



# EXPECTATIONS OF UNIVERSITY LECTURERS AND STUDENTS ON SMART LEARNING ENVIRONMENTS

**G. S. Prakasha, Rituparna Chakraborty**

Christ University, India

E-mail: prakasha.gs@christuniversity.in, rituparna.chakraborty@christuniversity.in

**S. Thirumalesha, C. S. Gururaja**

Mount Carmel College, India

E-mail: thirumalesh@mccblr.edu.in, gururaj@mccblr.edu.in

**T. Yolila Sangtam, Keneivi-u Rhatsu**

Nagaland University, India

E-mail: yolila@nagalanduniversity.ac.in, lkeneivi@gmail.com

**Grace Maria Jochan**

St. Joseph's University, India

E-mail: grace.jochan@res.christuniversity.in

## Abstract

*Education in the 21st century has become more technology integrated, and the shift from conventional modalities of teaching to technology-assisted teaching methodologies accelerated during the pandemic years. The current study employed a qualitative research design (n=12) to explore this shift and the expectations of these novel teaching modalities from both facilitator and learner perspectives in urban higher education settings in India. An inductive thematic analysis of the qualitative data revealed that there is a significant gap in lecturers' and students' definitions and expectations of smart learning environments. The themes that emerged from the data were bifurcated into lecturer and student perspectives on smart learning environments and included innovative nature, novelty and complexity, student excitement, and limitations of content. Based on the findings, lecturer and student expectations of SLE platforms had points of convergence and divergence which are unique to the socio-cultural positions of the participants. The current study argues the need to devise methods to improve the efficacy of SLEs in developing economies.*

**Keywords:** smart learning environments, augmented reality, virtual reality, qualitative study

## Introduction

Cyberspace and its possibilities of instantaneous connection and maximized efficacy have contributed to a revolutionary reverberation in the education sector since the recent pandemic years. The interactive smart learning environments with affordances of personalized, adaptable learner-centric technological assistance offer infinite possibilities in teaching and learning practices for both educators and students alike (Tabuenca et al., 2021). Smart Learning Environments (SLE) refer to learning environments that allow extensive flexibility for learning to provide maximum engagement, efficiency, and reflectiveness in the learning process (Cheung et al., 2021). Smartphones, hand-held devices, interactive whiteboards, and learning management systems are a few of the many technologies that aided in the transition to smart learning environments (Spector, 2016). The readiness, however, for these technology-

assisted learning techniques was limited in low-income countries due to a lack of affordability for software or hardware and poor internet signals (Mousa et al., 2020).

With the advent of learning management systems, smart learning environments have gathered more momentum. These analytical models allow for the measurement, collection, analysis, reporting, and interpretation of data from learners through complex data infrastructures and optimize learning outcomes with greater accuracy based on the measured factors (de Freitas et al., 2020; West et al., 2016). Compared to conventional education, these technology-assisted smart learning environments are found to improve students' involvement, conceptual clarity, and motivation (Carillo & Flores, 2020; Roque-Hernández, 2020; Sreehari, 2020). This data mining facilitated through learning analytics platforms significantly helped to improve student performance, learning outcomes, course choices, and retention through collecting, analyzing, interpreting, and presenting assessment data (Stephan, 2017; Vega-Hernández et al., 2018). Studies on flipped classroom models also proposed that student satisfaction significantly improved with the introduction of self-paced learning methods, which emphasized student autonomy (Sergis et al., 2018). Morgado et al. (2021) reported that integrative learning environments are smarter, and it is quintessential for lecturers to migrate to digital space. Still, on the other hand, evidence also suggests that the knowledge of information and communication technologies (ICT) through scaffolded training, perceptions towards these ICTs, and integration of the same in their teaching plans significantly contributed to their educational beliefs about using SLE (Comi et al., 2017; Ha & Soo-Young, 2019; Tondeur et al., 2018).

As data-driven SLEs and their optimized learning outcomes are gaining popularity in centers of higher education, the disadvantages of this educational transformation were also studied. Educational institutions often use third-party platforms for SLEs. Therefore, the information collected and analyzed no longer stays within the physical boundaries of the institution, creating a privacy lax where third-party systems could manipulate the collected behavioral data to understand their preferences, drives, and aptitudes (Alier et al., 2021; Viberg et al., 2020; Williamson, 2016). Dare (2021) assumed that these massively scaled data on student-lecturer interactions were examples of the education sector falling prey to surveillance capitalism. Through participative observation, excessive literature review, and analysis of legal frameworks, particularly GDPR and FERPA, Alier et al. (2021) concluded that technological advancements lead to a loss of control over personal information, making it challenging to ensure user confidentiality and privacy, the growth of data surveillance in the education sector. The privacy laws concerning these data storage and use are nascent and have been unable to keep up with the evolving technologies (Stephan, 2017). Confirmatory factor analysis on large empirical data from Croatia proposed that the perceived effectiveness of government regulation reduces online privacy concerns. In contrast, computer anxiety has a major positive impact on online privacy concerns among internet users (Škrinjarić et al., 2019).

The use of learning analytics also intensified students' disciplining and normalizing continuous assessment of students and their learning path (Manolev et al., 2019). Teaching and learning, therefore, move beyond the essentialist truth to a simulated hyperreality raising ethical dilemmas over surveillance (Page, 2017). An Australian study by Lawson et al. (2016) illustrated the use of data collected through learning analytics platforms to predict behaviors and label students, thus using the data beyond the initial point of consent, suggesting that the surplus of behavioral data, therefore, needs to be brought under the purview of legal frameworks to deal with the privacy laws and ethical dilemmas. Williams et al. (2019) empirically proposed that student satisfaction with online learning was largely mediated by the privacy the institution offered with respect to their learning process, thus entailing the importance of engaging with privacy and ethical dilemmas in SLEs. However, a systematic review of the ethical issues of learning analytics highlighted a lack of empirical evidence-based guidelines on the ethical aspects of using learning analytics for teaching and learning (Tzimas & Demetriadis, 2021).

There have also been studies on both the physical and psychological health of using smart devices for education, including back pain, anxiety, and online addiction (Myung-Sill & Seomon, 2021) but little on the educator-learner expectations of the SLE, particularly from the context of a developing country. This study attempts to explore the experiences of SLEs in the urban higher-education institution, where the transition to SLE was an immediate response to continuing educational processes during the pandemic and impromptu. There have been studies entailing concerns about the over-collection and harvesting of massively scaled data in the education sector (Koohestani et al., 2019; Teimouri et al., 2018; Willis et al., 2016). A symbiotic relationship exists between the education and technology sectors in the developed world. But there is little preparedness to embrace the advancements of the fourth industrial revolution, especially in developing economies (Jarke & Breiter, 2019; Oke & Fatima Araujo, 2020).

### *Theoretical Framework*

The technology acceptance model (TAM) by Davis (1989) and self-determination theory (SDT) by Deci and Ryan (1977) were adapted to this study to explore the experiences of lecturers and students from both technological and psychological perspectives. TAM (Davis, 1989) explains that the use of technology is determined by five concepts- perceived usefulness, perceived ease of use, attitude toward using, behavioral intention to use, and actual use. Although it was initially proposed to understand the adoption of IT in the workplace, it has recently been adopted in educational contexts to better the integration of e-learning models into traditional models of teaching and learning (Al-Gahatani, 2016; Racero, et al., 2020; Su & Li, 2021). Self-determination theory (Ryan & Deci, 2000), originally proposed as a motivational theory postulating that behavior is influenced by autonomy, relatedness, and competence, has also been widely used in educational contexts to understand and measure learner perceptions and outcomes of new teaching models. The feasibility of combining TAM and SDT to understand smart learning environments has already been demonstrated but often in school-level education. This study is particularly interested in extending the application of these theoretical frameworks in college education, particularly in the context of the post-pandemic developing country scenario.

### *Context*

Educators around the world started adopting smart learning environments in their classes since the last decade. However, countries with a large population and suffering from lower economies are yet on their way to adopt it to their different levels of education system. College teaching in these countries seems to be a conventional frontal teaching mode and has not yet adopted a multimodal approach nor emphasized a smart learning environment for the benefit of teaching and learning. Quite often we see lecturers and students criticizing the education system for not having an education which is productive and useful for the future. Smart learning environment can actually bridge this gap if implemented appropriately. Nevertheless, there is a lack of understanding of the idea of SLE by both lecturers and students. Thus, the current study aimed to understand the expectations of lecturers and students from SLE and what are the challenges they face while they try to implement SLE. The researchers framed the following research questions to explore the understanding of SLE by lecturers and students in higher education.

### *Research Questions*

- To determine the expectations of lecturers and students from a smart learning environment in their teaching and learning respectively.
- To determine the various challenges faced by lecturers and students while using a smart learning environment in their teaching and learning respectively.

### **Research Methodology**

#### *General Background*

The Internet and its affordances created an impetus in the field of education in the last decade through varied educational technologies. Educational institutions around the world were quick to invest and implement these novel technological advancements to improve the efficacy of teaching and learning. The non-WEIRD economies during most of this time, often due to their limited resources, could not harness the benefits of these smart learning environments. However, the experience of the pandemic and subsequent shutdown of daily activities, including the educational processes, simulated the rapid growth in the use of smart learning environments even in these developing economies. Although face-to-face teaching and learning modality was revived after the pandemic, smart learning environments remained integrated within the education system. Since the emergence of these platforms in these sociocultural contexts is unprecedented, there is an essential need to explore the expectations that stakeholders in higher education, particularly lecturers and students, have about using these platforms. Therefore, the present study explored lecturers' and students' expectations of smart learning environments through a qualitative inquiry.

An exploratory qualitative research design was employed to explore the expectations of lecturers and students from smart learning environments. The study followed a qualitative context-bound inductive thematic approach following the Braun and Clarke (2006) model. The study was conducted in 2022.

#### *Sample*

The current study carefully recruited six lecturers teaching in universities who are proactive in using digital technologies and six students studying in universities, who regularly and proactively study in a smart learning environment. The sampling technique used for the study was purposive, and participants were approached using a snowball sampling method (Creswell, 2003). The demographic details of the participants are presented in Table 1 below. Pseudonyms such as F and S were used respectively for lecturers and students to ensure the anonymity of participants.

**Table 1**  
*Showing the Demographic Characteristics of the Sample*

Faculty Pseudonym	Gender	Age	Teaching Discipline
F1	Female	32	Social Science
F2	Male	36	Natural Science
F3	Female	39	Commerce
F4	Female	42	Information Technology
F5	Male	34	Social Science
F6	Male	45	Commerce
Students Pseudonym	Gender	Age	Stream of study
S1	Male	19	B Com
S2	Male	23	MSc
S3	Female	18	BA
S4	Male	20	BA
S5	Female	19	BSc
S6	Female	22	MA

*Instrument and Procedures*

The initial draft of the interview schedule was prepared by the researchers and was sent to a panel of experts in the field for face and content validation. The feedback from the panel was incorporated into the schedule. The final version of the semi-structured interview schedule is presented in Table 2.

**Table 2**  
*Showing the Semi-structured Interview Questions*

Interview questions for lecturers <ul style="list-style-type: none"> <li>• How do you think smart learning environments have affected your teaching pedagogy? Elaborate.</li> <li>• Can you elaborate on the various challenges you face when using these teaching platforms? (Prompt: Difficulties)</li> </ul>	Interview questions for students <ul style="list-style-type: none"> <li>• How have the smart learning environments affected your learning at the University? Explain</li> <li>• What challenges do you encounter when using these platforms for learning purposes? Explain</li> </ul>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The recruited participants were invited for the semi-structured interview through the video conferencing platform Google-meet at their convenience. Interviews were conducted by two of the researchers, who have completed their doctoral degrees and with extensive experience in qualitative research. Consent was obtained before beginning the interview. Interviewers also asked subsequent on-spot sequential questions wherever necessary to elicit in-depth information. Interviews were audio-recorded for transcription purposes, and the data was saved in a password-protected file accessible to the researchers.

### Data Analysis

Audio-recorded interviews were manually transcribed for analysis. The researcher followed the steps of Braun and Clarke's (2006) inductive thematic analysis.

- The transcripts were read multiple times to ensure familiarity with the data
- Initial codes were generated from the items of interest
- Sub-themes were generated from the emerging repetitive patterns of codes
- Themes were generated from the collation of sub-themes.

Emergent themes and sub-themes from the data are presented in Table 3 in the Results section below.

### Research Results

The study explored the expectations of educators and learners from an urban Indian setting regarding smart learning environments used in addition to the classroom models of teaching and learning. An inductive thematic analysis gave the following themes and sub-themes bifurcated into two categories, lecturer-participant related, and student-participant related and is as organized in Table 3.

**Table 3**

*Shows the Themes and Sub-themes on the Educator-learner Expectations in SLE*

Themes	Sub-themes
<b>Lecturers' perspective</b>	
1. Innovative nature of SLE	<ul style="list-style-type: none"> <li>• Feelings of enthusiasm</li> <li>• Enhanced teaching efficacy</li> </ul>
2. Novelty and complexity of SLE	<ul style="list-style-type: none"> <li>• Difficulties in technological adaptation</li> <li>• Constraints in tracking learner's progress</li> </ul>
<b>Students' perspective</b>	
3. Student Excitement	<ul style="list-style-type: none"> <li>• Eagerness at the novelty</li> <li>• Affordance of interactivity and engagement</li> </ul>
4. Restrictive in content/Limitations of content	<ul style="list-style-type: none"> <li>• Difficulties in navigation</li> <li>• Difficulties in mentoring</li> </ul>

#### *Main-Theme 1: Innovative Nature of Smart Learning Environments*

Smart learning platforms were considered more inclusive and learner-centric by the participant lecturers than the traditional modalities of classroom engagement as they allow for personalization and adaptation of content to the context and aptitude of the learner. They gained popularity during the pandemic and helped continue education beyond the geographical barriers imposed by the pandemic. Even in the post-pandemic scenario, lecturers know these SLEs will continue to function as an essential teaching and learning modality in higher education settings. This theme discusses the lecturers' positive perceptions of the novel smart learning environments and contains the sub-themes of feelings of enthusiasm and enhanced teaching efficacy.

### *Sub-theme 1: Feelings of Enthusiasm*

Most lecturer participants recalled the novelty of SLEs and their varied choices as exhilarating. Unlike the physical classroom modalities of teaching and learning, smart learning environments can cater to the different sensory modalities of learners. F3 enthusiastically describes the myriad of options available to enhance teaching quality in the following snippet.

*F3: "Initially, it was all first chalk and talk to using power-points and slides and (now) all sorts of let's say any sort of animation to teach in the form of demonstration" (Personal communication).*

Although there was little training as the shift to technology-assisted learning was accelerated by the pandemic, lecturers positively embraced the technologies. They soon became active users of the technology-assisted learning techniques, immersing themselves in the nuances of teaching-learning experiences. Lecturer participants recalled their initial engagements with smart learning platforms and how from a time when these were sparsely popular, they became the most accessible mode of learning across the country.

*F4: SLE is a very new thing that has come up. It is a new thing. It was there I wouldn't deny it but the wave of usage of smart learning happened right after Covid hit and it was not very readily accessible to remote areas of our country where many couldn't even think of having this alternative mode of learning. (Personal Communication).*

These options of using the virtual reality platforms were exhilarating for the lecturers themselves, and this enthusiasm encouraged them to engage and use them more profoundly in their teaching processes. Participants often considered these platforms to be commendable. They affirmed to use them to their full potential in their teaching processes as in the excerpt below.

*F2: "Smart learning becomes a supreme type of learning like for example we use resources like the Internet. We often have unlimited access to material and all that." (Personal Communication)*

### *Sub-theme 2: Enhanced teaching efficacy*

Smart learning environments allow better visualizations to teach the concepts and simulated experiences for involved learning. It helps simplify otherwise complex concepts into interactive and engaging segments for students. Educators recognized the benefits of these platforms during the pandemic years and continued to advocate using them in the post-pandemic scenario as an additional resource to facilitate effective learning. SLEs encouraged varied learning strategies enhancing memory and consolidation of learned material. A lecturer participant with over five years of teaching in higher education comments about smart learning environments below.

*F5: "I find them very convenient because when we are explaining something using some of these technologies, let's say something as simple as PowerPoint or a presentation, or using certain videos to understand or explain a mechanism, that's much easier than talking about it or trying to draw it on the board. Or conducting online tests, I find it very convenient because it has been particularly useful" (Personal Communication).*

SLE platforms are often considered not just to enhance the teaching process but also to enhance the learning outcome. They offer tools to track the progress and access the adequate level of knowledge comprehension students would have achieved after a module. Participants

commented on these easing processes of measuring student progress and thereby, these platforms also gained data for adequately developing their newer versions.

*F4: "Student data can be used for predictive analysis mostly. They are trying to predict, say, for example, to understand or develop the software for the future" (Personal Communication).*

Lecturers were also favorable towards the SLE for their tailor-made suggestions based on each student's unique progress. Platforms also offered opportunities for interaction between the educator and learner, thus enhancing the overall learning outcome of the group.

*F1: "When the lecturer is interacting with students with regard to their progress or some sort of, let's say when we discuss with students about their shortcomings and how they can improve can be seen from their progress on the portal" (Personal Communication).*

### *Main Theme 2: Novelty and Complexity in SLE*

Lecturer participants, although they expressed enthusiasm and increased teaching efficacy, were also bothered by the complexity of the smart learning environments. Most of them had little training and experience in these platforms and had to consciously learn to navigate through them when they were introduced during the pandemic. The sub-themes of difficulties in technological adaptation and constraints in tracking student progress detail the experience of this struggle lecturers had to go through on these platforms.

#### *Sub-theme 1: Difficulties in technological adaptation*

The introduction of the Internet is relatively new in non-WEIRD economies. Therefore, most lecturers received little internet-based training during their educational training, and a gap exists between lecturers' digital competence and students. Participants who were lecturers were aware of this and voiced their concerns about understanding the platform and its nuances.

*F2: "I think there is a lot of experimentation that needs to be done. As lecturers, we are also figuring out a lot of things. We are not very clear about the entire process" (Personal Communication).*

Therefore, there is an added effort for lecturers involved to consciously learn the new methods of using these platforms. Lecturers reported helplessness in understanding the varied ways of navigating through the platform. It was not uncommon for lecturers to experience roadblocks while adapting to technology-related challenges online, and participants also anticipated the need to explore the challenges of these new methodologies as in the excerpt below.

*F1: "Chalk and talk was a process that was there for generations so what are the challenges of that we are already aware of but as time progresses, I think we need to explore, more research needs to be conducted in this area, so we generate knowledge to understand the challenges, advantages and accordingly take it forward" (Personal Communication)*

#### *Sub-theme 2: Constraints in tracking student progress*

Participants also reported that they were restricted in tracking student progress during a session, although student progress was continuously monitored through the software used. Lecturers felt they had lost the physical connection with students and could not gauge if an activity was exciting, or a lesson was understood through observation. This was mainly a significant challenge when the number of students was greater in their classrooms.

*F3: "I don't know if it adds to it but because it has become online, we have also become, like increased the number of assignments and activities than engagement or something that we would have in face-face interactions" (F3, Personal Communication).*

Conventional face-to-face teaching-learning allowed constant observation, and the lecturer had more authority over the pace at which students were progressing, whereas, in SLE platforms, lecturer participants reported feeling oblivious about the student's progress once the student was engaged in the activity. This led to lecturers trusting the students' comments, and this transfer of responsibility to students to pace their own progress was new in the sociocultural context of the participants. Some participants also had doubts about student motivation as in the comment below.

*F5: "Students are highly indulging in smart malpractice. Because see I think that many of their works can be plagiarized" (Personal Communication)*

These doubts and concerns over student motivation in truly engaging with the material were assumed to have decreased the initial motivation lecturer participants had when using these smart learning platforms. An anecdote of the same is provided below.

*F3: "I think they would indulge in a lot of these practices. So yeah. Because of this, I would say that my motivation has come down, there is a general feeling that maybe everyone is doing it so why even bother to put in 100 percent" (Personal Communication).*

This, therefore, becomes a significant challenge affecting both lecturer motivation and the learning outcome of students. Cultural stereotypical assumptions of students being less responsible with their learning tasks could also be interpreted considering the unique socio-cultural context of the participants.

### *Main Theme 3: Student Excitement*

This theme contains the various responses student participants had toward the newly introduced smart learning environments. Two themes emerged from the data, eagerness at novelty and the affordance of interactivity and engagement. The emergent sub-themes are discussed below.

#### *Sub-theme 1: Eagerness at novelty*

The advent of smart learning environments often in response to continuing education during the pandemic was welcomed with considerable enthusiasm by the students. The new method allowed the use of their devices, which earlier were considered for entertainment purposes and that itself was exciting for many. S2 recalls her excitement in using her phone for once without her parents commenting on her increased screen time.

*S3: "When we turned online, I joined classes through my phone and for the first time my parents were okay with me using the phone" (Personal Communication).*

The use of these platforms was considered more straightforward and convenient and student participants reported feeling more heard. Participants also reported that they found the platforms to be very helpful in the learning process and enhanced their learning outcomes to a greater extent.

*S5: "It is offering more or less everything that is required at this point... I think this is a much more efficient way of learning since its very flexible" (Personal Communication).*

Smart learning platforms were also perceived by student participants to have created a deeper connection between the lecturer and student in comparison to the offline mode of learning as in the excerpt that follows.

*S1: "Initiation between student and lecturer is more on online rather than offline mode and classrooms" (Personal Communication).*

#### *Sub-theme 2: Affordance of interactivity and engagement*

The integration of SLE with different smart devices or the Internet of Things enables the learning process to be mobile transcending geopolitical boundaries. Complex information could be broken down into more manageable chunks, and synchronous interactivity increases engagement and hence the learning outcomes. Content that once had to be explained using words and diagrams on two-dimensional surfaces was now transformed into three-dimensional models which could be perceived more holistically enhancing the learning experience.

*S2: "All those problems get solved in platforms like g classroom where we can actually see the process and also explained by the professor." (Personal Communication).*

SLE platforms also offered a mirage of options to store and retrieve the modules from multiple platforms which was perceived as a great flexibility advantage by most student participants. A 19-year-old undergraduate student explains what the mobility smart learning environments offer by comparing them with older methods in the excerpt below.

*S5: "Storing and retrieving data gets easier online because it doesn't take much space and accessing those data whenever you want and retrieving that anytime. It's much more flexible. It is a bit harder work, more time-consuming when it was offline, I think" (Personal Communication).*

Another student participant comments on the personalized organizational capability of these platforms and how they have eased the process of learning.

*S6: "Every student has their own login page and tabs under which every assignment of every subject comes in. So, it is easy to track my submissions etc. So, it helps in facilitating learning in my opinion" (Personal Communication).*

#### *Main Theme 4: Limitations of content*

Smart learning environments have also posed certain challenges, particularly in content that is not amenable to a three-dimensional or visual-kinaesthetic presentation. Student participants also reported having encountered certain challenges using these platforms, and this theme categorizes those challenges into two sub-themes, difficulties in navigation and difficulties in mentoring.

#### *Sub-theme 1: Difficulties in navigation*

The initial experiences of using smart learning environments were very similar for both populations in the sample. Both lecturers and students recalled their initial difficulties navigating the various options. Technical glitches, particularly related to poor internet connectivity and

slow streaming, were the most common challenges encountered by students. Participant S3 remarks that even with all its challenges, it worked well enough to help him continue his education. A snippet from his transcript follows.

*S3: "During Covid, this was the only option many of us had so although there are glitches, at least education didn't stop. So, I am kind of contented with online education." (Personal Communication)*

Student participants also commented about their difficulty in navigating through factual and fictitious information online especially when they had to work with the Internet in general for their supplementary learning. A postgraduate student participant raised her concerns about understanding the authenticity of websites as in the excerpt,

*S6: "Sometimes, for example, when we check for plagiarism, we upload the material into a website or app, they show a report for the plagiarism. But when you put the same article again, the percentage of plagiarism increases. It means that, I guess, they are stealing our article. But I don't know what to do about it." (Personal Communication).*

Student participants also posited that this issue could be resolved if lecturers could offer more support in navigating through SLEs. S1 raises his concern on the same.

*S1: "Students they are still learning, and they are not in a position to understand or are not using these tools for generating knowledge so I think lecturers should take on this responsibility." (S1, Personal Communication).*

### *Sub-theme 2: Difficulties in Mentoring*

When SLEs were swiftly introduced to the teaching curriculum, one of the biggest challenges to encounter was the novelty of the platforms. This led to a period of confusion that student participants recalled as a difficult phase where they felt no supports were available.

*S1: "I would like my lecturers to help me with this, but I don't know sometimes it feels like it is out of their control as well." (Personal Communication)*

This skepticism towards learning was also accelerated by factors like increased workload implemented to compensate for the lack of face-to-face interactions and uncertainty about the outcomes of the various activities that were assigned. S6 recalls her experience of not receiving feedback on some of her work assigned during this time and how that had demotivated her.

*S6: "In my research class, I had written a paper and we had to submit. It was told to us that if we write well then there is a possibility that might be published or something of that sort. But there was no feedback given to us. We have no idea about what has happened to that article." (Personal Communication).*

The uncertainty of the situation, with unseen support from lecturers and a lack of peer groups, subsequently contributed to a diffused responsibility leading to an increased incidence of academic dishonesty. Student participants felt that the anonymity, often perceived in a virtual space, made smart malpractices easier to attempt and made them less guilty than in face-to-face learning methodologies. The perception of this anonymity and the diffused responsibility is best explained in the excerpt below.

*S4: "In offline mode, it's difficult to engage in malpractice also you have a constant fear because someone is looking at you. There are students around, the environment is such that there are consequences but in online mode, I think the fear gets very less somehow even though your video is on, and all precautions are taken, still the fear reduces" (Personal Communication).*

## Discussion

The present study explored the expectations of lecturers and students towards smart learning environments through a qualitative framework, and themes were generated as illustrated in Table 3. Both lecturer and student participants commented on the multimodality of smart learning environments and how they improved learning outcomes and enhanced knowledge and skills, as reported in the literature (Pei & Wu, 2019). However, the present study also reported that one factor contributing to this perceived increase in learning outcomes was the affordability of organization in these platforms, allowing students to focus on learning skills rather than gathering and organizing resource materials. Student participants particularly found it beneficial to find their resources in one space to use their time effectively.

The themes of innovative nature and student excitement had sub-themes such as enhanced learning through lecturer efficacy, feelings of enthusiasm, novelty, and engagement, which learners perceived to be contributing to their autonomy in the learning space. The autonomy that learners perceived to have attained in these smart learning environments could be understood through the lens of self-determination theory (Ryan & Deci, 2000), where the internal control they assumed over learning controls and outcomes contributed to a positive outlook toward the use of ICTs in education (Racero et al., 2020). Adams and Khojasteh (2018) empirically demonstrated the association between perceived support in the autonomy of learners as a need for supportive climate and student performances among school-going children. Blended learning models improving students' internal satisfaction in learning were also validated in a study on the flipped classroom model before the pandemic (Sergis et al., 2018).

The perception of multimodality in online learning aiding improved learning outcomes, was, however, contradicted in a study of the psychological perceptions of students' engagement in online learning in the US, South Korea, and Columbia (Zapeta-Cuervo, 2021). However, the engagement in smart malpractices and the perceived lack of lecturer motivation also suggest the possibility of online learning being stressful. The unique socio-cultural position of the sample, which promotes increased academic competition and social pressures on attaining a college degree, could have been a significant factor contributing to this difference.

Personalization in smart learning environments was perceived to be advantageous and enhancing teaching-learning efficacy by both lecturer and student participants. This problem-focused learning emphasizes the lecturers' and students' awareness and positive outlook toward the affordability of personalization in smart learning environments. This affordability was also explored earlier in the empirical study of Vega-Hernandez et al. (2018), where they explored the use of ICTs among students from different subject streams among students from a developed country.

In the context of the present study, lecturers had little training about the use of ICTs and smart learning environments during the pandemic when these platforms were adopted to substitute for physical face-to-face classroom interactions. The importance of this readiness for adopting e-learning in higher education in the context of a developing country is also influenced by factors like lack of hardware and software as well as poor internet bandwidth (Mousa et al., 2019). Previous studies suggest that training lecturers for the ICTs with adequate scaffolding and continuous feedback improved their positive associations with the use of ICTs in their classrooms irrespective of their gender and age (Comi et al., 2017; Tondeur et al., 2018). Therefore, since these smart learning environments continue to dominate a significant

part of the teaching learning process in University education, it becomes quintessential for organizations to provide adequate training and support to their educators to enhance student engagement and subsequently the learning outcomes.

The present study also indicated the importance of student-content interaction and the lecturer's role in interactive content on the perceived student satisfaction in online learning environments (Alqurashi, 2018). The increased workload of creating more interactive content, along with the lack of honesty from the student population, has also contributed to the decrease in lecturer motivation, and this finding is in accord with Elshami et al. (2020) which also proposed that faculty satisfaction in online learning was imperative by workload and institutional support. There is, therefore, an inevitable relationship between the perception of lecturer motivation and the autonomy of students in determining the efficacy of technology-assisted learning, and these findings are consistent with the proposed model of student engagement in online learning (Chiu, 2022). The sub-theme difficulties in mentoring and tracking students' progress notice the presence of a cycle between lecturer and student expectations and how the perceived futility of expectations leads to diminished learning outcomes. As the expectations about SLE increased, the expectation of learning outcomes amongst students and lecturers also becomes a significant need to perform the best, leading to heightened engagement in smart malpractices among learners. As many learners engaged in these academic dishonesty behaviors, lecturers felt helpless about their lack of control in this situation and found mentoring for a positive attitude towards SLE difficult. This diffusion of responsibility and anonymity that the SLEs offer contributes to the lack of motivation to initiate more interaction with students. This was again perceived as lecturers' lack of engagement, probably decreasing their guilt and feelings towards students' engagement in malpractice may lead to a vicious cycle of miscommunication.

## Conclusions and Implications

The study explored the expectations of lecturers and students in smart learning environments as intended in the context of India. The four major themes derived from the qualitative data are the innovative nature, novelty, and complexity of SLE, student excitement, and limitations of content. While both parties assumed that technology-assisted learning offered enhanced teaching efficiency, interactivity and engagement, there were also challenges, especially in adapting to the nuances of SLEs. Smart learning environments thrived during the pandemic and continue to stay mainstream in the post-pandemic scenario with the problem-solving learning environment and multimodality, which soars the learning outcomes. There were also visible discrepancies between the two groups' expectations and implementations regarding their expectations of each other. Lecturers were aware of smart malpractices and were discontented with the widespread nature of this academic dishonesty. Students, however, desired for lecturers to be more immersive in their digital skills to provide maximum engagement and interaction in learning. Based on the findings, the current study argues the imminent need for SOP (standard operating procedures) for the smooth functioning of SLE in Higher education. There is a pressing need to devise methods to improve personal responsibility and initiate self-learning. A functional, hands-on approach is necessary to deal with online disinhibition and academic honesty. At the same time, improved personalized evaluation methods are to be crafted for transparent assessment of learning outcomes. Remote education would co-exist with the traditional face-to-face educational models facilitating equity and opportunity for learners beyond their geopolitical positions.

## Conflict of interest

There is no conflict of interest among the authors. All authors have significantly contributed to the paper. The corresponding author ideated, guided the entire manuscript, and will hold the responsibility to respond to reviewer comments.

## Acknowledgement

This research received no specific grant from funding agencies. The researchers thank all the participants of the study and the University, for encouraging us to carry out the present study.

## References

- Adams, C., & Khojasteh, J. (2018). Igniting students' inner determination: The role of a need supportive climate. *Journal of Educational Administration*, 56(4), 382-397. <https://doi.org/10.1108/JEA-04-2017-0036>
- Alier, M., Casañ Guerrero, M.J., Amo, D., Severance, C., & Fonseca, D. (2021). Privacy and e-learning: A pending task. *Sustainability*, 13(16), Article 9206. <http://dx.doi.org/10.3390/su13169206>
- Al-Gahatani, S. S. (2016). An empirical investigation of e-learning acceptance and assimilation: A structural equation model. *Applied Computing and Informatics*, 12(1), 27-50. <https://doi.org/10.1016/j.aci.2014.09.001>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Chiu, T. K. F. (2022). Applying the self-determination theory (SDT) to explain student engagement in online learning during the COVID-19 pandemic. *Journal of Research on Technology in Education*, 54(1), 14-30. <https://doi.org/10.1080/15391523.2021.1891998>
- Cheung, S. K. S., Kwok, L. F., Kongkiti, P., & Yang, H. H. (2021). Shaping the future learning environments with smart elements: Challenges and opportunities. *Revista de Universidad y Sociedad del Conocimiento. International Journal of Educational Technology in Higher Education*, 18(1), Article 16. <http://dx.doi.org/10.1186/s41239-021-00254-1>
- Comi, S., Gui, M., Origo, F., Pagani, L., & Argentin, G. (2016). Is it the way they use it? Teachers, ICT, and student achievement. University of Milan Bicocca Department of Economics, Management and Statistics Working Paper No. 341, *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2795207>
- Dare, E. (2021). Online learning platforms and the confessional subject. *Architecture and Culture*, 9(2), 249-259. <https://doi.org/10.1080/20507828.2021.1888211>
- De Freitas, E., Rousell, D., & Jäger, N. (2020). Relational architectures and wearable space: Smart schools and the politics of ubiquitous sensation. *Research in Education*, 107(1), 10-32. <https://doi.org/10.1177/0034523719883667>
- Elshami, W., Taha, M. H., Abuzaid, M., Saravanan, C., Al Kawas, S., & Abdalla, M. E. (2021). Satisfaction with online learning in the new normal: The perspective of students and faculty at medical and health sciences colleges. *Medical Education Online*, 26(1), Article 1920090. <https://doi.org/10.1080/10872981.2021.1920090>
- Ha, C., & Lee, S.-Y. (2019). Elementary teachers' beliefs and perspectives related to smart learning in South Korea. *Smart Learning Environments*, 6(1), Article 3. <https://doi.org/10.1186/s40561-019-0082-5>
- Hope, A. (2015). Foucault's toolbox: Critical insights for education and technology researchers. *Learning, Media and Technology*, 40(4), 536-549. <https://doi.org/10.1080/17439884.2014.953546>
- Jarke, J., & Breiter, A. (2019). Editorial: The datafication of education. *Learning, Media, and Technology*, 44(1), 1-6. <https://doi.org/10.1080/17439884.2019.1573833>
- Koohestani, H. R., et al. (2019). Lived experiences of nursing students about ethical concerns of using mobile learning in educational and clinical contexts. *Journal of Medical Ethics and History of Medicine*, 12. <http://dx.doi.org/10.18502/jmehm.v12i5.858>

- Lawson, C., et al. (2016). Identification of "at risk" students using learning analytics: The ethical dilemmas of intervention strategies in a higher education institution. *Educational Technology Research & Development*, 64(5), 957–968. <https://doi.org/10.1007/s11423-016-9459-0>
- Manolev, J., Sullivan, A., & Slee, R. (2019). The datafication of discipline: ClassDojo, surveillance and a performative classroom culture. *Learning, Media and Technology*, 44(1), 36-51. <https://doi.org/10.1080/17439884.2018.1558237>
- Myung-Sill, C., & Seomun, G. (2021). Health Issues with learning to use smart devices in the Digital Age: Using a grounded theory approach. *International Journal of Environmental Research and Public Health*, 18(13), 7062. <http://dx.doi.org/10.3390/ijerph18137062>
- Morgado, J. C., et al. (2021). Smart education as empowerment: Outlining veteran teachers' training to promote digital migration. *Technology, Knowledge, and Learning*, 26(4), 897-916. <http://dx.doi.org/10.1007/s10758-021-09494-6>
- Oke, A., & Fatima Araujo, P. F. (2020). Innovations in teaching and learning: Exploring the perceptions of the education sector on the 4th industrial revolution (4IR). *Journal of Open Innovation: Technology, Market, and Complexity*, 6(2), 31. <http://dx.doi.org/10.3390/joitmc6020031>
- Page, D. (2017). The surveillance of teachers and the simulation of teaching. *Journal of Education Policy*, 32(1), 1-13. <https://doi.org/10.1080/02680939.2016.1209566>
- Pen, L. (2021). Applying the PECSL: Using case studies to demonstrate the pedagogy of experience complexity for smart learning. *Smart Learning Environments*, 8(1). <http://dx.doi.org/10.1186/s40561-021-00158-7>
- Pei, L., & Wu, H. (2019). Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Medical Education Online*, 24(1). <https://doi.org/10.1080/10872981.2019.1666538>
- Racero, F. J., Bueno, S., & Gallego, M. D. (2020). Predicting students' behavioral intention to use open source software: A combined view of the technology acceptance model and self-determination theory. *Applied Sciences*, 10(8), Article 2711. <https://doi.org/10.3390/app10082711>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Sergis, S., Sampson, D. G., & Pelliccione, L. (2018). Investigating the impact of flipped classroom on students' learning experiences: A Self-determination theory approach. *Computers in Human Behavior*, 78, 368-378. <https://doi.org/10.1016/j.chb.2017.08.011>
- Škrinjarić, B., Budak, J., & Rajh, E. (2019). Perceived quality of privacy protection regulations and online privacy concern. *Economic Research-Ekonomska Istraživanja*, 32(1), 982–1000. <https://doi.org/10.1080/1331677x.2019.1585272>
- Spector, J. M. (2016, March). *Smart learning environments: Concepts and issues*. In Society for Information Technology & Teacher Education International Conference (pp. 2728-2737). Association for the Advancement of Computing in Education (AACE).
- Stephan, S. H. (2017). Trust-related privacy factors in e-learning environments. *Distance Learning*, 14(4), 49-54. <https://www.proquest.com/scholarly-journals/trust-related-privacy-factors-e-learning/docview/2057948333/se-2?accountid=38885>
- Su, Y., & Li, M. (2021). Applying technology acceptance model in online entrepreneurship education for new entrepreneurs. *Frontiers in Psychology*, 12, Article 713239. <https://doi.org/10.3389/fpsyg.2021.713239>
- Teimouri, M., Seyed, R. B., Griffiths, M. D., & Md, S. H. (2018). A model of online protection to reduce children's online risk exposure: Empirical evidence from Asia. *Sexuality & Culture*, 22(4), 1205-1229. <http://dx.doi.org/10.1007/s12119-018-9522-6>
- Tondeur, J., Aesaert, K., Prestridge, S., & Consuegra, E. (2018). A multilevel analysis of what matters in the training of pre-service teachers' ICT competencies. *Computers & Education*, 122, 32-42. <https://doi.org/10.1016/j.compedu.2018.03.002>
- Tzimas, D., & Demetriadis, S. (2021). Ethical issues in learning analytics: A review of the field. *Educational Technology Research & Development*, 69(2), 1101–1133. <https://doi.org/10.1007/s11423-021-09977-4>

- Vega-Hernández, M., Patino-Alonso, M., & Galindo-Villardón, M. (2018). Multivariate characterization of university students using the ICT for learning. *Computers & Education, 121*, 124-130. <https://doi.org/10.1016/j.compedu.2018.03.004>
- Williams, D., Kilburn, A., Kilburn, B., & Hammond, K. (2019). Student privacy: A key piece of the online student satisfaction puzzle. *Journal of Higher Education Theory and Practice, 19*(4), 115-120. <https://www.proquest.com/scholarly-journals/student-privacy-key-piece-online-satisfaction/docview/2291990716/se-2?accountid=38885>
- West, D., Huijser, H., & Heath, D. (2016). Putting an ethical lens on learning analytics. *Educational Technology, Research and Development, 64*(5), 903-922. <http://dx.doi.org/10.1007/s11423-016-9464-3>
- Willis, J., Slade, S., & Prinsloo, P. (2016). Ethical oversight of student data in learning analytics: A typology derived from a cross-continental, cross-institutional perspective. *Educational Technology Research & Development, 64*(5), 881-901. <https://doi.org/10.1007/s11423-016-9463-4>

Received: June 22, 2023

Revised: July 12, 2023

Accepted: August 01, 2023

Cite as: Prakasha, G. S., Chakraborty, R., Thirumalesha, S., Gururaja, C. S., Sangtam, T. Y., Rhatsu, K., & Jochan, G. M. (2023). Expectations of university lecturers and students on smart learning environments. *Problems of Education in the 21<sup>st</sup> Century, 81*(4), 501-516. <https://doi.org/10.33225/pec/23.81.501>

<b>G. S. Prakasha</b> (Corresponding author)	PhD, Associate Professor, Christ University, Bangalore, India. E-mail: prakasha.gs@christuniversity.in ORCID: <a href="https://orcid.org/0000-0002-1287-7606">https://orcid.org/0000-0002-1287-7606</a>
<b>Rituparna Chakraborty</b>	PhD, Assistant Professor, Department of Psychology, Christ University, Bangalore, India. E-mail: rituparna.chakraborty@christuniversity.in ORCID: <a href="https://orcid.org/0000-0001-6023-3728">https://orcid.org/0000-0001-6023-3728</a>
<b>S. Thirumalesha</b>	PhD, Assistant Professor, Mount Carmel College, India. E-mail: thirumalesh@mcclbr.edu.in
<b>C. S. Gururaja</b>	PhD, Assistant Professor, Mount Carmel College, India. E-mail: gururaj@mcclbr.edu.in
<b>T. Yolila Sangtam</b>	PhD, Assistant Professor, Nagaland University, India. E-mail: yolila@nagalanduniversity.ac.in
<b>Keneivi-u Rhatsu</b>	Nagaland University, India. E-mail: lkeneivi@gmail.com
<b>Grace Maria Jochan</b>	PhD Student, Department of Psychology and Counselling St. Joseph's University, India. E-mail: grace.jochan@res.christuniversity.in ORCID: <a href="https://orcid.org/0000-0001-5091-065X">https://orcid.org/0000-0001-5091-065X</a>