

Understanding Factors Affecting Smart Classroom Adoption: An Empirical Investigation in Saudi Arabia Higher Education

Maram Saeed Alzaidi, Taif University, Saudi Arabia

ABSTRACT

This study sheds light on the role of technological factors (i.e., perceived usefulness, perceived enjoyment, and compatibility) and knowledge sharing between teachers and students in predicting smart classroom adoption in the context of higher education in Saudi Arabia. The authors selected a sample of 285 instructors from six universities in Saudi Arabia. Structural equation modelling was utilised to analyse the data and test the suggested hypotheses. The results indicated that technological factors (i.e., perceived usefulness, perceived enjoyment, and compatibility) have a significant influence on intention to adopt smart classroom. Furthermore, knowledge sharing plays a significant role in predicting smart classroom adoption. The results offer meaningful implications for practice and theory.

KEYWORDS

Knowledge Sharing, Saudi Arabia, Smart Classroom Adaptation, Technological Factors

1. INTRODUCTION

In the course of recent years, advanced education establishments applied different developments to incorporate better utilization of innovation, to diminish costs, encourage the quest for training arrangements, and to help dynamic. One of these advancements is smart classroom that has been pondered to incorporate innovation to give highest training administrations to the understudies (Porter et al., 2016). Scientists have focused harder on the smart classroom as one of these learning inventive techniques (for example Salloum et al., 2018; Qasem et al., 2019). Smart classroom is an actual study hall that fuses cutting edge innovation in schooling to improve the educators' capacity to encourage understudies' learning and the understudies' abilities to participate in formal instructive educating and learning encounters over the prospects of ordinary study halls (Gasevic et al., 2019). The utilization and appropriation of smart classroom has a significant job in diminishing the expense and improving the training execution (Porter and Graham, 2016; Tariq et al., 2017).

Educators have shown a developing revenue in utilizing school sites to give understudies an innovation rich climate that can help encourage learning, just as improve connections with

DOI: 10.4018/IJCRM.2022010105

This article published as an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and production in any medium provided the author of the original work and original publication source are properly credited.

students (Mokhtar et al., 2016). Surviving exploration has investigated instructors' mentalities toward innovation in the homeroom, grounded in the information that educators will plan and execute innovation rehearses that mirror their convictions about instructing and learning (Klein, et al., 2019). Nonetheless, mechanical developments should be acknowledged by instructors before they can be embraced and coordinated into instructive contributions (Odeh, Garcia-Perez, and Warwick, 2017). Teachers should initially see how these advancements can be utilized adequately to help different learning modalities (Hannache-Heurteloup and Moustaghfir, 2020). As people embrace versatile advancements that change their everyday exercises and even their ways of life, it is unavoidable that portable innovations will be received in the instructive climate by educators. Appropriately, it is basic that we comprehend educators' insights about creative advancements, like tablets, that can be utilized to connect with the shrewd school site innovation. Educators assume a vital part in receiving advances for homeroom use, (Fearnley and Amora, 2020), we subsequently look to comprehend the components that drive their aims to embrace tablet advances in this investigation.

The worldwide innovation transformation has showed in traveling from work area figuring to inescapable utilization of portable innovation. This innovation offered openings for conveying new and fascinating strategies for realizing whether inside or outside the homeroom. The examination upheld the viability of versatile innovation. Moreover, the writing showed that m-learning has offered extensive advantages by building and supporting the inventive, cooperative, intuitive capacities and limits inside the learning conditions. A few creators have alluded to the versatile learning ability to improve the collective learning (Matsebula and Mnkandla, 2016). Besides, some significant advantages of portable learning are permitting information and data assortment, improving and constructing information and offering the essential help by incorporating work exercises and understudies' encounters in learning (Dolawattha, Pramadasa, and Jayaweera, 2019).

The achievement of new innovation acknowledgment is exceptionally reliable on the people's eagerness in embracing to a specific innovation. Truth be told, scientists have given a significant consideration to the advanced education IT improvements (for example Bianchi and Sousa, 2016; Karia, and Soliman, 2017; Yeap, Ramayah, and Soto-Acosta, 2016). Notwithstanding, little consideration has been given to seeing how advanced education establishments can effectively embrace savvy study hall developments (Hamidi and Chavoshi, 2018). Past examinations centre primarily around inspecting the hierarchical impacts of internet learning and thus its worth (Kizilcec et al., 2017) or the snags of e-learning in advanced education (for example Sarraf et al., 2017). Along these lines, embracing a hypothesis cantered way to deal with inspect the urgent part of outer pressing factors (institutional powers) in supporting smart classroom selection (Qashou, 2020).

In light of the above conversation, the current examination embraces a particular way to deal with give a total model to researching the impact of innovative variables and teacher-student relationship on intention to adopt smart classroom in Saudi Arabia context. In the event that it demonstrates fruitful, the current examination can contribute the accompanying to the advanced education writing: (1) a strong system that can give a far reaching comprehension of the impact of technological factors on smart classroom usage; and (2) explore the impact of knowledge sharing between teachers and students on the adoption of smart classroom. The discoveries of this examination give a significant knowledge into the drivers of the adoption of smart classroom with regards to advanced education. The discoveries of this investigation have suggestions for advanced education organizations and IT organizations. The current investigation is introduced in five areas as follows. Presentation, hypothetical foundation, creating theories and proposed model. The methods is introduced in section three, trailed by the analysis of the data and the outcomes examined. At last, the study contributions and further explores are introduced.

2. LITERATURE REVIEW

2.1. Smart Classroom Adoption

Smart education entitles uses of most recent or smart innovations as a team with cutting edge educational practices, devices and methods (Han and Xu, 2020) for the powerful conveyance of instruction administrations. These smart innovations are sufficiently proficient to change the instructing and learning conveyance measures in associations. In this way, an examination may be important to improve learning and instructing strategies to connect with understudies who are carefully situated in their livings (Singh and Miah, 2020). For example, understudy's cloud-based versatile realizing which goes past the circle of distance training prospects. Along these lines, Smart education fundamentally opens up freedoms to improve learning apparatuses and advance showing conveyance procedures (Galimullina, Ljubimova, and Ibatullin, 2020). Students' smart devices or advanced cells associated with the Internet gives direct admittance to any data sources inside the homeroom or outside of the study hall climate. Yet, this isn't sufficient, the upgraded rendition of availability as remote interconnected organizations in the middle of heterogeneous gadgets established a framework for the new time of smart education (Morze, Smyrnova-Trybulska, and Glazunova, 2021).

Thomas and Anderson (2014) show that "Smart classroom" are set up in constructivist epistemology, which is generally known premise of an excellent academic procedure. Constructivist instructional method focuses primarily on understudies improving their own insight through friendly cooperation in a learning setting (Kuppusamy, 2020). Such a strategy can contribute in more different understudies showing draws near (Mitrofanova et al., 2020) and to improve understudies' basic reasoning capacities contrasting with customary homeroom (MacLeod et al., 2018), which will accordingly upgrade scholastic and learning execution (Kusumadewi, Yustiana, and Wijayaningrum, 2020). Earlier exploration uncovered that "Smart classroom" causes understudies to establish their own tone of study, urge them to team up, is intelligent, energize imagination, and understudies can use the web-based interface to look for data (Kolb, 2019). Because of the benefits gave by "Smart classroom", the positive impacts of the "Smart classroom" on understudies learning results has brought about a wide spreading and prominence (for example Toto and Limone, 2020). Some creating social orders are in any event, offering noteworthy government sponsorship to advance the appropriation of "Smart classroom" in advanced education establishments (Saunders, Oradini, and Clements, 2017). Thus, understanding the elements influencing the appropriation of "Smart classroom" in advanced education establishments has become an issue critical, especially as to the outside pressures in advancing the utilization of these developments in advanced education organizations. Moreover, brilliant study halls has been analyzed by countless investigations with regards to advanced education. The writing audit have recognized three principle subjects and are clarified underneath. The primary exploration bunch centers around the impact of brilliant study hall on understudies' accomplishments and execution (MacLeod et al., 2018). The subsequent exploration bunch centers essentially around arrangements that urge higher instructive establishments to receive "Smart classroom". For example, Van Horne and Murniati (2016) proposed that schools and colleges should execute innovation imbued learning conditions that help cooperative learning. The third exploration stream focus harder on techniques. The greater part of studies are hypothetical and subjective (for example Aguilar et al., 2018). Nonetheless, to the most awesome aspect our insight, this has not so far been directed by whatever other exploration that utilizes a quantitative technique to inspect drivers of "Smart classroom adoption" in the advanced education setting. Consequently, the current examination explores factors influencing "Smart classroom adoption" by teachers in advanced education foundations.

2.2. Technological Factors Affecting Smart Classroom Adoption

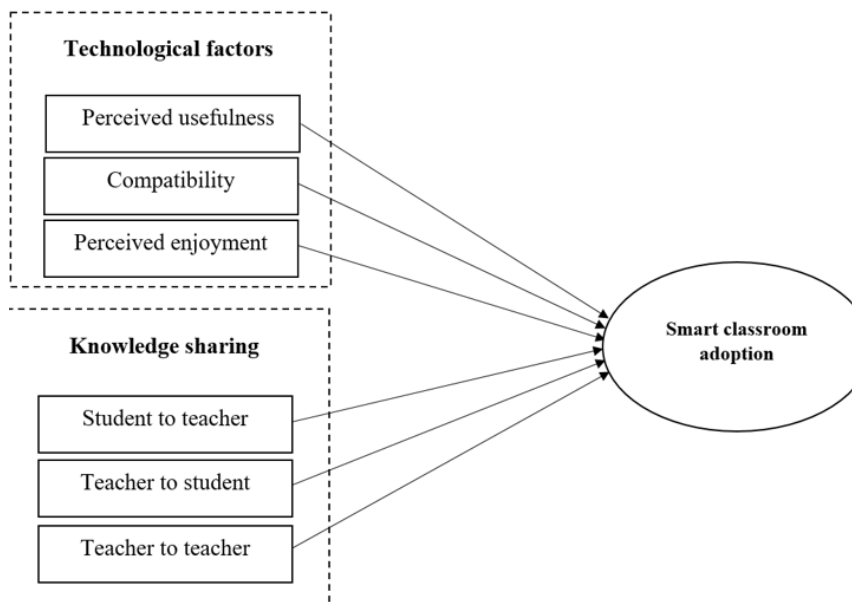
Technological variables allude to the advancement includes that were used by a few investigations in past IT developments impacting the authoritative utilization (Rogers Everett, 1995). Past examinations

thought about perceived usefulness, compatibility, and perceived enjoyment to be critical and rouse the association to utilize the IT (Selim, Eid, and Agag, 2020). Hence, in light of the Rogers Everett (1995), the current examination included three innovative components (for example perceived usefulness, compatibility, and perceived enjoyment) impact on intention to adopt smart classroom with regards to advanced education. In past research, IT information has been distinguished by a few examinations as a critical factor that impacts associations IT selection (for example Ahmadi et al., 2017; Kwet and Prinsloo, 2020). Consequently, technological variables impacts the intention to adopt smart classroom in higher education foundations. Figure 1 demonstrates the developed conceptual framework.

In light of Rogers Everett (1995), intricacy is characterized as “how much an advancement is seen as moderately hard to comprehend and utilize”. A few establishments may discover development as perplexing due to the absence of related information and abilities, rather not intricate by those organizations, which have the necessary information and abilities. Advanced education establishments have a mind boggling instruction framework contrasted with different settings. With regards to IT advancements, earlier investigations uncovered that apparent intricacy impacts IT developments embracing choice (Ahmadi et al., 2017). Uncovered that organizations working costs these days are a major issue in view of developing the rivalries between organizations. Relative benefits implies that embracing the IT advancements perishes organizations working expenses. In the creating climate, earlier examination demonstrated that overall benefits affect organization penchant to receive IT advancements (Aguilar et al., 2018). Similarity is characterized as “how much a development is seen as reliable with the qualities, experience and needs of possible units of reception” (Rogers Everett, 1995). Advancement dissemination hypothesis recommends that higher similarity of a development with encounters, needs, and estimations of a firm will advance the advancement selection. Moreover, Ahmadi et al. (2017) discovered that similarity is perhaps the main determinants of data framework development appropriation in authoritative setting.

Perceived usefulness alludes to the degree by which an occupant accepts that utilizing smart classroom will bring significant outward results, for example, improving help execution and saving time, endeavours and cash (Kim et al., 2007). Helpfulness mirrors an occupant’s worth judgment of

Figure 1.



smart classroom in regards to its utilitarian and instrumental help for administration securing. It is related with psychological discernment, like evaluation of administration accommodation, economy, effectiveness and necessity satisfaction (Li et al., 2019). Occupants can arrive at incorporated smart classroom (for example different data push and self-administrations) through different stages to acquire applicable data and satisfy pertinent assignments, which can lighten time and endeavors (Anrong et al. 2016). The different ethics of smart classroom can improve administration execution of occupants multiply. In this way, occupants will exploit smart classroom to improve execution. Earlier observational examinations have shown the solid relationship between saw value and individual IT appropriation aim (Uğur and Turan 2018).

Perceived enjoyment alludes to the degree by which an inhabitant accepts that utilizing smart classroom is charming (Olfat et al., 2020). Earlier investigations propose that IT appropriation goal can be controlled by inherent inspiration (for example perceived enjoyment), which is valid for both indulgent situated (for example online games) and utilitarian oriented (for example e-learning) frameworks (Abdullah and Ward 2016). For instance, earlier examinations have observationally shown that appropriation expectation of utilitarian-situated frameworks (for example Web based learning administrations, internet banking administration and PCs in working environment) is altogether identified with apparent satisfaction (Shiau and Chau 2016). Singular association with data frameworks can be seen as a wellspring of joy because of qualities of contemporary ITs (Mahnke, Benlian, and Hess 2015; Manny-Ikan, et al., 2011). Contemporary ITs typically utilize various media and graphical interfaces, which empower singular association with them to turn out to be progressively arresting and pleasurable (MacLeod et al., 2018). People are normally delight looking for in nature. Their social goal towards ITs can be formed by such wonderful encounters (Cetto et al., 2015). Appropriately, in this investigation, despite the fact that smart classrooms are predominantly conveyed for utilitarian objectives, inhabitants' cooperation with the data system based administrations may reach out past simple instrumentality to get delight and satisfaction as an end in itself. Such pleasure as an inborn inspiration additionally assumes a critical part in clarifying smart classrooms reception aim. Consequently, we propose the following hypotheses:

Hypothesis 1: Perceived usefulness has a significant influence on smart classroom adoption.

Hypothesis 2: Compatibility has a significant influence on smart classroom adoption.

Hypothesis 3: Perceived enjoyment has a significant influence on smart classroom adoption.

2.3. Knowledge Sharing and its Effects on Smart Classroom Adoption

Past investigations have featured the job of technology in influencing the turn of events and lead of knowledge-sharing associations including instructors (Reychav, Warkentin, and Ndicu, 2016). We suggest that educators' discernments about how the adoption of smart classrooms influence instructors' and students associations, just as instructors' collaborations with partners, will likewise influence their aim to adopt smart classrooms. We recognize the associations started by educators and coordinated to students, collaborations started by students and coordinated to instructors, and cooperation between educators themselves, as three particular types of correspondence that happen in smart education environment. One factor in fruitful usage of innovation in the homeroom is client acknowledgment (Walczak, and Taylor, 2018), and we suggest that instructors are bound to adoption smart classrooms, since they see the adoption of these technologies as a methods for upgrading these knowledge-sharing collaborations. In this way, we suggest the following hypotheses:

Hypothesis 4: Knowledge-Sharing Perceptions (Teacher-to-Student) has a significant influence on smart classroom adoption.

Hypothesis 5: Knowledge-Sharing Perceptions (Student-to-Teacher) has a significant influence on smart classroom adoption.

Hypothesis 6: Knowledge-Sharing Perceptions (Teacher-to-Teacher) has a significant influence on smart classroom adoption.

3. METHODOLOGY

3.1. Sample and Data Collection

Data were acquired from a sample of 350 instructors from 6 universities in Saudi Arabia, all of which had actualized the utilization of smart classrooms. Prior to disseminating the questionnaires, we got endorsement from the Ministry of Higher Education, just as from the head at each school. A sum of 285 questionnaires were valued for the final analysis, yielding a response rate of 81.5%. The majority of the respondents went in age from 30–45 (42.7%), and 12% more than 51. As far as smart classroom use, 37.4% of the educators revealed that they utilized the Internet under 5 hours per week, 21.9% somewhere in the range of 3 and 4 hours every week, 17.3% somewhere in the range of 2 and 3 hours per week, and 22.4% detailed utilizing the Internet over 10 hours per week. In the example, 9% of the educators had a Bachelor's certificate, and 91% a Master's certificate or higher.

3.2. Measurements

The study variables scales were adjusted from recently approved measures and were marginally updated to fit the current setting. All study items were tried utilizing five point Likert scales that range from 1 (strongly disagree) to 5 (strongly agree). Besides, the first English survey was converted into Arabic using back translation approach since this examination was conducted in Saudi Arabia.

Perceived enjoyment and perceived usefulness were adopted from a validated scaled from prior research (e.g., Chen, 2013; Kim, Chan, and Gupta, 2007). Compatibility scale was adopted from Grover (1993). Knowledge-sharing was evaluated utilizing the ESECI scale Keiser and Schulte (2007). Inside the first scale, measures existed for two distinct kinds of cooperation and connections among students and instructors: (1) educator to student (i.e., how instructors communicate with and identify with students), and (2) students to instructor (i.e., how students interface with and identify with instructors) (Brown and Krager, 1985). The first scale included 38 items which surveyed joint effort in a university as indicated by five measures: beneficence, respect for autonomy, justice, non-maleficence, and fidelity. Common method bias was assessed utilizing Harman's one-factor test on the grounds that our information were self-detailed and gathered during a similar period. The outcomes uncovered that three components with eigenvalues above 1.0 were arranged, representing 69.53% of the all-out fluctuation. The principal factor didn't represent most of the change (21.18%).

4. DATA ANALYSIS AND RESULTS

4.1. Measurement Model

The estimation model and underlying links were assessed utilizing AMOS 22 that follows the two-stage scientific strategy: a measurement model followed by a structural model. The develop legitimacy and dependability of the measurement model were surveyed with the utilization of confirmatory factor analysis. The "goodness-of-fit indices" for the measurement model are: $\chi^2(638) = 1289.349$; $p < 0.00$; "goodness-of-fit index" (GFI) = 0.93; "adjusted goodness-of-fit index" (AGFI) = 0.91; "root mean square error of approximation" (RMSEA) = 0.064; "Tucker-Lewis index" (TLI or NNFI) = 0.96; "normed fit index" (NFI) = 0.95; and "comparative fit index" (CFI) = 0.97. The RMSEA (0.062) demonstrates satisfactory fit, which is underneath and near the cut off estimation of 0.08 recommended by MacCallum et al. (1996). The estimations of TLI or NNFI and CFI are near or over the cut-off estimation of 0.95 (Hu and Bentler, 1999). GFI is higher than 0.90 suggested by Hair et al. (2016). Albeit the chi-square test is huge, the normed chi-square worth (χ^2/df) is 1.826, which is far beneath the cut-off esteem three suggested by Fornell and Larcker (1981). Given that a solitary

fit list can't be utilized to completely decipher the model, the assessment should be founded on aggregate understanding of the fit records. We thusly decipher the general model fit as satisfactory. As demonstrated in Tables 1 and 2, all normalized relapse loads (stacking gauges) are critical and higher than 0.5 and accordingly supporting convergent validity (Gerbing and Anderson, 1988). All "average variance extracted" (AVE) gauges are higher than or near suggested level of 0.5 and develop reliabilities are higher than suggested level of 0.6 (Fornell and Larcker, 1981). In this way, taken all in all, the loadings, AVE, and develop reliabilities offer introductory help for the convergent validity of the measurement model. Since all AVE gauges are bigger than the relating squared entomb develop connection gauges, the discriminant validity is illustrated (Fornell and Larcker, 1981).

4.2. Structural Model

The fit indices for the proposed structural model are acceptable demonstrating a good fit between the data and the proposed model: $\chi^2(669) = 1490.247$; $p < 0.00$; GFI = 0.92; AGFI = 0.90; RMSEA = 0.065; TLI = 0.95; NFI = 0.93; CFI = 0.96; and normed chi-square = 2.3490. The fit indices values are acceptable.

Figure 2 demonstrates the results of the study hypotheses showing path coefficients and t-values for each estimated path. Hypotheses 1-6 were tested and the results supported all the study hypotheses. H1 suggested that perceived usefulness has a significant effect on intention to adopt smart classroom. The results indicated that perceived usefulness has a significant positive influence on smart classroom adoption ($\beta = 0.49$, $p < 0.001$). The results also indicated that the link between compatibility, perceived enjoyment, and smart classroom adoption were found to be significant ($\beta = 0.52$; 0.13, $p < 0.001$).

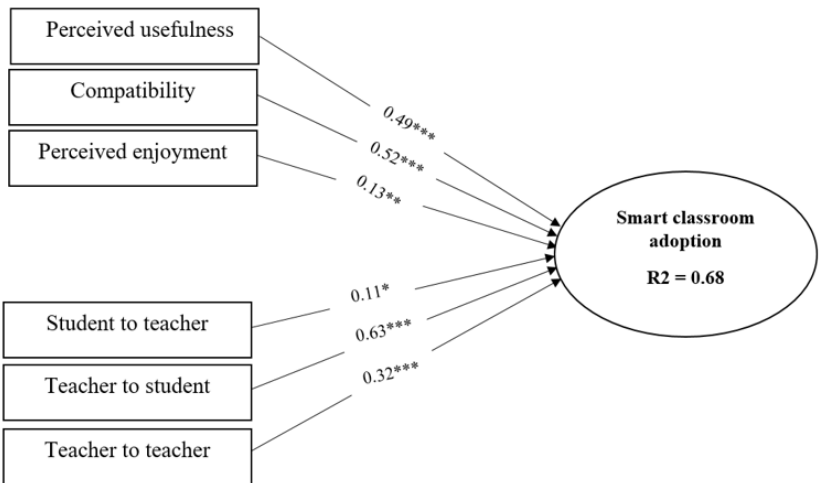
Table 1. Measurement statistics of construct scales

Constructs/Indicators	Loadings	CR	VIF	Cronbach's α	AVE	Mean	SD
Smart classroom adoption (SCA)							
SCA1	0.94	0.96	1.920	0.94	0.639	3.20	0.738
SCA2	0.97					3.29	0.803
SCA3	0.93					4.03	0.912
SCA4	0.95					4.12	0.923
SCA5	0.90					3.29	0.837
Perceived usefulness (PUS)							
PUS1	0.92	0.93	2.104	0.89	0.540	3.89	0.673
PUS2	0.95					3.20	0.834
PUS3	0.91					3.85	0.709
PUS4	0.95					4.30	0.812
Compatability (COP)							
COP1	0.90	0.94	2.102	0.93	0.637	3.20	0.783
COP2	0.93					3.89	0.903
COP3	0.89					4.30	0.826
Perceived enjoyment (PEN)							
PEN1	0.89	0.92	1.290	0.88	0.549	4.03	0.834
PEN2	0.90					3.20	0.783
PEN3	0.94					4.12	0.810
Student –Teacher (STT)							
STT1	0.94	0.95	2.120	0.92	0.647	4.14	0.783
STT2	0.90					3.12	0.830
STT3	0.93					3.89	0.881
Teacher-student (TTS)							
TTS1	0.90	0.97	1.290	0.94	0.630	3.20	0.890
TTS2	0.94					4.78	0.773
TTS3	0.93					3.21	0.695
Teacher-Teacher (TTT)							
TTT1	0.94	0.95	2.015	0.93	0.549	3.29	0.803
TTT2	0.90					3.21	0.856
TTT3	0.93					3.78	0.793

Table 2.

	SCA	PUS	COP	PEN	STT	TTS	TTT
SCA	0.794						
PUS	0.450	0.893					
COP	0.304	0.378	0.806				
PEN	0.409	0.632	0.439	0.793			
STT	0.430	0.293	0.328	0.348	0.772		
TTS	0.648	0.569	0.457	0.627	0.438	0.749	
TTT	0.329	0.672	0.622	0.563	0.621	0.612	0.842

Figure 2.



Regarding the knowledge sharing, our study revealed that the 3 relationship between student – teacher ($\beta = 0.11$, $p < 0.05$), teacher - student ($\beta = 0.63$, $p < 0.001$), and teacher - teacher ($\beta = 0.32$, $p < 0.001$) were supported. Thus, H1-H6 were supported.

5. DISCUSSION AND CONCLUSION

This examination exactly investigated the adoption of smart classroom by joining the motivation theory of IT adoption (for example; perceived enjoyment and perceived usefulness) and knowledge

sharing. All the proposed hypotheses were supported, proposing the huge jobs of perceived enjoyment and perceived usefulness and knowledge sharing in supporting the adoption of smart classroom.

Our study findings show that intrinsic motivations and extrinsic (i.e., perceived enjoyment, and perceived usefulness) are emphatically identified with smart classroom adoption. This finding proposes that occupants join significance to utilitarian and libertine worth when settling on adoption of smart classroom. These outcomes are as per past selection considers, which demonstrate that people look for all around characterized objectives and wonderful encounters (Arkorf and Abaidoo, 2015; Odeh, Garcia-Perez, and Warwick, 2017; Porter et al., 2016) demonstrated that if the client accepts that innovation improves execution, the client will have higher expectation and will be bound to utilize the innovation (Davis, 1985). Thinking about the connection among perceived usefulness and aim to adopt smart classroom, the discoveries show that there is an immediate and critical relationship among perceived usefulness and intention to adopt smart classroom. Perceived usefulness is a basic and huge factor affecting understudies' social expectations (De Laet, et al., 2020). Likewise the information in Figure 2 show that perceived usefulness has an immediate and critical impact on the goal to adopt smart classroom.

While we can just theorize on the reasons basic the absence of critical connections for these two develops, it is essential that the way coefficient for understudy to-instructor collaborations was negative, and near being huge. This might be demonstrative of reservations with respect to instructors about how the selection of tablets in the study hall may adversely affect understudy started associations toward them. It may likewise be that educators couldn't enough address understudies' impression of the understudy instructor collaboration since they were not the initiators. Surviving examination shows that understudies' mentality impacts innovation acknowledgment (Cronan and Douglas, 2012; McFarland and Hamilton, 2005). Simultaneously the educators might have been looking at their evaluation of understudy instructor association to instructor understudy connection which the educators start. An exact investigation would be important to explain the conceivable reason for the sudden relationship. To the degree that this is the situation, more cautious assessment.

This investigation has a few examination suggestions. In the first place, to the most amazing aspect our insight, this examination is among the main endeavours to observationally research the components and their relating effects on the smart classroom adoption. The surviving writing on brilliant local area has predominantly cantered around the reasonable level, like subjective comprehension of keen local area definitions, activities and savvy local area stage structures (Selim, Eid, and Agag, 2020; Yucel 2017). The meaning of smart classroom adoption appropriation by inhabitants for the accomplishment of smart local area achievement raises the criticalness to see how to encourage instructors 'willingness to embrace smart classroom adoption. In any case, restricted experimental exploration has been led on this issue. Subsequently, the current investigation that experimentally examinations how innovative conviction factors (for example perceived usefulness and perceived enjoyment) and knowledge sharing (for example students-teachers relationship) influence smart classroom adoption, gives new bits of knowledge into additional exploration on smart education.

The current examination has made clear hypothetical commitments in an unexpected way: First, notwithstanding the way that few investigations have been led to look at the determinants of IT developments selection, little is thought about the elements influencing the IT advancement appropriation in the advanced education setting. Regardless, most examinations as of late inspected the primary determinants of IT appropriation. Thinking about savvy homerooms as an advancement, most specialists who examined development appropriation zeroed in primarily on dissemination of advancement (DOI) (Rogers Everett, 1995) to build up their examination models. Thusly, this examination is the first to research the fundamental elements influencing the savvy study halls appropriation by incorporating DOI (Rogers Everett, 1995) with institutional hypothesis (Scott and McGuire, 2017) to comprehend the brilliant homerooms selection by advanced education foundations in the UAE. Accordingly, our examination supplement past research that has inspected technological factors as a vital precursor to the IT advancement appropriation yet has not hypothetically given an

exhaustive model to technological factors. These discoveries are in accordance with and develop the outcomes by Liang et al. (2007) and offer exact proof of the impact of technological factors on IT adoption.

Our discoveries demonstrated that apparent perceived usefulness and enjoyment assumes a significant part as a vital determinant of smart classroom adoption. The primary explanation for this possibly educators knew about the advantages of the smart classroom adoption. Accordingly, the Saudi Arabia government can devise a cooperation intend to upgrade the educators' mindfulness through preparing and schooling projects and workshops. In this manner, keen homerooms can be recognized as an empowering agent to help teachers and become an extreme arrangement of instructive progression in tackling basic issues inside Saudi Arabia advanced education organizations.

The advanced education's organizations administrators and government should fit the shrewd homerooms into the current foundations framework and work strategies, and necessities of the advanced education establishments. Along these lines, smart classrooms ought to be viable with the individual establishment and its framework. Moreover, it very well may be legitimized that advanced education foundations need a few prerequisites to improve the similarity of smart classrooms with their present IT in regards to programming, equipment and applications. Because of the intricacy of brilliant homerooms that fuse diverse IT and administrations, thus, this can obstruct establishments' choice to utilize smart classrooms in light of protection from change. Besides, the high level highlights of smart classrooms requires escalated mindfulness and preparing for the teachers.

6. LIMITATIONS AND FUTURE RESEARCH

Similarly as with any investigation, this examination isn't without restrictions which researchers should consider when deciphering the outcomes. To start with, to get more adroit ends, it is intriguing to imitate this exploration in an alternate setting. Second, the culturally diverse issue was neglected in the current exploration, so further examination in various culture may add to the information by testing its recommended model there. Third, fundamental variables (for example socioeconomics factors) could be investigated to check whether they influence instructors intentions to adopt smart classroom in Saudi Arabia. Analysing such factors and adding them to the current model would be a useful expansion of the current examination. Future examination can lead a longitudinal report to research the causality and interrelationships among factors that are significant to smart classroom adoption. At last, the current investigation gives an important comprehension of the principle drivers of keen homerooms reception in the advanced education setting. Consequently, directors can separate various methodologies that contribute in improving these determinants. Nonetheless, future examinations are urged to evaluate the viability of different methodologies in upgrading the huge determinants.

REFERENCES

- Aguilar, J., Cordero, J., & Buendía, O. (2018). Specification of the autonomic cycles of learning analytic tasks for a smart classroom. *Journal of Educational Computing Research*, 56(6), 866–891. doi:10.1177/0735633117727698
- Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. *International Journal of Instructional Technology and Distance Learning*, 12(1), 29–42.
- Brown, R. D., & Krager, L. A. (1985). Ethical issues in graduate education: Faculty and student responsibilities. *The Journal of Higher Education*, 56(4), 403–418. doi:10.1080/00221546.1985.11780701
- Chen, R. (2013). Member use of Social Networking Sites—An Empirical Examination. *Decision Support Systems*, 54(3), 1219–1227. doi:10.1016/j.dss.2012.10.028
- Cronan, T. P., & Douglas, D. E. (2012). A student ERP simulation game: A longitudinal study. *Journal of Computer Information Systems*, 53, 3–13.
- De Laet, T., Millecamp, M., Ortiz-Rojas, M., Jimenez, A., Maya, R., & Verbert, K. (2020). Adoption and impact of a learning analytics dashboard supporting the advisor—Student dialogue in a higher education institute in Latin America. *British Journal of Educational Technology*, 51(4), 1002–1018. doi:10.1111/bjet.12962
- Dolawattha, D. D. M., Pramadasa, H. K., & Jayaweera, P. M. (2019). The Impact Model: Teachers' Mobile Learning Adoption in Higher Education. *International Journal of Education and Development Using Information and Communication Technology*, 15(4), 71–88.
- Fearnley, M. R., & Amora, J. T. (2020). Learning Management System Adoption in Higher Education Using the Extended Technology Acceptance Model. *IAFOR Journal of Education*, 8(2), 89–106. doi:10.22492/jje.8.2.05
- Fornell, C., & Larcker, D. F. (1981). *Structural equation models with unobservable variables and measurement error: Algebra and statistics*. Academic Press.
- Galimullina, E., Ljubimova, E., & Ibatullin, R. (2020). SMART education technologies in mathematics teacher education-ways to integrate and progress that follows integration. *Open Learning*, 35(1), 4–23. doi:10.1080/02680513.2019.1674137
- Gasevic, D., Tsai, Y. S., Dawson, S., & Pardo, A. (2019). How do we start? An approach to learning analytics adoption in higher education. *The International Journal of Information and Learning Technology*.
- Gerbing, D. W., & Anderson, J. C. (1988). An updated paradigm for scale development incorporating unidimensionality and its assessment. *JMR, Journal of Marketing Research*, 25(2), 186–192. doi:10.1177/002224378802500207
- Grover, V. (1993). An empirically derived model for the adoption of customer-based interorganizational systems. *Decision Sciences*, 24(3), 603–640. doi:10.1111/j.1540-5915.1993.tb01295.x
- Hair, J. F. Jr, Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- Hamidi, H., & Chavoshi, A. (2018). Analysis of the essential factors for the adoption of mobile learning in higher education: A case study of students of the University of Technology. *Telematics and Informatics*, 35(4), 1053–1070. doi:10.1016/j.tele.2017.09.016
- Han, Z., & Xu, A. (2020). Ecological evolution path of smart education platform based on deep learning and image detection. *Microprocessors and Microsystems*, 80, 103343. doi:10.1016/j.micpro.2020.103343
- Hannache-Heurteloup, N., & Moustaghfir, K. (2020). Exploring the barriers to e-learning adoption in higher education: A roadmap for successful implementation. *International Journal of Management Education*, 14(2), 159–182.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. doi:10.1080/10705519909540118
- Karia, N., & Soliman, M. (2017). Factors affecting enterprise resource planning (ERP) systems adoption among higher education institutions in Egypt. *International Journal of Advanced and Applied Sciences*, 4(5), 8. doi:10.21833/ijaas.2017.05.025

- Keiser, K. A., & Schulte, L. E. (2007). The development and validation of the elementary school ethical climate index. *School Community Journal*, 17, 73–88.
- Kim, H.-W., Chan, H. C., & Gupta, S. (2007). Value-based Adoption of Mobile Internet: An Empirical Investigation. *Decision Support Systems*, 43(1), 111–126. doi:10.1016/j.dss.2005.05.009
- Klein, C., Lester, J., Rangwala, H., & Johri, A. (2019). Technological barriers and incentives to learning analytics adoption in higher education: Insights from users. *Journal of Computing in Higher Education*, 31(3), 604–625. doi:10.1007/s12528-019-09210-5
- Kuppusamy, P. (2020). Blockchain Architecture Stack to Smart Education. In *Digital Transformation and Innovative Services for Business and Learning* (pp. 129–158). IGI Global. doi:10.4018/978-1-7998-5175-2.ch008
- Kusumadewi, R. F., Yustiana, S., & Wijyaningrum, S. A. 2020, May. Smart Education in Mathematics Learning for Elementary School. In *1st Borobudur International Symposium on Humanities, Economics and Social Sciences (BIS-HESS 2019)* (pp. 12-15). Atlantis Press.
- Kwet, M., & Prinsloo, P. (2020). The ‘smart’ classroom: A new frontier in the age of the smart university. *Teaching in Higher Education*, 25(4), 510–526. doi:10.1080/13562517.2020.1734922
- Li, R., Huang, Q., Chen, X., Zheng, B., & Liu, H. (2019). Factors affecting smart community service adoption intention: Affective community commitment and motivation theory. *Behaviour & Information Technology*, 38(12), 1324–1336. doi:10.1080/0144929X.2019.1585475
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149. doi:10.1037/1082-989X.1.2.130
- MacLeod, J., Yang, H. H., Zhu, S., & Li, Y. (2018). Understanding students’ preferences toward the smart classroom learning environment: Development and validation of an instrument. *Computers & Education*, 122, 80–91. doi:10.1016/j.compedu.2018.03.015
- Manny-Ikan, E., Dagan, O., Tikochinski, T., & Zorman, R. (2011). [Chais] Using the Interactive White Board in Teaching and Learning—An Evaluation of the SMART CLASSROOM Pilot Project. *Interdisciplinary Journal of E-Learning and Learning Objects*, 7(1), 249–273.
- Matsebula, F., & Mnkandla, E. (2016, November). Information systems innovation adoption in higher education: Big data and analytics. In *2016 International Conference on Advances in Computing and Communication Engineering (ICACCE)* (pp. 326-329). IEEE. doi:10.1109/ICACCE.2016.8073769
- McFarland, D., & Hamilton, D. (2005). Factors affecting student performance and satisfaction: Online versus traditional course delivery. *Journal of Computer Information Systems*, 46, 25–32.
- Mitrofanova, Y. S., Filippova, O. A., Gudkova, S. A., & Ivanova, E. V. (2020). Quality Assessment of Modular Educational Resources for Smart Education System. In *Smart Education and e-Learning 2020* (pp. 513–525). Springer. doi:10.1007/978-981-15-5584-8_43
- Mokhtar, S. A., Al-Sharafi, A., Ali, S. H. S., & Al-Othmani, A. Z. (2016, May). Identifying the determinants of cloud computing adoption in higher education institutions. In *2016 International Conference on Information and Communication Technology (ICICTM)* (pp. 115-119). IEEE. doi:10.1109/ICICTM.2016.7890787
- Morze, N. V., Smyrnova-Trybulska, E., & Glazunova, O. (2021). Design of a university learning environment for SMART education. In *Research Anthology on Preparing School Administrators to Lead Quality Education Programs* (pp. 518–545). IGI Global. doi:10.4018/978-1-7998-3438-0.ch024
- Odeh, M., Garcia-Perez, A., & Warwick, K. (2017). Cloud computing adoption at higher education institutions in developing countries: A qualitative investigation of main enablers and barriers. *International Journal of Information and Education Technology (IJJET)*, 7(12), 920–927. doi:10.18178/ijjet.2017.7.12.996
- Olfat, M., Shokouhyar, S., Ahmadi, S., Tabarsa, G. A., & Sedaghat, A. (2020). Organizational commitment and work-related implementation of enterprise social networks (ESNs): The mediating roles of employees’ organizational concern and prosocial values. *Online Information Review*, 44(6), 1223–1243. doi:10.1108/OIR-04-2019-0124
- Porter, W. W., & Graham, C. R. (2016). Institutional drivers and barriers to faculty adoption of blended learning in higher education. *British Journal of Educational Technology*, 47(4), 748–762. doi:10.1111/bjet.12269

- Qasem, Y. A., Abdullah, R., Jusoh, Y. Y., Atan, R., & Asadi, S. (2019). Cloud computing adoption in higher education institutions: A systematic review. *IEEE Access: Practical Innovations, Open Solutions*, 7, 63722–63744. doi:10.1109/ACCESS.2019.2916234
- Qashou, A. (2020). Influencing factors in M-learning adoption in higher education. *Education and Information Technologies*, 1–31.
- Reychav, I., Warkentin, M., & Ndicu, M. (2016). Tablet adoption with smart school website technology. *Journal of Computer Information Systems*, 56(4), 280–287. doi:10.1080/08874417.2016.1163996
- Rogers, E. M. (1995). Diffusion of Innovations: modifications of a model for telecommunications. In *Die diffusion von innovationen in der telekommunikation* (pp. 25–38). Springer. doi:10.1007/978-3-642-79868-9_2
- Salloum, S. A., Al-Emran, M., Khalaf, R., Habes, M., & Shaalan, K. (2019). An Innovative Study of E-Payment Systems Adoption in Higher Education: Theoretical Constructs and Empirical Analysis. *International Journal of Interactive Mobile Technologies*, 13(6), 68. doi:10.3991/ijim.v13i06.9875
- Sarrab, M., Al-Shihi, H., Al-Khanjari, Z., & Bourdoucen, H. (2017, November). Proposing new mobile learning (M-learning) adoption model for higher education providers. In *Interactive Mobile Communication, Technologies and Learning* (pp. 69–76). Springer.
- Saunders, G., Oradini, F., & Clements, M. (2017). SMART Teaching in New and Old Classrooms. *IAFOR Journal of Education*, 5(1), 85–109. doi:10.22492/ije.5.1.05
- Scott, S., & McGuire, J. (2017). Using Diffusion of Innovation Theory to Promote Universally Designed College Instruction. *International Journal on Teaching and Learning in Higher Education*, 29(1), 119–128.
- Selim, H. M., Eid, R., & Agag, G. (2020). Understanding the role of technological factors and external pressures in smart classroom adoption. *Education + Training*, 62(6), 631–644. doi:10.1108/ET-03-2020-0049
- Singh, H., & Miah, S. J. (2020). Smart education literature: A theoretical analysis. *Education and Information Technologies*, 25(4), 3299–3328. doi:10.1007/s10639-020-10116-4
- Tariq, M. I., Tayyaba, S., Rasheed, H., & Ashraf, M. W. (2017, March). Factors influencing the cloud computing adoption in higher education institutions of Punjab, Pakistan. In *2017 International Conference on Communication, Computing and Digital Systems (C-CODE)* (pp. 179–184). IEEE. doi:10.1109/C-CODE.2017.7918925
- Toto, G. A., & Limone, P. (2020, September). New Perspectives for Using the Model of the Use and Acceptance of Technology in Smart Teaching. In *International Workshop on Higher Education Learning Methodologies and Technologies Online* (pp. 115–125). Springer.
- Walczak, S., & Taylor, N. G. (2018). Geography learning in primary school: Comparing face-to-face versus tablet-based instruction methods. *Computers & Education*, 117, 188–198. doi:10.1016/j.compedu.2017.11.001
- Yeap, J. A., Ramayah, T., & Soto-Acosta, P. (2016). Factors propelling the adoption of m-learning among students in higher education. *Electronic Markets*, 26(4), 323–338. doi:10.1007/s12525-015-0214-x