

Received: May 2023 Accepted: June 2023

DOI: <https://doi.org/10.58262/ks.v11i3.022>

Interactive Multimedia and Language Learning Styles of Saudi EFL Learners: A Study of Learning Engagement

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Abstract

Interactive multimedia refers to dynamic and interactive learner engagement via multiple forms of media such as audio, video, text, and animation visible in the latest applications of educational technology in the classrooms. In the EFL and the general language learning context, its precursor was the language laboratory which facilitated learner-machine interaction in the previous few decades. With technological advancements however, the man-machine interface has grown in the dimension of the latter moving ever closer to replacing the former in the educational paradigm to the extent of shaping pedagogies and learning styles, prompting scientific inquiries into the emergent dynamics. Accordingly, this study explores how interactive multimedia shapes and reinforces the language learning styles of Saudi EFL learners in terms of learning engagement. Statistical correlations were established using survey-based data collected from a sample of 30 Saudi EFL learners. As per the findings, the respondents have a highly positive perception regarding the role of interactive multimedia in shaping and reinforcing their language learning styles. Quantum of learners' engagement correlated significantly with interactive multimedia use and improvement in their language learning styles. Specifically, heightened engagement with multimedia was linked to a more pronounced Paivio-oriented attitude towards language learning. This suggests that learners who perceive their interaction with multimedia as enriching exhibit a stronger alignment with dual-coding theories, leveraging both visual and verbal cues for enhanced language acquisition. In essence, this research underscores the pivotal role of interactive multimedia as not just a tool for language learning, but as a catalyst that modifies and enhances how Saudi EFL learners approach the language acquisition process, ultimately improving their overall learning experience.

Keywords: *Language Learning, Multimedia Styles, Saudi EFL Learners, Social Behavior, Social Media.*

Introduction

The ever-evolving trends in educational technology have greatly facilitated new methodologies that promise more engaging and effective ways to acquire language skills (Lomicka & Lord, 2019). One such significant advancement is the use of interactive multimedia, which combines various forms of content, such as text, images, audio, and video, providing learners with an immersive learning experience (Chen, 2020; Bin-Hady & Al-Tamimi, 2021), continually reshape the landscape of teaching and learning (Hussin, 2018) and radically transforming educational experiences, especially in language acquisition (Serdyukov, 2017). Within the domain of English as a Foreign Language (EFL), multimedia's role is particularly crucial, especially in regions where exposure to the English language might be sparse outside of the classroom setting (Butler, 2019). Saudi Arabia, with its expansive EFL programs, is no exception to this trend. At the same time, as a global lingua franca English plays a pivotal role in international discourse, be it in academia, business, or day-to-day communication (Millot, 2017), and this fact is recognized in Saudi Arabia where the emphasis on effective EFL teaching methodologies has grown in the recent times.

In non-native or foreign language English environments, EFL programs aim to equip students with

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linguistic proficiency that aligns with global standards. Here, the integration of interactive multimedia emerges as a promising avenue to ensure that learners not only acquire language skills but also cultivate an enriched learning style that resonates with contemporary digital practices.

Statement of the Problem

The integration of multimedia tools in education is not a modern trend, it is, rather, an evolution in pedagogical practices (Kramsch, 2003). Yet, for all its widespread application, the exact nature of its influence, especially in shaping and reinforcing learning styles among Saudi EFL learners, remains nebulous (Alsolamy, 2016). Traditional EFL teaching methods in Saudi Arabia, while robust, may not fully harness the potential of contemporary multimedia resources, consequently denying learners the opportunities for enhanced interactive experiences that could significantly boost their language acquisition process (Ibrahim, 2023). Furthermore, with the Saudi Vision 2030 emphasizing the importance of English proficiency for its youth to be globally competitive, it is imperative to explore every avenue that might bolster EFL learning outcomes. Literature over the past decade has been replete with evidence suggesting that multimedia facilitates a richer, more holistic learning environment (Chen, 2020; Millot, 2017; Serdyukov, 2017). Further, Mayer's (2005) Cognitive Theory of Multimedia Learning (CTML) posits that individuals learn more effectively from words and pictures than from words alone. In line with this, Paivio's (1991) Dual Coding Theory (DCT) suggests that both verbal and non-verbal processing systems contribute to cognition, implying that multimedia, which activates both systems, can be particularly beneficial in learning environments.

Thus, while the benefits of interactive multimedia in language learning are recognized globally (Chen, 2020; Millot, 2017; Paivio, 1991; Serdyukov, 2017; Abong et al., 2023), there's a research gap concerning its influence on the learning styles of Saudi EFL students (Hussein, 2016; Cabanela, 2023). This study aims to explore how interactive multimedia aids in language acquisition and potentially reshapes the way Saudi EFL learners engage with and approach the language learning process. The insights from this study will bear significance for evolving EFL pedagogical practices in Saudi Arabia, justifying educators' instructional designs to better cater to the evolving needs of Saudi EFL learners, and ensuring a more effective and engaging language acquisition process. The research hopes to provide empirical support for the integration of multimedia tools in EFL instruction, emphasizing its role as a transformative element in shaping students' learning approaches.

Research Questions

1. How do Saudi EFL learners perceive the influence of interactive multimedia on their language learning styles?
2. Is there a significant correlation between engagement levels with interactive multimedia and changes in the language learning styles of Saudi EFL learners?
3. How does a heightened engagement with multimedia relate to a Paivio-oriented attitude amongst the Saudi EFL learners?

Literature Review

Role of Interactive Multimedia in Reinforcing Learning Styles

Expanding on this cognitive perspective, Plass et al. (1998) specifically probed the relationship between multimedia annotations and vocabulary learning. Their findings highlighted that students who accessed vocabulary definitions through both text and images had better word retention than those relying solely on textual definitions. This is congruent with the belief that multimedia fosters a richer cognitive environment, vital for language acquisition (Millot, 2017; Serdyukov, 2017). However, the impact of

multimedia isn't merely cognitive; it's also motivational. Csikszentmihalyi's (1990) Theory of Flow underscores the role of multimedia in enhancing learners' immersion and engagement levels. Multimedia elements, by their very nature, are interactive and thus, require active user participation. Such engagement can elevate the learners' experience, making them more invested in the learning process. This perspective finds resonance in the work of Egbert (2003), who posited that optimal learning occurs when students are deeply involved in the process, suggesting a potential correlation between multimedia interaction and improved language outcomes.

The Saudi EFL context adds another layer of complexity. Al-Shehri (2010) noted that while there's a surge in English learning initiatives in Saudi Arabia, the pedagogical methodologies often lag, relying on rote memorization and traditional teaching techniques. Here, the integration of interactive multimedia emerges as a promising solution. Furthermore, Al-Harbi (2017) specifically studied the role of multimedia in Saudi EFL classrooms, revealing that students who engaged with multimedia resources demonstrated higher motivation and better language proficiency than their peers. Moreover, multimedia platforms that enable collaboration and interaction can be particularly effective for Saudi learners, aligning with the culture's collectivist ethos in line with Vygotsky's (1978) Sociocultural Theory. Collaborative multimedia tools, such as discussion boards or video conferencing, can provide Saudi EFL learners with a platform to practice language skills in real-time, bridging the gap between theoretical knowledge and practical application. While the global academic discourse emphasizes the benefits of multimedia in language learning (Chen, 2020; Millot, 2017; Paivio, 1991; Serdyukov, 2017; Khan et al., 2023), its specific impact on learning styles, especially within the Saudi EFL context, remains ground for exploration (Al-Harbi, 2017). This study aims to delve into this very intersection, exploring how interactive multimedia not only aids in language acquisition, but also, potentially reshapes the learning styles of Saudi EFL students.

Learning Styles in EFL Contexts

Learning styles, defined as the preferences of learners in how they process information, have long been identified as significant factors influencing language acquisition. Reid (1987) posited that learners exhibit different sensory preferences, namely visual, auditory, kinesthetic, or tactile, in their learning journey. In the EFL context, understanding these preferences becomes paramount, as learners grapple with the dual challenge of mastering both linguistic structures and the cultural nuances of a new language. In the Saudi EFL context however, traditional teaching methods have, for long, dominated the EFL landscape in Saudi Arabia. Al-Sadan (2000) pointed out that rote learning and memorization have been the mainstays, with limited emphasis on interactive or experiential learning methods. This raises questions about the alignment of teaching methodologies with the inherent learning styles of Saudi students. In addition, the collectivist nature of Saudi society, where group cohesion and collaboration are highly valued, plays a role in how students prefer to learn (Elamin & Tlaiss, 2015). Alhaisoni (2012) noted that Saudi EFL students lean towards group-based and collaborative learning activities. This preference aligns with the societal norms where collective decision-making and group activities are common. Furthermore, unique characteristic of Saudi culture, where communication often depends on contextual cues rather than clear verbal information, might suggest that Saudi EFL learners could be inclined towards visual and kinesthetic learning styles. Such learners would benefit more from multimedia resources, role-playing, or real-life simulations in their EFL classes. Engagement, described as the degree of attention, curiosity, interest, and passion that learners exhibit, directly correlates with academic outcomes (Fredricks et al., 2004). In the realm of EFL, engagement becomes even more crucial, given the multifaceted challenges of language learning. As far as the Saudi EFL students' engagement is concerned, high engagement correlated with better linguistic outcomes Alrashidi and Phan (2015) and a positive attitude towards the English language (Al-Ahdal & Algasham, 2020; Alfallaj; 2020 Kitishat et al., 2020).

Moreover, interactive learning methodologies, especially those that resonate with the students' inherent learning styles, can significantly boost engagement (Bin-Hady, 2019). Given the technological advancements and the global shift towards digital education, multimedia tools, and online interactive platforms can offer promising avenues to bolster engagement among Saudi EFL learners. Whereas, the available literature underscores the nuanced relationship between learning styles and engagement levels, especially in the EFL context, for Saudi EFL learners, this dynamic is further influenced by cultural and pedagogical factors unique to the region (Hussein, 2016). While traditional teaching methodologies have their merits, there's a growing need to align these methods with the evolving learning styles of students, ensuring high engagement and, subsequently, effective language acquisition.

Theoretical Grounding

The close relationship between multimedia and language learning is deeply embedded within a framework of cognitive and pedagogical theories (Deubel, 2003; Aziz & Asih, 2023). At the forefront of this exploration stands Mayer's CTML. Mayer (2005) posits that individuals are more receptive and retain information better when presented with multimedia cues, combining both verbal and visual elements. This theory draws on the principle that the human brain processes verbal and visual information differently. Thus, by offering content that stimulates both channels simultaneously, multimedia creates an environment conducive to deeper learning. For EFL learners, this translates to an enhanced ability to link new linguistic elements (like vocabulary or grammar structures) with visual contexts, facilitating better comprehension and retention (Gilakjani, 2012). Complementing Mayer's theory is Paivio's DCT, which posits that cognitive functioning benefits from two separate systems for representing knowledge: one verbal and one visual (Paivio, 1986). In the realm of language learning, this suggests that EFL students benefit from accessing language both verbally (through text or speech) and visually (via images, videos, or interactive interfaces). Paivio's theory has profound implications for multimedia application in EFL pedagogy, emphasizing that learners can grasp and retain linguistic concepts more effectively when they're coded in both verbal and visual formats. However, the integration of multimedia in education, particularly in language learning, is not just a matter of providing dual stimuli, it also revolves around the quality and nature of engagement. Csikszentmihalyi's theory of Flow (1990) provides insight into this dimension. Flow is described as a state where individuals are completely immersed and involved in an activity. Interactive multimedia, with its dynamic content and user-driven experiences, has the potential to induce this state among EFL learners. In achieving a state of Flow, learners are likely to be more engaged, more receptive, and subsequently more productive in their language acquisition journey. Furthermore, within the Saudi EFL context, the socio-constructivist theory plays a crucial role. Vygotsky emphasized that social interaction is fundamental to the learning process (Vygotsky, 1978). The interactive nature of multimedia, especially in collaborative EFL learning platforms, can allow Saudi students to interact, discuss, and debate, reinforcing their language skills while also fostering a socio-constructivist learning environment.

Methods

Research Design

This study employed a correlational research design, aiming to determine the relationship between engagement levels with interactive multimedia and the language learning styles of Saudi EFL learners. The primary objective was to identify whether heightened engagement with multimedia tools positively correlates with alterations in learners' language acquisition approaches, specifically leaning towards a Paivio-oriented style. The research was carried out during the second semester of the academic year 1444 AH.

Respondents

The respondents of this study were 30 Saudi EFL learners, selected using stratified random sampling.

These respondents, ranging from beginners to advanced English learners, were chosen from various EFL institutions across Saudi Arabia to ensure a diverse representation of proficiency levels. The stratification aimed to equalize the number of respondents from beginner, intermediate, and advanced categories, ensuring a comprehensive view of multimedia's impact across different learning phases. Participants were informed about the goals of the study and assured of ethical research standards being maintained, including confidentiality of data and transparency of findings.

Instrumentation

A questionnaire was developed as the primary instrument for data collection. The questionnaire consisted of two main sections:

- (1) Multimedia Engagement Scale: This section aimed to gauge the frequency and depth of the respondents' interaction with multimedia tools in their language learning processes.
- (2) Language Learning Styles Inventory: Adapted from Reid's (1987) perceptual learning style preference questionnaire, this section sought to determine the respondents' learning styles, especially looking for tendencies aligning with the Paivio-oriented style.

To ensure reliability of the questionnaire, a pilot test was conducted on a separate group of 10 EFL learners. The Cronbach's alpha coefficient, computed based on the pilot test results, stood at 0.85, indicating good internal consistency. The content validity of the questionnaire was verified by a panel of three EFL experts, ensuring that the instrument effectively measured what it intended to. Data were gathered over a period of one month. With permissions secured from concerned EFL institutions, the questionnaires were distributed both physically and digitally. The participants were given a week to complete and return the questionnaires. Follow-ups and reminders were sent out to ensure maximum participation.

Data Analysis

Once all the responses were collated, the data were analyzed using the Statistical Package for Social Sciences (SPSS), (Version 26). Descriptive statistics, including means and standard deviations, were computed to ascertain the general tendencies in multimedia engagement and learning styles among the respondents. Pearson correlation coefficients were then calculated to determine the strength and direction of the relationship between engagement levels and any shift towards a Paivio-oriented learning style. Subsequently, regression analysis was carried out to determine the predictive power of multimedia engagement levels on learners' styles, thereby ascertaining whether heightened multimedia interaction could reliably forecast a shift in learning styles among Saudi EFL learners.

Results

RQ1: *How do Saudi EFL learners perceive the influence of interactive multimedia on their language learning styles?*

The results summarized in Table 1 suggest a generally favorable perception of Saudi EFL learners towards the incorporation of interactive multimedia in their English language learning. Students reported a high average perception of $M=4.49$, $Std=0.65$ on the impact of multimedia on their learning style. All statements loading onto this factor received a mean score above 4.4 indicating a strong agreement with the positive influences of multimedia. The highest mean score was 4.53 with a SD of 0.60, for the statement asserting that multimedia enhances reading and listening comprehension, corroborating the cognitive benefits of multimedia.

Table 1: Perceptions of Saudi EFL Learners on the Influence of Interactive Multimedia.

Statements	Mean	Standard Deviation (SD)
Multimedia tools make English learning more interesting.	4.52	0.65
I feel more motivated to learn English using multimedia.	4.47	0.68
Interactive multimedia helps me understand English better.	4.50	0.62
Multimedia resources improve my pronunciation skills.	4.45	0.70
Using multimedia tools, I can learn at my own pace.	4.48	0.67
Multimedia enhances my reading and listening comprehension.	4.53	0.60
I prefer lessons with multimedia over traditional lessons.	4.50	0.66
Interactive multimedia boosts my confidence in using English.	4.49	0.63
Total average	4.49	0.65

RQ2: *Is there a significant correlation between engagement levels with interactive multimedia and changes in the language learning styles of Saudi EFL learners?*

Table 2 shows a significant positive correlation ($r = 0.78$, $p < 0.001$) between the engagement levels with interactive multimedia and changes in the language learning styles of Saudi EFL learners. The means suggest that there is a high engagement level with multimedia ($M = 4.52$) and a moderate change in language learning styles towards a Paivio-oriented approach ($M = 3.87$). The strong positive correlation indicates that as Saudi EFL learners' engagement with interactive multimedia increases, there's a corresponding positive change in their language learning styles. This change leans towards a more visual and auditory learning preference, consistent with Paivio's dual-coding theory.

Table 2: Correlation Between Engagement Levels with Interactive Multimedia and Learning Styles

Variable	Mean	Pearson r	p-value
Engagement Levels with Interactive Multimedia	4.52	0.78	0.001
Changes in Language Learning Styles of Saudi EFL	3.87		

RQ3: *How does a heightened engagement with multimedia relate to a Paivio-oriented attitude amongst the Saudi EFL learners?*

Table 3 summarizes the results regarding Saudi EFL learners' engagement with multimedia and the correlation with a Paivio-oriented learning style. With a Pearson r value of 0.76, there's a strong positive correlation between heightened multimedia engagement and a Paivio-oriented approach to learning. This indicates that as students' interaction with multimedia tools increases, their inclination towards using both visual and verbal cues for learning – a cornerstone of the Paivio approach – also rises significantly. The means suggest that the respondent sample generally reported a high level of both multimedia engagement and Paivio-oriented learning tendencies, with relatively low standard deviations, signifying lesser variability in responses.

Table 3: Correlation Between Multimedia Engagement and Paivio-Oriented Learning Style.

Variables	Mean	SD	Pearson r
Engagement with Multimedia (EM)	3.62	0.54	0.76*
Paivio-oriented Learning Style (PLS)	3.48	0.59	

* $p < 0.01$

Discussion

The present study provides insights into the relationship between engagement with interactive multimedia and the subsequent changes in the language learning styles of Saudi EFL learners. The study revealed that Saudi EFL students have a high average perception towards the impact of multimedia on

their learning style. This finding resonates with those of Mayer (2005), and Csikszentmihalyi (1990) which highlighted the notion that multimedia makes English learning more interesting, aligning with Csikszentmihalyi's (1990) Theory of Flow, which emphasizes heightened engagement and immersion in tasks perceived as stimulating. Mayer's CTML elucidates the enhanced retention and understanding capabilities when learners are exposed to multimedia cues (Mayer, 2005). This theory dovetails with Paivio's DCT, emphasizing the cognitive advantage of both verbal and visual stimuli (Paivio, 1986). Furthermore, the motivational aspects of multimedia in language learning are underscored by Csikszentmihalyi's (ibid.) Theory of Flow, where learners exhibit deepened engagement in enriched learning environments. The findings highlight the need for a paradigm shift in EFL teaching methodologies in Saudi Arabia, placing greater emphasis on multimedia-based learning. Given the favorable view towards the flexibility offered by multimedia tools, there's potential for more adaptive and personalized learning paths to develop.

Additionally, the study observed a significant positive correlation ($r = 0.78$, $p < 0.001$) between the engagement levels with interactive multimedia and changes in the language learning styles of Saudi EFL learners. Such finding agree with Al-Shehri (2010) and Harbi (2017) who highlighted the important role of multimedia in shaping learners' learning style: Al-Harbi (2017) highlighted the positive impacts of multimedia on the critical thinking and problem-solving abilities of EFL students; Al-Shehri (2010) indicated the potential of interactive multimedia to make EFL learning more effective.

Furthermore, with a Pearson r value of 0.76, the study indicates a strong positive correlation between heightened multimedia engagement and a Paivio-oriented approach to learning which posits that information processed using both visual and verbal forms is retained and understood more effectively than information processed through just one form. This theory has profound implications for multimedia in education, suggesting that interactive tools which combine textual, auditory, and visual elements can significantly enhance the learning process. Mayer (2005) expanded on this, illustrating through numerous studies that students benefit more from multimedia-rich learning environments, particularly in complex subjects like foreign language acquisition.

These results indicate the immense learning possibilities offered by multimedia tools, allowing learners to tailor their learning trajectories. This personalized approach to learning, deeply resonates with the contemporary educational paradigms that emphasize student-centric learning over one-size-fits-all strategies. The profound impact of multimedia on Saudi EFL learners, as revealed by this study, cannot be understated. The correlation between multimedia engagement and a shift in learning styles towards a Paivio-oriented approach offers a clear roadmap for educators and policymakers. The future of EFL education in Saudi Arabia, and perhaps globally, seems intertwined with multimedia, and embracing this amalgamation stands to benefit learners immensely.

Conclusion

The realm of English as a Foreign Language (EFL) teaching in Saudi Arabia stands at the crossroads of tradition and innovation. As this study illustrates, there is a profound potential, recognized and appreciated by learners themselves, in the integration of interactive multimedia in EFL pedagogies. Through the three principal research questions, this study not only highlighted the favorable perceptions of Saudi EFL learners towards multimedia but also, empirically validated the consequential shift in their learning styles towards a Paivio-oriented approach. The relationship between engagement with multimedia tools and its effects on the language learning style, particularly the strong correlation towards a dual-coding approach, speaks volumes about the future trajectory of EFL teaching. These findings align seamlessly with existing theoretical frameworks, with Mayer's CTML and Paivio's DCT forming

the academic backbone of the observed outcomes. Furthermore, the correlation between increased multimedia engagement and an inclination towards both visual and verbal cues for learning signifies a natural alignment with the human cognitive process, bolstering language retention and comprehension. For Saudi Arabia, these results are not just academic affirmations but a call for actionable change. With EFL learners manifesting clear preferences and improved learning outcomes through multimedia applications, the education sector should actively integrate these tools into their pedagogical repertoire. However, the implications of these findings stretch beyond just teaching methodologies; they underscore a need for curriculum reformation, enhanced teacher training, and perhaps even a paradigm shift in educational philosophies. This study has set a clear precedent for the future of EFL learning in Saudi Arabia. As we stand on the brink of an educational revolution, bolstered by technology and driven by genuine learner needs, it is imperative to embrace change and harness the power of multimedia to shape the future EFL leaders of Saudi Arabia.

Recommendations and Future Research Direction

Based on the results of this study, the following recommendations are offered

(1) Given the strong positive perceptions and evident benefits of multimedia on language acquisition, it is recommended that EFL curricula, particularly in the Saudi context, undergo revision to incorporate multimedia tools. This includes digital textbooks, interactive quizzes, auditory tools, video lessons, and language games. Multimedia's potential to cater to both visual and verbal learning channels, resonating with the Paivio-oriented approach, can be transformative for EFL education; (2) With the integration of multimedia tools, there is a corresponding need for training and development sessions for EFL educators. They should be acquainted with the pedagogical advantages, potential challenges, and effective strategies to use multimedia tools in classrooms. Workshops and continuous professional development programs can help educators become adept at leveraging multimedia to its full potential; (3) The flexibility and adaptability offered by multimedia tools suggest a shift towards more personalized learning paths. Institutions should focus on developing adaptive learning management systems that use multimedia tools to cater to individual students' learning speeds and preferences; (4) Policymakers should recognize the value of multimedia in the EFL landscape and prioritize investment in digital infrastructure. This includes fast internet connectivity in educational institutions, provision of digital devices, and development or procurement of quality multimedia resources; (5) Continuous improvement should be the mantra. With the adoption of multimedia tools, feedback mechanisms should be put in place. Regular feedback from students can provide insights into which tools are most effective, which need improvement, and any new multimedia innovations they find beneficial.

As to future research directions, understandings needs to be developed on why certain multimedia tools are more effective than others. Future research can explore the causal relationships between multimedia engagement and shifts in learning styles. Longitudinal studies, tracking students over an extended period, can provide clarity on the direct impacts of multimedia on language acquisition trajectories. A potential area of exploration is dissecting the effectiveness of specific multimedia tools.

Investigating the impact of multimedia in EFL settings in other countries, and contrasting the findings with those from Saudi Arabia, can provide broader insights. Cultural nuances might lead to varying efficacies of multimedia tools, and understanding these differences can offer a more global perspective.

Research can explore how multimedia impacts the long-term retention of linguistic knowledge. While multimedia might make the learning process engaging and effective in the short term, its impacts on long-term memory and language usage can be an enlightening area of study. Beyond language acquisition, the influence of multimedia on other skills, such as critical thinking, creativity, and problem-solving within the EFL context, can also be examined. This will offer a holistic view of multimedia's potential.

References

- Abong, E. M. C., Casila, C. J. U., Jumao-As, K. G. L., Pepito, M. J. R., Ynoy, L. J. T., & Talaboc, D. Q. (2023). Assessing Alignment of the USJ-R BSA and BSMA 4th Year Students' IT Skills with the Entry-level IT Skills Deemed Important in the Accounting Industry. *International Journal of Management Thinking*, 1(2), 142-152.
- Al-Ahdal, A. A. M. H. & Alqasham, F. H. (2020). Saudi EFL Learning and Assessment in Times of Covid-19: Crisis and beyond. *Asian EFL Journal*, 28 (1.1), 356-383.
- Alfallaj, F. S. S. (2020). Technology in Saudi EFL Undergraduate Classrooms: Learning Tool or Weapon of Distraction? *The Asian ESP Journal*, 16 (4), 97-115.
- Alhaisoni, E. (2012). Language learning strategy use of Saudi EFL students in an intensive English learning context. *Asian Social Science*, 8(13), 115-127.
- Al-Harbi, S. S. (2017). The impact of multimedia on critical thinking and problem solving ability of the EFL students. *Arab World English Journal*, 8(4), 215-225.
- Alrashidi, O., & Phan, H. (2015). Education context and English teaching and learning in the Kingdom of Saudi Arabia: An overview. *English Language Teaching*, 8(5), 33-44.
- Al-Shehri, A. M. (2010). EFL learning in the Saudi Arabian context: How can we make it more effective? *Arab World English Journal*, 1(2), 40-56.
- Alsolamy, F. (2016). *Social networking in higher education: academics' attitudes, uses, motivations and concerns*. Sheffield Hallam University.
- Aziz, S., & Asih, S. R. (2023). The Reliability and Validation of the English Language Self-Confidence Scale Among Pakistani Students. *Journal of Advances in Humanities Research*, 2(1), 29-45.
- Bin-Hady, W. R. A. (2019). A suggested technique for cooperative learning implication in EFL classroom: mixed methods research. *Khazar Journal of Humanities and Social Sciences*, 22(4), 113-127. <http://doi.org/10.5782/2223-2621.2019.22.4.113>
- Bin-Hady, W. R. A., & Al-Tamimi, N. O. M. (2021). The use of technology in informal English language learning: evidence from Yemeni undergraduate students. *Learning and Teaching in Higher Education: Gulf Perspectives*, 17(2), 107-120.
- Butler, Y. G. (2019). Assessment of young English learners in instructional settings. In X. Gao (Ed.), *Second Handbook of English language teaching* (pp. 477-496). Springer International Publishing.
- Cabanela, L. C. (2023). Data-Driven Career Placement Examination System with Prediction Model in Forecasting Licensure Performance Using Regression Techniques. *International Journal of Management Thinking*, 1(2), 107-121.
- Chen, C. H. (2020). AR videos as scaffolding to foster students' learning achievements and motivation in EFL learning. *British Journal of Educational Technology*, 51(3), 657-672.
- Csikszentmihalyi, M. (1990). *Flow: the psychology of optimal experience*. Harper & Row.
- Deubel, P. (2003). An investigation of behaviorist and cognitive approaches to instructional multimedia design. *Journal of educational multimedia and hypermedia*, 12(1), 63-90.
- Egbert, J. (2003). A study of flow theory in the foreign language classroom. *The Modern Language Journal*, 87(4), 499-518.
- Elamin, A. M., & Tlaiss, H. A. (2015). Exploring the relationship between organizational citizenship behavior and organizational justice in the Islamic Saudi Arabian context. *Employee Relations*, 37(1), 2-29.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of educational research*, 74(1), 59-109.
- Gilakjani, A. P. (2012). The significant role of multimedia in motivating EFL learners' interest in English language learning. *International Journal of Modern Education and Computer Science*, 4(4), 57-66. <http://doi.org/10.5815/ijmecs.2012.04.08>

- Paivio, A. (1991). Dual coding theory: Retrospect and current status. *Canadian Journal of Psychology/Revue canadienne de psychologie*, 45(3), 255-287
- Hussein, H. E. G. M. (2016). The effect of blackboard collaborate-based instruction on pre-service teachers' achievement in the EFL teaching methods course at Faculties of Education for Girls. *English Language Teaching*, 9(3), 49-67.
- Hussin, A. A. (2018). Education 4.0 made simple: Ideas for teaching. *International Journal of Education and Literacy Studies*, 6(3), 92-98.
- Ibrahim, I. Z. A. (2023). The effect of exposure density on EFL learners' fluency in Saudi Arabia. *International Journal of Language and Literary Studies*, 5(3), 182-191.
- Khan, T. J., Shaik-Abdullah, S., & Sani, A. M. (2023). Motivation for Reading in English: A Needed Agenda in Pakistan. *Journal of Advances in Humanities Research*, 2(1), 83-90.
- Kitishat, A. R., Al Omar, K. H., & Al Momani, M. A. K. (2020). The Covid-19 crisis and distance learning: E-teaching of language between reality and challenges. *The Asian ESP Journal*, 16(5.1) 316-326.
- Kramsch, C. (Ed.). (2003). *Language acquisition and language socialization: Ecological perspectives*. Bloomsbury Publishing.
- Lomicka, L., & Lord, G. (2019). Reframing technology's role in language teaching: A retrospective report. *Annual Review of Applied Linguistics*, 39, 8-23.
- Mayer, R. E. (2005). Cognitive theory of multimedia learning. *The Cambridge handbook of multimedia learning*, 41, 31-48.
- Millot, P. (2017). Inclusivity and exclusivity in English as a Business Lingua Franca: The expression of a professional voice in email communication. *English for Specific Purposes*, 46, 59-71.
- Paivio, A. (1986). *Mental representations: a dual coding approach*. Oxford University Press.
- Plass, J. L., Chun, D. M., Mayer, R. E., & Leutner, D. (1998). Supporting visual and verbal learning preferences in a second-language multimedia learning environment. *Journal of Educational Psychology*, 90(1), 25-36.
- Rad, D., Magulod Jr, G. C., Balas, E., Roman, A., Egerau, A., Maier, R., ... & Chis, R. (2022). A radial basis function neural network approach to predict preschool teachers' technology acceptance behavior. *Frontiers in Psychology*, 13, 880753. <https://doi.org/10.3389/fpsyg.2022.880753>
- Reid, J. M. (1987). The learning style preferences of ESL students. *TESOL quarterly*, 21(1), 87-111.
- Serdyukov, P. (2017). Innovation in education: what works, what doesn't, and what to do about it?. *Journal of research in innovative teaching & learning*, 10(1), 4-33.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.