Mediation analysis of students' perceived benefits in predicting their satisfaction to technology-enhanced learning

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Abstract

Purpose – Students' perception towards learning technologies in the disruptive times like coronavirus disease (2019) COVID-19 is what the educational institutes are striving to know so that the educational institutes could provide the best learning experiences to students. The present study attempts to identify the technology-enhanced learning (TEL) factors (i.e. informational quality, compatibility, resource availability, self-efficacy, subjective norms, subject interest and informational quality) with the mediation effect of perceived benefits on student satisfaction to TEL amongst non-technical students of different college/universities at Chhattisgarh state.

Design/methodology/approach – Purposive sampling technique with "criterion variable" was applied to collect responses from 600 participants. Students, who are enrolled in non-technical courses at different colleges/universities, were participated in the present study. The data collection process was completed during April–November 2019.

Findings – The results revealed that perceived benefits to TEL were significantly and positively mediated between all the TEL factors (i.e. information quality, compatibility, resource availability, self-efficacy, subjective norms, subject interest and institutional branding) and student satisfaction to TEL.

Originality/value – The present study itself is a novel study by taking TEL factors such as informational quality, compatibility, resource availability, self-efficacy, subjective norms, subject interest and institutional branding by considering perceived benefits as mediator to examine the influence on student satisfaction to TEL.

Keywords Perceived benefits, Student satisfaction, Technology-enhanced learning

Paper type Research paper

1. Introduction

In the COVID-19 pandemic, technology is crucial for effective communication. During a period of restricted social activities and physical separation, the globe relied on technology for study and employment activities. The use of information and communication technology (ICT), particularly in education, has continued to grow in recent years. Moreover, this situation calls for remote education, and it necessitates the participation of all educational stakeholders, including students, instructors and others (Sun *et al.*, 2020). Due to its cost-effectiveness, reusability, and adaptability, technology-based learning is becoming an increasingly popular instrument for promoting educational opportunities (Tzeng *et al.*, 2007).

ICT creates a lot of opportunities in business and the education sector worldwide (Kim and Park, 2018). The ICT provides an alternative to the traditional education system through an online learning system (Hasan and Bao, 2020). Students can access online classes virtually whilst sitting anywhere without physical presence at the same premise. TEL requires the Internet to communicate amongst students and teachers (Samsudeen and Mohamed, 2019).

Higher education institutions are attempting to convert their conventional student services, such as the teaching-learning process, the admission process, library services, counselling services and other similar services, into today's digital-based services. The World Health Organisation (WHO) has previously said that the COVID-19 crisis would continue for an extended time (Jagannath, 2020). It has now become necessary for them to adapt the contemporary teaching-learning methods and other services as in the digital/technology-based format.

The development of ICT has prompted the education industry to begin using technology-based learning systems to enhance the efficacy and efficiency of learning. TEL allows students to access learning resources from any location. It enhances the learning materials by using a variety of learning sources and multimedia learning tools, and it enables instructors to evaluate and modify the contents smoothly (Surjono, 2013). TEL is one of the most recent learning applications in educational technology that can facilitate distance learning in which the instructor and students are not engaging as face to face at the same time and location (Liaw and Huang, 2013). Currently, TEL is viewed as one of the biggest potential issues before educational institutions (Chang, 2013).

The educational institutions are exploring several methods to get an edge over the competition in providing online learning to students, but none have been effective in producing the required results. Given this, the current research investigates the mediation role of students' perceived benefits between different TEL variables (i.e. informational quality, compatibility, resource availability, subjective norms, subject interest, self-efficacy and institutional branding) and student satisfaction to TEL.

2. Literature review

Every student's attitude to learning has changed due to the COVID-19 circumstances, and the institution's teaching-learning services have changed as a result. Technology, such as computers, cell phones, the Internet, apps, and other tools, facilitates distance learning (online learning) as an educational process or activity. Students benefit from online learning since it offers them a virtual environment in which they may participate in various activities (Al-Rahmi *et al.*, 2018). Technology-based learning is recognised as a method for preparing people and organisations for shifts (from one to another) occurring in the global economy, particularly in the Internet era, because it is cost effective, flexible and can be delivered easily without the need for special equipment or a physical location (Carey and Blatnik, 2005). As a result of its interactivity and ease, teaching and learning via the Internet has been welcomed as a significant advancement in education (LaRose *et al.*, 1998; Keller and Cernerud, 2002). Clearly, given the current scenario, learning technologies have steadily gained importance in improving teaching and learning and deciding whether or not an institution will be successful in the long run. Consequently, technology is being more incorporated into classrooms to improve and enhance students' learning experiences and performance.

Like Alenezi *et al.* (2010), several researchers asserted that universities are interested in investing in higher-technology tools and programmes that both instructors and students may appreciate. When it comes to using technology, educational institutions consider two main factors: flexibility and skill development. Several educational institutions are using technology to aid in delivering everyday instruction. Students are provided with technological tools such as computers, tablets and access to the Internet to encourage

them to continue their learning. However, Candarli and Yuksel (2012) asserted that many students are unmotivated and do not want to actively participate in learning via online learning apps despite their teachers having urged them to do so. This situation creates difficulties. Lack of drive, interest and personal character/self-efficacy are factors that contribute to this situation.

Technology-based learning aids in improving students' learning outcomes, allows them to be more flexible in terms of time and location and lowers their overall learning costs. Students' recognition that the outcome of the technology-based learning system is beneficial to them allows it to be considered an effective medium of learning (Salloum *et al.*, 2019a). In order to succeed, students must embrace and use learning tools, which is not always the case. Higher education students, being a well-educated population, often have a strong understanding of the benefits of utilising technology for learning purposes and are more likely to utilise it. Many study results indicate that greater levels of knowledge do not always incline much higher levels of usage of learning technologies, which counters the general assumption (Holden *et al.*, 2008).

There could be a variety of factors influencing students' satisfaction with TEL; however, direct factors such as informational quality (Chae *et al.*, 2002; Koufaris, 2002), compatibility (Chiu *et al.*, 2005; Sahin and Shelley, 2008; Joo *et al.*, 2011; Wu and Liu, 2013; Rahman *et al.*, 2015), resource availability (Bower and Kamata, 2000), self-efficacy (Womble, 2008), subjective norms (Shen *et al.*, 2013; Kuo *et al.*, 2013), subject interest (Esterhuyse *et al.*, 2016) and institutional branding (Hwang and Hyun, 2012; Hwang *et al.*, 2014; Ahmed *et al.*, 2017) should be considered the primary and necessary factors that influence one's satisfaction with learning technologies. The existence of perceived benefits amongst students significantly influences their satisfaction (Al-Hawari and Mouakket, 2010; Ifinedo, 2016).

2.1 What is technology-enhanced learning?

TEL can be defined as the usage of computer or any technology to provide training or education courses to learners or students; such courses may be learnt or studied online, off-life or mixed method of both modes (Hemming, 2008; Al-Busaidi, 2013). Thus, TEL offers learners a better opportunity to study online or offline at any time and space at their convenience (Fayter, 1998; Homan and Macpherson, 2005). Hence, TEL is the acquisition and usage of knowledge disseminated primarily by electronic means (Janda, 2016; Tetteh, 2016). TEL can also be termed e-learning, mobile learning, technology-based learning, technology-assisted learning, web-based learning, online learning etc.

2.2 Benefits of technology-enhanced learning

TEL encompasses various ICT-based techniques such as YouTube, websites, learning management systems, mobile and web apps and other similar platforms. Students, instructors and professionals may benefit from technology-based learning since it removes the need to be restricted by physical limits (Fayter, 1998; Homan and Macpherson, 2005). As one of the results of information technology development, TEL has offered a new method for instructors and students to participate in learning processes (Ferrari *et al.*, 2013). It makes use of an electronic application to enhance teaching and learning activities via the use of digital media such as the Internet or local computer networks (Clark and Mayer, 2016). TEL is a facility that uses information technology to help in the learning process (Arkorful and Abaidoo, 2014). Using a TEL system helps students improve their cognitive abilities by allowing them to comprehend learning concepts via distributed resources. Lee *et al.* (2009) state that using electronic media and gadgets such as cell phones, tablets and laptops as an instrument to increase the accessibility of communication, TEL creates a new method of learning amongst students (Krishnan and Husain, 2017).

2.3 Incorporated variables in the study

(1) Informational Quality

Informational quality is the quality of the material/content provided by information systems. Gustavsson and Wanstrom (2009) defined information quality as "the ability to satisfy the learners' informational needs".

(2) Compatibility

Compatibility is the degree to which engaging in a course-related study using TEL is perceived as consistent with the students' existing values, beliefs and past information behaviour. Rogers (2003) defined compatibility as "the degree in which a new technology is continuously seen with prior experience, existing values and needs of latent adopters".

(3) Resource availability

Resource availability is the availability of online learning resources with respect to TEL. Singh (2016) stated that TEL resources contain all digital resources available online or offline used by higher education students. TEL resources in this research are open education resources (i.e. Massachusetts Institute of Technology - OpenCourseWare, National Programme on Technology Enhanced Learning lectures), massive open online courses (i.e. courses available at Coursera, edX), several videos on YouTube platform, eBooks and various other free educational websites like journals, articles, blogs etc.

(4) Self-efficacy

Self-efficacy is the degree of one's decision as per their ability to perform a specific behaviour (Bandura, 1977, 1986, 1997). Self-efficacy represents the self-confidence and capability to control individuals' motivation, behaviour and social environment.

(5) Subjective norms

Subjective norms refer to the effect of social groups and peers on the decision-making of an individual who belongs to that society. Subjective norms are related to the influence of societal groups and peers on the decision-making of an individual who belongs to that society (Salloum *et al.*, 2019b).

(6) Subject interest

Subject interest is the degree to learners' involvement in the TEL environment, which contributes to improved academics. Singh (2016) stated that subject interest and related kinds of study resources (TEL contents and textbooks) play complex situational factors that make the learners likely to use more/less of a subject using TEL at any certain point of time.

(7) Institutional branding

Institutional branding is the image of the institution in society. Branding mainly focusses on the added value and creates a more intangible relationship between the user and organisation. Kotler (1994) stated that a brand is essentially a promise of the organisation to transfer a specific set of features, benefits and added services with respective product/services to the user.

(8) Students' perceived benefits

Perceived benefits refer to the degree to which a learner thinks that using TEL will benefit his/her study in terms of time, effort and cost. Bennett and Bennett (2003) stated that students' perceived benefits are the degree to which the teachers compare new innovation

with the existing one and talk about the benefits and costs of an adopted new technology (Rogers, 1995).

    (9)   Student satisfaction

Individuals' feelings of pleasure or disappointment as a consequence of contrasting their assessment of a product or service's performance with their acceptance of the product or service may be described as satisfaction (Hsu and Chiu, 2004).

2.4 Research question
The research question of the present study is:

    (1)   Whether students' perceived benefits to TEL play as positive and significant mediator in the link between TEL factors (i.e. informational quality, compatibility, resource availability, self-efficacy, subjective norms, subject interest and institutional branding) and their satisfaction in different Higher Educational Institutions of Chhattisgarh state?

3. Methodology
3.1 Conceptual framework
Since the present study attempts to answer the above research question, thus, the authors propose the below conceptual model (Figure 1).
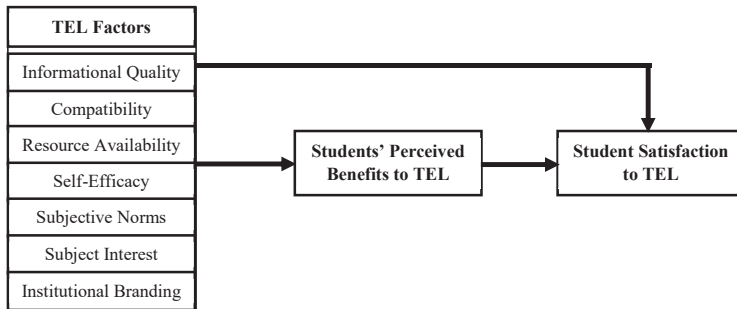

Figure 1.
Conceptual framework of the study

3.2 Hypothesis

    H1. Students' perceived benefits to TEL would emerge as a significant mediator between informational quality and their satisfaction to TEL.

    H2. Students' perceived benefits to TEL would emerge as a significant mediator between compatibility and their satisfaction to TEL.

    H3. Students' perceived benefits to TEL would emerge as a significant mediator between resource availability and their satisfaction to TEL.

    H4. Students perceived benefits to TEL would emerge as a significant mediator between self-efficacy and their satisfaction to TEL.

    H5. Students' perceived benefits to TEL would emerge as a significant mediator between subjective norms and their satisfaction to TEL.

    H6. Students' perceived benefits to TEL would emerge as a significant mediator between subject interest and their satisfaction to TEL.

H7. Students' perceived benefits to TEL would emerge as a significant mediator between institutional branding and their satisfaction to TEL.

3.3 Sampling and data collection

Correlational research design is applied in the present study. Authors collected primary data using the purposive sampling technique with "criterion variable". Participants were chosen based on certain criteria, such as undergraduate and postgraduate students enrolled in non-technical courses at any college/university in Chhattisgarh who had been utilising technology-based learning for at least one year. Around 745 questionnaires were distributed to participants, out of which only 600 responses were returned useable for analysis, approximately 80.53% correct responses. The data collection process was completed during April–November 2019.

3.4 Research instrument

The authors used previous study constructs with certain modifications to collect the primary data as per the present research objectives. The research instrument was properly tested by sending it to four subject experts to examine the content creation and gain certain valuable insights. After getting positive response from experts, authors conducted a pilot study using a 50-sample size to regain confidence and check the content validity of the final research instrument. The participants recommended no modifications, and the final research instrument was ready to collect the primary data. The present study finally obtained information quality (three items) modified from Ahn *et al.* (2007); compatibility (three items) adapted from Moore and Benbasat (1991); resource availability (three items) modified from Taylor and Todd (1995) and Lu (2008); self-efficacy (three items) adapted from Compeau and Higgins (1995) and Hartshorne and Ajjan (2009); subjective norms (three items) modified from Tarhini *et al.* (2017); subject interest (four items) modified from Singh (2016); institutional branding (four items) modified from Singh (2016); students' perceived benefits (five items) modified from Tarhini *et al.* (2017) and Suh and Han (2002) and student satisfaction (five items) adapted from Lin *et al.* (2018) and Tarhini *et al.* (2017).

3.5 Scale validation

The authors applied partial least square confirmatory factor analysis (CFA) in the present study. As a result, Tables 1 and 2 shows the reliability and validity measures.

3.5.1 Reliability measures. Internal consistency is measured through Cronbach alpha, whose value must be more than 0.7 (Nunnally, 1978). The present study analysis scores above 0.7 for all the nine constructs as shown in Table 1. The reliability measure can also be determined by Rho A, whose value was greater than 0.7 in Table 1.

Constructs	Cronbach's alpha	Rho A	CR	AVE
Informational quality	0.706	0.756	0.813	0.592
Compatibility	0.712	0.731	0.775	0.538
Resource availability	0.773	0.782	0.821	0.604
Self-efficacy	0.726	0.751	0.747	0.698
Subjective norms	0.701	0.705	0.832	0.624
Subject interest	0.717	0.757	0.789	0.509
Institutional branding	0.709	0.714	0.797	0.62
Students' perceived benefits	0.707	0.724	0.769	0.573
Student satisfaction	0.811	0.821	0.869	0.57

Table 1.
Measurement results

Discriminant validity (Fornell–Larcker criterion)									
Constructs	C	IQ	IB	SPB	RA	SE	SS	SI	SN
C	0.733								
IQ	0.497	0.769							
IB	0.484	0.495	0.707						
SPB	0.478	0.388	0.542	0.687					
RA	0.464	0.53	0.539	0.438	0.777				
SE	0.481	0.458	0.501	0.386	0.541	0.706			
SS	0.57	0.476	0.623	0.614	0.48	0.504	0.755		
SI	0.548	0.474	0.593	0.565	0.416	0.554	0.648	0.714	
SN	0.434	0.416	0.555	0.553	0.472	0.503	0.575	0.577	0.79

Note(s): C = compatibility; IQ = informational quality; IB = institutional branding; SPB = students' perceived benefits; RA = resource availability; SE = self-efficacy; SS = student satisfaction; SI = subject interest and SN = subjective norms

Table 2.
Discriminant validity

3.5.2 Validity measures. 3.5.2.1 Convergent validity. Convergent validity is measured to examine whether the multiple items in the scale are in agreement (Fornell and Bookstein, 1982; Barclay *et al.*, 1995). The composite reliability (CR) scores must be greater than 0.7, which depicts a fair measure of internal consistency reliability (Bagozzi and Yi, 1988; Hair *et al.*, 2010). Table 1 explains the value of composite reliability above 0.7 for all the nine constructs.

The average variance extracted (AVE) is considered a determinant of convergent validity of the scale. The value of AVE must be greater than 0.5 (Hu *et al.*, 2004; Henseler *et al.*, 2009). Table 1 indicates the value of AVE for all the nine constructs above 0.5.

3.5.2.2 Discriminant validity. Discriminant validity explains whether the constructs are independent from each other. The value of discriminant validity must be greater than 0.5 for attaining the constructs validity. Table 2 indicates the value of discriminant validity above 0.5 for all the nine constructs. Thus, it can be said that the present study possesses a satisfactory measurement model.

3.6 Data analysis
The present study applied regression analysis and CFA to analyse the primary data.

4. Analysis and results
4.1 Testing of H1
Regression analysis was incorporated to examine the mediating effect of students' perceived benefits in the relationship between informational quality and student satisfaction. In which Table 3 and Figure 2 explains the direct effect between information quality and students' perceived benefits was found significant (IQ → SPB) (β = 0.301, t = 7.725, p < 0.001). A positive and significant link is also found between information quality and student satisfaction (IQ → SS) (β = 0.351, t = 10.197, p < 0.001). In addition, Table 3 and Figure 2 also revealed a significant relationship between students' perceived benefits and their satisfaction

Table 3.
Direct, indirect and total effects between informational quality, perceived benefits and student satisfaction

Predicted relationship	Standardised path loading (β)	t-value	p-value	Indirect effect	Total effect
IQ → SPB	0.301	7.725	***	–	0.301
IQ → SS	0.351	10.197	***	0.116**	0.467
SPB → SS	0.387	11.238	***	–	0.387

Note(s): IQ = informational quality; SPB = students' perceived benefits and SS = student satisfaction

(SPB → SS) (β = 0.387, t = 11.238, p < 0.001). Thus, the direct effects between the variables explained significant relations, and hence, it is evidenced to be the case of partial mediation. Moreover, indirect effect was also showed significant association (β = 0.116, p < 0.001) with a total effect (β = 0.467, p < 0.001) between information quality and student satisfaction (IQ → SS). Hence, it concludes that students' perceived benefits are found to be partially mediated (0.116) between informational quality and student satisfaction.

4.2 Testing of H2
Regression analysis was applied to investigate mediating effect of students' perceived benefits between compatibility between compatibility and student satisfaction. In which Table 4 and Figure 3 explains that compatibility was found to be significant with students perceived benefits (C → SPB) (β = 0.358, t = 9.39, p < 0.001). Also, compatibility revealed positive and significant relationship with student satisfaction (C → SS) (β = 0.406, t = 11.854, p < 0.001). In addition, students' perceived benefits explained positive and significant linkage with student satisfaction (SPB → SS) (β = 0.347, t = 10.121, p < 0.001). Thus, the direct effects between the variables explained significant relations, and hence, it is evidenced to be the case of partial mediation. Moreover, Table 4 and Figure 3 indicated that indirect effect was also found significant (β = 0.124, p < 0.001) with total effect (β = 0.531, p < 0.001) between compatibility and student satisfaction (C → SS). Hence, it concludes that students' perceived benefits are partially mediated (0.124) between compatibility and student satisfaction.
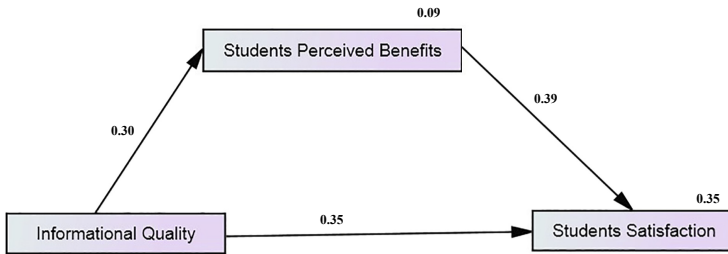

Figure 2.
Mediating effect of students' perceived benefits between information quality and student satisfaction

Predicted relationship	Standardised path loading (β)	t-value	p-value	Indirect effect	Total effect
C → SPB	0.358	9.39	***	–	0.358
C → SS	0.406	11.854	***	0.124**	0.531
SPB → SS	0.347	10.121	***	–	0.347
Note(s): C = compatibility; SPBs = students perceived benefits and SS = student satisfaction					

Table 4.
Direct, indirect and total effects between compatibility, perceived benefits and student satisfaction
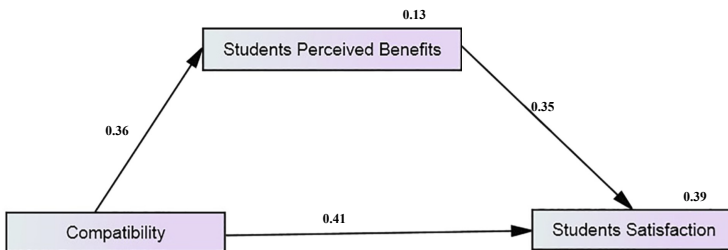

Figure 3.
Mediating effect of students' perceived benefits between compatibility and student satisfaction

4.3 Testing of H3

Regression analysis was applied to examine the mediating effect of students' perceived benefits between resource availability and students' adoption intention to TEL. In which Table 5 and Figure 4 explains the direct effect of resource availability on students' perceived benefits associated significantly (RA → SPB) (β = 0.357, t = 9.341, p < 0.001). Resource availability is also linked significantly with student satisfaction (RA → SS) (β = 0.341, t = 9.609, p < 0.001). Students' perceived benefits also indicate significant and positive relationship with their satisfaction (SPB → SS) (β = 0.371, t = 10.474, p < 0.001). Thus, the direct effects between the variables explained significant relations, and hence, it is evidenced to be the case of partial mediation. Table 5 and Figure 4 also showed the indirect effect of resource availability on student satisfaction correlated significantly and positively (RA → SS) (β = 0.132, p < 0.001) with total effect (β = 0.473, p < 0.001). Hence, it concludes that students' perceived benefits are found to be partially mediated (0.132) between resource availability and student satisfaction.

4.4 Testing of H4

Regression analysis was incorporated in examining the mediating effect of students' perceived benefits between self-efficacy and student satisfaction. In which Table 6 and Figure 5 explains positive and significant relationship between self-efficacy and students' perceived benefits (SE → SPB) (β = 0.336, t = 8.744, p < 0.001). Self-efficacy also revealed positive relationship with student satisfaction (SE → SS) (β = 0.360, t = 10.349, p < 0.001). In addition, students' perceived benefits indicated significant linkage with student satisfaction

Predicted relationship	Standardised path loading (β)	t-value	p-value	Indirect effect	Total effect
RA → SPB	0.357	9.341	***	–	0.357
RA → SS	0.341	9.609	***	0.132**	0.473
SPB → SS	0.371	10.474	***	–	0.371
Note(s): RA = resource availability; SPB = students' perceived benefits and SS = student satisfaction					

Table 5.
Direct, indirect and total effects between resource availability, perceived benefits and student satisfaction

Figure 4.
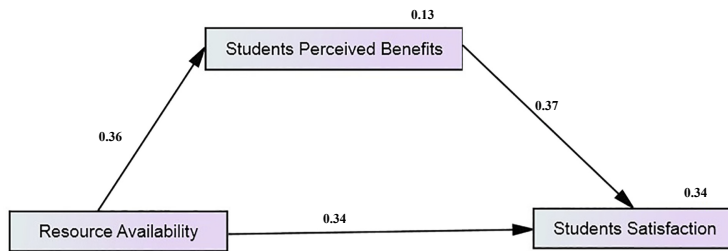Mediating effect of students' perceived benefits between resource availability and student satisfaction

Predicted relationship	Standardised path loading (β)	t-value	p-value	Indirect effect	Total effect
SE → SPB	0.336	8.744	***	–	0.336
SE → SS	0.360	10.349	***	0.125**	0.485
SPB → SS	0.371	10.678	***	–	0.371
Note(s): SE = self-efficacy; SPB = students' perceived benefits and SS = student satisfaction					

Table 6.
Direct, indirect and total effects between self-efficacy, perceived benefits and student satisfaction

(SPB → SS) (β = 0.371, t = 10.678, p < 0.001). Thus, the direct effects between the variables explained significant relations, and hence, it is evidenced to be the case of partial mediation. Table 6 and Figure 5 also showed that the indirect effect indicated significant association (β = 0.125, p < 0.001) with total effect (β = 0.485, p < 0.001) between self-efficacy and student satisfaction (SE → SS). Hence, it concludes that students' perceived benefits are found to be partially mediated (0.125) between self-efficacy and student satisfaction.

4.5 Testing of H5

Regression analysis was applied to investigate the mediating effect of students' perceived benefits between subjective norms and student satisfaction. In which Table 7 and Figure 6 explains the direct effect of subjective norms on students' perceived benefits found significantly associated (SN → SPB) (β = 0.430, t = 11.649, p < 0.001). Subjective norms was also found significantly connected with student satisfaction (SN → SS) (β = 0.443, t = 12.661, p < 0.001). Students' perceived benefits also indicated significant relations with student satisfaction (SPB → SS) (β = 0.302, t = 8.638, p < 0.001). Thus, the direct effects between the variables explained significant relations, and hence, it is evidenced to be the case of partial mediation. Table 7 and Figure 6 also showed the indirect effect of subjective norms on student satisfaction (SN → SS) (β = 0.130, p < 0.001) with total effect (β = 0.573, p < 0.001) which is significantly associated. Hence, it concludes that students' perceived benefits are partially mediated (0.130) between subjective norms and student satisfaction.
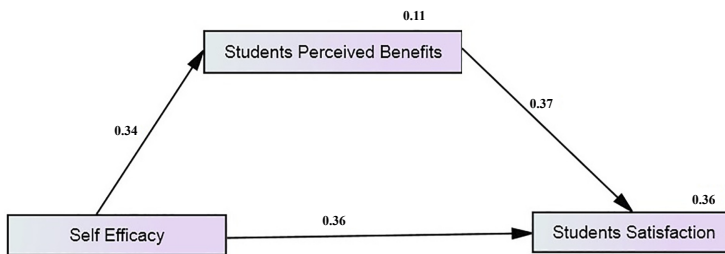

Figure 5.
Mediating effect of students' perceived benefits between self-efficacy and student satisfaction

Predicted relationship	Standardised path loading (β)	t-value	p-value	Indirect effect	Total effect
SN → SPB	0.430	11.649	***	–	0.430
SN → SS	0.443	12.661	***	0.130**	0.573
SPB → SS	0.302	8.638	***	–	0.302
Note(s): SN = subjective norms; SPB = students' perceived benefits and SS = student satisfaction					

Table 7.
Direct, indirect and total effects between subjective norms, perceived benefits and student satisfaction
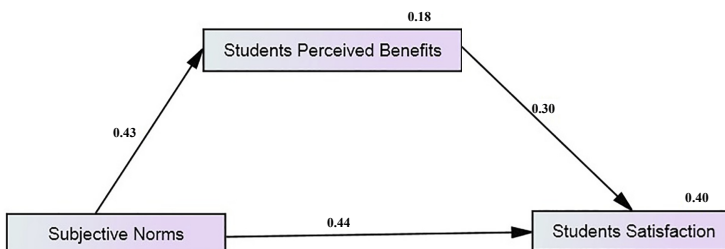

Figure 6.
Mediating effect of students' perceived benefits between subjective norms and student satisfaction

4.6 Testing of H6

Regression analysis was incorporated to investigate the mediating effect of students' perceived benefits between subject interest and student satisfaction. In which Table 8 and Figure 7 explains the direct effect of subject interest on students' perceived benefits were significantly correlated (SI → SPB) ($\beta = 0.350$, $t = 9.150$, $p < 0.001$). Subject interest was also found significantly and positively linked with student satisfaction (SI → SS) ($\beta = 0.403$, $t = 11.775$, $p < 0.001$). In addition, students' perceived benefits were found significantly connected with student satisfaction (SPB → SS) ($\beta = 0.351$, $t = 10.272$, $p < 0.001$). Thus, the direct effects between the variables explained significant relations, and hence, it is evidenced to be the case of partial mediation. Table 8 and Figure 7 also indicated the indirect effect of subject interest on student satisfaction correlated significantly (SI → SS) ($\beta = 0.123$, $p < 0.001$) with total effect ($\beta = 0.526$, $p < 0.001$). Hence, it concludes that students' perceived benefits are partially mediated (0.123) between subject interest and student satisfaction.

4.6.1 Testing of H7. Regression analysis is applied to examine the mediating effect of students' perceived benefits between institutional branding and student satisfaction. In which Table 9 and Figure 8 explains the direct effect of institutional branding on students' perceived benefits significantly associated (IB → SPB) ($\beta = 0.410$, $t = 11.016$, $p < 0.001$). Institutional branding was also found positively linked with student satisfaction (IB → SS) ($\beta = 0.473$, $t = 13.974$, $p < 0.001$). Students' perceived benefits indicated positive relations with student satisfaction (SPB → SS) ($\beta = 0.298$, $t = 8.807$, $p < 0.001$). Thus, the direct effects between the variables explained significant relations, and hence, it is evidenced to be the case of partial mediation. Table 9 and Figure 8 also showed the indirect effect of institutional branding on student satisfaction connected significantly and positively (IB → SS) ($\beta = 0.122$,

Predicted relationship	Standardised path loading (β)	t-value	p-value	Indirect effect	Total effect
SI → SPB	0.350	9.150	***	–	0.350
SI → SS	0.403	11.775	***	0.123**	0.526
SPB → SS	0.351	10.272	***	–	0.351
Note(s): SI = subject interest; SPB = students' perceived benefit and SS = student satisfaction					

Table 8.
Direct, indirect and total effects between subject interest, perceived benefits and student satisfaction

Figure 7.
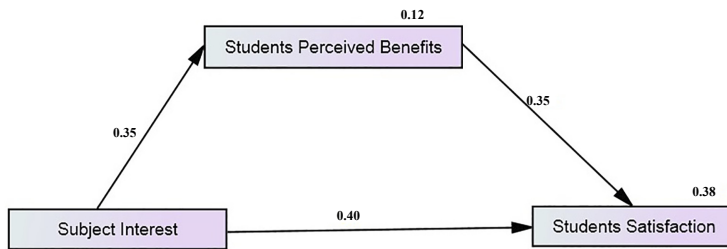Mediating effect of students' perceived benefits between subject interest and student satisfaction

Predicted relationship	Standardised path loading (β)	t-value	p-value	Indirect effect	Total effect
IB → SPB	0.410	11.016	***	–	0.410
IB → SS	0.473	13.974	***	0.122**	0.596
SPB → SS	0.298	8.807	***	–	0.298
Note(s): IB = institutional branding; SPB = students' perceived benefits and SS = student satisfaction					

Table 9.
Direct, indirect and total effects between institutional branding, perceived benefits and student satisfaction

$p < 0.001$) with total effect ($\beta = 0.596$, $p < 0.001$). Hence, it concludes that students' perceived benefits are partially mediated (0.122) between institutional branding and student satisfaction (see Table 10).

5. Discussion and findings

(1) The result of the first hypothesis test indicated that students' perceived benefits to TEL is found significant and partially mediated between informational quality and student satisfaction to TEL, and thus, the hypothesis is accepted. Hence, it can be concluded that in the presence of students' perceived benefits to TEL, perceived informational quality hugely influences their satisfaction to TEL. Usually, student search for quality content which can help in their study and improve their learning effectiveness, and when they have knowledge that certain benefits such as quality content they would access, it directly increases their satisfactory level.

(2) The outcome of the second hypothesis test revealed that students' perceived benefits to TEL is found significant and partially mediated between compatibility and student satisfaction to TEL, and thus, the hypothesis is accepted. Hence, it can be said that in the presence of students' perceived benefits to TEL, compatibility factor directly and positively influences their satisfaction to TEL. In simple terms, modern learners are equipped with technologies and have become compatible with because it provides certain benefits which fulfils their needs and requirements, ultimately, providing satisfaction to learning technologies.
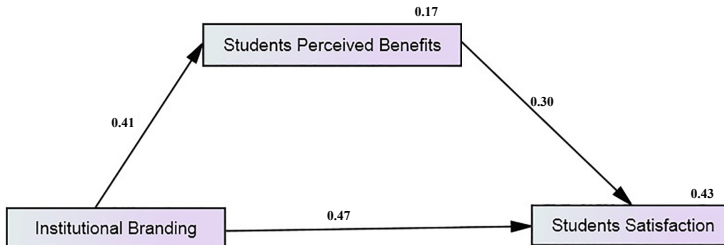
Figure 8.
Mediating effect of students' perceived benefits between institutional branding and student satisfaction

Hypotheses	Statements	Decision
H1	Students' perceived benefits to TEL would emerge as a significant mediator between informational quality and their satisfaction to TEL	Confirmed
H2	Students' perceived benefits to TEL would emerge as a significant mediator between compatibility and their satisfaction to TEL	Confirmed
H3	Students' perceived benefits to TEL would emerge as a significant mediator between resource availability and their satisfaction to TEL	Confirmed
H4	Students perceived benefits to TEL would emerge as a significant mediator between self-efficacy and their satisfaction to TEL	Confirmed
H5	Students' perceived benefits to TEL would emerge as a significant mediator between subjective norms and their satisfaction to TEL	Confirmed
H6	Students' perceived benefits to TEL would emerge as a significant mediator between subject interest and their satisfaction to TEL	Confirmed
H7	Students' perceived benefits to TEL would emerge as a significant mediator between institutional branding and their satisfaction to TEL	Confirmed

Table 10.
Outcomes of the proposed hypotheses

(3) The result of the third hypothesis test predicted that students' perceived benefits to TEL is found significant and partially mediated between resource availability and student satisfaction to TEL, and thus, the hypothesis is accepted. Hence, it can be concluded that in the presence of students' perceived benefits to TEL, resource availability factor positively and directly impacts student satisfaction to TEL. Resource availability at the premise (home and educational institutes) positively enhances their inclination towards more using it, as they have knowledge about learning technologies and its functionalities and various benefits. The higher and better the learning resources for students, the higher will be their adaptability and will create satisfaction amongst students at last.

(4) The outcome of the fourth hypothesis test revealed that students' perceived benefits to TEL is found significant and partially mediated between self-efficacy and student satisfaction to TEL, and thus, the hypothesis is accepted. Hence, it can be said that in the presence of students' perceived benefits to TEL, self-efficacy factor directly and positively enhances their satisfaction to TEL. Students' self-confidence and their self-abilities are high related to learning technologies because their interaction with technologies is not new and they know how to use and its various advantages as well. Thus, the higher self-efficacy amongst students improves their likeliness for satisfaction and vice versa.

(5) The result of the fifth hypothesis test explained that students' perceived benefits to TEL is found significant and partially mediated between subjective norms and student satisfaction to TEL, and thus, the hypothesis is accepted. Thus, it can be concluded that in the presence of students' perceived benefits to TEL, subjective norms factor directly and positively affects student satisfaction to TEL. Students come across different people including teachers, parents and other students, which influences them to use certain leaning technologies which possess certain benefits; this situation compels, also attracts them to use technology, which at last increases their satisfaction.

(6) The outcome of the sixth hypothesis test revealed that students' perceived benefits are found significant and partially mediated between subject interest and student satisfaction to TEL, and thus, the hypothesis is accepted. Hence, it can be concluded that in the presence of students' perceived benefits to TEL, subject interest to TEL positively influences their satisfaction. Students' interest motivates them to engage more, especially when it comes to technology as they are more user-friendly. Modern students possess knowledge about its pros and cons and accordingly they use it, which eventually leads them to their satisfaction.

(7) The result of the seventh hypothesis test explained that students' perceived benefits are found significant and partially mediated between institutional branding and student satisfaction, and thus, the hypothesis is accepted. Hence, it can be concluded that in the presence of students' perceived benefits to TEL, institutional branding factors directly affects their satisfaction to TEL. It implies that a higher brand name and status, as well as a higher image of the institution, have a greater impact on students when they are aware of the advantages of utilising TEL, which eventually results in their satisfaction.

6. Contribution of the study
The present study contributes to the theory and practice in the management field. The present study thoroughly discusses the idea of having knowledge of various benefits of using

learning technologies, and in view of this, how the independent factors of TEL such as informational quality, compatibility, resource availability, self-efficacy, subjective norms, subject interest and institutional branding affects to student satisfaction. Conclusively, all the factors provided significant relations with the criterion variable, i.e. student satisfaction to TEL, which shows the significance of how these factors play a big role in satisfying and retaining potential learners when they are in knowledge of receiving certain benefits of using TEL.

The dramatic entry of COVID-19 pandemic and shattering of all the sectors in all the country including education field hugely impacted the "normal" process of doing things. Specifically, the education field came out with certain new ideas of reaching and teaching to the students, i.e. online mode of learning. However, this field is still evolving and struggling. Big higher educational institutions are still making suitable strategies to attract and retain the potential learners by transforming their services to online mode. In these conditions, the present study will help them understand the need and want of today's latent students and accordingly they can strategize their services and can target the potential learners out of it. The study specifically focusses on what factors the students get attracted to more and what satisfies them in what conditions.

The outcomes of the study will not only help the higher education of Chhattisgarh Government, but also help several other private higher education institutions to understand the mindset of students that how they can be satisfied and retained. Due to COVID-19 conditions, every educational institute needs to be changed, especially in providing teaching-learning process as the WHO has also stated that COVID-19 situation will persist for longer period of time (Jagannath, 2020). This clearly indicates that whatever services you provide, what sector you are in, you must change or perish.

7. Conclusion

TEL is the need of the hour, especially when it is impossible to forecast when the outbreak would be over. However, its usage for learning purposes has proven its significance in enhancing the learning effectiveness amongst students. The benefits of TEL is well known amongst the teacher-student community; thus, the present research investigated the mediating effect of perceived benefits in the link between TEL factors (i.e. informational quality, compatibility, resource availability, self-efficacy, subjective norms, subject interest and institutional branding) and student satisfaction to TEL. Primary data were collected from non-technical students enrolled in different college/universities at Chhattisgarh state, who are using TEL at least for one year. Regression analysis was incorporated to test the mediation, which revealed that all the factors tested in the mediation of perceived benefits to TEL were positively and significantly correlated with student satisfaction. Thus, the educational institutes must focus on to these factors before introducing or implementing their teaching-learning services to online mode.

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