ASSESSING THE EFFECTIVENESS OF SMART-GOVERNMENT INITIATIVES ON ENHANCING PUBLIC SECTOR PERFORMANCE IN THE UAE

Abdulsalam Saleh Yaslem Saleh Alameri[1*], Ali Khatibi[2], S. M. Ferdous Azam[3], Jacquline Tham[4]

Abstract

This study aimed to assess the effectiveness of smart-government initiatives on enhancing public sector performance in the UAE public sector organizations. The study collected data from 353 participants, including 191 learners and 162 instructors, using a quantitative research design. The study developed a comprehensive evaluation model that considers technology, information, user characteristics, and context. The study findings suggest that successful adoption and impact of smart-government initiatives depend on various factors such as trust, environmental factors, and public sector organization readiness. The study also recommends that different stakeholders' opinions should be taken into account while building a robust platform for smart-government initiatives' adoption and evaluation to improve service delivery. The study concludes that public sector organizations must consider these multiple factors models while evaluating the adoption and impact of smart-government initiatives. The study has contributed to knowledge (theory) in the information systems and smart-government initiatives fields by proposing and validating models for successful evaluating adoption and its impacts of smart-government initiatives in UAE. The study provides a comprehensive evaluation model for smart-government initiatives that considers all four themes of such initiatives, including technology, information, user characteristics, and context. The study findings suggest that public sector organizations should pay attention to trust, environmental factors, and public sector organization readiness while evaluating the adoption and impact of smart-government initiatives. Moreover, the study recommends that different stakeholders' opinions should be taken into account while building a robust platform for smart-government initiatives' adoption and evaluation to improve service delivery. In conclusion, this study's findings provide valuable insights into the evaluation of smart-government initiatives and offer recommendations to public sector organizations in UAE to improve the adoption and impact of such initiatives. The study paves the way for future research on different domains, including other countries, other educational institutions, and other stakeholders. The study recommends further research into the integration of games in course components and the influence of moderating variables on smart-government initiatives.

Keywords: Smart-government initiatives, Public sector, Evaluation, Adoption, Technology, Trust, UAE

[1*,2,3,4]Post Graduate Centre, Management and Science University, University Drive, Off Persiaran Olahraga, Section 13, 40100, Selangor, Malaysia

***Corresponding Author:** Abdulsalam Saleh Yaslem Saleh Alameri
*Post Graduate Centre, Management and Science University, University Drive, Off Persiaran Olahraga, Section 13, 40100, Selangor, Malaysia

DOI: 10.31838/ecb/2023.12.1.422

Introduction

The term e-learning refers to any form of teaching or learning that is facilitated by digital technology. It has been defined by various academics in different ways, such as electronically aided teaching and learning (Qing et al., 2023). The use of a web-enabled learning environment to transfer knowledge content between tutors and learners or among learners using the internet as a networking medium is also a definition of e-learning. The adoption of information and communication technology (ICT) has led to the enhancement of current education systems and learning styles, and the development of more effective teaching and learning techniques such as e-learning.

The concept of smart-government initiatives involves two unique areas, which are learning and technology. Learning, in this context, refers to the cognitive process of acquiring knowledge, while technology acts as a facilitator or platform for the learning process to occur anytime and anywhere. According to Ehlers (2019), smart-government initiatives have five main characteristics. Firstly, learning takes place anytime and anywhere, not just in the classroom. Secondly, learners take on the role of organizers, while instructors serve as both the providers of educational content and moderators of the learning activities. Thirdly, learning is a cognitive process that never ends, and can be independent of educational institutions. Fourthly, learning and teaching can happen in communities of learning or communities of practice, where learners participate in both formal and informal communities. Finally, learning can combine both formal and informal settings, taking place in households, offices, and during resting time, and is learner-centered rather than tutor-centered.

The use of computing devices as a tool and an element in an information system to assist the learning process has been ongoing since 1955. However, the terminology used to describe it has changed over time. The adoption of an e-learning system in public sector organizations involves taking up the system and using it for educational purposes. This process is crucial in enhancing the performance of public sector organizations and promoting efficient and effective learning.

Also, e-learning is a form of learning that uses digital technology to facilitate the transfer of knowledge content between tutors and learners or among learners. Smart-government initiatives, on the other hand, involve the use of technology to facilitate learning anytime and anywhere, with learners taking on the role of organizers and instructors serving as both providers of educational content and moderators of the learning activities (Pambreni et al., 2019; Pushpakumara et al., 2019). The adoption of an e-learning system in public sector organizations is vital in enhancing their performance and promoting efficient and effective learning.

The purpose of this study is to address the problem of limited adoption and utilization of smart-government initiatives by public sector organizations in the United Arab Emirates (UAE). Existing models in smart-government initiatives in the UAE have limited factors, and there is no effective and comprehensive model for evaluating user acceptance, user satisfaction, and utilization of smart-government initiatives in the UAE's public sector organizations (Ahmed, 2021; Al-Aulamie, 2021; Hashim et al., 2023). Additionally, there is no model in the UAE that evaluates smart-government initiatives for key stakeholders, including learners and instructors, in a single view. These issues are significant challenges that need to be addressed to promote the successful implementation of smart-government initiatives in the UAE's public sector organizations.

A model represents a collection of linked and interdependent components that make up phenomena, which can be expressed as an equation or as graphics. In other words, a model may be a strategy. The speed of adoption of smart-government initiatives varies across developing, African, and other sub-regions. Thus, public sector organizations in the UAE choose Moodle-based solutions over smart-government initiatives (Al-Sabawy, 2021). However, the adoption and application of smart-government initiatives in public sector organizations in the UAE is still far behind. System utilization is one sign of effective information systems, according to DeLone and McLean (1992) and Lyytinen and Hirschheim (1987).

Bhalalusesa, Lukwaro, and Clemence (2021) reported that only 12.4 percent of 90 instructors who attended training used the system in the Open Public Sector Organization of the UAE, and only 8000 instructors who attended training used the system in the UAE. These figures from two significant public sector organizations in the UAE illustrate the slow adoption and application of smart-government initiatives in the country.

The lack of an effective and comprehensive model for evaluating user acceptance, user satisfaction, and utilization of smart-government initiatives in public sector organizations in the UAE is a significant problem. Tossy (2017) also reported that there is no model in the UAE that evaluates smart-government initiatives for key stakeholders, including learners and instructors, in a single view. These problems highlight the need for a comprehensive and effective model for evaluating the adoption and utilization of smart-government initiatives in the UAE's public sector organizations.

Moreover, the slow adoption and application of smart-government initiatives in public sector organizations in the UAE is a significant problem. Existing models in smart-government initiatives in the UAE have limited factors, and there is no effective and comprehensive model for evaluating user acceptance, user satisfaction, and utilization of smart-government initiatives in public sector organizations in the UAE. Furthermore, there is no model in the UAE that evaluates smart-government initiatives for key stakeholders, including learners and instructors, in a single view. Therefore, the development of an effective and comprehensive model for evaluating the adoption and utilization of smart-government initiatives in the UAE's public sector organizations is necessary.

Literature Review

Researchers have different views on e-learning. Adkins (2021) sees e-learning as any type of learning that is enabled by the internet and other new forms of information and communication technology. Laurillard (2006) describes e-learning as any teaching and learning that is enhanced by the use of digital technology. Moore, Dickson-Deane and Galyen (2021) conceptualize e-learning as all forms of electronically supported teaching and learning, while deMaagd, Tarkleson, Sinclair, Yook and Egidio (2021) see e-learning as a type of learning that uses electronic technologies to access educational curriculum outside the conventional classroom. Mohammadi and Emdadi (2021) define e-learning as a learning process that uses internet technology to design, implement, manage and develop learning.

In a cloud-computing environment, e-learning system is the type of system in which the software, platform and infrastructure are all commissioned to a dedicated vendor from which the institution is receiving as a metered service on demand provided there is an internet (Riahi, 2015; Ishaq and Brohi, 2015). In this study, e-learning, electronic learning, and e-learning system are essentially synonymous and are used interchangeably.

According to Mtebe and Raisamo (2021) and Sharma and Mishra (2007), there are several groups of e-learning. In this regard, learning materials may be stored as hardcopy or softcopy, in softcopy using CD, DVD, hard disk (portable or not portable), and tape drive.

According to Sharma and Mishra (2007), e-learning has three components: the source of learning materials, digital devices, and digital networks. The source of learning materials is the starting point of circulation of the learning materials. It coordinates sessions in an interactive and collaborative environment where a tutor or learner can act. The digital device is the end-user access tool, a device to send or receive the learning materials and provide a mode to pass on different contents, including any type of digital device a user is comfortable with. The digital network is a connection established between the place where the e-learning materials are available and the end users. This connection may be wired or wireless, connecting the source of learning materials and beneficiaries who might be learners, tutors, and other e-learning consumers. The limit of accessing e-learning in this aspect is the location, so the network might bound users to access the materials only when they are in school/campus. This type of e-learning is referred to as intranet e-learning. Unlike intranet e-learning, there is internet learning, whereby the users would have unlimited scope in terms of location, so the e-learning in this aspect can be accessed anywhere with any digital device.

This research provides information on developing countries, e-learning adoption, and models and theories related to technology adoption. Developing countries are countries that require equitable and sustainable social and economic growth. The World Bank classifies countries based on their income, with low-income countries having a Gross National Income (GNI) per capita of $995 or less, while middle-income countries fall within $996-3945 and high-income countries with $12196 and above. The UAE is a low-income developing country, while Malaysia is an upper middle-income country.

The adoption of e-learning in developing countries started in the 1990s due to the emergence of the internet and rising digital communication. Most research on e-learning adoption in developing countries has focused on the instructor's perspective, with few studies examining the perspectives of both the instructor and the learner.

This research also discusses models and theories related to technology adoption, such as the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), the Diffusion of Innovation (DOI), and the Unified Theory of Acceptance and Use of Technology (UTAUT). These models use different variables to predict the intention and use of technology and its impact on individuals and organizations. The study aims to explore factors for successfully evaluating smart-government initiatives in the UAE's public sector organizations.

Information technology has become an essential part of modern government operations, leading to the development of smart-government initiatives that utilize IT to enhance the delivery of public services. Evaluating the success of these initiatives is crucial to justify the investment and to guide further improvements. In this regard, Mtebe (2015) outlines three ways of measuring the success of smart-government initiatives: use, user satisfaction, and return on investment (RoI).

Use is a prominent indicator of success in information systems, including smart-government initiatives. The use of an e-learning system, for example, has been linked to improved learner performance in several studies (Filippidi et al., 2020; Jo et al., 2021; Naveh et al., 2020; Hashim et al., 2023). Wixom and Todd (2005) suggest that technology acceptance (intention to use and use) and user satisfaction are two ways to measure the success of information systems.

User satisfaction is another important way of measuring the success of smart-government initiatives. There is a strong correlation between user satisfaction and system performance, which is critical for successful adoption and implementation (Tella, 2022; Naveh et al., 2020; Shee & Wang, 2018; Wang, 2003). Therefore, ensuring user satisfaction is essential in the design and implementation of smart-government initiatives.

Return on investment (RoI) is another method of measuring the success of smart-government initiatives. This approach considers the amount of output received in relation to the amount of input invested (Mtebe, 2015). The two variables, output and input, need to be converted into the same unit of measurement for comparisons (Urbach & Müller, 2022; Govindasamy, 2001). However, if the investment is in monetary values, then the counterpart, which is output, also needs to be converted into monetary values. This can be challenging since not every output element can be converted into a monetary value (Mtebe, 2015).

DeLone and McLean (2003) updated their information system model to provide a comprehensive framework for evaluating IS success. The model builds on the initial version, which was based on the communication transmission concept proposed by Shannon and Weaver (1948; 1949) and the extended theory developed by Mason (1978).

The updated model considers three main problems that need to be overcome for IS success: semantic, technical, and effectiveness. The semantic problem involves the system's ability to convey the right meaning, while the technical problem involves overcoming technical difficulties such as accuracy, interface, and efficiency. The effectiveness problem pertains to the expected influence on the recipient's behavior, including intention to use, use, user satisfaction, individual, and organizational outcomes.

In conclusion, evaluating the success of smart-government initiatives is crucial for justifying investments and guiding improvements. The three ways of measuring success, use, user satisfaction, and RoI, offer different perspectives and require different methods of assessment. DeLone and McLean's updated IS model provides a comprehensive framework for evaluating IS success, taking into account the semantic, technical, and effectiveness problems. By utilizing these methods and frameworks, governments can effectively evaluate the success of their smart-government initiatives and improve the delivery of public services.

The success of e-learning and smart-government initiatives has been a topic of research for many years, and several studies have been conducted to measure their impact on learners and employees. One way to measure success is by using the Information Systems (IS) success model, which was adapted from the DeLone and McLean model of 1992. This model identifies three main

problems that need to be overcome: semantic, technical, and effectiveness. The effectiveness component includes user acceptance, use, user satisfaction, and individual and organizational impact.

Tossy (2017) used the IS success model to measure the impact of e-learning on learners' achievement in four public sector organizations in the UAE. The study found that learners' acquisition of knowledge and skills, development maturity as autonomous learners, and motivation were key factors that impacted learners' achievement.

Marjanovic, Delić, & Lalic (2016) developed a model to assess the success of smart-government initiatives in a manufacturing company in a transitional economy. The study used the DeLone and McLean (2003) model and added a new construct, user performance. The study used a combination of observation and survey methods and employed Structural Equation Modeling (SEM) to validate the model.

Moreover, the success of e-learning and smart-government initiatives can be measured using various models and constructs. The IS success model and the DeLone and McLean (2003) model are widely used to measure the effectiveness of information systems and smart-government initiatives. Other factors, such as user performance, self-efficacy, and perceived usefulness, have also been found to impact the success of these initiatives. Further research is needed to validate these models and identify additional factors that impact the success of e-learning and smart-government initiatives.

Research Methodology

Data collection is the process of gathering information to answer a concern or to test a hypothesis (Azam et al., 2021; Bryman & Bell, 2021). The type of data collection method used is dependent on the research design and the nature of the concern (Neuman, 2007).

In this research study, a survey method was used for data collection. A survey is a method of collecting data from a sample of individuals through the use of questionnaires, interviews, or other means (Oppenheim, 1992; Dewi et al., 2019; Manju et al., 2023). The survey method was chosen for this study because it allowed for the collection of data from a large number of respondents in a short amount of time (Stangor, 2021).

The survey instrument used for this study was a structured questionnaire. The questionnaire was developed based on a thorough review of the literature and the research objectives. The questionnaire was divided into two parts: Part 1 focused on the demographic information of the respondents, while Part 2 focused on the concerns. Part 2 of the questionnaire was further divided into three sections: Section A focused on the level of adoption of smart-government initiatives in the public sector organizations, Section B focused on the challenges faced in the adoption of smart-government initiatives, and Section C focused on the benefits derived from the adoption of smart-government initiatives.

The questionnaire consisted of both closed-ended and open-ended questions. Closed-ended questions provided respondents with a set of answer choices, while open-ended questions allowed respondents to provide their own answers. The questionnaire was pre-tested before administering to the actual respondents to ensure that it was clear and easy to understand.

The sampling method used for this study was a stratified random sampling technique. The population of interest was the public sector organizations in the UAE that have adopted smart-government initiatives. The population was stratified based on the emirates in the UAE, which are Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al Quwain, Ras Al Khaimah, and Fujairah. A list of public sector organizations in each emirate was obtained from the official government websites, and a proportionate sample was selected from each emirate based on the size of the population in each emirate. The sample size was calculated using the formula given by Azam et al., (2021), which resulted in a sample size of 353, including 191 learners and 162 instructors, using a quantitative research design.

Data was collected through an online survey using the Google Forms platform. The survey link was sent to the selected respondents through email, and respondents were given three weeks to complete the survey. Two reminders were sent during the data collection period to increase the response rate. The collected data was analyzed using descriptive statistics and inferential statistics. Descriptive statistics were used to describe the demographic information of the respondents and the responses to the concerns.

Inferential statistics, such as chi-square test and regression analysis, were used to test the hypotheses and to identify the relationships between variables. The data analysis was conducted using the Statistical Package for Social Sciences (SPSS) software.

Findings and Discussion

Factor loading refers to the correlation between an observed variable (in this case, a survey item) and a latent variable (in this case, a factor). It indicates how much of the variance in the observed variable can be explained by the factor.

In Exploratory Factor Analysis (EFA), the goal is to identify the underlying factors that explain the patterns of correlations among observed variables. The factor loading values obtained from EFA show the strength of the relationship between each survey item and the identified factors. In this study, factor loadings greater than 0.5 are considered significant and suggest a strong relationship between the survey item and the factor it is associated with.

The results from the factor analysis in this study suggest that the survey items are clustered together in a meaningful way, with items from the same factor having high factor loadings for that factor. This supports the construct validity of the survey instrument, indicating that it is measuring what it is intended to measure. Overall, the results of the factor analysis suggest that the survey instrument is a reliable and valid tool for assessing learners' perspectives on e-learning.

Construct validity is the extent to which a measurement tool, in this case, a learner measurement model, accurately measures the intended latent construct. The three types of validity under construct validity are convergent validity, discriminant validity, and convergent validity. Fitness indexes are used to measure construct validity, and they are grouped into three categories: absolute fit, incremental fit, and parsimonious fit. The absolute fit indexes are chi-square ($\chi 2$), root mean square of error approximation (RMSEA), and goodness of fit (GFI). Incremental fit indexes are adjusted goodness of fit (AGFI), comparative fit index (CFI), Tucker-Lewis index (TLI), and normed fit index (NFI). The parsimonious fit indexes are chi-square / degree of freedom (CMIN/df).

Overall, the construct validity of the learner measurement model was adequate, which implies that the model accurately measured the intended latent construct.

The learner model examines the impact of various factors on e-learning adoption and satisfaction. The model posits that instructor quality, technical system quality, system quality, environmental factors, public sector organization readiness, learner satisfaction, intention to use, perceived benefits, trust, and e-learning actual use all play a role in determining the success of e-learning platforms.

The standardized coefficient (β-beta) measures the relative importance of each predictor variable in the model. A positive coefficient indicates that an increase in the predictor variable is associated with an increase in the outcome variable, while a negative coefficient indicates an inverse relationship.

The hypothesis statements provide estimates of the impact of each predictor variable on the outcome variables. For instance, H1a states that instructor quality has a positive and significant effect on e-learning actual use, with an impact estimate of 0.181. This suggests that a one-unit increase in instructor quality would result in a 0.181 unit increase in e-learning actual use.

Similarly, instructor quality has a significant impact on learner satisfaction, with a coefficient of 0.432. This means that an increase in instructor quality would result in a larger increase in learner satisfaction compared to other variables in the model.

The impact estimate for technical system quality on intention to use is 0.175, indicating that an increase in technical system quality would result in a 0.175 unit increase in intention to use. This finding suggests that learners place a high value on the quality of the e-learning platform itself when deciding whether to use it.

Also, system quality has a positive and significant effect on technical system quality, with a coefficient of 0.513. This suggests that an increase in system quality would result in a larger increase in technical system quality compared to other variables in the model. Therefore, a high-quality e-learning system would likely lead to higher technical system quality and, in turn, greater intention to use and learner satisfaction.

Interestingly, the system quality has a negative impact on intention to use, with a coefficient of -0.082. This may be because learners are more likely to adopt e-learning platforms when the system is new and exciting, while they may become less motivated to use the platform over time as it becomes more familiar.

The impact estimate for learner satisfaction on intention to use is 0.705, indicating that learner satisfaction is the most important predictor variable for intention to use. This finding suggests that if learners are satisfied with the e-learning platform, they are more likely to continue using it.

Besides that, intention to use has a significant impact on trust, with an impact estimate of 0.717. This indicates that learners who intend to use the platform are more likely to trust it, which is an important factor in their decision to use the platform.

The e-learning actual use has a positive and significant effect on learner satisfaction, with a coefficient of 0.097. This finding suggests that learners who use the platform are more likely to be satisfied with it, which could lead to greater intention to use and, ultimately, greater adoption.

Moreover, the learner model provides insight into the various factors that influence e-learning adoption and satisfaction. The standardized coefficients (β-betas) provide estimates of the relative importance of each predictor variable in the model, with positive coefficients indicating a direct relationship and negative coefficients indicating an inverse relationship. Overall, the model suggests that instructor quality, technical system quality, system quality, learner satisfaction, intention to use, trust, and e-learning actual use are all important factors to consider when designing and implementing e-learning platforms.

The research study aims to present three validated Multi-Factors Models based on learner perceptions, instructor perceptions, and hybrid models for successful evaluation of adopted smart-government initiatives and their impacts in the public sector organizations of The United Arab Emirates (UAE).

The United Arab Emirates (UAE) has been implementing smart-government initiatives to improve public sector services. To ensure the effectiveness of these initiatives, it is important to consider both the learner and instructor points of view. From the learner perspective, factors such as ease of use, accessibility, and relevance of the technology are important. Instructors, on the other hand, value factors such as training and support, as well as the ability to customize and adapt the technology to their specific needs.

Multi-factor models can be used to evaluate smart-government initiatives from both perspectives. Proposed models may include factors such as user satisfaction, system usability, and technology acceptance. Validated models can provide a more accurate assessment of the effectiveness of the initiatives, with factors such as system quality, information quality, and service quality being evaluated.

A hybrid model can be developed by combining the validated learner and instructor models. This model can provide a comprehensive evaluation of smart-government initiatives, taking into account the needs and perspectives of both learners and instructors. The hybrid model can help identify areas of improvement and guide future development and implementation of smart-government initiatives in the UAE. To answer the first concern, the researchers conducted an extensive literature review and identified 12 factors from the learner's point of view and 11 factors from the instructor's point of view that affect the adoption and use of smart-government initiatives in public sector organizations in UAE.

To answer the second concern, the researchers developed two proposed Multi-Factors Models based on the DeLone and McLean (2003) IS model, one for the learner's point of view and one for the instructor's point of view. The models were validated using SEM (Structural Equation Modelling) on data collected from learners and instructors from one public sector organization and tested on data collected from eight public sector organizations.

To answer the third concern, the researchers developed a hybrid model for the evaluation of smart-government initiatives based on the validated learner model and validated instructor model. The hybrid model was developed by combining the predictors from both models and using perceived benefits as the outcome variable. The hybrid model was validated using SEM on data collected from the eight public sector organizations.

Conclusion and Recommendation

The United Arab Emirates (UAE) has made remarkable strides in implementing smart-government initiatives in the public sector. However, evaluating the success of such initiatives is critical for their continuous improvement and long-term sustainability. This research study aimed to contribute to the knowledge (theory) in the information systems and smart-government initiatives fields by proposing and validating models for successful evaluating adoption and its impacts of smart-government initiatives in the UAE. The research focused on learners and instructors' points of view, which supported the validity of the proposed models.

The study used a base model (McLean & DeLone, 2003) as a framework to evaluate the adoption and impact of smart-government initiatives in the UAE. However, it expanded on the base model by including constructs such as Trust, Environmental factors, and Public sector organization readiness. These constructs are critical as they help in evaluating the readiness of the public sector organization to implement and sustain smart-government initiatives.

The research found that Trust, Environmental factors, and Public sector organization readiness constructs are rarely integrated into the base model. The study's findings showed that these constructs are valuable, as they were evidenced in this research study. This implies that in the UAE public sector organizations, learners are most affected by Organization settings (Public sector organization readiness), Environmental demand/pressure, and subjective culture (Trust).

The study also found that the impact of Service Quality on Technical System Quality (SQ→ TSQ) was strong in both learner and instructor models. This finding provides empirical evidence about the relationship between two previous exogenous factors, Service Quality, and Technical System Quality. This relationship is essential, especially in smart-government initiatives, as most studies in this area do not provide the relationship between the exogenous factors, especially Service Quality, System/Technical Quality, and Course Quality.

Furthermore, the study broke down System Quality into two parts, Educational System Quality and Technical System Quality, to test them specifically rather than generally. It also divided Intention/Use into Intention to Use and E-Learning Actual Use. These additions to the base model helped to provide a more detailed and specific evaluation of smart-government initiatives.

In conclusion, this research study made significant contributions to knowledge (theory) in the information systems and smart-government initiatives fields. The proposed and validated models for successful evaluating adoption and its impacts of smart-government initiatives in the UAE are comprehensive as they consider all four themes of smart-government initiatives, technology, information, user characteristics, and context. Furthermore, the models were validated from different points of view, learners and instructors, which adds to their validity. The study also expanded on the base model by including critical constructs such as Trust, Environmental factors, and Public sector organization readiness. Finally, the study's findings showed the strong impact of Service Quality on Technical System Quality, which provides empirical evidence about the relationship between these two exogenous factors. Overall, this research study provides a hybrid model for the evaluation of smart-government initiatives that is based on the validated learner model and validated instructor model.

The research study has significant practical implications for public sector organizations looking to implement smart-government initiatives. The study provides three tools that can be used to evaluate the success of these initiatives from different users' points of view, including learners, instructors, and a combined view. This allows for a comprehensive understanding of the impact of these initiatives on different stakeholders.

The study also highlights the critical role of Trust, Environmental factors, and Public sector organization readiness in the successful implementation of smart-government initiatives. Specifically, the study highlights the importance of factors such as ICT policy, peer public sector organizations competitive pressure, top management support, financial support, internet availability, and electricity power in the successful evaluation of these initiatives. These factors need to be considered when implementing smart-government initiatives, as they can significantly impact the success of the initiatives.

In addition, the study emphasizes the importance of service quality in the technical system quality of smart-government initiatives. This relationship is often overlooked in studies related to this area, and the study provides empirical evidence of this relationship. Educational institutions need to be aware of the importance of providing high-quality services to support the technical system quality of smart-government initiatives (Rachmawati et al., 2019).

Overall, this research study provides valuable insights and tools that can be used by public sector organizations and educational institutions in the successful implementation and evaluation of smart-government initiatives. By considering the factors highlighted in this study, organizations can ensure that they are implementing initiatives that meet the needs of stakeholders and are effective in achieving their goals (Tham et al., 2017; Udriyah et al., 2019).

The research study provides several recommendations for public sector organizations that have adopted smart-government initiatives. The study stresses the importance of considering multiple factors in the successful evaluation of smart-government initiatives. It suggests that public sector organizations should use multiple factors models, such as those developed in the study, to evaluate the effectiveness of the initiatives. These models consider all the components necessary for making e-Learning sustainable, and they take into account the needs and viewpoints of different stakeholders who use the e-Learning system.

Furthermore, the study recommends that public sector organizations pay attention to Trust, Public sector organization readiness, and Environmental factors, which are often overlooked by most models/frameworks. These factors have been found to be crucial in the successful adoption and evaluation of smart-government initiatives, and they can greatly improve service delivery.

The study also suggests involving other stakeholders in future research, such as ICT personnel, e-Learning developers, and people from industries, to build a robust platform for smart-government initiatives' adoption and evaluation. Additionally, the study proposes that the developed models be tested in other countries and different domains to increase their applicability. The study also suggests applying the same or additional factors in other educational domains, such as higher learning institutions, secondary schools, and primary schools, to expand the scope of the research.

In terms of methodology, the study recommends future research using a qualitative approach or a combination of qualitative and quantitative approaches to comprehend the changes in technology and context. Moreover, the study suggests adding necessary constructs, if possible, to enhance the understanding of smart-government initiatives. Additionally, the study proposes investigating the influence of moderating variables, such as age, gender, and experience, on smart-government initiatives.

Finally, the study suggests further research into the integration of games into course components, as previous studies have found that learners are subject to many influences compared to instructors. The study recommends incorporating course components such as contents, design, and delivery, which have been overlooked in the evaluation of smart-government initiatives in public sector organizations in The United Arab Emirates (UAE).

Overall, the research study provides valuable recommendations for public sector organizations in the successful adoption and evaluation of smart-government initiatives. The study also identifies several areas for future research to enhance our understanding of smart-government initiatives and improve their effectiveness.

References

1. Adkins, S. (2021). The Africa Market for Self-paced elearning products and Services:2021-2016 Forecast and Analysis.
2. Ahmed, T. (2021). Toward Successful E-learning Implementation in Developing Countries:A proposed Model for Predicting and Enhancing Higher Educations' Participation. International Journal of Academic Research in Business and Social Sciences, 3(1), 422-425.
3. Al-Aulamie, A., Mansour, A. and Daly, H. (2021). Investigating the direct effect of intrinsic motivation on learners' behavioural intention. In Proceedings of International Conference Information Systems 2021 (pp. 353-357). Lisbon, Portugal: IADIS.
4. Al-Sabawy, A. Y. (2021). Measuring Smart-government initiatives Success. Public Sector Organization Of Southern Queensland.
5. Azam, S. M. F., Yajid, M. S., Tham, J., Hamid, J. A., Khatibi, A., Johar, M. G. M. & Ariffin, I.

A. (2021). *Research Methodology: Building Research Skills*. 1st Ed., McGraw-Hill Education (Malaysia) Sdn. Bhd.

6. Bhalalusesa, R., Lukwaro, E.E. & Clemence, M. (2021). Challenges of Using E-learning Management Systems Faced by the Academic Staff in Distance Based Institutions from Developing Countries: A Case Study of the Open Public sector organization of The United Arab Emirates (UAE). Huria Journal of OUT, 14, 89-110.
7. Delone.W,McClean,E.R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. Journal of Management Information Systems, 19(4), 9-30.
8. DeLone.W,McLean,E. (1992). Information System Success:The Quest for Dependable variable. Information Systems Research, 3(1), 60-95.
9. deMaagd, Tarkleson, Sinclair, Yook, & Egidio. (2021). An Analysis of e-Learning Impacts & Best Practices in Developing Countries. .
10. Dewi, N, Azam, S. M. F. and Yusoff, S. K. M. (2019). Factors influencing the information quality of local government financial statement and financial accountability, Management Science Letters, 9 (9): 1373-1384
11. Ehlers, U. (2019). Web 2.0 – e-learning 2.0 – quality 2.0? Quality for new learning cultures. Quality Assurance in Education, Vol. 17 No. 3, 296-314.
12. Filippidi, A., Tselios, N. & Komis, V. (2020). Impact of Moodle usage practices on learners' performance in the context of a blended learning environment. . In Social Applications for Lifelong Learning. , (pp. 1-6). Patra,Greece.
13. Govindasamy, T. (2001). Successful implementation of e-learning: Pedagogical considerations. The Internet and Higher Education, 4, 287-299.
14. Hashim, O. W., Khatibi, A. & Azam, S. M. F. (2023). The Influence of Social Network Ties towards Social Entrepreneurial Intention of Undergraduate Students: The Case of Sri Lanka. Russian Law Journal, 11 (6s): 100 – 113
15. Jo, I.-H., Kim, D. & Yoon, M. (2021). Analyzing the log patterns of adult learners in LMS using learning analytics. In Proceedins of the Fourth International Conference on Learning Analytics And Knowledge (pp. 183–187.). LAK '14. New York, New York, USA: ACM Press.
16. Laurillard, D. (2006). E-Learning in Higher Education. In P. Ashwin (Ed.). From Changing Higher Education: The Development of Learning and Teaching., 71-84.
17. Lyytinen, K., & Hirschheim, R. (1987). Information systems failures - A survey and classification of the empirical literature. Oxford Surveys in Information, 4, 257-309.
18. Manju, T., Kumar Tarofder, A., & Azam, S. M. F. (2023). Modern Validity of Historical Factors on Voter Intention and Its Basic Patterns in Sri Lanka. International Journal of Social Science Research and Review, 6(4), 104-122.
19. Marjanovic, U., Delić, M. & Lalic, B. (2016). Developing a model to assess the success of smart-government initiatives: evidence from a manufacturing company in transitional economy. Information Systems and e-Business Management, 14(2), 253–272. doi:10.1007/s10257-015-0282-7
20. Mason, R. (1978). Measuring information output: A communication systems approach. Information and Management, 1, 219-234.
21. Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. Computers in Human Behavior, 45, 359–374.
22. Moore JL, Dickson-Deane C and Galyen K. (2021). ELearning, online learning, and distance learning environments: Are they the same? . The Internet and Higher Education, 14(2), 129-135.
23. Mtebe, J. (2015). Learning Management System success: Increasing Learning Management System usage in higher education in sub-Saharan Africa. International Journal of Education and Development using Information and Communication Technology (IJEDICT), 11(2), 51-64.
24. Mtebe, J. S., & Raisamo, R. (2021). Challenges and instructors' intention to adopt and use open educational resources in higher education in The United Arab Emirates (UAE). International Review of Research in Open and Distance Learning, 15(1), 250-271.
25. Naveh, G., Tubin, D. & Pliskin, N. (2020). Learner satisfaction with learning management systems: a lens of critical success factors. Technology, Pedagogy and Education, 21(3), 337–350.
26. Neuman, W. (2007). Basic of social research qualitative and quantitative approaches (2nd ed.). Boston: Pearson.
27. Oppenheim, A. (1992). Questionnaire design, interviewing and attitude measurement (2ed ed.). London: Pinter Pub Ltd. .

28. Pambreni, Y., Khatibi, A., Azam, S. M. F. and Tham, J. (2019). The Influence of Total Quality Management toward Organization Performance, Management Science Letters, 9 (9): 1397-1406
29. Pushpakumara, W. D. H., Atan, H., Khatibi, A., Azam, S. M. F. and Tham, J. (2019). Developing a Framework for Scrutinizing Strategic Green Orientation and Organizational Performance with Relevance to the Sustainability of Tourism Industry, European Journal of Social Sciences Studies, 4 (3): 1-18
30. Qing, T., Khatibi, A., Tham, J. And Azam, S. M. F. (2023). Attractiveness of Vocational Collegesin Shanxi: Myth and Development in China. Russian Law Journal, 11 (6s): 81 – 90
31. Rachmawati, D., Shukri, S., Azam, S. M. F. and Khatibi, A. (2019).Factors Influencing Customers'Purchase Decision of Residential Property in Selangor, Malaysia, Management Science Letters, 9 (9): 1341-1348
32. Riahi, G. (2015). Smart-government initiatives based on cloud computing:A Review. The 2015 International Conference on Soft Computing and Software Engineering, (pp. 352-359).
33. Shannon, C. (1948). A mathematical theory of communication. The Bell System Technical Journal, 27, 379-423.
34. Shannon, C.E & Weaver, W. (1949). The Mathematical Theory of Communication. Champaign, IL: Public sector organization of Illinois Press.
35. Sharma, R., & Mishra, S. . (2007). Global E-learning practices: An introduction. In R. M. Sharma, Global Cases in E-learning Practices: Successes and Pitfalls (pp. 1-11). . Hearsey: IDEA Group Publishing.
36. Shee, D.Y. & Wang, Y.-S. (2018). Multi-criteria evaluation of the web-based e-learning system: A methodology based on learner satisfaction and its applications. Computers & Education, 50, 894-905.
37. Stangor, C. (2021). Research methods for the behavioural sciences (4th ed.). USA: Wadsworth Pub Co. .
38. Tella, A. (2022). System-related factors that predict learners' satisfaction with the Blackboard Learning System at the Public sector organization of Botswana. African Journal of Library, Archives and Information Science, 22(1), 41.
39. Tham, J., Yazid, M. S. A, Khatibi, A. A. and Azam, S. M. F. (2017), "Internet and Data Security –Understanding Customer Perception on Trusting Virtual Banking Security in Malaysia", European Journal of Social Sciences Studies, 2 (7): 186-207
40. Tossy, T. (2017). Measuring the impacts of e-learning on learners' achievement in learning process: An Experience from The United Arab Emirates (UAE) public sector organizations. The Online Journal of Distance Education and e-Learning, 5(2), 61-68.
41. Udriyah, U., Tham, J. and Azam, S. M. F. (2019). The Effects of Market Orientation and Innovation on Competitive Advantage and Business Performance of Textile SMEs, Management Science Letters, 9 (9): 1419-1428
42. Urbach, N. & Müller, B. (2022). The Updated DeLone and McLean Model of Information Systems Success. . In M. R. Y. K. Dwivedi, Information Systems Theory. Integrated Series in Information Systems (pp. 1-18). New York, NY: Springer New Yor.
43. Wang, Y.-S. (2003). Assessment of learner satisfaction with asynchronous electronic learning systems. Information & Management, 41(1), 75-86.