ACCEPTANCE OF E-LEARNING USING ARTIFICIAL INTELLIGENCE TECHNOLOGY IN MILITARY EDUCATION PROCESS IN UAE

ALI MOHAMED ALI ALNAQBI

A project report submitted in partial
Fulfillment of the requirement for the award of the
Doctor of Philosophy in Technology Management

Faculty of Technology Management and Business
University Tun Hussein Onn Malaysia

APRIL 2022

ACKNOWLEDGMENTS

Praise Allah, Lord of the Worlds, enabled me to complete this study optimally.

I want to express my gratitude, thanks, and appreciation to those who helped me complete this work. On the top, my supervisor, Assoc. Prof. Dr. Azlina Binti Md Yassin for her consistent encouragement, advice, and invaluable guidance throughout this research study.

Special thanks go to the UAE Joint Command & Staff College (JCSC) commander, the teachers, and the students (batch number 28/2019) for participating in this study, completing the survey, and sharing their experiences with me.

Additional appreciation goes to my family members (my wife, my sons, and my daughters) and my friends for their support in accomplishing this work.

Finally, I want to thank those who have contributed directly or indirectly to this research's success.

ABSTRACT

Recently, UAE has adopted Artificial Intelligence (AI) and e-learning systems in several fields, including education. Military colleges have embraced this new technology with the institutions running on the conventional educational system. This study assessed the current adoption status, challenges, and strategies of using an AI-based e-learning system in the UAE military-based colleges. This study aims to identify the level of acceptance of e-learning using artificial intelligence (AI) technology in the military education process in the UAE from students and teachers of the Joint Command and Staff College (JCSC). It is a quantitative assessment study based on students' and teachers' perceptions of UAE-JCSC. Data was collected using a questionnaire survey, where the questionnaire was distributed to a total of 240 JCSC students and teachers at the college. However, only 207 completed forms were received. The questions were divided into three sections: level of adoption, challenges, and strategies in using an AI-based e-learning education system. It was concluded there are statistically positive significant relationships between the three factors: the current AI and e-learning application; strategies and budgets set by the state to implement AI and e-learning; the availability of critical success factors in applying AI and e-learning in military colleges process and the improvement of flow at the significance level $P=0.000 < 0.05$. However, challenges encountered by AI and eLearning applications in the military education process are strongly but negatively correlated with the acceptance of AI in Military colleges. Those four variables explain 98.5% of the variation and change in the acceptance of AI and e-learning in military colleges. The findings from this study are beneficial; it provides a valuable source of information for devising strategies to

promote the uses of these modern tools and motivate the students to get the maximum benefits of AI and e-learning technologies. It is expected that this study will have several contributions and positive repercussions that can be summarized in theoretical and practical assistance. It constitutes a helpful reference for future studies if it provides for subsequent researchers and scientists interested in artificial intelligence valuable literature and recommendations related to critical success factors in the application of artificial intelligence and e-learning in military colleges. This study will have practical implications for students in encouraging them to use AI and e-learning techniques to improve access to resources and new learning methods and motivate decision-makers in the UAE. To provide intelligent applications for teaching the military students to enable them to receive education and maintain their military training simultaneously.

ABSTRAK

Baru-baru ini, UAE telah menggunakan sistem Kecerdasan Buatan (AI) dan e-pembelajaran dalam beberapa bidang, termasuk pendidikan. Kolej tentera telah menerima teknologi baharu ini dengan institusi yang menjalankan sistem pendidikan konvensional. Kajian ini menilai status penerimaan semasa, cabaran dan strategi menggunakan sistem e-pembelajaran berasaskan AI di kolej berasaskan tentera UAE. Kajian ini bertujuan untuk mengenal pasti tahap penerimaan e-pembelajaran menggunakan teknologi kecerdasan buatan (AI) dalam proses pendidikan ketenteraan di UAE daripada pelajar dan guru Kolej Komando dan Kakitangan Bersama (JCSC). Ia merupakan kajian penilaian kuantitatif berdasarkan persepsi pelajar dan guru terhadap UAE-JCSC. Data dikumpul menggunakan tinjauan soal selidik, di mana borang soal selidik telah diedarkan kepada seramai 240 orang pelajar dan guru JCSC di maktab berkenaan. Bagaimanapun, hanya 207 borang yang lengkap telah diterima. Soalan-soalan tersebut dibahagikan kepada tiga bahagian: tahap penerimaan, cabaran, dan strategi dalam menggunakan sistem pendidikan e-pembelajaran berasaskan AI. Disimpulkan terdapat hubungan signifikan secara statistik positif antara tiga faktor: aplikasi AI dan e-pembelajaran semasa; strategi dan belanjawan yang ditetapkan oleh negara untuk melaksanakan AI dan e-pembelajaran; ketersediaan faktor kejayaan kritikal dalam mengaplikasikan AI dan e-pembelajaran dalam proses kolej tentera dan peningkatan aliran pada aras keertian $P=0.000 < 0.05$. Walau bagaimanapun, cabaran yang dihadapi oleh aplikasi AI dan ePembelajaran dalam proses pendidikan ketenteraan sangat kuat tetapi berkorelasi negatif dengan penerimaan AI di kolej Tentera. Empat pembolehubah tersebut menerangkan 98.5% variasi dan perubahan dalam penerimaan AI dan e-pembelajaran di kolej tentera. Dapatan daripada kajian ini adalah bermanfaat; ia menyediakan sumber maklumat yang berharga untuk merangka strategi

untuk mempromosikan penggunaan alatan moden ini dan memotivasikan pelajar untuk mendapatkan faedah maksimum teknologi AI dan e-pembelajaran. Kajian ini diharapkan dapat memberi beberapa sumbangan dan kesan positif yang boleh dirumuskan dalam bantuan teori dan praktikal. Ia menjadi rujukan berguna untuk kajian masa depan jika ia menyediakan untuk penyelidik dan saintis seterusnya yang berminat dalam kesusasteraan berharga kecerdasan buatan dan cadangan yang berkaitan dengan faktor kejayaan kritikal dalam aplikasi kecerdasan buatan dan e-pembelajaran di kolej tentera. Kajian ini akan memberi implikasi praktikal kepada pelajar dalam menggalakkan mereka menggunakan AI dan teknik e-pembelajaran untuk meningkatkan akses kepada sumber, kaedah pembelajaran baharu dan memotivasikan pembuat keputusan di UAE. Untuk menyediakan aplikasi pintar untuk mengajar pelajar tentera bagi membolehkan mereka menerima pendidikan dan mengekalkan latihan ketenteraan mereka pada masa yang sama.

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 Background

Humans are immersed in a society increasingly involved in an inclusive technology process in today's context. Technology has transformed a change in many of the world's population habits. People have modified how they interact, read, communicate, write, and become informed using new technologies. In this scenario, the need for education to adapt to the Fourth Industrial Revolution arises. Therefore, applying Information and Communications Technology (ICT), as well as Artificial Intelligence (AI) technology in the classrooms, has become a must-have reality (Hinojo-Lucena *et al.* 2019).

Developments in the digital world are reflected positively in modern education methods (Kose *et al.* 2015). Furthermore, e-learning is widely used for reaching the desired aims in various educational conditions (Regmi & Jones, 2020).

Today's revolution is based on new knowledge and innovation. It includes the era of AI, which provides information on improving and filling gaps in learning and teaching and allowing teachers to practice the educational process better. (Almohammadi *et al.* 2017).

The education zone (which is subject to societal changes because both are advancing simultaneously) also passes through this inevitable adaptation to new

technological interaction communities. This process is geared towards recent trends and features regarding new proposals in the educational sector. Therefore, by relying on artificial intelligence techniques, students can access many learning tools to create new methods and means to implement the collected knowledge or create new ones (Ocaña-Fernández, Valenzuela-Fernández & Garro-Aburto, 2019). Recently, various e-learning and intelligent systems in which artificial intelligence is applied in an educational context describe adopting such technology in education (Soledad, 2004; Ganzfried & Yusuf, 2018). For example, intelligent teachers guide student learning by discovering students' progress in education based on student content and personal characteristics. In contrast, intelligent, distributed teaching systems favor student cooperation by supporting and encouraging interaction (Al-Mushasha, 2013).

The flexibility and ease of artificial intelligence and e-learning are among the most prominent drivers that will make countries adopt them in their educational systems. For example, reports of global importance, such as the Horizon Report (a reference in educational technology), predict that will implement AI in higher education within four to five years (Becker *et al.* 2017). Rodriguez and Brito's (2017) study mentioned that AI changes education by automating teaching tasks. Programs specialize in personalized education, discover topics that need reinforcement in the classroom, guide and support students outside of the classroom, and intelligently use data to teach and assist students. AI applications can be considered a viable solution for the personal education process because they provide a new and attractive perspective related to dynamic learning and virtual interaction, facilitating the learning process. The support mechanism will also be available for the student when necessary (Miailhe & Lannquist, 2018).

Military Education entails officers' professional training to prepare them to lead the military force under their command optimally to discharge their duties in peace and war effectively. It starts with recruit training, proceeds to education and training specific to military tasks, and might include extra training during an army career (Sen, 2013).

Military academies and institutes play pivotal strategic roles at several levels. Some related to the technical and technological development of the armies, both in the training and qualification of the national workforce or the use of advanced combat weapons, imply qualitative mutations in the armies' operational and combat performance.

These academies and institutes represent the scientific and research laboratories to crystallize the prevailing theories of warfare worldwide, analyze them, and study the possibilities and opportunities of benefiting from their elements in the national armies. Academies then build and develop the combat theories of these armies according to modern developments on other levels, such as their role in creating national identities of the commands and melting them to contribute effectively to support and strengthen the components of national unity (EditorialBoard, 2013).

The Armed Forces in the UAE were able, in record time, thanks to planning, organization, and management with sound scientific foundations, to deal with the latest technologies, equipment, and weapons and to build a solid modern army capable of facing challenges, defending the homeland and protecting national interests. (AlHadad, 2013).

Strategies planned by the General Command of the Armed Forces, under the directives of His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the State and Supreme Commander of the Armed Forces, may God protect him, were based on achieving successive qualitative leaps to keep pace with the times by acquiring the latest weapons of the age, and continuing training on them to improve their use and handling, with constant work on qualifying national cadres to reach the highest levels of combat proficiency. It was natural that implementing this strategy would lead to building armed forces with high competencies and the ability to confront movements in defense of the homeland and achieve its security and stability (Roberts, 2020).

In rehabilitation and training, the armed forces have achieved significant military developments in building their forces and defensive strength by graduating successive batches of the nation's youth from its various affiliated colleges. The armed forces established military institutes, schools, and colleges that train and rehabilitate young people. It militarily suited the requirements of the times and the latest developments. It provided these educational institutes with all the capabilities and military sciences that allow the students to receive the necessary military sciences, which qualify them to fulfill demands in national service (Dalton & Shah, 2021).

Undoubtedly, training and scientific qualification has become a recognized principle. A well-known fact, despite the scarcity of research and literature related to this in our Arab countries, essential functions such as leadership is now seen as not an

automatic process that does not require training or preparation or that leadership competencies are born; instead, people are seen as having innate talent in this context, rather, leadership is seen as a process that is made and developed according to specific procedures, and in institutes and colleges entrusted with reshaping, improving, and developing behavior according to scientific and methodological rules recognized globally, and this is what is meant by training and qualification of leaders at the junior and middle levels as a science (Roberts, 2020). It is based on methodological foundations and learning theories that depend on the self-abilities of both the trainee and the trainer. According to the previous background, the military colleges and institutes in the UAE work according to a scientific perspective based on preparing the officers scientifically and physically to prepare them for various military units. They are equipped with multiple types of military and civil knowledge and sciences, which enable them to keep pace with and realize modern concepts, ideas, and visions that support force development plans. They make the Armed Forces a sophisticated institution keeping pace with the modern era, where science and technological developments have become a distinctive feature of advanced armies (Dalton & Shah, 2021).

The preparation of officers and non-commissioned officers in the modern era has become a complex and vital issue. It has become necessary for them to possess many varied capabilities and skills unlimited to keep scientific and applied knowledge (AlHadad, 2013). That the officers can translate scientific and academic expertise into realistic actions, behaviors, and implementation plans, given that the reactivity of military action and its rapid pace and requirements of the ability to make the right decision, speed of perception, and good behavior, make this work more comprehensive than being abbreviated or reduced within the scope of science curricula and applied. Today education in military academies has become more diversified and complex than regular education, as general culture has become a required and specialized culture. It became vital for military academy students to be familiar with modern management methods and the rules of strategy science with its details, besides mastering the skills of contemporary martial arts, absorbing its theories, and training on the latest equipment to manage the complexities of the conflict environment (AlHadad, 2013; Roberts, 2020). The intertwining of international relations in the modern era and the growing strategic

challenges are reflected in the curricula of military colleges, which have become complex and include a vast amount of military and civil sciences and knowledge (Dalton & Shah, 2021).

Previous studies have shown that AI has vast potential in the military sector beyond weapons systems, as it is often referred to as a tool for "boring, dirty, and dangerous" jobs. It also provides artificial intelligence applications to avoid endangering human lives or assigning humans tasks that do not require the human mind's creativity. AI systems can also reduce military logistics and sensing costs, enhance connectivity and transparency in complex systems, and advance the peacekeeping agenda by communicating military actors' capabilities and motivations more effectively (Özdemir, 2019; Kania, 2019). It indicates the importance of including education in military colleges with this type of AI education, which the UAE seeks through launching the National Innovation and Artificial Intelligence Strategy.

According to Al-Hamad (2020), students' acceptance of this technology is critical to its successful application. However, including these new technologies in education is the structural acceptance of users' new standards. Besides that, contradictions and concerns arise from their application in military science education.

Although AI has become the study of the modern era for many researchers, the UAE's continuous endeavor to be in the first place among Arab countries in adopting AI and pioneering information technology (Halawa, 2018) was indicated by Salloum *et al.* (2019) that there is no such study in this field. Hence, the primary motivation behind this study is the extent to which teachers and students in the UAE accept this technology, whether in the public education sector or military education sector.

1.2 Problem Statement

Military education focuses on training students in the specialized engagement skills needed in future combat. The fundamental differences between civilian and military education are goals, motivations, and target applications. In traditional civic education, the achievement is measured by the knowledge gained from the lecture program. Hence, the extent of educational attainment is generally open. However, the goal of military

education is to prepare military personnel for specialized jobs and tasks. Moreover, in military education systems, learning is measured through mastery of predetermined doctrines and standards. Military education aims at converting the cadet officer from a junior to a military specialist (Tung *et al.* 2009).

Military education includes training programs ranging from the primary curriculum to in-service and advanced education. After completing the primary curriculum, military officers should receive specialized short-term training in schools of various military branches, including infantry, armor, artillery, and so forth (Seow *et al.* 2005). Due to officers' and military personnel's job responsibilities, officers in military colleges rarely have time to leave their training to receive an education on a traditional campus. To solve this dilemma, distance learning and e-learning systems have been introduced in recent years due to the increasing need to train non-commissioned officers in rapidly changing international conflict scenarios (TRADOC, 2001). Combining e-learning with computer-based training has proven effective in improving officers' combat educational skills (Roffe, 2002; Schechter, Urdan & Weggen, 2000). The first studies of e-learning applications in military education were conducted by Bonk and Wisher (2000) and DUSD (1999) of the United States Department of Defense. These reports called for using online learning systems to improve military education efficiency. Recently examined the integration of e-learning technologies with the on-campus military education program (Sentz, 2006; USGA, 2004).

Since student officers often have difficulty leaving their on-campus programs, e-learning is a must in the field. Moreover, with the development of computing and internet technologies, the e-learning approach can effectively provide distance learning through artificial intelligence systems with the same learning efficiency as on-campus programs (Tung *et al.* 2009).

Likewise, the United Arab Emirates government pays excellent attention to military education and training. It seeks to meet military colleges and institutes' urgent needs by using new technology to enhance learning (Revolvy, 2018). In this way, they will avoid finding themselves at some point applying the old traditional method and outdated educational methodologies in a country that established the world's first ministry of artificial intelligence.

Challenges and conflicts are an integral part of any student's daily life, but they differ in military college students. Besides, military education students in the UAE face the same challenges mentioned earlier, most notably the great challenge of lack of time and individual learning differences. Challenges and competitions are more complicated for military students because they have to compete to prove their daily and military tasks. They should prepare for assignments, look for various information sources related to the topic (such as multiple examples, past events, stories, etc.), and do a daily review of the tests while also preparing for graduation from college. They also have to attend regular afternoon academic program classes at Abu Dhabi University to obtain a bachelor's degree. Other learning challenges represent disparity in students' educational level and intellectual abilities, as students differ in capabilities. Some are gifted learners. Others are normal or slow to learn. It puts the Emirati military student in front of the need for modern educational technologies that ease and give flexibility in coordinating their education with their daily military tasks (Revolvy, 2018).

With the increasing interest in e-learning and artificial intelligence techniques, this technology has become a solution that various universities and colleges resort to, making it easier for students to acquire knowledge and science with the least effort and the most significant possible benefit. Major higher education institutions in the United Arab Emirates have begun embedding electronic learning with an integrated artificial intelligence approach. Different e-learning tools have become part of the learning process. Artificial intelligence systems are among these software tools that are effective learning management systems to enhance the learning process (Salloum *et al.* 2019).

Various factors, however, are involved in determining the success of such environments, and these factors must be taken into consideration to create a successful and effective e-learning system. Salloum *et al.* (2019) indicated that after initial experiences of e-learning and AI in education in UAE colleges and universities, most learners do not continue with their e-learning courses and prefer traditional learning over it. Hence, it is necessary to understand the factors involved so that the learner does not have a "negative experience, which leads to superficial learning" (Alkandari, 2015). In addition, these factors may impact learners' acceptance, willingness, and decision-making regarding the long-term adoption of e-learning. Hence, when a new e-learning

environment or AI tool is introduced into the learning process, institutions and teachers must demonstrate their willingness to use these systems to encourage students to accept and use them fully. The success of e-learning and AI systems (Kanwal & Rehman, 2017) will ultimately depend on learner acceptance and system implementation (Van Raaij & Schepers, 2008). Lee (2006) considers external factors that influence e-learning acceptance. Hence, these factors should be investigated and grouped according to their importance.

Accordingly, the main objective of this study is to examine the acceptance of e-learning in the military educational environment in the United Arab Emirates and identify the impact and extent of e-learning and artificial intelligence in the country and the strategies and budget set by it. In addition, this study considers the challenges facing this learning on the importance of its acceptance and spread among students.

1.3 Research Questions

Based on the previously discussed research problem, this study will answer the main research question, which is: "What is the level of acceptance of using e-learning with artificial intelligence technology in the military education process in the UAE from the perspective of students and teachers?" This research question is subdivided into the following sub-questions:

(i) What is the current level of e-learning using AI technology in the military education process?

(ii) What strategies and budgets are allocated for e-learning using AI technology in developing the military education system in the UAE?

(iii) What are the challenges in implementing this intelligent technology in military colleges? And what are the best ways to overcome them and apply AI effectively from students' and teachers' points of view?

(iv) What are the critical success factors for applying e-learning using AI technology in the UAE military colleges?

(v) What is the Relation between the Availability of Critical Success Factors on the Acceptance of the Application of E-learning using AI in the UAE Military Education System?

1.4 Research Objectives

This study aims to "Identify the level of acceptance of using e-learning with AI technology in the military education process in the UAE from the viewpoint of students and teachers." The objectives of the study are:

(i) To identify the current level of e-learning using AI technology in the military education process.

(ii) To identify the strategies and budget allocated for e-learning using AI technology in developing the military education system in the UAE.

(iii) To find out the challenges in implementing this intelligent technology in military colleges and the best ways to overcome them and apply AI effectively from students' and teachers' points of view.

(iv) To determine the critical success factors for applying e-learning using AI technology in the UAE military colleges.

(v) To identify the relation between the Availability of Critical Success Factors on the Acceptance of E-learning Applications using AI in the UAE Military Education System.

1.5 Scope of the Study

This study's scope is to develop a better military education process and create an intelligent education system, using Artificial Intelligence technology and E-learning in the military education process. For military education and training, intelligent learning is time-consuming and potentially costly in terms of planning and implementation. However, this new technology's expected long-term impact is sufficient to make teaching and learning more productive and cost-effective (Stone, 2017).

1.6 Significance of the Study

The researcher's motivation for this study is to solve the unsolved students' problems mentioned in the research problem and gain the intellectual joy of doing some creative work to gain respectability. The researcher believes that this study is particularly significant due to investigating the acceptability of using e-learning with artificial intelligence technology in the UAE's military education process. According to the researcher's knowledge, no investigation was conducted. Therefore, this study is essential for:

(i) **Students**: The study sheds light on new technology in the educational process. Introducing AI applications to students may encourage them to improve access to resources and new learning methods.

(ii) **Teachers/ Instructors:** Teachers may find this new technique very useful, modern, and untraditional for teaching methods and provide better support and unbiased feedback for students.

(iii) **Decision-makers:** Hopefully, the study will motivate decision-makers to implement AI applications in the UAE Armed Forces' teaching process.

(iv) **Military Education Command in the UAE:** The study may convince the Military Education command in the UAE to encourage teachers to implement new technological techniques in the teaching process. Hence, hiring an IT company to build this system is imperative.

1.7 Limitation of Study

Because of the researcher's spatial and time limitations, the study was restricted only to the students and teachers of the UAE Joint Command and Staff College during the academic year 2018/2019 of course number 28 that graduated on the 3rd of July 2019. Hence, the researcher was careful enough to conduct the study based on these limitations. The researcher performed an effective plan such that the study was completed and submitted on time. The topic anticipates future contributions from different researchers

utilizing a similar technical approach to expand the research sample to include all other military colleges in the UAE.

1.8 Terminology

The following are the operational definitions of terms used in this study:

- **Acceptance**: The "acceptance" definition means; the readiness of an education system in the armed forces to use e-learning with artificial intelligence technology.
- **E-learning:** There has been considerable debate about a comprehensive definition of e-learning in which existing definitions tended to reflect the researchers' specializations and interests. For example, educators' historical influences meant that e-learning could be an optional presentation of standard delivery. At the same time, specialists in the technical aspects of hardware and software differed by prioritizing ICT's effects on educational and pedagogical relationships (Algahtani, 2011).

  One perspective in defining e-learning is derived from distance learning. Since e-learning evolved as a form of distance learning, a study by correspondence, the term's meaning changed when ICT emerged. One of the most famous definitions of distance learning concerned an educational process in which a significant proportion of the teaching was conducted by someone remote from the learner. Accordingly, e-Learning is one of the systems of the e-Life section, which is technological related to the life cycle. Based on electronics, e-Life enables humans to carry out daily activities through technical assistance. Internet, satellite, or CD-ROMs are various electronic media choices available. Through e-Learning, teaching can be delivered simultaneously and at different times (Teahan, 2010). Hastungkara and Triastuti (2019) argue that e-Learning is a type of learning that can communicate material through electronic media (Internet, Intranet, satellite, TV, CD-ROM). In contrast, Alqahtani and Rajkhan (2020) consider that e-Learning is a learning process facilitated by communication information technology to create efficiencies not obtained by traditional learning process models (Elfaki *et al.* 2019).

  Accordingly, this study adopts the definition of e-learning from the three perspectives of distance learning, technological, and pedagogy, where it is defined as

an educational process in which a large proportion of the teaching is conducted by someone who is away from the learner, through the use of modern technological means represented by networks, computers, and other advanced electronic channels (such as wireless, satellite, cellular technologies, and iPad), which are well designed, learner-centered and interactive to anyone, anywhere, anytime through the use of the Internet and digital technologies in coordination with the principles of instructional design.

- **Fourth Industrial Revolution:** "Fourth Industrial Revolution" is the name given by the World Economic Forum in Davos, Switzerland, in 2016, to the last link in the series of industrial revolutions, which is currently underway (Postelnicu & Câlea, 2019). In the wake of the three industrial revolutions that the world has witnessed since the end of the eighteenth century until the present day, our world is now living in the era of the Fourth Industrial Revolution, which is based on the achievements of the Third Industrial Revolution that began since the middle of the last century, especially with regard to the unprecedented development of communication networks and information technologies, as the first industrial revolution used water and steam to move machines, and the second industrial revolution used electricity for large-scale production, and the third industrial revolution focused on the use of electronics and information technologies to automate production, the fourth industrial revolution revolves around blending technologies that blur the boundaries between everything that is physical, digital and biological in light of the crucible of rapid technological developments whose effects have extended to a large number (Xu *et al.* 2018).

  This revolution differs from its previous revolutions in three main dimensions, represented in 1) the rapid spread of the technologies accompanying this revolution, 2) the breadth and depth of its effects to include all areas, and 3) its ability to bring about a fundamental change in production systems, economic relations and the way societies function (Penprase, 2018).

  The Fourth Industrial Revolution is based on the digital revolution, representing new ways to become an integral part of societies and even the human body. The Fourth Industrial Revolution is characterized by emerging technology breakthroughs in many areas, including robotics, artificial intelligence, nanotechnology, quantum computing,

REFERENCES

Abyat, A. (2017). Disadvantages of traditional education. Retrieved from mawdoo3.com website: https://mawdoo3.com/

Adams, K. A. & Lawrence, E. K. (2015). Research methods, statistics, and applications. Los Angeles: *SAGE*.

Afify, M. K. (2018). The Impact of Interaction between Timing of Feedback Provision in Distance E-Learning and Learning Styles on achieving Learning Outcomes among Arab Open University Students. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(7), 3053-3068.

Agarwal, R. (2018). 10 Examples of Artificial Intelligence You're Using in Daily Life. Retrieved from https://beebom.com/examples-of-artificial-intelligence/

Ahir, K., Govani, K., Gajera, R., & Shah, M. (2020). Application on virtual reality for enhanced education learning, military training, and sports. *Augmented Human Research*, 5(1), 1-9.

Al-Azawei, A. H. S. (2017). Modeling e-learning adoption: The influence of learning style and universal learning theories (Doctoral dissertation, University of Reading).

Aldosari, S. A. M. (2020). The future of higher education in the light of artificial intelligence transformations. *International Journal of Higher Education*, 9(3), 145-151.

Algahtani, A. (2011). Evaluating the effectiveness of the e-learning experience in some universities in Saudi Arabia from male students' perceptions (Doctoral dissertation, Durham University).

Algahtani, M. (2011). An Overview: Intelligent Tutoring System. Retrieved from https://www.researchgate.net/publication/239732834_An_Overview_Intelligent_Tutoring_Systems

AlHadad, Y. J. (2013). Military Academies in the UAE: Qualitative Development & Scientific Progress. *Nation Shield*, 497(1), 1-63.

AlHamad, A. Q. M. (2020). Acceptance of E-learning among university students in UAE: A practical study. *International Journal of Electrical & Computer Engineering*, 10(4), 3660-3671.

Alhashmi, S. F., Salloum, S. A., & Abdallah, S. (2019, October). Critical success factors for implementing artificial intelligence (AI) projects in Dubai government United Arab Emirates (UAE) health sector: Applying the extended technology acceptance model (TAM). *In International Conference on Advanced Intelligent Systems and Informatics* (pp. 393-405). Cham: Springer.

Ali, S., Uppal, M. A., & Gulliver, S. R. (2018). A conceptual framework highlights e-learning implementation barriers. *Information Technology & People*, 31(1), 156-180.

Alkandari, B. (2015). An investigation of the factors affecting students' acceptance and intention to use E-learning systems at Kuwait University: Developing a technology acceptance model in E-learning environments (Doctoral dissertation, Cardiff Metropolitan University).

AlkhaleejTimes. (2017). UAE Strategy for Artificial Intelligence to Drive Growth in the Country. *Alkhaleej Times*. Retrieved from https://www.khaleejtimes.com/nation/dubai/artificial-intelligence-to-drive-uae-growth

Almekhlafi, A. G. (2009). An evaluation study of an e-learning course at the United Arab Emirates University: A case study. In *2009 International Conference on Future Computer and Communication* (pp. 437-442). IEEE.

Almohammadi, K., Hagras, H., Alghazzawi, D., & Aldabbagh, G. (2017). A survey of artificial intelligence techniques employed for adaptive educational systems within e-learning platforms. *Journal of Artificial Intelligence and Soft Computing Research*, 7(1), 47-64.

Al-Mushasha, N. F. A. (2013). Determinants of e-learning acceptance in higher education environment based on an extended technology acceptance model. In the 2013 *Fourth International Conference on e-Learning," Best Practices in Management, Design, and Development of e-Courses: Standards of Excellence and Creativity"* (pp. 261-266). IEEE.

Alqahtani, A. Y., & Rajkhan, A. A. (2020). E-learning critical success factors during the covid-19 pandemic: A comprehensive analysis of e-learning managerial perspectives. *Education Sciences*, 10(9), 216.

Alzahrani, A. M. (2019). Factors that influence secondary school teachers' acceptance of e-learning technologies in teaching in the kingdom of Saudi Arabia. *Journal of Research in Curriculum Instruction and Educational Technology*, 5(2), 175-196.

Amaguaña, F., Collaguazo, B., Tituaña, J., & Aguilar, W. G. (2018, June). Simulation system based on augmented reality for optimization of training tactics on military operations. In *International Conference on Augmented Reality, Virtual Reality and Computer Graphics* (pp. 394-403). Cham: Springer.

Ananga, P. (2020). Pedagogical considerations of E-Learning in education for development in the face of COVID-19. *International Journal of Technology in Education and Science,* 4(4), 310-321.

Andries J. du Plessis, Nalinh Douangphichit, P. D. (2016). HRM in relation to employee motivation and job performance in the hospitality industry. *Journal of International Business Research and Marketing*, 1(4), 1-30.

Arghode, V., Brieger, E. W., & McLean, G. N. (2017). Adult learning theories: Implications for online instruction. *European Journal of Training and Development*, 41(7), 593-609.

Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages, and disadvantages of its adoption in higher education. *International Journal of Instructional Technology and Distance Learning*, 12(1), 29-42.

Awang, Z. (2012). Research methodology and data analysis. 2nd ed. *Selangor, Malaysia: UiTM Press.*

Ayers, R. (2016). The Future of Artificial Intelligence: 6 Ways it Will Impact Everyday Life. Retrieved from https://bigdata-madesimple.com/the-future-of-artificial-intelligence-6-ways-it-will-impact-everyday-life/

Baker, R., Andre, E. Xiangen Hu, M. M. (2017). Artificial intelligence in education. *Cham: Springer*.

Baleni, Z. G. (2015). Online formative assessment in higher education: Its pros and cons. *Electronic Journal of e-Learning*, 13(4), 228-236.

Bartlett, J. E., Kotrlik, J. W. & Higgins, C. C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information Technology, Learning and Performance Journal*, 19(1), 43–50.

Becker, D. B. A. (2018). Artificial Intelligence in Education. Ireland's Yearbook of Education. Retrieved from https://educationmatters.ie/artificial-intelligence-in-education/

Becker, S. A., Cummins, M., Davis, A., Freeman, A., Hall, C. G., & Ananthanarayanan, V. (2017). *The New Media Consortium. NMC horizon report: 2017 higher education edition (pp. 1-60)*.

Bin, Y., & Mandal, D. (2019). English teaching practice is based on artificial intelligence technology. *Journal of Intelligent & Fuzzy Systems*, 37(3), 3381-3391.

Bonk, C. J. (2000). Applying collaborative and e-learning tools to military distance learning: A research framework (Vol. 1107). *US Army Research Institute for the Behavioral and Social Sciences.*

Bonk, C. J., & Wisher, R. A. (2000). Applying collaborative and e-learning tools to military distance learning: A research framework (*Technical Report#* 1107). Alexandria, VA: United States Army Research Institute for the Behavioral and Social Sciences.

Bradáč, V., & Kostolányová, K. (2017). Intelligent tutoring systems. *Journal of Intelligent Systems*, 26(4), 717-727.

Braunsberger, K. & Gates, R. (2009). Developing inventories for satisfaction and Likert scales in a service environment. *Journal of Services Marketing*, 23(4), 219–225.

Brigette, H. (2017). The future of leadership: Rise of automation, robotics and Artificial Intelligence. London: MBA Caribbean Organisation

Bruce Cheung, Lucas Hui, J. Zhang, S.-M. Y. (2003). SmartTutor: An intelligent tutoring system in web-based adult education. *Journal of System and Software*, 68(1), 11–25.

Bryman, A. & Bell, E. (2007). Research designs: Business research methods. (2nd ed. pp44-73). New York. Oxford University Press.

Cairodar (2017). Advantages of Traditional Education. Retrieved from http://www.cairodar.com/

Cerezo, R., Bogarín, A., Esteban, M., & Romero, C. (2020). Process mining for self-regulated learning assessment in e-learning. *Journal of Computing in Higher Education*, 32(1), 74-88.

Cockburn, I. M., Henderson, R., & Stern, S. (2019). 4. The impact of Artificial

Intelligence on innovation: An exploratory analysis (pp. 115-148). Chicago: University of Chicago Press.

Collis, J., & Hussey, R. (2009). Business research: A practical guide for undergraduate and postgraduate students. Basingstoke: Palgrave Macmillan.

Conati, C. (2009, June). Intelligent Tutoring Systems: New Challenges and Directions. In Twenty-First International Joint Conference on Artificial Intelligence. Retrieved from: https://www.aaai.org/ocs/index.php/IJCAI/IJCAI-09/paper/viewPaper/671

Cooper, D. R. & Schindler, P. S. (2011). Business research methods (11th ed). New York: McGraw-Hill Irwin.

Cox, E. P. I. (1980). The optimal number of response alternatives for a scale: A review. *Journal of Marketing Research*, 17(4), 407–422.

Creswell, J. (2009). Research design: Qualitative, quantitative, and mixed methods approach. 3rd edition, London: Sage Publication.

DAĞ, F., & Erkan, K. (2010). A personalized learning system based on semantic web technologies. https://doi.org/10.4018/978-1-61692-008-1.ch013

Dalton, M., & Shah, H. (2021). Evolving UAE Military and Foreign Security Cooperation: Path toward Military Professionalism. Washington: Carnegie Endowment for International Peace.

Darwish, M. A. (2017). Research methods in the humanities. Egypt: Minia University.

Dašić, P., Dašić, J., Crvenković, B., & Šerifi, V. (2016). A review of intelligent tutoring systems in e-learning. *Annals of the Oradea University: Fascicle of Management and Technological Engineering*, 15(3), 85-90.

Davis, Z. (2019). Artificial Intelligence on the battlefield. *PRISM*, 8(2), 114-131.

Deloitte, (2017). VR, AR, MR for defense and public sector. https://www2.deloitte.com/

Di Vaio, A., Palladino, R., Hassan, R., & Escobar, O. (2020). Artificial intelligence and business models in the sustainable development goals perspective: A systematic literature review. *Journal of Business Research*, 121, 283-314.

Division, C. (2018). Education in UAE. Retrieved from http://www.uaecd.org/k-12-education

Donkin, R., Askew, E., & Stevenson, H. (2019). Video feedback and e-Learning enhance laboratory skills and engagement in medical laboratory science students. *BMC*

Medical Education, 19(1), 1-12.

Doskocil, D. (2016). The Three Main Challenges Teachers Face in Today's Classroom. Retrieved from class craft blog website: https://www.classcraft.com/blog/features/3-main-challenges-teachers-face/

Dreheeb, A. E., Basir, N., & Fabil, N. (2016). Impact of system quality on Users' satisfaction in continuation of the use of E-learning system. *International Journal of e-Education, e-Business, e-Management and E-learning,* 6(1), 13–25.

DUSD (1999). Department of Defense strategic plan for advanced distributed learning. Office of the Under Secretary of Defense for Personnel and Readiness, Department of Defense, Washington, DC.

Edarabia (2016). Joint Command and Staff College. Retrieved from https://www.edarabia.com/joint-command-staff-college-jcsc-abu-dhabi-uae/

EditorialBoard (2013). Military Academies in the UAE. *UAE National Shield Magazine*.

Elfaki, N. K., Abdulraheem, I., & Abdulrahim, R. (2019). Impact of e-learning vs. traditional learning on student's performance and attitude. *International Journal of Medical Research & Health Sciences*, 8(10), 76-82.

EOLD. (2018). The English Oxford Living Dictionary. Retrieved from https://en.oxforddictionaries.com/definition/artificial_intelligence

E-learning world (2021). 5 Ways AI Can be Applied in ELearning. https://yourelearningworld.com/5-ways-ai-can-be-applied-in-elearning/

Fahimirad, M., & Kotamjani, S. S. (2018). A review on the application of artificial intelligence in teaching and learning in educational contexts. *International Journal of Learning and Development*, 8(4), 106-118.

Faqih, K. M. (2016). Which is more important in e-learning adoption, perceived value or perceived usefulness? Examining the moderating influence of perceived compatibility. In 4th Global Summit on Education GSE. Kuala Lumpur. World Conferences.

Farrokhi, F., & Mahmoudi-Hamidabad, A. (2012). Rethinking convenience sampling: Defining quality criteria. *Theory & Practice in Language Studies*, 2(4), 784-792.

Fekety, M. (2015). Pros and Cons of Artificial Intelligence. Retrieved from https://www.linkedin.com/pulse/pros-cons-artificial-intelligence-mike-fekety/

Felea, M., Albăstroiu, I., Vasiliu, C., & Georgescu, B. (2018). E-Learning in higher education: An exploratory survey among Romanian students. In *The International Scientific Conference eLearning and Software for Education* (Vol. 4, pp. 157-162). " Carol I" National Defence University.

Feng, M., Heffernan, N., & Koedinger, K. (2011). Student modeling in an intelligent tutoring system. *Intelligent Tutoring Systems in E-learning Environments: Design, Implementation, and Evaluation*, 5(1), 208-236.

Ferriman, J. (2008). 3 Types of eLearning. Retrieved from https://www.learndash.com/3-types-of-elearning/

Fletcher, J. D. (2009). Education and training technology in the military. *Science*, 323(5910), 72-75.

Flores, A., Alfaro, L., Herrera, J., & Hinojosa, E. (2019). Proposal models for personalization of e-learning based on flow theory and artificial intelligence. *International Journal of Advanced Computer Science and Applications*, 10(7), 380-390.

Floyd, J. & Fowler, J. (2008). Survey research methods (Applied Social Research Methods). Thousand Oaks, CA: SAGE.

Gaad, E., Arif, M., & Scott, F. (2006). Systems analysis of the UAE education system. *International Journal of Educational Management*, 20(4), 291-303.

Ganzfried, S., & Yusuf, F. (2018). Optimal Weighting for Exam Composition. *Education Sciences*, 8(1), 36.

Gartner. (2019). Gartner Says AI Augmentation Will Create $2.9 Trillion of Business Value in 2021. Retrieved from https://www.gartner.com/en/newsroom/press-releases/2019-08-05-gartner-says-ai-augmentation-will-create-2point9-trillion-of-business-value-in-2021.

Gershgorn, D. (2017). The Quartz Guide to Artificial Intelligence. Retrieved from https://qz.com/1046350/the-quartz-guide-to-artificial-intelligence-what-is-it-why-is-it-important-and-should-we-be-afraid/

Gillies, R. (2016). Dialogic interactions in the cooperative classroom. *International Journal of Educational Research*, 76, 178–189.

Godwin, S. M. (2006). Globalization, education, and Emiratisation: A study of the United

Arab Emirates. *The Electronic Journal of Information Systems in Developing Countries*, 27(1), 1-14.

Gokulan, D. (2018). Education in the UAE: Then, Now, and Tomorrow. *Khaleej Times*. Retrieved from https://www.khaleejtimes.com/kt-40-anniversary/education-in-the-uae-then-now-and-tomorrow

Goyal, S. (2012). E-Learning: Future of education. *Journal of Education and learning*, 6(4), 239-242.

Graham, J. M. (2006). Congeneric and (essentially) tau-equivalent estimates of score reliability: What they are and how to use them. *Educational and Psychological Measurement*, 66(6), 930-944.

Halaweh, M. (2018). Viewpoint- Artificial Intelligence Government (Gov. 3.0) The UAE Leading Model. *Journal of Artificial Intelligence Research*, 62, 269–272.

Harkut, D. G., & Kasat, K. (2019). Introductory chapter: Artificial intelligence challenges and applications. In *Artificial Intelligence: Scope and limitations*. IntechOpen.

Hastungkara, D. P., & Triastuti, E. (2019). Application of e-learning and artificial intelligence in education systems in Indonesia. *ANGLO-SAXON: Journal of the English Language Education Study Program*, 10(2), 117-133.

Hernandez-Del-Olmo, F., & Gaudioso, E. (2013). Autotest: An educational software application to support teachers in creating tests. *Computer Applications in Engineering Education*, 21(4), 636-640.

Hicks, P. (2016). The Pros and Cons Of Using Virtual Reality In The Classroom. Retrieved from https://elearningindustry.com/pros-cons-using-virtual-reality-in-the-classroom

Hill, J., Ford, W. R., & Farreras, I. G. (2015). Real conversations with artificial intelligence: A comparison between human-human online conversations and human–chatbot conversations. *Computers in Human Behavior*, 49, 245-250.

Hinojo-Lucena, F. J., Aznar-Díaz, I., Cáceres-Reche, M. P., & Romero-Rodríguez, J. M. (2019). Artificial intelligence in higher education: A bibliometric study on its impact in the scientific literature. *Education Sciences*, 9(1), 51.

Hisham, A. & Sattam, A. (2010). Factors Influencing the Effectiveness of E-Learning Systems in Educational Process (EduWave): Jordan Case Study. *European Scientific*

Journal, 8(28).

Horton, W. (2018). Types of e-learning. Retrieved from http://horton.com/consulting/types/player.html

Hošková-Mayerová, Š., & Rosická, Z. (2015). E-learning pros and cons: Active learning culture. *Procedia-Social and Behavioral Sciences*, 191, 958-962.

Ikedinachi, A. P., Misra, S., Assibong, P. A., Olu-Owolabi, E. F., Maskeliūnas, R., & Damasevicius, R. (2019). Artificial intelligence, smart classrooms and online education in the 21st century: Implications for human development. *Journal of Cases on Information Technology* (JCIT), 21(3), 66-79.

Ischebeck, J. (2017). Using eLearning Technologies To Improve The Quality Of Teaching. Retrieved from https://elearningindustry.com/elearning-technologies-to-improve-the-quality-of-teaching-using.

Ismail, A. (2016). AI Technology and its applications in education. Amman, Jordan: Alam Alkotob.

Jajal, T. D. (2018). Artificial Intelligence. Retrieved from https://medium.com/@tjajal/distinguishing-between-narrow-ai-general-ai-and-super-ai-a4bc44172e22

Jihan, Y. & Sami, S. (2018). An Intelligent Tutoring System for learning classical cryptography algorithms (CCAITS. *International Journal of Academic and Applied Research* (IJAAR), 2(2), 1–11.

Jing Huang, Z. C. (2016). The research and design of a web-based Intelligent Tutoring System. *International Journal of Multimedia and Ubiquitous Engineering*, 11(6), 337–348.

Johnson & Christensen. (2004). *Educational research: Quantitative, qualitative and mixed approaches*, (2nd ed). Boston: Allyn & Bacon.

Juhary, J. (2007). Pedagogy considerations for e-Learning in a military learning environment. *MERLOT Journal of Online Learning and Teaching*, 3(4), 375-382.

Kania, E. B. (2019). Chinese military innovation in artificial intelligence. Testimony to the US-China Economic and Security Review Commission. Center for a New American Security, USA.

Kanwal, F., & Rehman, M. (2017). Factors affecting e-learning adoption in developing

countries: Empirical evidence from Pakistan's higher education sector. *IEEE Access*, 5, 10968-10978.

Keating, J., & Nourbakhsh, I. (2018). Teaching artificial intelligence and humanity. *Communications of the ACM*, 61(2), 29-32.

Keles, A., & Keles, A. (2011). Intelligent tutoring systems: Best practices. In *Intelligent Tutoring Systems in E-Learning Environments: Design, Implementation, and Evaluation* (pp. 1-26). IGI Global.

Kew, S. N., Petsangsri, S., Ratanaolarn, T., & Tasir, Z. (2018). Examining the motivation level of students in e-learning in higher education institutions in Thailand: A case study. *Education and Information Technologies*, 23(6), 2947-2967.

Kimani, D., Adams, K., Attah-Boakye, R., Ullah, S., Frecknall-Hughes, J., & Kim, J. (2020). Blockchain, business, and the fourth industrial revolution: Whence, whither, wherefore, and how? *Technological Forecasting and Social Change*, 161, 120254.

Kivunja, C. (2018). Distinguishing between theory, theoretical framework, and conceptual framework: A systematic review of lessons from the field. *International Journal of Higher Education*, 7(6), 44-53.

Kommetter, C., & Ebner, M. (2019, June). A pedagogical framework for mixed reality in classrooms based on a literature review. In *EdMedia+ Innovate Learning* (pp. 919-929). Association for the Advancement of Computing in Education (AACE).

Kose, U., Arslan, A., & Campus, A. K. (2015). E-learning experience with artificial intelligence supported software: An international application on English language courses. *GLOKALde*, 1(3), 61-75.

Landis, H. (2014). Two Perspectives on E-Learning Design: A Synopsis of a U. S. and a European Analysis. *The International Review of Research in Open and Distributed Learning*, 15(4).

Lee, Y. C. (2006). An empirical investigation into factors influencing the adoption of an E-learning system. *Online Information Review*, 30(5), 517–541.

Li, K. C., & Wong, B. T. M. (2021). A literature review of augmented reality, virtual reality, and mixed reality in language learning. *International Journal of Mobile Learning and Organisation*, 15(2), 164-178.

Liu, X., Zhang, J., Hou, G., & Wang, Z. (2018, July). Virtual reality and its application in

the military. In *IOP Conference Series: Earth and Environmental Science*, 3 (170), 32- 55.

Ludwig, C., & Reimann, C. (2005). Augmented reality: Information at focus. Cooperative Computing & Communication Laboratory, 4(1), 1-12.

Maas, M. J., & Hughes, J. M. (2020). Virtual augmented and mixed reality in K–12 education: A literature review. *Technology, Pedagogy, and Education*, 29(2), 231-249.

Malhotra, N. K., & Birks, D. F. (2007) *Marketing research, an applied approach*, (3rd ed). Englewood Cliffs, NJ: Prentice-Hall.

Mao, C. C., Sun, C. C., & Chen, C. H. (2017, January). Evaluate Learner's Acceptance of Augmented Reality-Based Military Decision Making Process Training System. In *Proceedings of the 5th International Conference on Information and Education Technology* (pp. 73-77).

Marr, B. (2018). How Is AI Used In Education -- Real World Examples Of Today And A Peek Into The Future. Retrieved from https://www.forbes.com/sites/bernardmarr/2018/07/25/how-is-ai-used-in-education-real-world-examples-of-today-and-a-peek-into-the-future/#a3c503e586e8

Mateu, J., Lasala, M. J., & Alamán, X. (2015). Developing mixed reality educational applications: The virtual touch toolkit. *Sensors*, 15(9), 21760-21784.

McBurney, D.H. & White, T.L. (2009). Research methods (8th ed). CA: Cengage Learning.

McCarthy J., Minsky M., R. N., and S. c. (1955). A Proposal For The Dartmouth Summer Research Project On Artificial Intelligence. Retrieved from http://www-formal.stanford.edu/jmc/history/dartmouth/dartmouth.html

McIntyre, L. J. (2005). Need to Know: Social Science Research Methods. New York: McGraw-Hill.

McLeod, S. (2008). Likert Scale. Retrieved from https://www.simplypsychology.org/likert-scale.html

MehmetKesima, Y. (2012). Augmented Reality in education: Current technologies and the potential for education. *Procedia - Social and Behavioral Sciences*, 47, 297–302.

Mercer, C. (2018). How VR and AR Could be Used in Education. Retrieved from https://www.computerworlduk.com/careers/how-vr-ar-could-be-used-in-education-3653710/

Miailhe, N., & Lannquist, Y. (2018). A challenge to global governance. In "Plant Algorithm: Artificial Intelligence for a predictive and inclusive form of integration in Latin America". *Integration and Trade Journal*, 22(44), 207-217.

Michael Crotty. (1998). The foundations of social research- meaning and perspective in the research process. Thousand Oaks, CA: SAGE.

Mödritscher, F. (2006). E-learning theories in practice: A comparison of three methods. *Journal of Universal Science and Technology of Learning*, 28(1), 3-18.

Murray, T. (1998). *Principles for pedagogy-oriented knowledge-based tutor authoring system*. New York, NY: Kluwer Academic.

Mustafa, A. (2020). The personalization of e-learning systems with the contrast of strategic knowledge and learner's learning preferences: An investigatory analysis. *Applied Computing and Informatics*, 17(1), 153-167.

Mustapha, B. (2017). Learning styles of adults and metacognitive approach to E-Learning"... Towards a cognitive and social constructivist view of learning". *New Trends and Issues Proceedings on Humanities and Social Sciences*, 3(1), 484-491.

Myers, J. H., & Warner, W. G. (1968). Semantic properties of selected evaluation adjectives. *Journal of Marketing Research*, 5(4), 409–412.

Neuman, W. L. (2013). Social research methods: Qualitative and quantitative approaches. Boston, MA: Pearson Education.

Nicholas V. Findler. (2015). Artificial Intelligence. Retrieved from http://emerituscollege.asu.edu/sites/default/files/ecdw/EVoice1/Articles section/n1 Findler 6x9.pdf

Norvig, R. &. (2010). *Artificial Intelligence a modern approach* (3rd ed). Boston, MA: Pearson Education.

Notis, A. (2018). 20 Types of Artificial Intelligence You Use Every Single Day and Don't Know It. Retrieved from https://bestlifeonline.com/artificial-intelligence/

Ocaña-Fernández, Y., Valenzuela-Fernández, L. A., & Garro-Aburto, L. L. (2019). Artificial Intelligence and Its Implications in Higher Education. *Journal of*

Educational Psychology-Propositos y Representaciones, 7(2), 553-568.

OneRageTime (2018). Usage of artificial Intelligence. Retrieved from https://www.oneragtime.com/24-industries-disrupted-by-ai-infographic/

Özdemir, G. S. (2019). Artificial Intelligence Application in the Military: The Case of the United States and China. SETA Analysis. Retrieved from https://www.setav.org/en/analysis-artificial-intelligence-application-in-the-military-the-case-of-united-states-and-china/

Padayache, I. (2002). Intelligent Tutoring Systems: Architecture and Characteristics. 32nd Annual SACLA Conference, 2002. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.106.5108&rep=rep1&type=pdf

Pange, A., & Pange, J. (2011). Is e-learning based on learning theories? A literature review. *International Journal of Educational and Pedagogical Sciences*, 5(8), 932-936.

Pantelidis, V. S. (2010). Reasons to use virtual reality in education and training courses and a model to determine when to use virtual reality. *Themes in Science and Technology Education*, 2(1-2), 59-70.

Patel, S., Panchotiya, B., Patel, A., Budharani, A., & Ribadiya, S. (2020). A survey: Virtual Augmented and Mixed Reality in education. *International Journal of Engineering Research & Technology*, 9(5).

Paterson, D. (2017). What are the advantages & disadvantages of artificial intelligence? Retrieved from https://www.quora.com/What-are-the-advantages-disadvantages-of-artificial-intelligence

Penprase, B. E. (2018). The fourth industrial revolution and higher education. *Higher education in the era of the fourth industrial revolution*, 10, 978-981.

Philbeck, T., & Davis, N. (2018). The fourth industrial revolution. *Journal of International Affairs*, 72(1), 17-22.

PolinaHäfner, VictorHäfner, J. (2013). Teaching methodology for Virtual Reality practical course in engineering education. *Procedia Computer Science*, 25, 251–260.

Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology*

Enhanced Learning, 12(1), 1-13.

Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, 12(1), 1-13.

Postelnicu, C., & Câlea, S. (2019). The fourth industrial revolution. Global risks, local challenges for employment. Montenegrin Journal of Economics, 15(2), 195-206.

Ramesh Mudgal. (2018, March 28). Artificial Intelligence: Impact on Education. Retrieved from https://gulfnews.com/uae/artificial-intelligence-impact-on-education-1.2196167

Raven, J. (2011). Word Emiratizing the Education Sector in the UAE: Contextualization and Challenges. Retrieved from https://www.semanticscholar.org/paper/Emiratizing-the-education-sector-in-the-UAE%3A-and-Raven/51da24bf7cea5c7568652471f0b1f1a6ec91a1ef

Ravitch, S. M. & Riggan, M. (2017). *How conceptual frameworks guide research*. (2nd ed). Los Angeles, CA: SAGE.

Rawal, K. (2018). Augmented And Virtual Reality In Education: The Next Big Bandwagons. Retrieved from https://elearningindustry.com/augmented-and-virtual-reality-in-education-bandwagons

Reddy, K. (2017). Advantages and Disadvantages of Artificial Intelligence. Retrieved from https://content.wisestep.com/advantages-disadvantages-artificial-intelligence/

Regmi, K., & Jones, L. (2020). A systematic review of the factors–enablers and barriers–affecting e-learning in health sciences education. *BMC Medical Education*, 20(1), 1-18.

Reid-Martinez, K., & Grooms, L. D. (2021). Constructivism in 21st Century Online Learning. In *Handbook of research on modern educational technologies, applications, and management* (pp. 730-743). IGI Global.

Revolvy. (2018). Joint Command and Staff College. Retrieved from https://www.revolvy.com/page/Joint-Command-and-Staff-College

Ridge, N., Kippels, S., & ElAsad, S. (2015). Education in Ras Al Khaimah and the United Arab Emirates. Retrieved from http://www.alqasimifoundation.com/admin/Content/File-22220185854.pdf

Rizov, T., & Rizova, E. (2015). Augmented reality as a teaching tool in higher education. *International Journal of Cognitive Research in Science, Engineering and Education*, 3(1), 1-9.

Roberts, D. B. (2020). Bucking the trend: The UAE and the development of military capabilities in the Arab world. *Security Studies*, 29(2), 301-334.

Robyn, G. S. (2009). Addressing the context of e-learning: Using transactional distance theory to inform design. *Routledge Distance Education*, 30(1), 5–21.

Rodrigo (2013). Collecting & Analysing Data for your Ph.D. Retrieved from https://writepass.com/journal/2013/06/collecting-analysing-data-for-your-phd/

Roffe, I. (2002). E-learning: Engagement, enhancement, and execution. *Quality Assurance in Education*, 10(1), 40–50.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, 26(2), 582-599.

Rouhiainen, L. (2018). Artificial Intelligence: 101 Things You Must Know Today About Our Future. CreateSpace Independent Publishing Platform.

Salloum, S. A., Al-Emran, M., Shaalan, K., & Tarhini, A. (2019). Factors affecting the E-learning acceptance: A case study from UAE. *Education and Information Technologies*, 24(1), 509-530.

Salloum, S. A., Al-Emran, M., Shaalan, K., & Tarhini, A. (2019). Factors affecting the E-learning acceptance: A case study from UAE. *Education and Information Technologies*, 24(1), 509-530.

Salloum, S. A., Al-Emran, M., Shaalan, K., & Tarhini, A. (2019). Factors affecting the E-learning acceptance: A case study from UAE. *Education and Information Technologies*, 24(1), 509-530.

Sarrafzadeh, A., Shanbezadeh, J., & Overmeyer, S. (2010). E-learning with affective tutoring systems. In *Intelligent Tutoring Systems in E-Learning Environments: Design, Implementation, and Evaluation*. Retrieved from https://doi.org/10.4018/978-1-61692-008-1.ch007

Saunders, M., Lewis, P., and Thornhill, A. (2007). Research methods for business students. (5th ed). UK: Pearson Education.

Schmelzer, R. (2019). AI Applications in Education. Retrieved from https://www.forbes.com/sites/cognitiveworld/2019/07/12/ai-applications-in-education/#2b68080862a3

Schmidt, A. (2017). How AI Impacts Education. Retrieved from https://www.forbes.com/sites/theyec/2017/12/27/how-ai-impacts-education/#3a177093792e

Schwab, K. (2017). *The fourth industrial revolution*. Geneva, Switzerland: World Economic Forum.

SeattlePI. (2018). The Advantages of Traditional Schools. Retrieved from https://education.seattlepi.com/advantages-traditional-schools-2140.html

Sekaran, U. & Bougie, R. (2009). *Research Methods for Business: A Skill Building Approach* (5th ed). Chichester: Wiley.

Sen, G. (2013). Professional Military Education in India: *Journal "Indian Higher Education: Perception, Policies, and Practices*.

Sentz, J. (2006). A learner-centered model for the use of e-learning within the context of resident professional military education. Retrieved from http://blogs.messiah.edu/wpcontent/blogs/2/uploads/learner_centered_model. Pdf.

Seow, C., Hughes, J., Newton, D., & Ellis, A. (2005). Effective implementation of e-learning: A case study of the Australian Army. *Journal of Workplace Learning*, 17(5), 1-15.

Shawish, W. M. (2015). *Research methods in Jurisprudence Studies*. (Master thesis, International Islamic Science University, Sheikh Noah Al-Qudah College of Sharia and Law, Jordan).

Siau, K., & Ma, Y. (2018). Artificial intelligence impacts higher education. MWAIS Proceedings, 42(5), 1-20.

Soledad, C. (2004). Sistemas inteligentes en la educación: una revisión de las líneas de investigación y aplicaciones actuales. *RELIEVE. Revista Electrónica de Investigación y Evaluación Educativa*, 10(1), 3-22.

Sousa, V. D., Zauszniewski, J. A., & Musil, C. M. (2004). How to determine whether a convenience sample represents the population. *Applied Nursing Research*, 17(2), 130-133.

Stone, A. (2017). How Virtual Reality Is Changing Military Training. Retrieved from https://insights.samsung.com/2017/07/13/how-virtual-reality-is-changing-military-training/

Sukamolson, S. (2011). *Fundamentals of quantitative research*. Language Institute. Chulalongkorn University.

SurveyMethods (2017). Pros and Cons of Doing Surveys In-House. Retrieved from https://surveymethods.com/blog/pros-and-cons-of-doing-surveys-in-house/

Tall, T. (2018). Augmented Reality vs. Virtual Reality vs. Mixed Reality: An Introductory Guide. Retrieved from https://www.toptal.com/designers/ui /augmented - reality-vs-virtual-reality-vs-mixed-reality

Tawafak, R. M., Romli, A. B., & Alsinani, M. (2019). E-learning system of UCOM for improving student assessment feedback in Oman higher education. *Education and Information Technologies*, 24(2), 1311-1335.

Techopedia. (2018). Strong Artificial Intelligence (Strong AI). Retrieved from https://www.techopedia.com/definition/31622/strong-artificial-intelligence-strong-ai

Tiffany Leung & Farhana Zulkernine, H. I. (2018). The use of Virtual Reality in Enhancing Interdisciplinary Research and Education. arXiv preprint arXiv:1809.08585.

Todaymilitary (2018). Military Schools. Retrieved from https://www.todaysmilitary.com/education-training/military-schools

Tomal, D. R. (2010). *Action research for educators*. Plymouth, UK: Rowman & Littlefield.

TRADOC (2001). The army distance learning program (TADLP) campaign plan. United States Army Training and Doctrine Command, Training Development and Analysis Directorate, Fort Monroe, Virginia, Retrieved from http://www.tradoc.army.mil/tadlp/documents/TADLP%20Campaign%20Plan%20SEP2001.pdf.

Tung, M. C., Huang, J. Y., Keh, H. C., & Wai, S. S. (2009). Distance learning in advanced military education: Analysis of joint operations course in the Taiwan military. *Computers & Education*, 53(3), 653-666.

Twycross, R. H., and A. (2015). Validity and Reliability in Quantitative Studies. Retrieved from https://www.researchgate.net/publication/280840011_Validity_and_reliability_in_quantitative_research

UAE Government (2018). UAE Artificial Intelligence Strategy. Retrieved from http://www.uaeai.ae/en/

UJ, A. (2018). Understanding Three Types of Artificial Intelligence. Analytics Insight. Retrieved from https://www.analyticsinsight.net/understanding-three-types-of-artificial-intelligence/

Urdan, T., & Weggen, C. (2000). Corporate e-learning exploring: A new frontier. *Computer News*, 53(11), 35–36.

US Government Accountability Office (2004, July 30). Military education: DOD needs to develop performance goals and metrics for advanced distributed learning in professional military education (Publication No. GAO-04–873).

Vagele-Kricina, A. (2021). E-Constructivism: A Ready Response to the Challenges of E-Learning. In *Practical perspectives on educational theory and game development* (pp. 130-147). IGI Global.

Valentina, A., & Nelly, A. (2014). The role of e-learning, the advantages and disadvantages of its adoption in Higher Education. *International Journal of Education and Research*, 12(1), 29-42.

Valery (2018). VR vs. AR vs. MR: What Is the Difference between the Technologies? Retrieved from https://jelvix.com/blog/vr-vs-ar-vs-mr

Valverde-Berrocoso, J., Garrido-Arroyo, M. D. C., Burgos-Videla, C., & Morales-Cevallos, M. B. (2020). Trends in educational research about e-learning: A systematic literature review (2009–2018). *Sustainability*, 12(12), 5153.

Van Raaij, E. M., & Schepers, J. J. (2008). The acceptance and use of a virtual learning environment in China. *Computers & Education*, 50(3), 838-852.

Vrazalic, L., Macgregor, R. C., Behl, D., & Fitzgerald, J. (2009). E-learning barriers in the United Arab Emirates: Preliminary results from an empirical investigation. IBIMA Business Review, 4 (1), 1-7.

VReality. (2019). What is Virtual Reality? Retrieved from https://www.vrs.org.uk/virtual-reality/what-is-virtual-reality.html

Wani, H. (2013). The Relevance of E-Learning in Higher Education. *Minda Masagi Press*, 3(2), 181-194.

Warner, R. S., & Burton, G. J. S. (2017). A fertile oasis: The current state of education in the UAE. Mohammed Bin Rashid School of Government, Dubai. Retrieved from https://www.mbrsg.ae/getattachment/658fdafb-673d-4864-9ce1-881aaccd08e2/A-Fertile-OASIS-The-current-state-of-Education-in.aspx

WIPO Technology Trends. (2019). Artificial Intelligence. Retrieved from https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf

Wu, B., & Zhang, C. (2014). An empirical study on continuance intentions towards E-Learning 2.0 systems. *Behaviour & Information Technology*, 33(10), 1027-1038.

Xu, M., David, J. M., & Kim, S. H. (2018). The fourth industrial revolution: Opportunities and challenges. *International journal of financial research*, 9(2), 90-95.

Yeaton, L. (2016). 3 Surprising Ways Artificial Intelligence is Changing Education. Retrieved from https://content.extremenetworks.com/extreme-networks-blog/3-surprising-ways-artificial-intelligence-is-changing-education-2

Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: Sage.

Yin, R. K. (2013). *Case study research: Design and methods*. (5th ed). Thousand Oaks, CA: SAGE.

Zahran, R., Pettaway, L. D., & Waller, S. (2016). Educational Leadership: Challenges in the United Arab Emirates. *Educational Leadership*, 5(1), 2-8.

Zhang, K., & Aslan, A. B. (2021). AI technologies for education: Recent research & future directions. *Computers and Education: Artificial Intelligence*, 100025.

Zhang, X., & Yuhao, L. (2012). Knowledge Building in E-Learning. *eLearning-Theories, Design, Software and Applications, Rijeka: InTech*, 23-36.