Insights from online education in the Egyptian higher education

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Abstract

Purpose – The introduction of technology in education has been a strategic objective at both the governmental and educational institutional levels long before Covid-19. However, the acceleration to e-learning caused by the pandemic disrupted the traditional classroom environment overnight forcing the entire sector at all levels, school, undergraduate and postgraduate, to shift to online learning. Regardless of readiness, the action was taken, and online instruction was implemented, improved, adjusted and enhanced during the experience. After 18 months comprising three semesters of online education amongst MBA and DBA students, the researchers decided to survey to investigate and assess the quality of the experience. The study aims to investigate the students' perception of this unique opportunity to provide an assessment of online education in higher education, achievement or failure, and based on the results, provide a roadmap for improvement. The study also addresses the uniqueness of the Egyptian higher education environment and the particularity of its student's context.

Design/methodology/approach – This study used a quantitative descriptive survey method to find out how students felt about their online education by giving them a questionnaire and using automated numerical computation to generate data. The total number of the completed survey was 853. However, to include only those responses that were completed attentively, a speed factor was calculated for each respondent. Cases with speed factors higher than three were excluded from the sample, leading to 666 accepted responses. Data collected were analysed using correlation, regression and path analysis.

Findings – Favourable satisfaction levels towards online education, and favourable perceptions towards university support, instructor–student communication and course design were found. Less favourable perceptions were found towards peer collaborations and student initiative.

Research limitations/implications – While the study proves reliability through the number of candidates participating in the survey, the rigorous measures of eliminations in the sample, the validity value of the questionnaire and the literature recommendation of the model are used here; yet it is important to point out that: further elements in the e-learning can and need to be studied, such as cultural implications, generational differences, government support reality from policies to infrastructure and management philosophy readiness in developing countries amongst other factors.

Practical implications – Resources and skills are amongst the factors that were found to affect students' satisfaction with online education, directly and positively. Student initiative was found to have a moderating role in how student, instructor and institution determinants affect students' satisfaction with online education.

Originality/value – The uniqueness of this paper is that it seeks to assess the agility of the Egyptian education system during COVID-19 in higher education. It provides evidence to the current status as no study assesses the student perception.

Keywords Higher education, Education management, Student satisfaction, e-learning

Paper type Research paper

Introduction

The global pandemic that was officially announced in March 2020 urged governments to implement different measures that ranged in severity and quickness, from complete

lockdown to relatively minimal curfews. As a crucial industry, the educational sector was no exception. An emergency e-learning mode was announced for the whole educational system, including schools and universities with undergraduate and postgraduate programmes. The crisis's timeline could not be accurately stated from a global perspective. The educational sector implemented the online mode using what was available to it and what was available to the students at home based on the already existing infrastructure, with all of its variations from one institution to another. As the crisis persisted, educational institutions realised that they needed to invest in staff training, software development, online educational strategy and technological infrastructure.

Despite the benefits that technology integration has always been said to bring, the current situation provides an excellent chance to examine both its benefits and drawbacks. The purpose of the study is to analyse the singular experience that everyone on Earth has had in more detail. Gain from the experience by sharing satisfactory and unsatisfactory tales. The particularity and distinctiveness of each setting provide the basis for satisfaction or not, hopefully leading to a roadmap on how to digitalize in favour of education with a focus on the student experience.

We begin the study with a section on the history of e-learning to address the aforementioned interest. The fieldwork is then described in terms of the study's structure and environmental issues. The process for gathering and analysing the data is then described and the results and analysis are then presented, leading to a section on recommendations and limitations that conclude the study.

Literature review

Learning theories were examined to see which ones were most suitable for the online learning process to identify the aspects that serve as proxies for the accomplishment of the learning process. The behaviourist learning theory, which Skinner created in 1953, contends that when knowledge is imparted by an instructor, students learn while acting as passive participants. This method of instruction was deemed suitable for imparting objective knowledge, Skinner (1965). Gagne (1984) created the cognitive learning theory in 1984 as a result of the requirement to take into account learning mechanisms that are appropriate for non-absolute information transfer. According to this view, learning occurs when students are engaged in the learning process and actively seek out information.

The contextual factor began to be recognised as a crucial element of successful learning processes as learning processes evolved. Chickering and Gamson created taxonomy of seven concepts in 1987 to measure the efficiency of the educational process. The following guidelines should be followed: promote open communication between the teacher and the students, foster student–student cooperation, employ active learning techniques, provide prompt feedback, emphasize student time on task, communicate high expectations and respect for individual student differences. These guidelines were discovered to have magnified impacts when combined, based on 50 years of study on teaching and learning (Chickering and Gamson, 1987). The study of Portela et al. (2019) on the effectiveness of online education during COVID-19 was based on these seven principles.

The constructivist learning theory considers how learners learn via experience while taking into account their social, cultural and contextual contexts. Because online learning is more dependent on the circumstances and efforts of the student, constructivist learning is seen as essential (Tsang et al., 2021). Three theories such as collaborative learning, cognitive information processing and facilitated learning—were created as expansions to this paradigm. The collaborative learning idea emphasises the need for sharing and cooperation between teachers and students. According to the cognitive information processing theory, which is supported by course design, learning occurs through cognitive processes like attention and encoding, storing and retrieving knowledge (Bovy, 1981).

The model created by Tsang *et al.* (2021) is used in the present study to evaluate the efficacy of online education used during the COVID-19 pandemic. It is anticipated that it will add to the literature in several ways. First, the study provides a practical implementation of the model that Tsang considered being a gauge of the efficiency of online learning. Second, the current study not only provides an assessment of the learning process but also identifies the precise factors that affect the process' efficacy or inefficacy. Third, the study offers an assessment of the graduate students context for online learning especially. Focussing on this context is essential because it is predicted that, for two reasons, both based on the constructivist learning method, the efficiency of such a form of instruction will change greatly between undergraduates and postgraduates. Postgraduate students experience distinct social, cultural and contextual circumstances than undergraduates do.

Prior to COVID-19, online learning gained popularity as a flexible and cost-effective way to supplement traditional higher education. During COVID-19, higher education institutions (HEIs), academic staff and students from all over the world faced a variety of difficulties and opportunities related to online teaching and learning.

Online education benefits

Understanding how technology supports online learning in HEIs is essential for implementation and access. However, developing more egalitarian, responsive and sustainable education systems for COVID-19 and beyond is a very difficult educational task that cannot be solved by technology alone (Facer and Selwyn, 2021).

Emerging technologies and practices, such as artificial intelligence, micro-credentialing, blockchain and open educational resources, are reported and predicted to have the potential to influence the future of global higher education teaching and learning. However, a full understanding of how these technologies can be applied to facilitate teaching and learning is still lacking (OECD, 2021; Pelletier *et al.*, 2021). Rather than concentrating solely on technology, policymakers, researchers and practitioners should use technology to engage in innovative pedagogy.

Without prior planning or testing, COVID-19 accelerated the shift to online education in an unprecedented way (Burgess and Sievertsen, 2020). With little time to prepare or adapt, the transition happened quickly. Face-to-face courses that were previously scheduled to be provided online were compelled to do so quickly. It was necessary for institutions, educators and students to immediately adjust. This generated questions regarding how this change might affect the educational process' effectiveness, which might have been sacrificed to prevent a complete disruption of instruction.

A project to link the management and educational fields to the scientific literature on the COVID-19 disruption was started by Rodrigues *et al.* (2020). However, HEIs were not the exclusive focus of this investigation. As a result, there is still a dearth of studies that thoroughly examine the scientific data about online higher education produced by international research and practice communities. To close this gap, the current study examines how higher education has changed since the epidemic. Moreover, Portela *et al.* (2019) conducted a study based on a survey of instructors and students from universities in 13 European nations studying economics and business administration to evaluate the effectiveness of online education to that of the originally established face-to-face mode. Their findings indicated that students believed online learning to be more effective and that this perception was mostly due to the flexibility it provides for time management, more responsibility and on-going feedback. The experience, however, was evaluated by the students as offering less interaction and a greater sense of isolation.

The overall findings demonstrated that, except for two areas, namely communicating high expectations to students and the amount of time they spend studying for a course, online

learning is not seen to sustain the quality of education provided by its face-to-face equivalent. Less active learning, delayed or absent feedback, less regard for individual student variations and worse peer collaborations were all identified as contributing factors to decreased effectiveness. It is important to note that the techniques employed in such universities relied heavily on passive distribution and minimal engagement.

A substantial percentage of the global higher education landscape is now occupied by online learning (Blumenstyk, 2015). This rise is due to its monetary viability, cost-effectiveness, flexibility, convenience and accessibility – in terms of time and place (Singh and Hurley, 2017; Bonk and Graham, 2012; Huang *et al.*, 2020; Onete *et al.*, 2014). This method of learning was also deemed appealing for the improved student interactions and teacher communication it delivers through discussion forums (Stevens, 2015).

Online education's drawbacks
Recently, a study by Abu Talib *et al.* (2021) looked at how academics and students were affected by the switch from traditional to online education. The results of this review imply that the quick transition has a detrimental effect on students' mental health. There may have been a decline in involvement amongst college students due to their reliance on recorded lectures, tiredness from extended screen time, and a lack of interpersonal contact. Despite these difficulties, the authors asserted that being obliged to participate in online learning may have sparked the development of creative teaching methods, the incorporation of contemporary technology and decreased educational costs.

Online learning has faced harsh criticism both in theory and practice, despite its widespread expansion. It has primarily been criticised for infrastructural obstacles that hinder students, teachers and institutions from operating effectively (Pelgrum, 2001; Shank and Sitze, 2004; Borup and Evmenova, 2019). These obstacles are brought about by a lack of, an inadequacy in, or poor management of the necessary hardware, software and connectivity (Bhati *et al.*, 2009). The absence of appropriate training for both instructors and schools is another facet of online education that has drawn criticism (Pelgrum, 2001). This lack of training leads to teachers' uneasiness when teaching online, their nervousness about computers and their distrust of technology, especially in older generations (Bhati *et al.*, 2009).

Additionally, there are psychological and behavioural factors that make online education less effective than in-person instruction. Students that take part in online learning experience loneliness (De Metz and Bezuidenhout, 2018). According to Portela *et al.* (2019), this alienation might affect students' motivation, time management, sense of responsibility, discipline and sense of belonging. This is because collaboration fosters involvement through idea sharing, which encourages critical thought and increased understanding (Chickering and Gamson, 1987). Researchers and practitioners both criticise online education for having integrity problems that are not present in face-to-face instruction (Gallant *et al.*, 2015).

Research methodology
To respect the anonymity of the institution in which we have conducted our research that it has been serving the higher education sector in Egypt for 50 years today and offers more than 18 specializations from diplomas, to master to doctoral degrees, in both the professional and academic arena. The Master of Business Administration (MBA) and the Doctor of Business Administration (DBA) were the two degrees on which we concentrated our research. The high numbers of students enrolled in these two programmes, which would provide reliability to the findings and conclusions, are the motivation and goal behind this decision. Furthermore, students in postgraduate business programmes come from a variety of disciplines, including law, business, engineering, medical and other liberal arts and sciences. This makes it possible

to draw broad conclusions. The efficiency of online education in postgraduate courses in Egypt has not yet been evaluated, to the researchers' knowledge.

This institution was in the midst of a busy spring 2020 recruitment period and one week out from the end-of-semester exams for fall 2019. Strategic decisions were made to resume the tests without interfering with the student schedule, and they were successfully administered entirely online. Out of the 300 candidates, 150 only chose to enrol online once it was stated that the spring 2020 semester will be done online. It is crucial to note that, even though just 150 candidates joined the online programme in the spring of 2020, enrolment numbers significantly increased the following semester, as shown in Figure 1 below.

The school invested in on-going surveys to enhance its understanding of what was going on which resulted in the development of the following questions:

(1) In terms of providing educational information and experiences for higher education, was online education satisfactory or unsatisfactory?

(2) Did online learning enable students' social experiences and professor rapport, or did it fail to do so?

(3) How do infrastructure and technical preparedness as an environmental aspect affect the online learning environment?

(4) What elements have the biggest influence on the online learning environment?

(5) How can we use the students' perception of this experience to draw lessons from it and create an improvement plan?

The students believed that online education was advantageous to them even if it was their first time taking an online course amid the COVID-19 epidemic (Agarwal and Kaushik, 2020; Rajabalee and Santally, 2020; Harasim, 2000; Sigala, 2002). Demographic traits, on the other hand, have a significant impact on how well an online course operates.

This study used an automated numerical computation to create data from a questionnaire given to students to determine how they felt about their teachers' online education. Peers collaboration, instructor–student communication, course design and university support are the predictor variables according to the model examined by Tsang. A fifth predictor variable—required resources and skills—was included in the model based on the literature's emphasis on the role played by technological factors in satisfaction with online education. The conceptual structure of the study is shown in Figure 2.
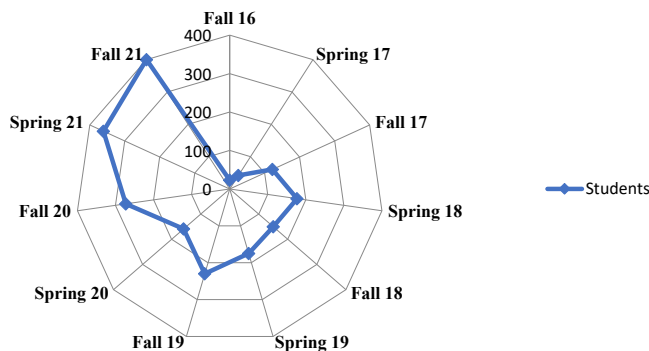
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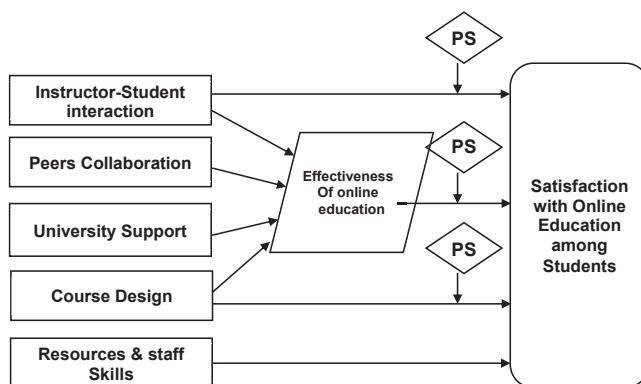
H1. Student–student/peer collaboration and communication positively affect student satisfaction with online education.

H2. Instructor–student communication positively affects student satisfaction with online education.

H3. Course design positively affects student satisfaction with online education.

H4. University Support positively affects student satisfaction with online education.

H5. Availability of resources and skills positively affects student satisfaction with online education.

Method
This study based on an online survey, using a questionnaire with high reliability. Peer collaborations, instructor–student communication, course design and university support are the predictive variables, according to Tsang *et al.* (2021). However, some adjustments were made to certain questions, and a few were added particularly of our interest in the Egyptian context, for which we have repeated the questionnaire reliability test to ensure the robustness of the findings and results.

The survey was sent to students, targeting those that have experienced both classrooms as well as online education. We used Survey Monkey to develop and dispatch the questionnaire. The population consisted of both males and females, with an age group from 22 to 55 years; all Great Cairo citizens had diversified working sectors and educational backgrounds. The questionnaire is divided into four major areas of investigation and again divided into eight sections. The first focus was investigating the platforms and technological impact on the educational experience; the second focus was investigating the quality of the course content online; the third focus was investigating the student–professor experience; the final focus was investigating the impact of the environment particularly on Egypt on the overall experience. These are the different angles; below we explain section by section the questions' values and objectives. Basic participant identification of programme and gender only was required, the remaining participant identifications were kept anonymous hence it does not add or deduct the value of the survey.

The *first section* was testing for peers' interaction: students' influence, interaction and network.

The *second section* assessed professor–student dialogue, with four items: its frequency, its impact and how it translates to content and course understanding.

The third section focussed on course design, with five items: course objective and material communication, module logical organization, intellectual stimulation and then course assessment tools relevance.

The fourth section is dedicated to the assessment of university support. Five items were targeted: policy quality, visibility, communicability and impact from the students' perception and experience.

The fifth section is rather environmental, with four items with a focus on students' possession of adequate technology devices, stable Internet connection and most importantly the digital knowledge to adapt and integrate online tools and platforms with sufficient confidence. The last section, consisting of two items only, assessed the level of satisfaction and education experience achievement from the online experience.

Overall, the questionnaire was designed to consume no more than three minutes to fill. A five-point Likert scale increases the participant's probability to start and finish the questionnaire.

The number of completed surveys was 853. However, to include only those responses that were completed attentively, a speed factor was calculated for each respondent by dividing the time spent to complete the survey by the median time to complete the survey. Cases with speed factors higher than three were excluded from the sample, leading to 666 accepted responses.

Results and discussion

To assess the reliability of the measurement tools, Cronbach's alphas were calculated for each construct. As shown in Table 1, Cronbach's alphas of the constructs showed acceptable internal consistency, with all alphas greater than 0.7.

Descriptive statistics showed that the sample was composed of 41 DBA students, and 625 MBA students; 73.1% of them are males and 26.9% are females. Table 2 shows the mean and standard deviation of responses on the instructor, institution and student determinants as well as proactive student and student satisfaction.

Construct	No. of items	α
Course design	5	0.945
Instructor–student communication	4	0.972
Proactive student	3	0.839
Resources and skills	4	0.723
Student satisfaction	2	0.965
Peer collaborations	4	0.948
University support	5	0.924

Table 1. Constructs reliability

Construct	Mean	SE
Course design	4.2	0.89
Instructor–student communication	4.08	1.07
Proactive student	3.62	1.13
Resources and skills	3.97	0.68
Student satisfaction	4.32	1.07
Peer collaborations	3.88	1.16
University support	4.27	0.86

Table 2. Descriptive statistics

To assess the effect of peer collaborations, instructor–student communication, course design and university support on student satisfaction with online education, correlation and multiple regression analyses were used. The correlation matrix in Table 3 shows that, gender showed no significant correlations with any of the variables. The highest significant correlations were between peer collaborations and instructor–student communication; instructor–student communication and each course design and overall satisfaction; course design and overall satisfaction.

After testing the assumptions of multiple regressions, the analysis was run to examine the effect of university support, resources and skills, peer collaborations, instructor–student communication and course design on student satisfaction with online education, controlling for programme and gender. The model summary showed an R squared equal to 0.874, which implies that university support, resources and skills, peer collaborations, instructor–student communication and course design explain 87.4% of the variance in student satisfaction with online education. As shown in Table 4, the results of the analysis showed that resources and skills, peer collaborations, instructor–student communication and course design have a significant effect on student satisfaction with online education, while university support did not show significant effects at the 5% level.

Based on this analysis, hypotheses H1, H2, H3 and H5 are accepted, while H4 is rejected. To test H5 whether proactive student initiative stimulate mediating mechanisms, a path analysis was performed. The starting point was to examine the effect of the five predictor variables on the mediating variables of proactive student controlling for programme and gender. The results (Table 5) showed that university support, peer collaborations, instructor–student communication and course design had significant relations, while resources and skills did not show significant results. The model summary showed an R squared equal to 0.76, implying that the predictor variables explained 76% of the variation in learning

	Programme	Gender	US	RS	SS	IS	CD	PLO	PS	OS
Programme	1	−0.01	−0.052	−0.01	−0.047	−0.063	−0.032	−0.082*	−0.087*	−0.037
Gender		1	0.048	−0.023	0.028	0.063	0.025	0.038	0.047	0.032
US			1	0.469**	0.612**	0.656**	0.716**	0.545**	0.378**	0.640**
RS				1	0.457**	0.524**	0.536**	0.469**	0.284**	0.551**
SS					1	0.895**	0.776**	0.831**	0.571**	0.790**
IS						1	0.846**	0.842**	0.572**	0.841**
CD							1	0.781**	0.555**	0.822**
PLO								1	0.580**	0.820**
PS									1	0.512**
OS										1

Table 3.
Correlation matrix

Dependent variable: overall satisfaction		
	B	*t*
CD	0.389*** (0.047)	8.208
Gender	−0.005 (0.046)	−0.107
IS	0.347*** (0.051)	6.774
Programme	0.01 (0.036)	0.288
RS	0.167*** (0.036)	4.641
SS	0.146*** (0.04)	3.692
US	0.043 (0.034)	1.24
(Constant)	−0.152 (0.152)	−1

Note(s): US = University Support, RS = Resources and Skills, SS = Peers collaboration, IS = Instructor–Student Communication, CD = Course Design

Table 4.
Coefficients: overall satisfaction

outcomes. The results also showed that only peer collaborations and course design had significant relations with student initiatives, while university support, resources and skills, and instructor–student communication did not show significant results. The model summary showed an R squared equal to 0.369, implying that the predictor variables explained 36.9% of the variation in student initiative.

The path analysis was to examine the effect of each proactive student initiative on student satisfaction with online education. The results showed in Table 6 represent that proactive student have a significant effect on student satisfaction with online education. The model summary showed an R squared equal to 0.675, implying that the predictor variables explained 67.5% of the variation in student satisfaction with online education.

To perform path analysis, the PROCESS macro of SPSS was used. First, the effect of resources and skills on overall satisfaction through proactive student initiative was assessed. Second, the effect of peer collaborations on overall satisfaction through proactive student initiative was assessed. The results showed no direct effect of peer collaborations on student satisfaction (LLCI = −0.0371, ULCI = 0.1202).

Third, the effect of instructor–student communication on overall satisfaction through proactive student initiative was assessed. The results showed a direct effect of instructor–student communication on student satisfaction (LLCI = 0.1481, ULCI = 0.3449). Finally, the effect of course design on overall satisfaction through proactive student initiative was assessed. The results showed a direct effect of course design on student satisfaction (LLCI = 0.2012, ULCI = 0.3859). As shown in Table 7, interaction terms between student initiative and instructor–student communication and course design showed significant effects at the 5% level, implying the moderating effect of student initiative.

Conclusion and contribution
According to the data, strong student satisfaction is evident in a mean over 4.0, which may be used to determine if online education was satisfactory or unsatisfactory. Positive opinions of university assistance, teacher–student interaction and course design were also discovered.

Dependent variable: proactive student		
	B	t- test
CD	0.381*** (0.082)	4.672
Gender	0.065 (0.079)	0.819
IS	0.141 (0.088)	1.594
Programme	−0.118* (0.061)	−1.924
RS	−0.061 (0.062)	−0.988
SS	0.277*** (0.068)	4.057
US	−0.112* (0.059)	−1.888
(Constant)	1.152 (0.262)	4.392

Note(s): US = University Support, RS = Resources and Skills, SS = Peers collaboration, IS = Instructor–Student Communication, CD = Course Design

Table 5. Coefficients: proactive student

Dependent variable: overall satisfaction		
	B	t
PS	0.052* (0.026)	2.017
(Constant)	1.545 (0.087)	17.759

Table 6. Coefficients: effect of proactive student (PS) on overall satisfaction

Dependent variable: overall satisfaction with interactions		
	Coefficient	*t*
(Constant)	−1.766 (0.311)	−5.67
Programme	0.041 (0.033)	1.25
Gender	0.006 (0.042)	0.144
US	0.202* (0.094)	2.15
RS	0.264** (0.1)	2.629
SS	0.076 (0.126)	0.602
IS	−0.226 (0.168)	−1.345
CD	0.571*** (0.152)	3.746
PS	0.609*** (0.098)	6.211
Int1	−0.032 (0.025)	−1.251
Int2	−0.039 (0.028)	−1.391
Int3	−0.005 (0.036)	−0.152
Int4	0.13** (0.05)	2.607
Int5	−0.106* (0.046)	−2.302

Note(s): US = University Support, RS = Resources and Skills, SS = Peers collaboration, IS = Instructor–Student Communication, CD = Course Design, PS = Proactive Student, Int1 = SI*US, Int2 = SI*RS, Int3 = SI*SS, Int4 = SI*IS and Int5 = SI*CD

Table 7.
Coefficients: overall satisfaction with Interactions

Proactive student results and student collaboration were all rated less favourably. This is in line with earlier research highlighting behavioural factors, such as feelings of isolation (De Metz and Bezuidenhout, 2018), a diminished sense of belonging (Portela *et al.*, 2019), a sense of responsibility, time management and motivation, that negatively affect the outcomes of online education.

Additionally, opinions of resources and skills were less favourable, supporting the idea that infrastructural impediments first appear during online education encounters (Bhati *et al.*, 2009; Pelgrum, 2001; Shank and Sitze, 2004).

Instructor–student interactions and course design were determined to have the most effects on the online educational experience. Student cooperation and university assistance were both shown to only have a little direct effect on students' perceptions of their learning results. Resources and skills were found to directly affect student satisfaction. Instructor–student communication and course design were both found to have both direct and indirect effects on student satisfaction with online education. This means that online constructive interactions with instructors and courses with clear objectives, structure, interesting material, challenges and assessment tools enhanced the student experience, which again added to student satisfaction.

Last but not least, this work adds two improvements to the model created and assessed by Tsang *et al.* (2021). First, resources and skills, which have been demonstrated to have a direct beneficial influence on students' satisfaction with online education, were added as a fifth predictor variable to the model. The second finding was that student initiative, which Tsang *et al.* (2021) identified as a mediating variable, really played a moderating role in determining how student, teacher and institution factors impact students' satisfaction with online education. Students who have the traits to take charge and use their online learning opportunities are happier in this regard.

Limitations and future studies

While the study's reliability is demonstrated by the large number of survey respondents, the stringent sample elimination procedures, the validity of the questionnaire and the literature's endorsement of the model employed here, it is crucial to note that additional aspects of

e-learning can and should be researched, such as cultural implications and generational differences; government support reality, including policies, infrastructure and management; and other factors that affect how the government operates.

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