



A Study on Educational Research of Artificial Neural Networks in the Jordanian Perspective Abstract

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ABSTRACT

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This study aims to investigate the effect of artificial neural network (ANN) systems and learning management systems (LMS) on the educational quality of Jordanian universities. The current study also investigates the moderating impacts of instructors' talents on the nexus of artificial neural network systems, learning management systems, and the educational quality of Jordanian institutions. Additionally, the study collected data via survey questionnaires and distributed it via personal visits. The researchers surveyed students and faculty members at Jordan's private universities. Additionally, the article used the smart-PLS to examine the reliability of variables, the validity of items, and the nexus of association between constructs. The findings indicated a significant

correlation between artificial neural network systems and learning management systems and the educational quality of Jordanian universities. Additionally, the results suggested that teachers' abilities considerably affect the relationship between the ANN system, the learning management system, and the educational quality of Jordanian universities. This page serves as a guide for regulators as they develop rules to boost the educational quality of Jordan's institutions.

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Introduction

Any country's prosperity is intimately related to its educational system as a country's young is ultimately responsible for determining its future. A well-educated and skilled youth has the potential to alter the course of any country's future (Sáez de Cámara et al., 2021). The educational system is a significant distinction between developed and developing countries. As the world has evolved into a technological village, these advancements have also affected the global education system. Technology has grown at a breakneck pace in recent years, affecting children and adults. Technology has both positive and negative sides. Even if the outcome is negative, technical advancement cannot be ignored. Over time, education systems worldwide have joyfully adapted to technological advances. Because education has evolved into a platform for rapid technological development, it is critical to establish good technology in education. Two facets of technological integration into education are examined: 1) Artificial Neural Networks and 2) Learning Management Systems. An artificial neural network (ANN) does not, in the same way, that an expert system does, replicate the cognitive processes and if/then logic of the human brain. It simulates some aspects of the brain's information processing and physical structure through the use of a network of neural connections. As a result, some authors referred to it as a "microscopic," "white-box" system, while an expert system was referred to as a "macroscopic," "black-box" system (Lau et al., 2019). Neural Networks' performance is not dependent on ruled-based programming. On the other hand, neural networks employ learning algorithms to "tune" their outputs to their inputs. The strategy is advantageous when rules are not specified explicitly and when "tuning" inputs to outputs is more convenient than studying the internal reasoning process (Binsawad, 2020). Almost every educational part now uses neural networks to analyse large volumes of data. e-Learning has recently evolved as an active area of research and innovation, attracting significant investment worldwide. It refers to the distribution of personalised, comprehensive, and dynamic learning content via the Web, hence assisting in building knowledge communities and connecting students and practitioners with experts. E-Learning complements the numerous stages of traditional education and, in some instances, is the only mode of instruction accessible, allowing for knowledge acquisition under specialised conditions (e.g. impaired students, absence of teaching structures, etc.). Students' learning activities generate students' knowledge; if the activity is not working properly, students' knowledge will not be consistent with the set learning objectives. E-learning is a technique of delivering education electronically over an internet network or the internet, utilising an education management system (Regmi & Jones, 2020; Rodrigues et al., 2019). The term "e-learning" refers to an effort to transform the educational process in schools and universities into a digital format compatible with internet technologies. E-learning is one solution to the issue of insufficient face-to-face time, which arises regularly during the learning process. Students can accomplish learning assignments via e-learning instead of relying on limited face-to-face time in class. E-learning is a result of technical improvements, such as the adoption of a Moodle-based learning management system (LMS) (Washington, 2019). A Learning Management System (LMS) is a type of software that aids in the learning process in online education. A Learning Management System is defined in its simplest form as "a computer programme that automates the administration, recording, and reporting of training activities." The basic goals of an LMS are to increase

the autonomy of learning and to enable LMS users to register, save, administer, and publish learning on the web, as well as print documents accessible via the LMS. The LMS enables users to design and manage learning activities in accordance with their intended goals and learning objectives (Fearnley & Amora, 2020; Simanullang & Rajagukguk, 2020). The learning management system has a significant impact on the educational quality at all levels, but particularly in university education, i.e. the higher education system (da Costa et al., 2020; Holmes & Prieto-Rodriguez, 2018).

Jordanian Education System

Jordan's history of higher education is scant. Jordan, previously Transjordan, a British protectorate, is a small country covering 90,650 square kilometres and home to approximately 4 million people. It was included in the Middle East following World War I. In the 1920s, national education systems formed in the region, resulting in a rapid expansion in Transjordan's school enrollment. Following his coronation in 1953, King Hussein began a Royal Court. Jordan's first public university, the Institution of Jordan, was created in 1962, and the country's second, Yarmouk University, was founded in 1976. Jordan currently has 32 universities. There are ten public, nineteen private, one regional, and two operate under their own set of regulations. Jordan's higher education department is committed to advancing higher education in the country. Figure 1 illustrates the government's expenditures on education.

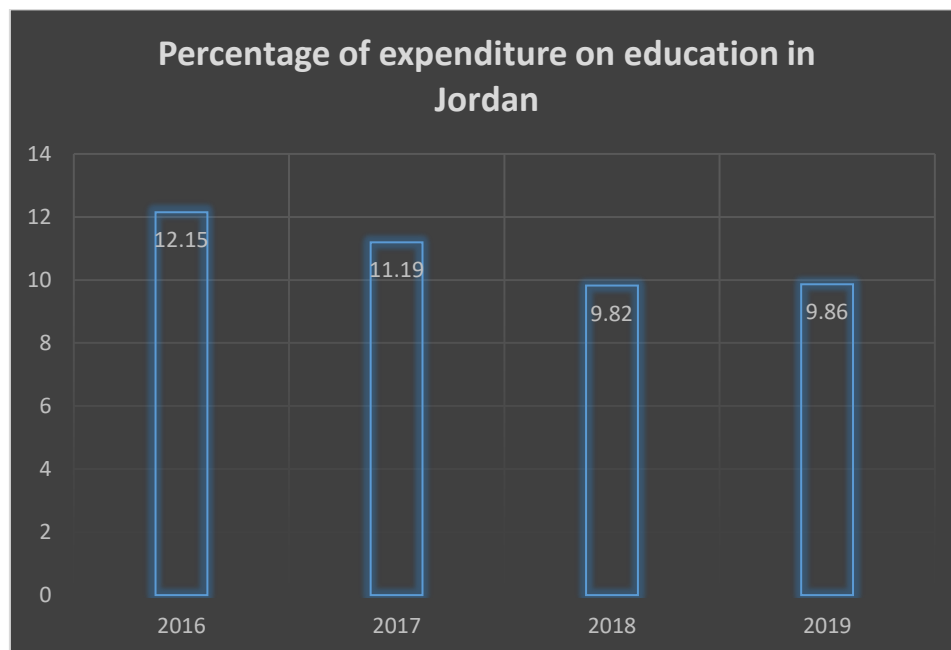


Figure 1: Jordan government expenditures on education

Study Gaps And Contribution

The current study addresses several gaps in the literature, including the following:

- 1) Al Amoush and Sandhu (2018) examined learning management systems exclusively from a Jordanian perspective, whereas the current study sought to determine the impact of learning management systems on educational quality.
- 2) Snoussi (2019) examined the influence of learning management systems on education in the UAE, whereas the current study will examine the impact in Jordanian universities with moderation.
- 3) Teachers' abilities as moderators on the nexus between learning management systems and educational quality have not been tested previously in Jordan;
- 4) The proposed model of artificial neural networks, learning management systems, teachers' abilities, and educational quality has not been tested previously in Jordan.
- 5) Although universities' educational quality has been extensively investigated, it has not yet reached its zenith from Jordan's perspective.

The current study will contribute to the literature in the following ways:

- 1) It will emphasise the importance of education quality to improve Jordan's university-level education system;
- 2) It will examine how artificial neural network systems and learning management systems affect education quality in Jordan universities; and
- 3) It will assist policymakers in formulating and implementing better policies to improve education quality in Jordan universities.

The current study's structure is further subdivided into distinct phases. The study's start was discussed in the first phase. In light of previous research, the second phase will examine the evidence for artificial neural network systems, learning management systems, teacher abilities, and educational quality. The third part will cover the process for collecting and analysing data linked to artificial neural network systems, learning management systems, teachers' talents, and educational quality. The fourth phase will reveal the study's conclusions based on the research completed thus far, and will include an approval of the results. The article will conclude with the study's implications, conclusion, and final recommendations.

Literature Review

Throughout the previous few decades, education has affected technical progress in various human activities and communities. This paper aims to assess the impact of ANN systems and learning management systems on the educational quality of Jordanian universities. The following is a review of the literature about the understudy constructs: (HALEK & UTOMO, 2021; KAHAR et al., 2021).

ANN Systems and Quality Education

The effective human brain is largely responsible for technical progress throughout the world. Not only has the human brain advanced technology, but it has also integrated this age into schooling to improve its quality. Okewu et al. (2021) examined artificial neural networks to incorporate educational quality into future and advanced education. The finding demonstrates that artificial neural networks can improve the accuracy and performance of educational quality. Artificial intelligence is a critical component of technological innovation that has had a significant impact on the educational quality in various places of the world. Gerasimovic and Bugaric (2018) evaluated artificial neural networks for student enrollment management to improve the assertion of educational quality. According to the logistic regression model, neural networks greatly identify the emergence of artificial intelligence to improve educational quality. The discipline of artificial intelligence has accumulated knowledge and information from education and computer science at Jordan's institutions (Butt et al., 2021; Gürses, 2021).

Additionally, Botha et al. (2021) stated a link between artificial intelligence neural networks, entrepreneurship education, and student entrepreneurial experience influencing educational quality. The linear regression model established the critical role of artificial neural networks in educational institutions as a factor affecting educational quality. This acquisition of information and expertise has also aided in improving educational quality using artificial neural networks. Thus, Henning et al. (2021) examined artificial intelligence and its potential applications in medical education and the future health sector. According to the report, artificial neural networks are about to usher in a revolution in the working world, elevating both professionals and the quality of education in several countries. Education in the modern day is supported by technology, particularly neural networking, knowledge base systems, and expert systems. These systems are highly developed educational tools that prepare students for careers in artificial intelligence in Jordanian universities (Gunawan et al., 2021; Jakavonytė-Staškuvienė, 2021)

Similarly, Noaman et al. (2017) explored the role of artificial neural networks in improving educational quality evaluation and achieving educational quality standards. The findings imply that the quality of teaching would be adaptable and might significantly improve with the assistance of artificial neural networks. The implications of artificial neural networks can also be viewed as an ecosystem that instils distinct perspectives in humans. These approaches are frequently referred to as producing tools that assist students in thinking critically about and solving crucial problems in various ways. With the preceding in mind, Adams and McLennan (2021) investigated the quality of education offered by teachers with the assistance and assistance of artificial neural networks of intelligence and other critical factors. The study concluded that educational quality might be improved globally through the right implementation of artificial intelligence and neural networks. These capacities assist Jordanian university students in relearning and unlearning and in the acquisition and retention of knowledge and information. Notably, the contribution of artificial intelligence systems infuses pupils with machine learning in various ways. These methods foster interpersonal skills and prediction abilities and academic success through the beneficial use of artificial neural network systems. Human intelligence simulation has resulted in the development of a computer intelligence system that has been applied in educational institutions to improve educational quality (Khoma & Vdovychyn, 2021).

H1: Artificial neural network system significantly influences education quality.

Learning Management System and Quality Education

The developing world has made significant technical advancements in the education industry to develop students better. These technology breakthroughs have resulted in numerous learning systems that assist educational institutions in implementing and evaluating the teaching and learning process. Nurakun Kyzy et al. (2018) assessed the learning management system and its deployment in educational institutions to promote higher educational quality for students. The findings suggested that the learning management system and its associated components greatly enhance students' educational quality. A learning management system is also used to evaluate teachers and students. Typically, a learning management system is defined as a software application built on acquired technology used to assess, implement, and plan the specialised learning process (Hamel, 2021).

Additionally, Hu et al. (2020) investigated the integration of mobile learning in societies, emphasising educational quality through the use of a learning management system. The study discovered that using a learning management system, many methods of retrieving learning resources are made convenient. Generally, the learning management system incorporates many modes of instruction, particularly eLearning, which enables teachers to assess the quality of education they give. Marineo and Shi (2019) discussed students' achievement in both the educational and professional sectors as a result of the effective deployment of a learning management system. Regression study proved the learning management system's effectiveness and outcomes in terms of student participation in assignments that contribute to educational quality.

Additionally, several forms are widespread in the learning management system students and faculty use at Jordanian universities. Codish et al. (2019) identified multiple behavioural patterns associated with the learning management system's alignment of all unstructured processes in educational institutions. According to the study, implementing a learning management system enables students to conceptualise knowledge from any source, increasing educational quality. It is a user interface that administrators, students, and instructors in educational institutions supply and operate. The central system is a web-based technology utilised throughout the world to provide advanced education to students and has a significant impact on the educational quality in Jordanian universities. Beerkens (2018) evaluated the assurance of quality education in conjunction with policies and increased progress and promises made through the use of an effective and visible learning management system. The findings indicated that the learning management system applied realistic techniques and policies that improved the quality of instruction. Numerous backward places worldwide lack technology and hence rely on physical education. The learning management system is widely employed in educational institutions and traditional educational institutions, local governments, and national government agencies.

Similarly, Lee and Zuilkowski (2017) examined educational quality concepts across global, national, and local discourses through the practical application of a learning management system. The results demonstrated that the combined efforts of the learning management system improved educational quality. This system is regarded as a critical

component of the global educational sector, since it contributes to the improvement of educational quality in various ways. These ideas persist not only in traditional classroom education but also in the majority of today's technology- and presentation-based education. Students acquire more knowledge than physical attendance throughout their school careers, enabling them to cope effectively with current difficulties and opportunities.

H2: Learning management system significantly influences the education quality.

Moderating Role of Teachers' Abilities

The world is familiar with extensive reviews of educational quality predictors that aid in achieving academic goals. Machine learning is a powerful predictor that enables students and teachers to evaluate their education quality. For example, Orrill and Millett (2021) evaluated teachers' capacity to reason in response to artificial neural networks and their effect on educational quality. The analysis established and promoted the moderating impact of teachers' abilities on artificial neural networks and educational quality. The role of teachers' abilities cannot be overlooked while discussing artificial neural network systems and educational quality. As a result, the moderating effect of instructors' talents is also guaranteed, with several implications for artificial intelligence and teacher abilities. With the preceding in mind, Jones et al. (2021) enumerated the pre-services of instructors and their self-efficacy, incorporating its moderating effect on artificial intelligence to develop and improve educational quality. The findings indicated that instructors' competence is critical and effective for enhancing educational quality along with artificial intelligence. Artificial intelligence and artificial neural network systems significantly impact educational quality by initiating a broad range of options. These levels are especially significant since they establish solid connections and demonstrate the moderating effect of Jordanian university professors' talents.

Thus, Wang et al. (2020) evaluated the representation and learning hierarchy via the lens of the implications of artificial neural networks on educational quality. The results indicate that the mechanisms of artificial neural networks are dominant in influencing the previous quality of education, with the ability of teachers acting as a moderating factor. Teachers' abilities are critical for the artificial neural network systems of intelligence and educational quality. Additionally, Erlinger (2021) underlined the importance of localised teachings and teachers' ability to improve educational quality through artificial neural networks. Teachers' abilities have risen to prominence as a moderating factor in the achievement of educational excellence and the development of artificial neural networks. Teachers' ability to greatly improve the involvement of artificial neural network systems in pupils' brains. Teachers' capabilities and experience enable them to include capable practises into their instruction, which has a moderating effect on artificial neural network systems.

Additionally, Feldman and Ozalp (2019) examined the calibre and capability of enthusiastic instructors about artificial intelligence and its application to improving educational quality. The findings established the reliability of teachers' abilities to eliminate restrictions in teaching through the use of artificial neural networks. Students are also reliant on the availability of qualified teachers in their immediate vicinity to benefit. This benefit establishes effective communication and knowledge integration and demonstrates the teachers' ability to deliver significant information and expertise. Numerous layers of

adaptive systems and artificial neural network systems that influence the quality of teaching had a significant effect on teachers' abilities. It is a network of neurons in students' brains that are favourably inserted by the faculties of lecturers at Jordanian institutions.

H3: Teachers' abilities significantly moderate the relationship between artificial neural networks and education quality.

Educational institutions have acquired a variety of technologies from across the world and locally, which aided them in providing a superior education to pupils. These technologies are acquired and implemented through teachers' positive and significant contributions. Thus, Lytzerinou and Iordanou (2020) studied the efficacy of manufactured arguments about instructors' abilities in evaluating the learning management system and educational quality. Attention to teachers' talents and skills may be critical to the effectiveness and educational quality of the learning management system. The primary reason for incorporating a moderating effect into the learning management system is to influence the educational quality.

Additionally, Obery et al. (2021) studied instructors' education, perceptions, and talents and their moderating effect on educational quality and learning management. Teachers can monitor students' performance and progress, critical for the learning management system and educational quality. The quality of education in Jordanian institutions is contingent on the teachers and students' perception and conceptualization of delivered knowledge.

Teacher talents influenced the learning management system significantly and materially. Additionally, Gutman (2017) evaluated the facilitation and services provided to teachers and students in educational institutions by regulating the learning management system. The findings indicated that the learning management system positively impacted students' awareness by boosting educational quality. Thus, Rahnuma (2020) described the improved quality of education in Bangladesh due to the system's significant and intrinsic application and teachers' talents. The study's frameworks examined the importance of teachers' skills in considerably regulating the educational quality via a learning management system. Unless the learning management system was properly maintained and instructed, these systems could not be operated. As a result, the teachers' ability examines and then runs the progress and performance of the learning management system, which affects education quality. Valiandes and Neophytou (2018), in this context, enumerated the professional development of teachers in terms of learning development and professional programmes that contribute to educational quality. The findings reveal that teachers' talents moderate the learning management system and educational quality. Numerous benefits are included in the learning management system, and one of the most significant is the ability to customise the online learning and training experience. This skill is strongly promoted in educational institutions during times of pandemics and urgent situations in which students cannot attend class.

Additionally, the learning management system permits the distribution of educational and training materials to students that have been considerably spread through the teachers' abilities. The automation of the learning management system ensures the continuity and sustainability of the fields of knowledge available online at Jordanian universities. Improved originality and creativity have been established through teachers' capacities to

govern learning management and education quality when handling various challenges and acquiring crucial skills.

H4: Teachers' abilities significantly moderate the relationship between the learning management system and education quality.

Research Methods

The study studies the influence of the ANN system and LMS on the educational quality of Jordanian universities and the moderating impacts of instructors' talents on the nexus of the ANN system, LMS, and educational quality of Jordanian universities. Additionally, the study collected data via survey questionnaires and distributed it via personal visits. The researchers surveyed students and faculty members at Jordan's private universities. Students are asked questions on the ANN system, LMS, and educational quality, while teachers are asked questions about their abilities. Thus, 513 surveys were distributed after twenty days, but only 291 questionnaires were received, representing a response rate of around 56.73 per cent.

Additionally, the article used the smart-PLS to examine the reliability of variables, the validity of items, and the nexus of association between constructs. The smart-PLS is an efficient statistical technique that performs well even when the authors utilise a complex model. Additionally, it produces the greatest findings when big sample sizes are used by researchers (Hair Jr et al., 2021). The "measuring model" was used to evaluate the reliability of variables and the validity of items. In contrast, the "structural model" was used to analyse the nexus between the relationships among constructs. The researchers investigate the "convergent validity" and "discriminant validity" of the "measurement model." The term "convergent validity" refers to the process of determining the validity of items through the use of "average variance extracted (AVE), factor loadings, composite reliability (CR), and Alpha."

Additionally, "discriminant validity" is utilised to determine the variables' reliability through the application of "Fornell Larcker, cross-loadings, and the Heterotrait Monotrait (HTMT) ratio." The current article employed education quality (EQ) as the dependent variable and 10 items from Seyfried and Pohlenz (2018). Additionally, the current study included teachers' ability (TA) as a moderating variable, utilising seven items modified from Mikeska et al. (2019). Finally, the current paper included two predictors: an artificial neural network system (ANNS) with eight items and a learning management system (LMS) with six items, both of which were derived from Al-Waeli et al. (2019). These variables are referenced in Figure 2's framework. The study studies the influence of the ANN system and LMS on the educational quality of Jordanian universities and the moderating impacts of instructors' talents on the nexus of the ANN system, LMS, and educational quality of Jordanian universities.

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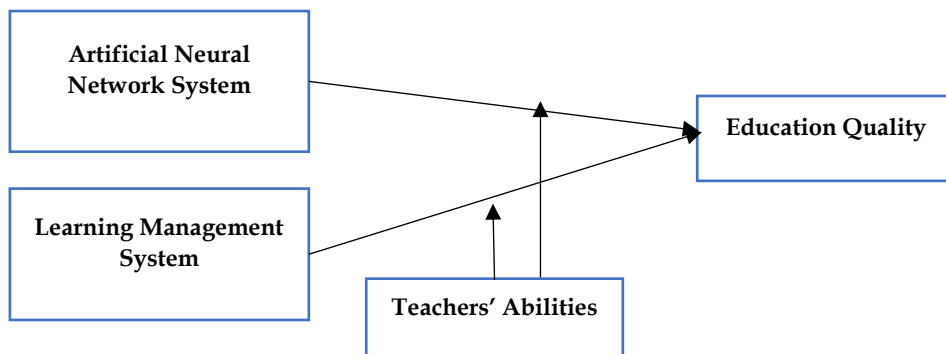


Figure 2: Conceptual model

Research Findings

The current findings demonstrate the "convergent validity" of the questions through the use of "average variance extracted (AVE), factor loadings, composite reliability (CR), and Alpha." To begin, the "factor loadings" statistics indicate that the values are greater than 0.50, indicating a significant degree of connectivity between items. Second, the data for "AVE" indicate that the values are greater than 0.50, indicating a significant degree of interdependence among the elements. Thirdly, the data for "CR" indicate that the values are greater than 0.70, indicating a significant degree of interdependence among the items. Finally, the figures for "Alpha" indicate that the values are greater than 0.70, indicating a significant degree of interdependence among the items. The conclusions regarding "convergent validity" are summarised in Table 1.

Table 1

Convergent validity

Constructs	Items	Loadings	Alpha	CR	AVE
Artificial Neural Network System	ANNS1	0.900	0.975	0.979	0.869
	ANNS2	0.932			
	ANNS3	0.954			
	ANNS4	0.942			
	ANNS5	0.911			
	ANNS6	0.951			
	ANNS8	0.933			
	Education Quality	EQ1			
EQ10		0.639			
EQ2		0.792			
EQ3		0.821			
EQ4		0.805			
EQ5		0.792			
EQ6		0.773			
EQ8		0.800			
EQ9		0.577			
Learning Management System	LMS1	0.836	0.893	0.919	0.655
	LMS2	0.855			
	LMS3	0.698			
	LMS4	0.763			
	LMS5	0.837			
	LMS6	0.855			
Teachers' Abilities	TA1	0.954	0.959	0.968	0.834
	TA2	0.953			
	TA3	0.829			
	TA4	0.952			
	TA5	0.954			
	TA6	0.954			
	TA7	0.827			

In addition, the “discriminant validity” is used to test the variables’ reliability using “Fornell Larcker, cross-loadings and Heterotrait Monotrait (HTMT) ratio”. Firstly, the “Fornell Larcker” was used, and the statistics were exposed that the first value in the ANNS column (0.932) is higher than the rest of the figures. In addition, the first value in the EQ column (0.761) is higher than the rest of the figures in the column. The first value in the LMS column (0.809) is higher than the rest of the figures in the column. Table 2 shows the “Fornell Larcker” findings.

Table 2

Fornell Larcker

	ANNS	EQ	LMS	TA
ANNS	0.932			
EQ	0.472	0.761		
LMS	0.494	0.509	0.809	
TA	0.498	0.504	0.523	0.913

Second, "cross-loadings" were applied, and the statistics revealed that the values of ANNS were significantly greater than the values of the other variables. The values in EQ were greater than the values in the remaining variable statistics. The values in LMS were greater than the values in the remaining variable statistics, and the values in TA were greater than the values in the remaining variable statistics. Table 3 summarises the data on "cross-loadings."

Table 3

Cross-loadings

	ANNS	EQ	LMS	TA
ANNS1	0.900	0.421	0.456	0.465
ANNS2	0.932	0.459	0.445	0.468
ANNS3	0.954	0.441	0.472	0.457
ANNS4	0.942	0.417	0.476	0.45
ANNS5	0.911	0.431	0.463	0.473
ANNS6	0.951	0.445	0.468	0.462
ANNS8	0.933	0.462	0.447	0.471
EQ1	0.305	0.808	0.358	0.398
EQ10	0.342	0.639	0.261	0.245
EQ2	0.326	0.792	0.373	0.359
EQ3	0.333	0.821	0.403	0.403
EQ4	0.306	0.805	0.35	0.377
EQ5	0.394	0.792	0.455	0.493
EQ6	0.43	0.773	0.459	0.446
EQ8	0.407	0.8	0.447	0.382
EQ9	0.358	0.577	0.305	0.278
LMS1	0.383	0.405	0.836	0.663
LMS2	0.451	0.451	0.855	0.731
LMS3	0.317	0.361	0.698	0.536
LMS4	0.399	0.394	0.763	0.663
LMS5	0.377	0.401	0.837	0.662
LMS6	0.456	0.448	0.855	0.723
TA1	0.457	0.45	0.764	0.954
TA2	0.459	0.457	0.766	0.953
TA3	0.441	0.471	0.72	0.829
TA4	0.462	0.461	0.758	0.952
TA5	0.461	0.449	0.774	0.954
TA7	0.443	0.466	0.718	0.827

Finally, the "HTMT ratio" was also used to check the "discriminant validity", and the statistics were exposed that the values of ratios are lower than 0.85. Table 4 shows the "HTMT ratio" findings.

Table 4

Heterotrait Monotrait ratio

	ANNS	EQ	LMS	TA
ANNS				
EQ	0.499			
LMS	0.527	0.555		
TA	0.515	0.531	0.686	

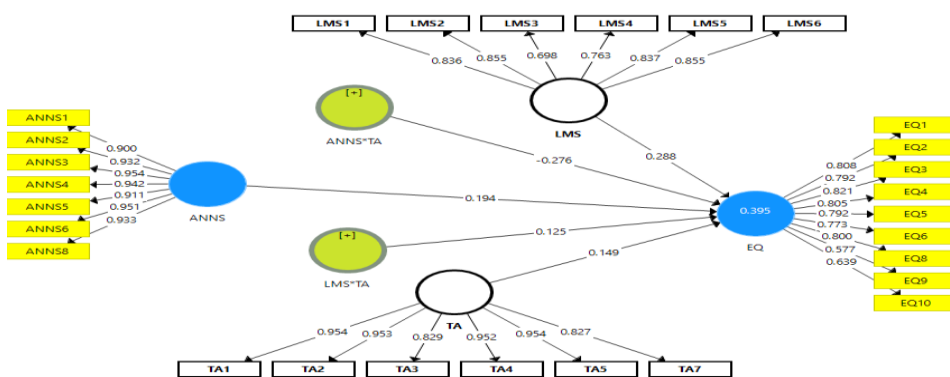


Figure 3: Measurement model assessment

The "structural model" findings indicate that the ANN system and LMS correlate with the educational quality of Jordanian universities, supporting H1 and H2. Additionally, the results suggested that for every 1% increase in ANNS, the EQ will increase by 0.194%, and vice versa. Further, the results indicated that for every 1% increase in LMS, the EQ increases by 0.288%, and vice versa. The results suggested that a 1% increase in TA results in a 0.149 percent increase in EQ, and vice versa. Finally, the findings reveal that teachers' abilities considerably affect the relationship between the ANN system, LMS, and educational quality in Jordanian universities, implying that H3 and H4 are true. Table 5 summarises the results of the "path analysis."

Table 5

path analysis

Relationships	Beta	S.D.	T Statistics	P Values	L.L.	U.L.
ANNS -> EQ	0.194	0.069	2.814	0.003	0.102	0.328
ANNS*TA -> EQ	-0.276	0.059	4.665	0.000	-0.366	-0.166
LMS -> EQ	0.288	0.092	3.129	0.001	0.152	0.457
LMS*TA -> EQ	0.125	0.065	1.934	0.028	0.006	0.235
TA -> EQ	0.149	0.084	1.782	0.039	0.010	0.248

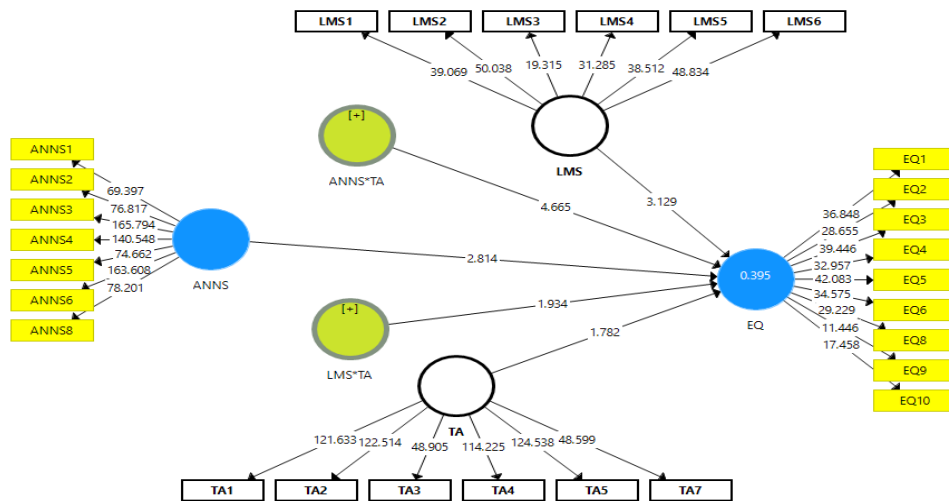


Figure 4: Structural model assessment

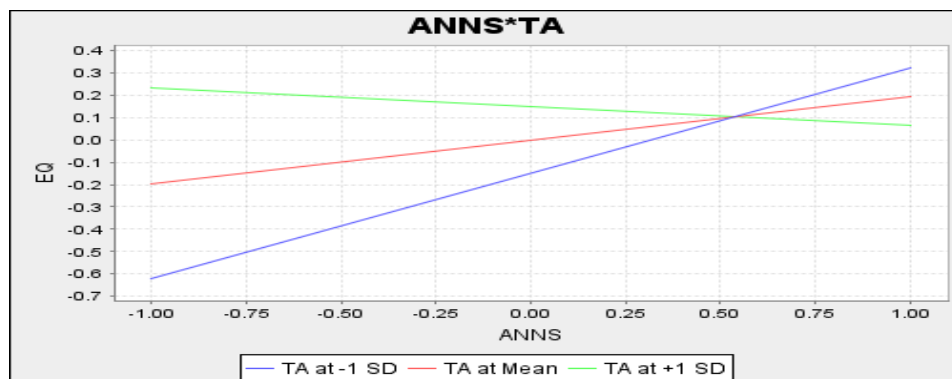


Figure 5: ANNS*TA

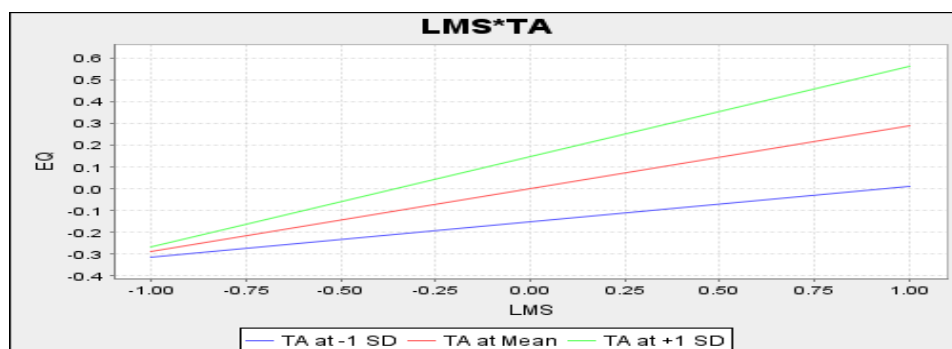


Figure 6: LMS*TA

Discussions Of The Findings

The findings indicated that an artificial neural network system had a beneficial effect on educational quality. These findings are corroborated by a recent study conducted by Lau et al. (2019) demonstrates that personalization is a critical component of high-quality education. The artificial neural network enables students to receive a customised approach to learning programmes based on their preferences and personal experiences. This system can trace a student's knowledge, learning speed, and desired outcomes by analysing their prior learning histories, identifying their weak places, and recommending the appropriate courses to ensure they get the most out of their education. These findings are also consistent with Alimissis et al. (2018) prior article, which evaluates an artificial neural network system in an educational system. According to the report, students frequently require assistance outside of classrooms to comprehend the material, but teachers are not always available. In this case, the artificial neural network is advantageous; it enables the development of artificial intelligence tutors and chatbots capable of actually replacing tutors, honing students' skills, and eliminating shortcomings outside of the classroom. Artificial neural networks improve education quality by providing 24/7 education services to students.

The findings indicated that the learning management system had a beneficial effect on the quality of instruction. These findings are corroborated by a recent study conducted by Washington (2019), which found that learning management systems are highly beneficial for educators and tutors to connect with students and control their education, contributing to education quality. This approach enables tutors or educators to manage the course's content in a structured manner. Teachers can incorporate text, photographs, pdfs, tables, videos, links, interactive tests, text formatting, and slideshows, among other elements. This enables them to maintain continuity in teaching, assist students in comprehending the syllabus, following it smoothly, enhancing their learning, and achieving their goals. As a result, the deployment of a learning management system enhances the quality of instruction. These findings corroborate a previous study by Nurakun Kyzy et al. (2018), which established that a learning management system is a software system that enables educators to create interactions with education stakeholders such as teachers, students, parents, visitors, and editors, based on their individual needs. As a result, they can document, administer, track, automate, and report on educational content, training procedures, and learning and development initiatives. Thus, they eliminate weak points, create opportunities for improvement, and thus increase the quality of instruction.

The findings indicate that instructors' abilities moderate the relationship between artificial neural network systems and educational quality. These findings corroborate a recent study by Chakraborty, Chattopadhyay, and Chakraborty et al. (2018). Their study demonstrates that to implement an artificial neural network in the education system, teachers must have a working knowledge of the system and use it to perform educational functions while assisting students in continuing their learning. Institutions with outstanding professors capable of interacting with an artificial neural network efficiently employ this technology to sustain students' attendance, enhance their learning, increase their interest in the classroom, and increase their knowledge. The artificial neural network

system may be deployed more successfully with capable teachers on board, improving education quality. These findings are corroborated with a previous study conducted by Yakubu et al. (2020). The study demonstrates that teachers can effectively teach if they are familiar with artificial neural network systems and possess the necessary abilities to prepare the network's nodes for operation. Thus, talented and skilled students contribute to the quality of education individually and through the properly implemented artificial neural network, which fosters consistency, saves time, eliminates space obstacles, and enhances educational quality.

The findings indicate that teachers' talents act as a moderator between the learning management system and the quality of instruction. These findings are corroborated by a recent study by Kite et al. (2020). Researchers found that teachers can successfully implement this system if they thoroughly understand all the relevant softwares and features. Moreover, they know process for navigating and the ability to manage educational processes, develop educational automation, conduct training programmes, and evaluate students' learning. When teachers with dynamic talents apply a learning management system effectively, they assist pupils in obtaining a standardised education in the subject area. These findings are also supported by Mpungose and Khoza (2020) previous study. Teachers who can recognise effective digital gadgets as well as manage the course, respond to students and parents, allow for convenient learning and training at any time, and are evaluated appropriately all contribute to improving education and sustaining it in difficult times. Thus, teachers' talents serve as a bridge between the learning management system and the quality of instruction.

Conclusions And Recommendations

The authors' motivation for conducting this research was to propose strategies for addressing management shortcomings in education and enhancing the country's educational quality. The purpose of this study was to determine the extent to which artificial neural network systems and learning management systems influence education quality and the function of instructors' talents about artificial neural network systems and learning management systems. The authors of the paper use a quantitative research technique to investigate aspects such as artificial neural network systems, learning management systems, instructors' talents, educational quality in Jordan's education sector, and the nature of their association. The findings demonstrated a positive correlation between artificial neural network systems and learning management systems and the quality of education. The artificial neural network system serves both teachers and students by removing constraints such as time, pace, and a lack of consistent physical engagement between teachers and students, increasing teachers' response to students' requirements and improving education quality.

Similarly, a learning management system enhances educational quality by providing a platform upon which courses can be managed remotely. Interactions between teachers and students can be developed. Students can be taught regularly through the assessment process, and thus educational quality can be improved and maintained. The study indicated that when teachers possess abilities, artificial neural network systems and learning management systems can contribute to educational quality more effectively.

Numerous theoretical ramifications flow from the current work. It significantly contributes to the body of knowledge about learning. This study stresses technological advancements and technical talents in the sphere of education. It investigates the effects of artificial neural networks and learning management systems on the quality of education. Although the relationship between artificial neural network systems, learning management systems, and educational quality has been explored in the preceding literature for a long period, these two relationships were constructed at distinct points in time. The new work, which investigates these interactions concurrently, adds to the body of knowledge. This study considers teachers' abilities as a moderator between artificial neural network system and learning management system and education quality, making a distinction in the literature as before this a little attention has been given to this aspect of education. This page serves as a guide for regulators as they develop rules to boost the educational quality of Jordan's institutions.

Additionally, the current work has empirical implications. This study demonstrates which behaviours the government, educational ministry, institutional administration, and students must follow to increase the quality of education. The government must promote scientific and technological advancements within the country, which would ultimately benefit the education sector by innovating technology and apps. The education ministry and administrators within the institutions must adopt policies that improve teacher technical abilities and promote artificial neural network systems and learning management systems to enhance the quality of education.

Limitations Of Research

The current study has significant limitations. Future researchers must work to overcome these limitations. This study examines the effects of artificial neural network systems and learning management systems on education quality. Many financial, cultural, and institutional issues can affect education quality, but the writers have chosen to ignore them. Thus, the current study is not thorough enough. Authors interested in education quality must write to include as many determinants as feasible. Also, the education industry and Jordanian universities are studied for the relationship between artificial neural networks, learning management systems, teacher talents, and educational quality. The Jordanian education sector has its own set of norms and regulations and unique improvement potential. Thus, future writers must include different educational systems.

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