Migration Letters

Volume: 21, No: S1(2024), pp. 575-585

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)
www.migrationletters.com

Improving Arabic Content Delivery on Cloud Computing Platforms for Jordanian E-learning Environments

Dr. Najwa Ahmad Saleem Khasawneh[1], A. J. Khasawneh[2], Dr. Mohamad Ahmad Saleem Khasawneh[3], Dr. Yusra jadallah abed Khasawneh[4]

Abstract

The primary objective of this study is to optimize the utilization of cloud computing platforms to examine the obstacles and potential opportunities related to the dissemination of Arabic educational resources in online learning settings within the context of Jordan. This research endeavour embraces a meticulous quantitative approach, employing surveys as the primary instrument for data collection. Additionally, face-to-face interviews are conducted to further enrich the dataset. This study employed a diverse array of statistical analysis techniques to thoroughly investigate the multifaceted challenges inherent in cloud computing and their subsequent implications. This comprehensive investigation utilized a range of statistical techniques, including descriptive statistics, t-tests, and analysis of variance (ANOVA), to analyze the data. This research sheds light on the paramount importance of adeptly tackling obstacles about localization, script support, and linguistic peculiarities in the propagation of Arabic content. This study further emphasizes the considerable potential of cloud computing in augmenting the efficiency and user satisfaction of online education.

Keywords: *Arabic content delivery, e-learning, cloud computing, challenges, optimization.*

Introduction

The educational system in the Kingdom of Jordan has seen a tremendous transformation, with the rise of e-learning as a powerful and important tool in the modern digital age. The COVID-19 epidemic has acted as a catalyst, hastening the trend toward online education, and shedding light on the urgent need and unrealized potential of e-learning in Jordan's educational system. The Turkish Ministry of Education (MoE) has developed a strategy plan for the years 2021-2025, and it focuses heavy emphasis on the central role of digital transformation in achieving the nation's educational objectives. This emphasizes the need to improve the quantity and quality of online learning materials (MoE, 2021). However, the most significant challenge in this context is the efficient transmission of instructional information in Arabic, the preeminent medium of pedagogy.

[1] Associate Professor, Irbid National University, faculty of educational Sciences, Class Teacher Department, n.khasawneh@inu.edu.jo., najwakhasawneh@gmail.com, https://orcid.org/0000-0003-4967-3399

[2] Department of History, Faculty of Arts and Languages, Jadara University, Jordan, akhasawneh@jadara.edu.jo , https://orcid.org/0000-0002-4460-0257

[3] Assistant Professor, Special Education Department, King Khalid University, Jordan, mkhasawneh@kku.edu.sa. https://orcid.org/0000-0002-1390-3765

[4] Department of Educational Administration, Faculty of Educational Sciences, Ajloun National University, Jordan. Yusra.khasawneh@anu.edu.jo, yusrajadallahabedkhasawneh@gmail.com, https://orcid.org/0000-0002-7253-412x

Because of its uniqueness and complexity, the Arabic language creates significant barriers in the distribution of e-learning materials. Arabic's complexities, such as its many dialects and unusual writing requirements, need individualized approaches to achieve maximum effectiveness in online education. As Jordan strives to create a knowledge-based economy, developing a highly educated and skilled labour population is of paramount importance (Al-Saidat & Al-Momani 2010). Due to the complexity and depth of the Arabic language, exploring new methods that promote the spread of Arabic information is a pressing need. This is critical for two reasons: increasing access and fostering understanding among a diverse student body.

The introduction of cloud computing platforms has heralded a sea change in the field of e-learning, providing universities with a wealth of new options for improving efficiency, scalability, and affordability in online education (Afuwape, 2022). These systems can solve a wide range of problems plaguing the field of online education. They do this by delivering a sturdy infrastructure and a wide variety of services that are capable of dynamically adjusting the ever-changing needs of both educators and learners. Modern cloud technologies have opened up exciting new possibilities for education by providing a nimble and user-friendly medium for the distribution of instructional materials (Alabdulkareem et al., 2019). In Jordan, cloud computing platforms are being widely used in the e-learning sector. Nonetheless, it is crucial to carefully consider the functionality and safety of the topic at hand.

There are a plethora of possible benefits of using cloud computing for e-learning in Jordan (Alsuwayed, 2017). However, it is critical to note that there are challenges inherent in this novel method. The above concerns include the need for a robust structure capable of meeting the increasing requirements of virtual pedagogy, as well as worries about the integrity of data and the privacy of individual users. It is of the highest importance to improve the efficacy and efficiency of cloud computing platforms for e-learning given the widespread use of cloud-based solutions by educational institutions. Following relevant legislative demands, it is crucial to build platforms that not only display ideal functionality but also emphasize the preservation of vital educational data (Alfawareh et al., 2021).

Objective of the Study

In light of these obstacles and opportunities, this research sets out to analyze the situation, make recommendations, and put them into action to increase the availability of Arabic materials in Jordanian e-learning contexts. In addition, it's an effort to make the most of cloud computing for educational purposes. The fundamental goal of this study is to make a substantial contribution to the development of e-learning in the setting of Jordan. The objective is to ensure its sustained success as a leading digital-age educational platform by enhancements to its effectiveness, accessibility, and scalability.

Literature Review and Previous Studies

The commitment of the Jordanian government to enhancing and modernizing educational methodologies has played a significant role in facilitating the rapid integration of e-learning within the sector. The study conducted by Wani (2013) provides valuable insights into the recent advancements in the domain of e-learning, with a specific focus on its application within the realm of higher education. The authors Wani (2013) highlight the importance of regular updates, particularly in the dissemination of Arabic information, to ensure efficiency and ease of access.

Cloud computing has rapidly emerged as an essential component within contemporary e-learning environments due to its cost-effectiveness, adaptability, and capacity for

expansion. A multitude of studies have underscored the advantages linked to cloud-based e-learning platforms. Al-Ruithe et al. (2018) investigate the potential ramifications of cloud computing on the educational community in terms of promoting collaboration and facilitating the exchange of resources. Al-Ruithe et al. (2018) further underscore the importance of continuous optimization of cloud services to optimize performance within e-learning environments.

Arabic, a member of the Semitic language family, poses significant challenges in the context of online education. Al-Saidat (2010) conducts an exhaustive investigation into the challenges associated with the integration of e-learning for the Arabic language and the limitations that are intrinsic to current e-learning platforms. The study emphasizes the necessity of employing focused approaches to address the challenges related to providing Arabic content, including but not limited to localization, script compatibility, and linguistic complexities (Al-Saidat, 2010).

There has been a significant surge in the implementation of cloud computing in the education sector of the Kingdom of Jordan. An exhaustive investigation was undertaken by Alfawareh et al. (2021) regarding the implementation of cloud computing in Jordann institutions. The study encompasses a comprehensive assessment of the technology's benefits, challenges, and recommended approaches for enhancement. Alfawareh et al. (2021] highlighted the increasing importance of cloud-based solutions and acknowledged the necessity for improved security measures and infrastructure optimization to adequately tackle the distinct requirements of e-learning in the Kingdom.

A considerable amount of effort and research has been devoted to expanding the accessibility of Arabic content on cloud computing platforms for electronic learning. By utilizing machine learning and natural language processing techniques, Marquez & Salgado (2000) propose a method for improving the effectiveness of Arabic instructional material delivery. Marquez & Salgado (2000) conducted a study that emphasized the importance of personalized content recommendations in augmenting levels of student engagement and enhancing educational achievements.

The establishment of standards and best practices for e-learning in Jordan is of the utmost importance. Al-Sharafi et al. (2017) examined the effects of optimal approaches in e-learning, with a particular focus on the significance of clearly defined instructional design that takes into account cultural and linguistic considerations. Al-Sharafi et al. (2017) underscore the criticality of incorporating comprehensive protocols to optimize the effectiveness of e-learning within the context of Jordan and other Arab countries.

Methods

To better use cloud computing platforms and better understand the difficulties of providing Arabic material in Jordanian learning settings, a quantitative study was conducted. The process included the retrospective actions of collecting data, analyzing that data, and assessing the effectiveness of the offered remedies.

This quantitative study relied heavily on responses from a survey sent to a representative sample of 150 Jordanian teachers and IT specialists. Their thoughts and feelings on the present status of Arabic content distribution and the utilization of cloud computing platforms in e-learning were the focus of this survey, which aimed to collect quantitative data from respondents. Participants were asked to indicate their level of agreement with various assertions and to respond to quantitative questions using numeric scales.

Quantitative survey results were analyzed statistically using information from the past. Means, standard deviations, and frequencies were employed as descriptive statistics to highlight the most important results. Where necessary, statistical tests like t-tests and ANOVA were used to do group comparisons and determine the significance of the results.

A set of quantitative solutions was devised, and preexisting cloud computing platforms were improved, to solve the issues revealed by the quantitative data analysis. These adjustments were made to better cloud computing infrastructures in terms of scalability and resource allocation, as well as Arabic language support, content production and curation tools. These upgrades were done before to deal with the highlighted quantitative issues.

Measured results from extensive testing in production e-learning settings were used to determine the efficacy of the suggested solutions and modifications. To evaluate the solutions quantitatively, we gathered and evaluated quantitative performance measures including reaction times, data transfer rates, and system uptime. To get quantitative insights into the usefulness and user-friendliness of the deployed solutions, feedback and satisfaction ratings from teachers and students who interacted with the improved systems were gathered.

Results

Table 1: Demographics of Survey Respondents

Variable	Count	Mean Age	Gender (Male/Female)	Education Level (Bachelor's/Master's/Ph.D.)
Respondents (N)	150	32.5	90/60	50/70/30

The study garnered active participation from a cohort of 150 individuals who graciously took part in the survey. The collective age of the participants can be approximated to be around 32.5 years. The distribution of genders exhibits a slight asymmetry, as evidenced by the participation of 60 female respondents and 90 male respondents. In terms of their educational attainment, it is noteworthy that among the respondents, 30 individuals have successfully acquired the prestigious PhD degree, while a significant majority of 70 respondents have attained the esteemed Master's degree. Furthermore, a considerable cohort of 50 respondents have accomplished the esteemed Bachelor's degree.

Table 2: Responses to Statements on Arabic Content Delivery Challenges

Statement	Mean Rating	Standard Deviation
Arabic content localization is a major challenge	3.8	0.6
Script support for Arabic fonts is problematic	4.2	0.5
Linguistic nuances in Arabic pose difficulties	3.6	0.7

The collective evaluation of the participants revealed that the task of localizing Arabic content was bestowed an average rating of 3.8 on a 5-point metric, thereby signifying its substantial nature as a challenge. The evaluation of script support for Arabic fonts yielded a noteworthy average rating of 4.2, indicating a higher level of perceived difficulty. This finding implies that users encountered more challenges and obstacles in utilizing Arabic fonts, highlighting the need for further attention and improvement in this domain. The evaluation of linguistic subtleties in the Arabic language yielded a moderately lower level of difficulty, as indicated by an average rating of 3.6.

Table 3: Performance Metrics for Optimized Cloud Computing Platforms

Metric	Mean Value	Standard Deviation
Response Time (ms)	250	45
Data Transfer Rate (Mbps)	35	8
System Uptime (%)	99.5	0.3

The cloud computing platforms exhibited remarkable optimization, showcasing commendable efficiency with a mean response time of 250 milliseconds. The data transmission speeds were measured accurately and found to be an amazing 35 Mbps on average. This result provides conclusive evidence for the lightning-fast and flawless transfer of data. The system's uptime was very stable, averaging a whopping 99.5%. This number demonstrates the platform's consistent dependability and solid performance.

Table 4: User Satisfaction Ratings

User Group	Mean Satisfaction Rating (1-5 scale)	Standard Deviation
Educators	4.2	0.4
Students	4.0	0.5

The survey found that teachers generally felt happy with the improved e-learning systems, with a mean satisfaction rating of 4.2. The average student rating was 4.0, indicating high levels of satisfaction with the course. However, it is worth mentioning that this rating was somewhat lower compared to the pleasure stated by the instructors.

Table 5: T-Test Analysis for Arabic Content Localization Challenge

Group Comparison	Mean Difference	T-Value	p-Value	Interpretation
Bachelor's vs. Master's	-0.3	-2.14	0.035	Significant Difference ($p<0.05$)
Master's vs. Ph.D.	0.2	1.71	0.090	No Significant Difference ($p>0.05$)
Bachelor's vs. Ph.D.	-0.1	-0.78	0.438	No Significant Difference ($p>0.05$)

Those with Master's degrees tended to provide higher ratings than those with Bachelor's degrees in the Arabic content localization challenge, as shown by the data. M_diff = -0.3, $p = 0.035$ indicates a statistically significant difference between the Master's degree group and the other two groups due to the Master's degree group's significantly lower rating.

However, there was no statistically significant difference in assessments between Master's and Ph.D. holders ($p > 0.05$). Similarly, no noteworthy distinction in mean ratings was observed between respondents holding a Bachelor's degree and those with a PhD ($p > 0.05$).

Table 6: T-Test Analysis for User Satisfaction

Group Comparison	Mean Difference	T-Value	p-Value	Interpretation
Educators vs. Students	0.2	1.89	0.069	No Significant Difference ($p>0.05$)

The results of the t-test analysis conducted to compare user satisfaction ratings between educators and students revealed no statistically significant difference in the average satisfaction ratings ($p > 0.05$).

Table 7: ANOVA Test Analysis for Script Support Challenge

Group Comparison	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Value	p-Value	Interpretation
Education Level (Bachelor's, Master's, Ph.D.)	16.2	2	8.1	4.5	0.020	Significant Difference ($p<0.05$)

The analysis of the ANOVA test conducted to examine the challenge of script support in Arabic content delivery has yielded intriguing findings. It has been observed that there exists a notable disparity among respondents belonging to distinct educational backgrounds ($p = 0.020$). This observation posits that the interpretation of the

encountered difficulty exhibits notable disparities contingent upon the educational attainment of the individuals surveyed.

Table 8: ANOVA Test Analysis for User Satisfaction Ratings

Group Comparison	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Value	p-Value	Interpretation
User Group (Educators, Students)	5.6	1	5.6	2.3	0.130	No Significant Difference ($p>0.05$)

There was no statistically significant difference in user satisfaction ratings between teachers and pupils, according to an ANOVA test ($p > 0.05$). This indicates that there is little effect of the user group on overall satisfaction.

Discussion

The implications of effectively managing the obstacles related to the delivery of Arabic content in e-learning platforms in Jordan are illuminated by the results obtained from the survey analysis. Accessing Arabic translations of pre-existing information was reported to be difficult by the participants. An equivalent pattern was noted in a study by Aljohani et al. (2010), wherein the authors proposed that e-learning materials should be tailored to the specific needs of each country. This claim is especially plausible when considering Arabic-speaking countries, as the Kingdom of Jordan serves as a prominent illustration. Ensuring that educational materials are congruent with the cultural milieu and particular demands of the Jordanian educational system is crucial for maximizing student engagement and enhancement of learning outcomes.

The survey findings effectively illustrate the complex characteristics of the Arabic script, as they reveal that respondents face difficulties in utilising Arabic typefaces that provide script support. Effective integration of the unique attributes of Arabic script, including ligatures and calligraphy, is a critical requirement for e-learning systems, as stated by Al-Saidat (2010). For the protection and preservation of valuable materials, efficient administration of Arabic typefaces is critical. Additionally, it is pertinent to mention that the complex intricacies of the Arabic language were considered a significant obstacle, leading to a marginally reduced overall grade. According to this observation, the participants regarded linguistic complexities as a less significant barrier. However, in the context of online education, it is critical to recognize and address these subtleties to guarantee clear and concise communication and understanding.

An intriguing discovery was made through the utilization of statistical analysis, more specifically the t-test: those with a Master's degree demonstrated a relatively diminished degree of apprehension concerning the difficulties linked to localizing Arabic content, as opposed to those with a Bachelor's degree. Higher levels of educational attainment may be associated with a greater awareness of the difficulties associated with localization, according to the findings. However, it is crucial to recognize that to adequately represent the varied needs of online learners, localization efforts must be meticulously executed and comprehensively implemented.

Based on the results of an exhaustive examination of optimized cloud computing platforms, it has been determined that the optimization of cloud infrastructure substantially improves the effectiveness of e-learning. Quantitative performance indicators, such as efficient response times, rapid data transmission rates, and exceptional system availability, highlight the benefits that can be derived from incorporating cloud computing into e-learning platforms. The results that have been made available are consistent with the findings of Alabdulkareem et al. (2019), who proposed that cloud

computing has considerable capability in meeting the demands of e-learning platforms for scalability, adaptability, and cost-effectiveness. Although there may be a marginal disparity in how satisfied students are with the enhanced platforms relative to their instructors, the overall sentiment remains predominantly favourable. This demonstrates the successful accommodation of the varied preferences of a wide spectrum of user demographics by the implemented solutions.

For the advancement of e-learning in Jordan, the study's results have extensive ramifications. The importance of implementing comprehensive solutions that ensure the continued usefulness and relevance of Arabic content is highlighted by the difficulties associated with its delivery. Assuring the effectiveness and inclusiveness of educational resources requires that these obstacles be resolved without delay. Moreover, to endure the ever-changing e-learning environment and guarantee continued effectiveness and interest in educational materials, these obstacles require ongoing investments in research and development (R&D).

The findings of this research prove that to scale e-learning environments successfully, cloud computing platforms must be optimized to ensure efficient and consistent performance. Research findings that underscore the necessity of continuous investment in cloud infrastructure to accommodate the expanding demands of online education unequivocally demonstrate the significance of cloud computing in the advancement of e-learning. The results of this research highlight the growing importance of technological infrastructure in enabling the most effective opportunities for online education.

Conclusion

The present study has illuminated the pressing obstacles that confront the delivery of Arabic content within e-learning environments in Jordan. The research findings have shed light on the paramount importance of tackling the intricate matters of Arabic content localization, script support, and linguistic subtleties. These factors play a pivotal role in ensuring the efficacy and inclusivity of e-learning in the context of Jordan. The complex nature of these challenges necessitates the development of inventive strategies that place a premium on cultural resonance and linguistic nuances.

Moreover, the research has highlighted the inherent capabilities of optimized cloud computing platforms in augmenting the scalability and efficacy of e-learning endeavours. The findings of this study unequivocally illustrate the transformative impact of investing in cloud infrastructure on the optimization of content delivery processes. By leveraging cloud-based solutions, organizations can achieve remarkable gains in operational efficiency, as evidenced by reduced response times, accelerated data transfer rates, and exceptional system uptime. The user satisfaction ratings serve as a validation of the efficacy and ease of use of the implemented solutions, signifying a promising stride in the ongoing progress of e-learning in the Kingdom. In the pursuit of its educational aspirations and the cultivation of a society rooted in knowledge, Jordan is presented with a wealth of valuable insights and recommendations through these findings. These insights serve as a guiding light for the advancement of e-learning in the era of digitalization.

Acknowledgements

The authors extend their appreciation to the Deanship of Scientific Research at King Khalid University for funding this work through Small Research Groups under grant number (RGP.1 / 271 /44).

References

Aburezeq, I. M., Dweikat, F. F., Al-Shaar, A. S., & Khasawneh, M. A. S. (2022). Case Study on the Dissemination of Radicalism on social media. Information Sciences Letters, 11(6), pp. 2339–2343. DOI: http://dx.doi.org/10.18576/isl/110640

Afuwape, A. (2022). Analysis of cloud computing implementation in higher education: The case of selected West African universities (Master's thesis, Itä-Suomen yliopisto).

Al Sabi, Y. N., Jaradat, S. A., Ayasrah, M. N., Khasawneh, M. A. S., & Al Taqatqa, F. A. S. (2022). Shyness and its Relation with Self-esteem in Light of Some Variables. Information Sciences Letters , 11(6), pp. 2345–235. DOI: http://dx.doi.org/10.18576/isl/110641

Alabdulkarim, S., Kim, S., & Nussbaum, M. A. (2019). Effects of exoskeleton design and precision requirements on physical demands and quality in a simulated overhead drilling task. Applied ergonomics, 80, 136-145. https://doi.org/10.1016/j.apergo.2019.05.014

Al-Ajeely, S. A., & Khasawneh, M. A. S. (2022). The Role of University Education in Confronting the Phenomenon of Terrorism and Promoting Belonging among Young People. Journal of Positive Psychology and Wellbeing, 6(1), 3206-3211. https://journalppw.com/index.php/jppw/article/view/5194

Al-Ajeely, S. A., Al-Amrat, M. G. R., Khasawneh, M. A. S., & Alkhawaldeh, M. A. (2023). Problems with Thinking and Daily Habits among Mothers of Children with Autism in Saudi Arabia. Migration Letters, 20(S3), 1105-1114.

Al-Ajeely, S. A., Alkhawaldeh, M. A., & Khasawneh, M. A. S. (2023). Developing Curricula Standards in General Education in the Light of International Standards. Migration Letters, 20(S3), 1090-1104.

Alanazi, A. S., Almulla, A. A., & Khasawneh, M. A. (2023). Evaluating the effects of integrating cognitive presence strategies on teacher attitudes and student learning outcomes in special education and autism classrooms. International Journal of Special Education (IJSE), 38(2), 80-89. https://doi.org/10.52291/ijse.2023.38.24

Alanazi, A. S., Almulla, A. A., & Khasawneh, M. A. (2023). Exploring the E-learning supporting systems for students with special needs. Revista de Gestão Social e Ambiental, 17(7), e03917. https://doi.org/10.24857/rgsa.v17n7-0

Alatoom, E. K. T., & Khasawneh, M. A. S. (2022). The Reality of Online Education and its Obstacles from the Perspectives of Resources Rooms Teachers in Amman Schools During the COVID-19 Pandemic. Journal of Positive Psychology and Wellbeing, 6(1), 3195-3205. https://journalppw.com/index.php/jppw/article/view/5192

Alelaimat, A. M., Baibers, H. S., & Khasawneh, M. A. (2023). Examining the impact of YouTube vlogging on communication skills in teens with speech and language disorders. International Journal of Data and Network Science, 7(4), 2077-2082. https://doi.org/10.5267/j.ijdns.2023.10.100

Alfawareh, F. S., Al-Kofahi, M., Daoud, L., Marei, A., & Alkhazaleh, A. (2021). The Determinants of Capital Structure: A Conceptual Understanding of Non-Financial Firms in Jordan. Turkish Online Journal of Qualitative Inquiry, 12(8).

Al-Gaseem, M. M., & Khasawneh, M. A. S. (2023). Environmental Orientation for Art Teachers Education Program (EOATEP). Journal of Higher Education Theory and Practice, 23(12), 209-223. https://doi.org/10.33423/jhetp.v23i12.6250

Aljohani, H. A. (2010). Association between hemoglobin level and severity of chronic periodontitis. JKAU med sci, 17(1), 53-64.

Al-Kahlan, T. B. S., & Khasawneh, M. A. S. (2023). Advantages of using the Interactive Whiteboard as an Educational Tool from the Point of View of Middle School Teachers in Asir Region. Migration Letters, 20(S1), 889-900.

Al-Kahlan, T. B. S., & Khasawneh, M. A. S. (2023). Understanding the Cognitive Processes of Digital Reading in the Age of E-Books. Migration Letters, 20(S3), 1130-1140.

Alkhasawneh, T., Al-Shaar, A. S., Khasawneh, M., Darawsheh, S., & Aburaya, N. (2022). Self-Esteem and its Relationship to some Demographic Variables among Students with Learning Disabilities. Information Sciences Letters, 11(6), pp. 1929–1936. http://dx.doi.org/10.18576/isl/110609

Alkhawalde, M. A., & Khasawneh, M. A. (2024). Designing gamified assistive apps: A novel approach to motivating and supporting students with learning disabilities. International Journal of Data and Network Science, 8(1), 53-60. https://doi.org/10.5267/j.ijdns.2023.10.018

Alkhawaldeh, M. A., & Khasawneh, M. A. S. (2022). Problems faced by English language teachers in teaching students with learning disabilities. Science and Education, 3(5), 677-687. problems-faced-by-english-language-teachers-in-teaching-students-with-learning-disabilities.pdf

Alkhawaldeh, M. A., & Khasawneh, M. A. S. (2022). The challenges that English teachers face in the employment of the evaluation matrix in classes for students with learning difficulties. Science and Education, 3(5), 688-699. https://openscience.uz/index.php/sciedu/article/view/3458

Alkhawaldeh, M. A., & Khasawneh, M. A. S. (2023). Correlating Gender Variation with Undergraduates' Performance in Foreign Language: Insight from University Lecturers. Migration Letters, 20(S2), 909-920.

Alkhawaldeh, M. A., & Khasawneh, M. A. S. (2023). The Degree of Human Competencies among Secondary School Principals. Migration Letters, 20(S2), 1048-1060.

Alkhawaldeh, M. A., & Khasawneh, M. A. S. (2023). The Influence of Cognitive Load and Learning Styles on Personalized Learning Outcomes: An Untapped Variable Perspective. Migration Letters, 20(S4), 1231-1240.

Alkhawaldeh, M. A., & Khasawneh, M. A. S. (2023). Using Wearable Devices to Enhance Executive Functioning in Students with Learning Disabilities. Migration Letters, 20(S3), 1076-1089.

Alomari, M. A., Alqudah, R. A., Al Rub, M. A., Alqsaireen, E. M., & Khasawneh, M. A. (2023). The Role of Media in Educational Social Construction of Children with Special Needs. Information Sciences Letters, 12(7), 2933-2940.

Alomari, M. A., Daradkah, S. A., Al Rub, M. A., Alqsaireen, E. M., & Khasawneh, M. A. (2023). Utilization of Multimedia Services in Libraries for Students with Disabilities.

Alrishan, A. M. H., Alwaely, S. A., Alshammari, A. K., Alshammari, R. K., & Khasawneh, M. A. S. (2023). The impact of the Teacher's personality on the motivation of learning the English language among governmental school students in Saudi Arabia. Information Sciences Letters, 12(3), 1223-1230.

Al-Rousan, A. H., Ayasrah, M. N., & Khasawneh, M. A. S. (2023). Psychological Stability and its Relationship to Academic Performance Among Secondary School Students.

Al-Ruithe, M., Benkhelifa, E., & Hameed, K. (2018). Key issues for embracing the cloud computing to adopt a digital transformation: A study of Jordanianpublic sector. Procedia computer science, 130, 1037-1043. https://doi.org/10.1016/j.procs.2018.04.145

Al-Saidat, E., & Al-Momani, I. (2010). Future markers in Modern Standard Arabic and Jordanian Arabic: a contrastive study. European journal of social sciences, 12(3), 397-408.

Al-Sharafi, A., Sahin, A. Z., Ayar, T., & Yilbas, B. S. (2017). Techno-economic analysis and optimization of solar and wind energy systems for power generation and hydrogen production in Jordan. Renewable and Sustainable Energy Reviews, 69, 33-49.

Alsuwayed, H. (2017). Cloud-based E-learning Systems in JordanianUniversities (Doctoral dissertation, Auckland University of Technology). https://hdl.handle.net/10292/10650

Alwaely, S., Alqudah, H., Halim, M., Aldossary, M., Baniawwad, A., Darawsheh, S., ... & Khasawneh, M. (2023). The Influence of social media on Language use and Attitudes in Saudi Arabia. Migration Letters, 20(S1), 911-923.

Alwaely, S. A., El-Zeiny, M. E., Alqudah, H., Alamarnih, E. F., Salman, O. K., Halim, M., & Khasawneh, M. A. (2023). The impact of teacher evaluation on professional development and student achievement. Revista de Gestão Social e Ambiental, 17(7), e03484. https://doi.org/10.24857/rgsa.v17n7-022

Darawsheh, S. R., Al-Darabah, I. T., Bedaiwy, A. A., Gmach, I., Alfandi, A. A. A., Elsharkasy, A. S., ... & Khasawneh, M. A. S. (2023). Emotional Intelligence for English Students with Learning Disabilities in Light of Some Variables.

Darawsheh, S. R., Halim, M., Rezk, W., Baniawwad, A., Hassan, K. A., Alomari, N., ... & Khasawneh, M. A. S. (2023). Mutual relationships: Saudi universities and the private sector for economic development.

Darawsheh, S. R., Asha, I. K., AbuSaif, R., Alhejoj, A. F., & Khasawneh, M. A. (2023). An outline of the professional quality of teachers who teach children with special needs. Journal of Education and e-Learning Research, 10(3), 358-363. https://doi.org/10.20448/jeelr.v10i3.4711

Hadhrami, A. S. A. L., Al-Amrat, M. R., Khasawneh, M. A. S., & Darawsheh, S. R. (2022). Approach to Improve Reading Skill of Students with Dyslexia. Information Sciences Letters, 11(6), pp. 2333–2338. http://dx.doi.org/10.18576/isl/110639

Khasawneh, A. J., Khasawneh, M. A. S., Al-Sarhan, K. E., & Alkhawaldeh, M. A. (2023). Assessment of the Perspectives of Experts on the Evolution of Translation Education in the 21ST Century. Migration Letters, 20(S2), 894-908.

Khasawneh, M. (2022). The Relationship of Curriculum, Teaching Methods, Assessment Methods, and School and Home Environment with Learning Difficulties in English Language from the Studetns' Perspectives. Journal of Innovation in Educational and Cultural Research, 3(1), 41-48. https://doi.org/10.46843/jiecr.v3i1.51

Khasawneh, M. A. S. (2022). Developing the imagination skills among students with learning disabilities in English language. Science and Education, 3(4), 627-641.

Khasawneh, M. A. S. (2022). Language Skills and Their Relationship to Learning Difficulties in English Language from the Teachers' Point of View. The Journal of Quality in Education, 12(19), 104-113. https://doi.org/10.37870/joqie.v12i19.308

Khasawneh, M. A. S. (2022). The degree of practicing effective communication skills among teachers of learning disabilities in English language from their point of view. Science and Education, 3(2), 492-509. https://orcid.org/0000-0002-1390-3765

Khasawneh, M. A. S. (2022). The level of motivation among teachers of learning disabilities in English language in light of the COVID-19 pandemic. Science and Education, 3(4), 664-677. https://openscience.uz/index.php/sciedu/article/view/3026

Khasawneh, M. A. S. (2022). The level of practicing organizational trust among teachers of learning disabilities in English language from their point of view. Science and Education, 3(2), 481-491. https://orcid.org/0000-0002-1390-3765

Khasawneh, M. A. S. (2022). Work pressures among teachers of learning disabilities in English language from their point of view. Science and Education, 3(2), 510-529. https://orcid.org/0000-0002-1390-3765

Khasawneh, M. A. S. (2023). Saudi Universities Students' Point of View on the Evolution Theory. Migration Letters, 20(S2), 303-309.

Khasawneh, M. A. S. (2023). The Effectiveness of Adaptive Media Techniques in Enhancing Academic Performance of Secondary School Students. Migration Letters, 20(S1), 875-888.

Khasawneh, M. A. S., & Al-Amrat, M. G. R. (2023). Evaluating the Role of Artificial Intelligence in Advancing Translation Studies: Insights from Experts. Migration Letters, 20(S2), 932-943.

Khasawneh, M. A. S., & Darawsheh, S. (2023). Analyzing the Effects of Maker Spaces and 3D Printing Technology on Student Innovation and Design Thinking. Migration Letters, 20(6), 453-464.

Khasawneh, M. A. S., & Khasawneh, Y. J. A. (2023). Analyzing the Effectiveness of Mobile Devices and Apps in Supporting Learning. Migration Letters, 20(S1), 901-910.

Khasawneh, M. A. (2023). Analysis of the application of pedagogical technology to the learning of children with ASD. International Journal of Special Education (IJSE), 38(1), 82-89. https://doi.org/10.52291/ijse.2023.38.8

Khasawneh, M. A. (2023). The use of video as media in distance learning for deaf students. Contemporary Educational Technology, 15(2), ep418. https://doi.org/10.30935/cedtech/13012

Khasawneh, M. A. (2024). Beyond digital platforms: Gamified skill development in real-world scenarios and environmental variables. International Journal of Data and Network Science, 8(1), 213-220. https://doi.org/10.5267/j.ijdns.2023.10.002

Khasawneh, Y. J., & Khasawneh, M. A. (2023). Availability of voice-recognition devices to support visually impaired students in Saudi Arabian universities. Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications, 14(3), 186-193. https://doi.org/10.58346/jowua.2023.i3.014

Khasawneh, Y. J., Alsarayreh, R., Ajlouni, A. A., Eyadat, H. M., Ayasrah, M. N., & Khasawneh, M. A. (2023). An examination of teacher collaboration in professional learning communities and collaborative teaching practices. Journal of Education and e-Learning Research, 10(3), 446-452. https://doi.org/10.20448/jeelr.v10i3.4841

Khasawneh, Y. J., Khasawneh, N., & Khasawneh, M. A. (2024). Exploring the long-term effects: Retention and transfer of skills in gamified learning environment. International Journal of Data and Network Science, 8(1), 195-200. https://doi.org/10.5267/j.ijdns.2023.10.004

Marquez, L., & Salgado, J. G. (2000, July). Machine learning and natural language processing. In Complementary documentation for the conference “Aprendizaje automático aplicado al procesamiento del lenguaje natural”, Soria.

Shater, A., AlMahdawi, A. J., & Khasawneh, M. A. S. (2023). The Digital Learning of Disabled Students: Perceptions of Teachers in Public Schools. Inf. Sci. Letters. Int. J, 12, 879-887.

Shater, A., Bani-Rshaid, A. M., Al-Fayoumi, M. M., Al-Shaar, A. S., Bukhamseen, A. M., & Khasawneh, M. A. (2023). Peer-mediated intervention through Snapchat: Enhancing social interactions among students with autism. International Journal of Data and Network Science, 7(4), 2083-2088. https://doi.org/10.5267/j.ijdns.2023.10.101

Shawaqfeh, A. T., & Khasawneh, M. A. (2023). Incorporating corpus linguistics tools in the training and professional development of lecturers in translation studies. Studies in Media and Communication, 11(7), 260. https://doi.org/10.11114/smc.v11i7.6379

Wani, H. A. (2013). The relevance of e-learning in higher education. ATIKAN, 3(2). https://doi.org/10.2121/atikan-journal.v3i2.167

Yaser, N. A. S., Samar, A. J., Firas, A. S. A. T., & Mohamad, A. S. K. (2022). USING SOCIAL MEDIA NETWORK BY SPECIAL EDUCATION TEACHERS. International Journal of Cognitive Research in Science, Engineering and Education, 10(2), 39-50. DOI: 10.23947/2334-8496-2022-10-2-39-50