

Perceptions of Secondary Stage Science Teachers in Najran District Toward Using E-learning in Teaching

Muna Ali Saif Thyab

Associate professor of curriculum and instruction, Najran University

Abdulsalam Dael Amer Saif *

Professor of curriculum and instruction, Najran University

Tel: 00966-537991731 E-mail: profdael@gmail.com

Abstract

This study aims to explore the perceptions of secondary stage science teachers in Najran district toward using e-learning. Data were collected from science teachers in Najran district during the second semester, 2022. Respondents of 184 were assessed for their Perceptions using a Likert type questionnaire with four factors: affect (liking), perceived usefulness, perceived control, and behavioral intention to use the e-learning. Different statistical procedures were employed to analyze the data, which included descriptive statistics, correlational analyses, and t-test. The results show that science teachers have positive perceptions toward the e-learning. Also the results showed no gender differences among participants regarding their perceptions were found. Implications for science teacher training and suggestions for further research are provided.

Keywords: Perceptions, Science Teachers, E-learning.

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Introduction

Technology has an important role in education. Technology helps learners to take advantages of their knowledge and skills more effectively and efficiently. Technology in the classroom has come a long way since the 1980s. Computers have changed the way that many teachers use to teach. Teachers can use computers to demonstrate dynamic processes in real time such as providing students with simulations those allow the teacher to produce deeper thought processes.

Learning is the fundamental goal of education and anything that helps in learning is always desirable in education. Educational e-learning is one of the factors that enhance learning and therefore is always emphasized. Educational e-learning means integrating e-learning in such a way that leads enhancement of learning process (Alnasraween & Shahadab, 2022). It is a practice by which the learning and teaching process can be improved (pandey, 2022). E-learning is the discipline which consists of gathering machine, process, method, system, management, control system and bridges between science and applications. The term e-learning refers to the learning methods which use electronic channels to deliver the instructional content. Moreover, e-learning is also referred to as web-based learning; e-learning based learning; online learning; and network learning (Mutambik, 2018) E-learning facilitates and cooperate the students. So the way by which facilitation and cooperation is provided is called the educational e-learning (Erarslan & Şeker, 2021). Educational opportunities can become more diverse with the use of educational e-learning.

In some educational systems, e-learning integration has been regarded among the top priorities in policy making, budget planning, and curriculum development. At the same time, e-learning is recognized as one of the key drivers for the improvement of teaching and learning (Alnasraween & Shahadab, 2022; Afshari, Bakar, Wong, Samah & Fooi, 2008; Wong, Atan & Sabudin, 2010), prompting governments to launch major initiatives and make considerable capital investments to build and maintain information communication e-learning (ICT) infrastructures in the schools (Moses, Khambari & Wong, 2008). In recent years, the Internet has not only fostered rapid access to information; it also facilitated changes in the nature of today's education (Pham & Tran, 2020). Internet becomes an important means for disseminating various educational materials to students.

Because of broad global attention given to e-Learning, various studies have been preceded by educational institutions and organizations (Santayasa, Agustini, & Pratiwi, 2020). The Saudi Ministry of Higher Education is one of those educational organizations that proposed the use of e-learning, and recognized the need of integrating Information and Communication E-learning (ICT) among universities in Saudi Arabia. It was reported that "the Saudi Arabian E-learning industry is projected to reach USD 125 million in 2008 and is set to grow at a compound annual rate of 33 per cent over the next five years" (Gazette, 2008). The increased projection shows vital focus on the advantages of e-learning in Saudi Arabia's modern education. However, many factors still influence negatively on the students' participation in the online courses. Al-Jarf (2007) observed that Saudi students had a negative attitude towards online learning.

There is a lot of research on the views of teacher's about technology use in the classroom. According to

Pandey (2022), experienced teachers who had little or no professional development in the use of technology in the classroom were less likely to use it in the classroom and were less likely to see the benefit of technology usage in the classroom. Alsaaidh (2022) found that the more teachers were involved in actually setting up classroom technology the more likely they were to use that technology for instruction (Alsaaidh, 2022). This is why it is important for teachers to receive technology skill training. Baydar (2022) found that teachers saw their roles as being more teacher centered and less student centered in classrooms that did not have computers.

Kula (2021) stated that boys appear to use computers for gaming whereas girls tend to use it for networking and communication. Schools need to develop better strategies for incorporating technology into classroom instruction by using this information. When middle school and secondary school teachers used web-based learning tools as part of their lessons, they perceived that their students were more successful as it appeared to significantly engage the students (Kay, Knaack, & Petrarca, 2009). Furthermore, the students also scored higher on tests. This study also found that teachers felt the web-based learning tools were easy for the students to use. The use of technology in the classroom allows students to engage in a more active way of thinking, literally a hands-on learning experience in which they are able to practice executing skills that would be impossible with a traditional book lesson.

Pertaining to the teaching of science, e-learning can help learners to understand abstract ideas, invisible processes, complex models and concepts like, energy, molecules, electrons, electric current, chromosomes. Geer and Sweeney assert that, Technology should be used to enhance learning; therefore, it is important for teachers to comfortable use it to ensure that the learners get the full advantages of available educational technology.

Im (2021) conducted a study to investigate the efficiency and effectiveness of an online learning system at an university. Their study reported that students in the online learning environment performed better than those who were enrolled in the traditional class. These students also possessed a higher level of satisfaction with their learning compared to their counterparts in the traditional classes. At the same time, Alshanaq and Domee (2010) supported this finding of the previous study regarding students' positive attitudes toward electronic learning.

At the same time, a study by Bhatiasevi (2011) found that students expressed willingness to use the e-learning system and overcome usability problems in order to achieve better grades. These students also showed greater satisfaction towards the e-learning materials. Sirtongthaworn, Krairit, Dimmitt and Paul (2006) reported that all instructors interviewed had little or no experience with online teaching methodology. Consequently, they lacked confidence in implementation of e-learning. From the students' perspective, they revealed that poor availability of access points, slow network communications, and a lack of software application as their challenges to participating in e-learning. These findings were supported by Saekow and Samson (2011), who found that instructors had failed to see the value of and were disinterested in implementing e-learning, while students had complained about the poor ICT infrastructure.

Research showed that teachers' beliefs influenced technology use in their classrooms and teachers with positive views about the use of technology in general, use computers in their lessons. In many cases, the teachers with technophobic tendencies refrain from making use of computers and mainly make use of the traditional teaching methods, although they do have access to ICT-resources. The general assumption, and the e-Education policy of the education department, is that the use of e-learning resources will provide teachers and learners with a wide range of interesting opportunities for creating different levels of interactivity (Pham & Tarn, 2020). For that reason, using e-learning in education becomes a necessity for occurring an effective learning among students.

Acceptance of e-learning mainly refers to a user's enthusiasm to adopt and use such learning for supporting students understanding (Sahin, 2021). Previously, procurers of e-learning could rely on organizational authority to ensure that e-learning was used, as is the case in many business settings. In education, this is usually not the case because users have greater volition in deciding which e-learning to use and when to use it. For example, students can often decide whether to study through e-learning or not without any academic consequences. Under these conditions, the success of any technological initiatives such as e-learning may be substantially affected by the degree to which potential users (students) are willing to use it. Therefore, this study tries to investigate the attitudes of pre-service science teachers toward e-learning as a participation for identifying factors that confront e-learning in Saudi Arabia.

With respect to e-learning in Saudi Arabia, Lal, and Algendy (2010) reported that attitudes of science teachers who attended courses in e-learning domain toward electronic learning are more positive. At the meantime, Mirza (2007) stated that more recognition and interest are finally given to e-learning among Saudi Arabia's academic institutions. These findings reflect the importance of using technologies in education in order to enhance the acceptance of e-learning.

Moreover, Khafaga (2021) confirms that the benefits derived from the e-learning system will not be achieved if the learners do not accept and participate effectively in their university's e-learning systems. On the other hand, some argue that many factors still influence negatively on the students' participation in the online courses. Supriyatno, Susilawati, & Hassan (2020) pointed out that using the online system for her English course

was a total failure. The author has also observed that the interaction between the participants was lacking and that the students had a negative attitude towards online courses.

Aim of this study

The aim of this study is to explore the e-learning acceptance of science teachers in Najran city. The research questions that guide this study are:

1. What is the general level of e-learning perception among science teachers in Najran city?
2. Is there a significant difference in e-learning acceptance among science teachers regarding the gender?

1.1.1 Heading 3

Methodology

Population and sample

The population of this study is the science teachers in Najran district, A total of 184 science teachers were randomly chosen as a sample for this. Of this sample, 93 were males and 91 were females.

Instrumentation

The instrument used in this study was the e-learning acceptance measure (ELAM), modified by Faqih & saif (2016). The measure comprises a 34-item questionnaire that has four components of e-learning. The first component, 'Affect', is composed of ten items and measures feelings towards e-learning. The second component 'Perceived Usefulness' consists of eight items that measure the individual's beliefs about the usefulness of e-learning in their job. The third component 'Perceived Control', is composed of six items that measure the perceived comfort level or difficulty of using e-learning. Finally, the fourth component, 'Behavioral Intention', is composed of six items that measure behavioral intentions and actions with regarding e-learning.

Responders used a five-point scale of strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The scores from the items on each component were gathered to provide individual scores on each component. The negative items were inverted coded in order that meaningful analyses at the sub-scale level could be conducted.

Concerning the instruments' validity, content validity is the only type of validity for which the evidence is logical rather than statistical and it is difficult to separate content validity from other types of validity (Kaplan & Saccuzzo, 1989). The technique of content-related validity was used to determine the surveys' validity, and according to the opinions of seven university professors who have experiences in the use of e-learning and computer in education. They held doctorates in either educational e-learning or science education, and are familiar with the e-learning standard required in academic research. The ELAS has been found to be a reliable instrument to measure science teachers' perceptions towards e-learning among, and the split-half method was used to determine the reliability of the survey. The coefficient of 0.83 was considered a highly acceptable indicator of the reliability of this survey

Procedures

Questionnaires have been distributed to the participants in the academic year 2021/2022, at the begging of the second semester. All participants administrated the questionnaires in week 2 of the semester.

Results

Science teachers' perceptions of e learning was measured in terms of the affective, perceived usefulness, perceived control, and behavioral intention components in the ELAM. The respondents' mean scores with the standard deviations of the four subscales are shown in table 1. The participants scored the highest on *affective* (mean = 4.32). The second highest score is that of the *behavioral intention* (mean = 4.27), followed by the *perceived control* (mean = 4.08), and then the *perceived usefulness* (4.00) which is the lowest score (mean = 3.92). These means indicate that science teachers were more positive about the intention to use e-learning and their affect towards e-learning than their control of the e-learning and their perceptions of the usefulness of the e-learning.

Table 1

Descriptive statistics and reliability coefficient for each subscale (n=184)

Subscale	Mean	SD	alpha
Affective	4.45	0.48	0.87
Perceived usefulness	4.00	0.89	0.79
Perceived control	4.08	0.94	0.82
Behavioral intention	4.27	0.51	0.84
Overall e-learning acceptance	4.21	0.70	0.83

The results also proposed that science teachers perceived themselves to be more in control of e-learning than they thought the e-learning was useful, and had Behavioral intention to use the e-learning more than seeing e-learning affective. At the overall level, e-learning acceptance is very well (4.09), and this indicates that science

teachers held a suitable acceptance to use e-learning in teaching science topics. The reliability coefficient for each subscale ranges from high (0.87) to moderate (.79). The reliability for the whole scale is high (0.83).

Table 2

Correlation matrix of the factors

Subscale	Affective	PU	PC
Perceived usefulness (PU)	0.31		
Perceived control (PC)	0.58	0.41	
Behavioral intention (BI)	0.56	0.28	0.55

* $p < .01$ (2-tailed)

The relationship between the factors is shown in Table 2. All factors have significantly correlations at the $p < .01$ level and the coefficients range from .31 to .58. This suggests that the four components were fairly independent to be used as independent variables. This allows us to examine the perceptions of science teachers toward e-learning by each factor.

Table 3

The difference between e-learning attitudes regarding the gender

Gender	n	Mean	SD	t-value	p
Male	93	3.88	0.94	0.04	<0.05
Female	91	3.91	0.98		

As shown in table 3, no significant difference was found among participants regarding their gender ($t = 0.04$, $P < 0.05$). So, these score suggest that female and male science teachers were similar in their perceptions toward the e-learning.

Discussion

As indicated from the results, science teachers showed positive perceptions towards the e-learning, as shown by the mean score for each factors which ranged between 4.00 and 4.45. The overall positive level of positive perceptions of science teachers toward e-learning could be interpreted in term of the potential encouragement of the educational sector in Saudi Arabia to use e-learning in education. At the same time, facilities offered by schools to using technologies could be the other reason that enable science teachers to employ e-learning in their teaching. This finding is supported by the study of Lal and Algendy (2010) which suggested a positive relationship between attending ICT courses and attitudes toward e-learning.

Increasing the use of computers in schools could have promoted greater opportunities of using related technologies, especially the Internet. It is expected that science teachers will benefit from the e-learning system offered by the ministry of Education in Saudi Arabia as long as there is an acceptance of e-learning system by those science teachers. This was confirmed by Ienezi (2011) as stated previously on the literature.

Conclusion

The increasing use of computers and other devices that enable science students' teachers to deal with the internet, and having those students' teachers study some of the ICT courses may play an important role in affecting their attitudes towards the e-learning and make them accept the e-learning as a suitable approach of learning. This study suggests a need for teacher educators to provide a conducive and non-threatening environment for pre-service science teachers to experience success in using the e-learning, with a view to allowing pre-service teachers to gain competence and confidence in using e-learning for teaching and learning. Future studies could include a systematic examination of all aspects of teacher education and how these interact to impact on pre-service science teachers' attitudes, acceptance, and usage of the e-learning as a tool for instructional purposes and professional development.

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