring, G. and Zhang, W. (2007), "Using online discussion forums to assist a traditional English class", *International Journal of E-Learning*, Vol. 6 No. 4, pp. 623-643.

Corresponding author
Kailash Kumar Sahu can be contacted at: mailtokailashsahu@gmail.com