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From traditional to constructive digital classrooms: Learners' perceptions of technologies in reading classes

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ABSTRACT

Technologies had significantly contributed to developing academia, especially for academic literacies. The growing demand for understanding the integration between contemporary reading technologies' usefulness, ease of use, continuous use and learners' perceptions in a higher education context is highlighted in the literature.

Among frequent studies on implications of reading technologies, only a few came across issues concerning learners' perceptions; none of them was conducted in an Arab context. The present study aims to explore learners' perceptions of implications, i.e., usability and usefulness, of technologies in traditional reading classrooms. Furthermore, the study aims to explore their preferences and motivations to continue using technologies in performing future academic tasks.

A quantitative survey questionnaire is used to collect data from 351 respondents through 34 questions using the Technology Acceptance Model (TAM) at 24 universities. The data were analysed using Partial Least Squares-Structural Equation Modelling (PLS-SEM), as well as descriptive analysis using SPSS.25.

The study verified proposed correlations in the conceptual model. The model and proposed hypotheses yield novel findings. The study identified preferences for using smartphones, then computers, interactive whiteboards and digital platforms in reading classes, respectively. It also found that the usefulness of technology significantly influences learners' preferences and ability to use it. The findings displayed a total variance of 89% for learners' motivation to continue using technologies, which they are able to use in future academic tasks. The study concluded with implications and recommendations for researchers and policymakers.

KEYWORDS: education, learners' perception, reading literacy, technology

1. Introduction

In the rapidly evolving landscape of education, the integration of technology has emerged as a transformative force, particularly in language learning and literacy development. As digital tools such as interactive software, electronic devices, and online platforms continue to reshape the academic practice of learning, their potential to enhance academic literacy and learners' engagement has garnered significant attention. These technologies promise to enrich learning experiences in classrooms by offering immediate feedback, fostering active interaction with texts, and personalising learning pathways with varied instructional models (Sumathy & Navamani, 2024). However, questions persist regarding their alignment with learners' needs, preferences, and the dynamic demands, especially in traditional learning classrooms. While prior research has explored implications of technologies in education, gaps remain in understanding how these tools specifically influence reading literacy outcomes and learner perceptions in educational contexts. This study seeks to address these gaps by investigating learners' experiences with reading technologies and evaluating their impact on fostering learner-centred, effective reading practices.

Studies concerning the assimilation of technologies in second language learning had acquired higher significance globally, especially in countries where foreign language learners require effective learning tools (Abdul Razak et al., 2020). This significance is imperative for discerning the integration of technology in language acquisition, particularly in context with challenging application conditions (Buehl, 2023). As in the case of the Arab context, the use of educational technologies within formal settings of traditional learning is associated with numerous challenges, such as inadequate infrastructure, limited resources, and a lack of necessary knowledge to use them effectively. Even though Al-Obaydi et al. (2024) illustrated that most of the challenges concerning educational technologies are related to the learners. Traditional learning practices have predominantly focused on rote memorisation and teacher-centred education, potentially resulting in resistance or scepticism towards more interactive, technology-enhanced methodologies. Thus, analysing learners' perceptions offers critical insights into reconciling contemporary instructional methods.

Huda and Hashim (2022) conducted educational technology research and identified that Western educational contexts, especially those of the United States and Europe, are the main subjects of research on the development of learning technology practices and resources. It is worth noting that many articles, processes, and designs are built around certain learning settings that may not be applicable to all parties involved. Accordingly, learning platforms, resources, and systems are characterised by these assumptions. In contrast, the opposite image creates significant barriers to accessibility and leads to profound inequalities, as in the case of traditional learning classrooms. Yet, investigation in the literature highlighted ongoing disagreement between several stakeholders, such as educators, practitioners and policymakers, regarding the employment of technologies in developing learners' literacies. The general consent among academics shows that technologies can be used as a cognitive aid in reading classrooms. By bridging this knowledge gap, the research aims to inform educators and policymakers on optimising technology-driven strategies for reading instruction based on traditional learners' perceptions. Consequently, subsequent enquiries motivated this study to gain a deeper understanding of this phenomenon.

1- What are the prominent technologies in reading classrooms?
2- What are the perceptions of learners on using technologies in reading classrooms?
3- What are the impacts of reading technologies on reading comprehension and language acquisition?
4- What are the perceptions of learners on the future use of reading technologies?

2. Literature Review

Technology encompasses a wide array of elements, including audio and video tools, the internet, videotapes, language-related software, chat rooms, blogs, and social networking sites. Higher education institutions have made substantial investments in technology resources, assistance and learning opportunities. Although technology is considered the main feature of the 21st century, numerous educators lack enthusiasm in incorporating it into their teaching methods (Ibrahim & Ismail, 2021). Couch (2023) argues that educational technology, especially in reading classes, represents a significant trend designed to fundamentally change teaching and instructional practices. The last decade has witnessed considerable innovation and transformation in the field of language teaching and learning, especially in translation and English language learning classrooms, largely driven by the

digital age and innovation of technologies (Zhao & Lai, 2023). Accordingly, this study started with reviewing literature, utilising pertinent queries through the Scopus database, rather than other databases such as Science Direct, WoS, Springer and Sage Publications, due to the number of studies published in this database, as shown in Appendix-A. However, a growing number of publications on technologies is illustrated in Figure.1 generated by Scopus analysis.
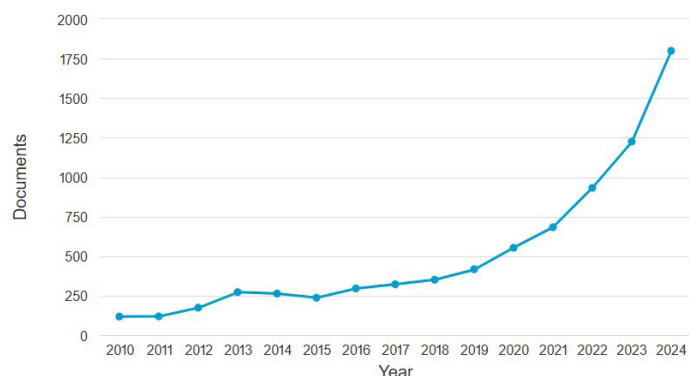

Figure.1 Published articles (2010-2024) adopted from Scopus database

Moreover, most of those publications focused on the implications of technologies on over 43% of the publications in social sciences for developing language acquisition within multilevel educational environments, as shown in Figure.2. The study identified that none of the reviewed works in the literature focused on learners' perception of technologies, especially in a traditional learning. This fact offers the present investigation a privilege to be the first study conducted in a traditional learning model and developing nation.
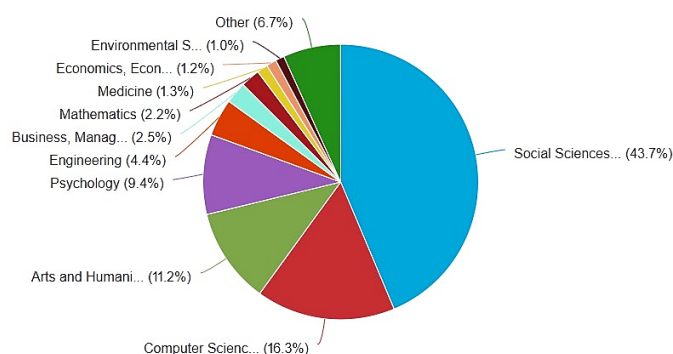

Figure.2 Publications by subject adopted from Scopus database

One of the recent studies presented by Werder and Otis (2023) asserts that technologies are transforming learners' perceptions of learning and comprehension of reading literacy development, especially in developed nations under inquiry-based and blended learning. The incorporation of technology has altered and enhanced the traditional teaching methodology, resulting in changes in classroom practices. Previously, Jiang et al. (2021) identified that use of technology in language acquisition has become prevalent owing to its adaptability, potential to provide stimulating and captivating content, and its ability to augment the active reading experience. Thus, using innovative reading technologies equips learners with the necessary knowledge for the attributed society.

Azhari et al. (2020) illustrated the active engagement of learners in the educational reading comprehension process as they construct new knowledge and understanding by building on their existing one. Electronic devices such as computers, smartphones are regarded as educational tools that play a significant role in fostering an interactive and engaging learning environment. Thus, focussing on the learners' perceptions can lead to the development of new insights in reading technologies. Several developing countries have yet to adopt or integrate reading technologies into their traditional educational settings. Al-Maashani and Mudhsh (2023) noted that "studies concerning educational technology in the Arab countries paint a generally negative picture of the provision of educational equipment and materials in schools" (p. 291). The integration of technology within traditional educational settings requires additional progress throughout the Arab region. Some affluent

Arab countries frequently utilise technology in educational settings to improve student learning outcomes; for example, the United Arab Emirates (UAE) has implemented a range of reading technologies and software in several educational institutions (Jenkinson & Alzaabi, 2021). Comparable educational institutions in the Sultanate of Oman are increasingly relying on literacy technologies to enhance the reading skills of traditional-based learners (Al-Senaidi et al., 2022).

As for the study context, the Iraqi government has highlighted the prominence of the English language. Various primary and higher education programmes demonstrate this commitment (Altae, 2020; Barzinji, 2024). However, several challenges arise in traditional higher education classrooms, particularly in translation and English language departments, as learners must proficiently develop four essential language skills, which can be demanding (Khudhur, 2020). Reading skills present a considerable challenge for second language learners, attributed to their restricted exposure to the English language (Mukhlif & Amir, 2017; Sherwani & Harchegani, 2022). Furthermore, there exists a deficiency in socialisation, an unsuitable learning environment, an absence of concepts and structures, insufficient self-confidence, a fear of errors, technological obstacles, a lack of understanding when utilising educational technology, and rigid instructional materials (Ghafar, 2024).

It is worth mentioning that a comprehensive review of the literature on the integration of technology and the development of reading skills in traditional learning classrooms indicates a substantial gap in the effectiveness of technologies from learners' perspectives in higher education settings. Thus, providing valuable insights into learners' readiness to adopt technology is crucial. This study seeks to demonstrate how such determination can leverage technological advantages to enhance the possibilities of constructive learning even more. It suggests that learners can enhance their subject knowledge in an engaging manner in technological environments while developing essential 21st century literacy skills, including communication and research. Consequently, the present investigation is driven by the following hypotheses:

H.1- Ability to use technology is significantly influenced by the usefulness of technology.
H.2-Ability to use technology is significantly influenced learners' academic behaviours.
H.3-Ability to use technology is significantly influenced learners' perception of technology.
H.4-Usefulness of technology is significantly influenced learners' academic behaviours.
H.5-Learners' academic behaviour is significantly influencing their motivations for continuous use of reading technologies.
H.6- Learners' perceptions of technology are significantly influence their motivations for continuous use of reading technologies.

3. Constructive Theory

Constructivism is a prominent theory of learning that emphasises the active role of learners in constructing their understanding and knowledge. Rooted in the work of theorists such as Jean Piaget and Lev Vygotsky, constructivism posits that learning is a process of building upon prior knowledge and experiences. This perspective challenges traditional and passive models of education, where learners are considered receptacles for information (Mvududu & Thiel-Burgess, 2012). Instead, constructivism encourages learners to explore, question, and engage in problem-solving activities that lead to deeper and more meaningful understanding through the facilitating factors offered by technologies of reading (Renninger, 2024). The theory supports the idea that learners prefer to engage in authentic, real-world tasks that promote critical thinking and collaboration rather than memorisation or rote learning.

The theory contributes to the present study in facilitating understanding influences of learners' previous knowledge and experience of using technologies in developing reading skills. Furthermore, how technology influences access and dissemination of information necessitates educators to modify their traditional teaching strategies to promote critical thinking and literacy skills pertinent to contemporary society. Moreover, the integration of technology to enhance reading literacy promotes student-centred or student-directed learning, representing a significant advantage. De Souza et al. (2021) identify that active engagement in learning fosters the development of essential skills, such as critical thinking, problem-solving, collaboration, and effective communication, which are integrated with the improvement of literacies through using technology in classes.

Research on learner preferences in the context of constructivism proposes that learners are more

motivated and engaged when they are given the autonomy to shape their learning (Kharroubi & ElMediouni, 2024). In constructivist classrooms, learners are often involved in reading activities that allow them to make choices about their learning. This type of learning aligns with learners' preferences for autonomy and relevance in their education, as it connects academic content to their personal interests and experiences. As learners become more involved in the reading comprehension process, they are able to internalise knowledge more effectively, which leads to greater academic success and satisfaction. Studies have shown that when learners are encouraged to take ownership of their learning, they are more likely to engage deeply and persist through challenges (Ramzan et al., 2023; Teng & Mizumoto, 2024). Lastly, the collaborative nature of constructivism promotes expressing learners' preferences for the adopted technologies to engage in shared reading experiences with others (Mohammed & Kınyo, 2020). Figure.3 displays the conceptual model deliberated by the present study to understand learners' perceptions of reading technologies.
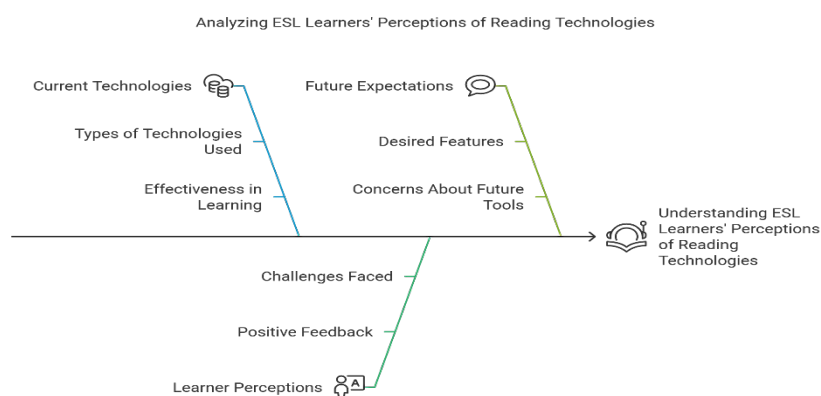

Figure.3 Proposed Conceptual Model

4. Method

The design of the research method functions as a framework that establishes primary understanding of the research rationale and practical steps of data collection and analysis procedures. However, the research paradigm, methodological choice and design are guided by the ontological strategy to generate answers to the proposed research questions Saunders et al. (2009). Thus, a survey questionnaire is utilised for collecting data for the present study. This methodological choice is based on the constructive nature of the current investigation (i.e. large sample data, anonymity, and standardised data) to identify learners' preferences and perceptions on reading technologies. The questionnaire consists of thirty-four questions adapted from the Technology Acceptance Model (TAM) proposed by Quadir and Zhou (2021) using a five-point Likert scale, ranging from 1 = Strongly Agree to 5= Strongly Disagree. Appendix-B displays the full constructs of the questionnaire.

Consequently, the sample of respondents comprised (4000) undergraduate learners from translation and English language departments in 24 Iraqi universities. Respondents were informed that their responses would be gathered and maintained in confidentiality. Data collection took place between 1st October until 15 December 2024 via an online link shared with respondents. The study employed a purposive sampling technique in selecting 351 responses from the broader population based on the benchmarking set by Krejcie and Morgan (1970) and Cohen et al. (2017) as detailed in Appendix-C. The use of this technique aims to attain a confidence level of 95% and a margin of error of 5%. Data analysis plays a significant role in ensuring a thorough examination of the current phenomenon (Tessmer & Harris, 2014). The correlations between constructs t validate the model and hypotheses were carried out using Smart-PLS 0.4 software, while comprehensive quantitative descriptive analysis of the mean score and standard deviation for the collected data was carried out using SPSS.25. The responses are represented in the cut-off points, as delineated in the scales established by Giancarlo (2001), Lair (2005), Pihie (2011) and Bagheri and Pihie (2014). The final phase included data presentation, linking each data source to the conclusion. Figure.4 illustrates the research methodological design sequence.
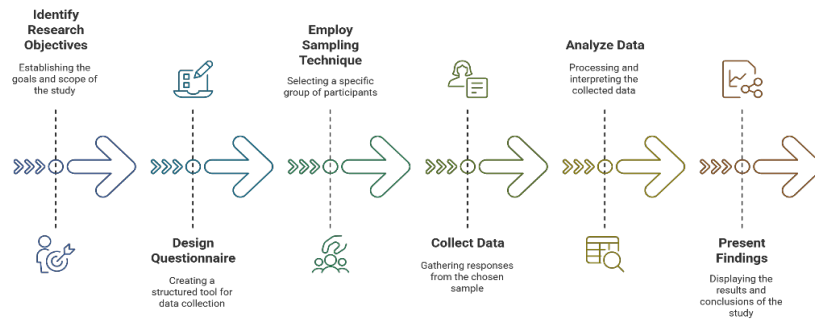
Figure.4 Sequence of Research Methodology

5. Results

This study presents its findings in two phases: Initially, data analysis was conducted utilising Smart PLS.4 for both measurement and structural models. Secondly, a descriptive analysis of the data is conducted utilising SPSS.25. Table.1 presents the demographic data of the respondents. The age group of 20-25 covered the largest number of respondents, with a frequency of 204, representing 58% of the total respondents' number. While the lowest age category was respondents aged 26-30 years, as evidenced by a representation of 42%. The table indicates a greater number of male respondents compared to female. This is substantiated by the respective percentages of 66% and 34%. In terms of the technologies' comprehension and usage, 76% of the respondents designated the use of smart phones, 67% used laptops, 64% used interactive whiteboard. Around 64% of the respondents used reading technologies in their education for the last two years, in comparison to 5% who used them for more than 3 years.

Table.1 Demographic Data Analysis

Demo. Variable	Categories	Frequencies	Percentage
Age	20-25	204	58.0
	26-30	147	42.0
Gender	Male	231	66.0
	Female	120	34.0
Technology	Computer	235	67.0
	Smart phone	224	76.0
	Inter. Whiteboard	125	64.0
	Digital learning Platform	143	24.0
Technology Usage	2 Years	218	64.0
	3 Years	112	31.0
	More than 3 Years	18	5.0
Papulation Size	4000	**Sample Size**	351

5.1 Measurement Model Analysis

A two-stage analysis technique was employed using smart PLS-SEM, as proposed by Hair and Joe (2020) and Sarstedt et al. (2021), whereas internal consistency was attained through measurement model analysis. Figure.5 determines that the complete indicators are athwart the variables of the survey R-square rates, correlations and outer loadings. The model showed loading wide-ranging from 0.701 to 0.931, exceeding the necessary threshold loading of 0.700 (Hair & Joe, 2020).
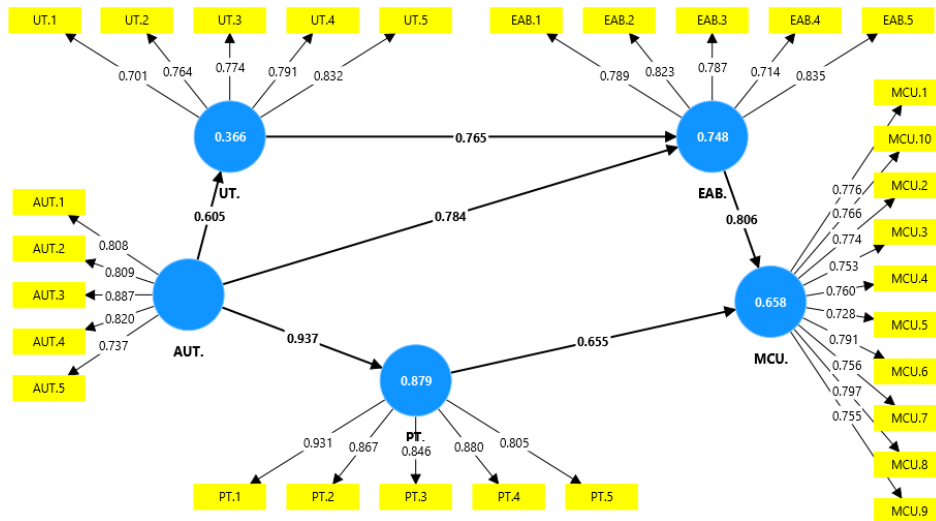
Figure.5 PLS-Algorithm for Confirmatory Factor

Regarding the assessment of reliability through Cronbach's Alpha, composite reliability and average variance exceeded the lowest threshold. Hair and Joe (2020) indicate that an acceptable value of Cronbach's alpha is over 0.7 and AVE over 0.500, whereas the results indicate that all variables in this study successfully met the AVE criterion. Hence, the results confirmed that the model can positively confirm construct reliability and validity as shown in Table.2.

Table.2 Measurement Model Analysis Results

Variable	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AUT.	0.873	0.889	0.907	0.662
EAB.	0.850	0.860	0.893	0.625
MCU.	0.922	0.924	0.934	0.586
PT.	0.917	0.922	0.938	0.752
UT.	0.832	0.842	0.882	0.599

Examining the unique features of each variable in the suggested model is crucial for precisely determining their roles in enhancing the model's validity and explanatory capacity (Shmueli et al., 2016). Heterotrait-monotrait ratio (HTMT) value proposed by Sarstedt et al. (2016) serves as a dependable metric for this criterion in the model that should not exceed 0.900. Table.3 displays the attainment of discriminant validity between any two variables, ranging from 0.669 to 0.886. Consequently, discriminant validity has been established.

Table.3 Discriminate Validity (HTMT)

Variable	AUT.	EAB.	MCU.	PT.	UT.
AUT.	0				
EAB.	0.885	0			
MCU.	0.759	0.874	0		
PT.	0.761	0.808	0.705	0	
UT.	0.669	0.886	0.674	0.754	0

Collinearity is crucial for errors' reduction within estimated paths' significance (Kyriazos & Poga, 2023). They recommended assessing variance inflation factor (VIF) to identify collinearity or multicollinearity in a model. Thus, VIF values should not exceed 3.300 for any interaction between dependent and independent variables. The present analysis values for VIF are shown in Table.4.

Table.4 Inner Model- Variance Inflation Factor (VIF)

Variables	VIF
AUT. -> EAB.	1.577
AUT. -> PT.	1.000
AUT. -> UT.	1.000
EAB. -> MCU.	2.178
PT. -> MCU.	2.178
UT. -> EAB.	1.577

5.2 Structural Model Analysis

The assessment of predicted paths within the model requires the utilisation of 5000 bootstrap PLS-SEM. Table.5 displays proposed hypotheses for path significances influencing learners' motivation for the continuous use and appreciation of reading technologies. The significant values obtained are SM = 0.939 and p = 0.000 for most of the constructs. Validity is supported by the unidirectional nature of confidence interval values associated with the projecting paths. However, the correlation between preferences for technologies and motivation for continuous use reported less significant values (SM = 0.145 and p = 0.298).

Table.5 Path's Significance Results

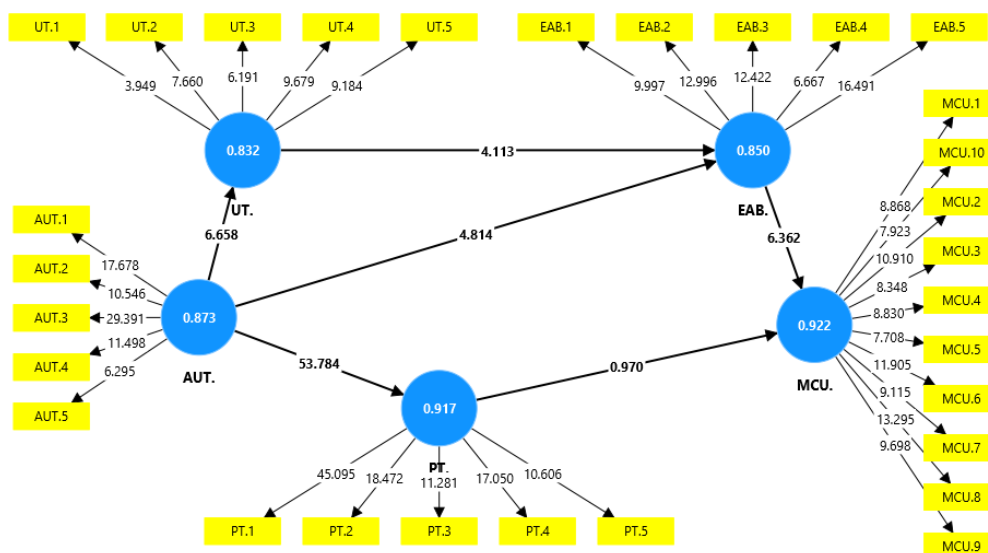| Hypotheses	Variables	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T statistics (|O/STDEV|)	P-Values
H.1	AUT. -> UT.	0.605	0.632	0.091	6.657	0.000
H.2	AUT. -> EAB.	0.507	0.494	0.102	4.977	0.000
H.3	AUT. -> PT.	0.937	0.939	0.017	53.780	0.000
H.4	UT. -> EAB.	0.458	0.472	0.107	4.275	0.000
H.5	EAB. -> MCU.	0.707	0.713	0.110	6.402	0.000
H.6	PT. -> MCU.	0.135	0.145	0.130	1.040	0.298

Figure.6 Bootstrap Image Results

Figure.6 illustrates the items' outer weights across the models' constructs adequately, thereby providing supplementary model validation. The determination coefficient (R^2) was used to assess the total variance of the model. Table.6 illustrates the model's explanatory power. The structural model accounted for 87.3% of total variance, as an indication to continue using the primary dependent variable. The tested model in this study accounted for over 87% of the variance in learners' motivation to continuously use reading technologies for English language learning. This rate of motivation is extensive, as stated by Hair et al. (2017), despite around

8% of the variance in learners' motivation not being motivated for continuous use due to some preferences of technologies' adoption.

Table.6 Determination Coefficient (R²)

Variables	R-square	R-square adjusted
EAB.	0.748	0.732
MCU.	0.658	0.636
PT.	0.879	0.875
UT.	0.366	0.346

Lastly, importance performance analysis (IPMA) was performed to examine the relevance of the direct antecedents of technology usage and motivate continuous use of technologies to compare their importance. It had been designated that perception of technologies, effects on academic behaviour and ability to use technology are considered as the primary antecedent required motivations for continuous use of reading technologies. Figure.7 presents the map that validates the results of IPMA.
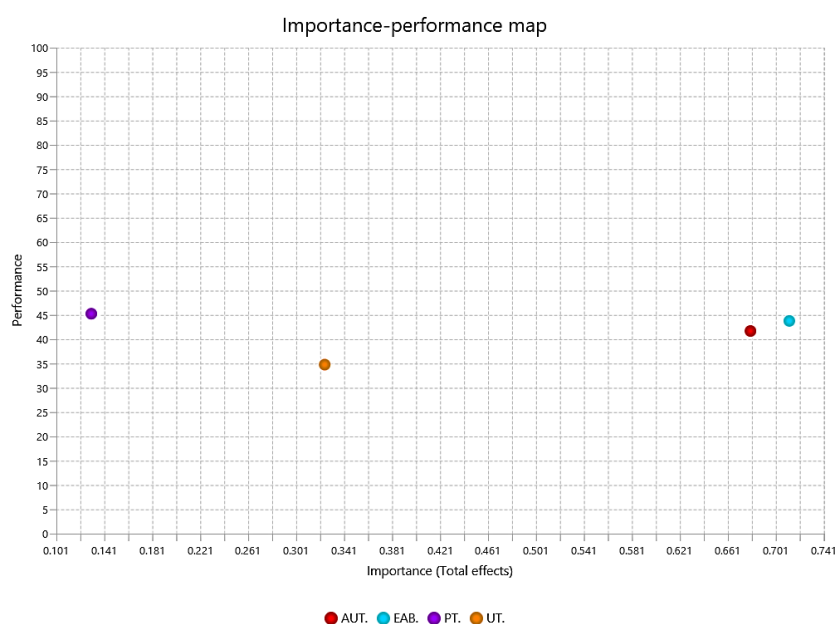

Figure.7 Importance Performance Map

5.3 Descriptive Analysis

The respondents showed significant indications regarding the preferences of technologies used to develop their reading skills. Figure.8 displays higher preferences for digital reading technologies of smartphones, computers, interactive whiteboards and digital learning platforms, respectively.
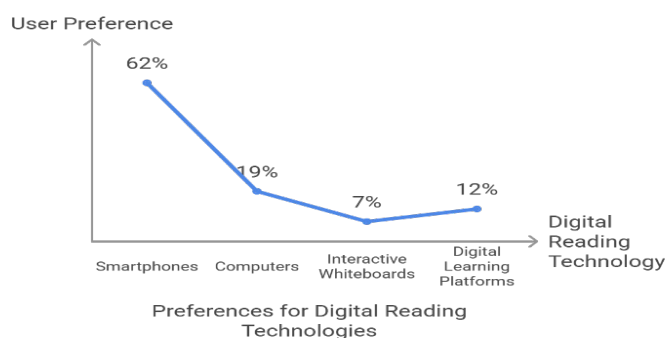

Figure.8 Preferences for Technologies in Reading Classrooms

In line with the previous results, 69% of the respondents expressed satisfaction with utilising technologies that enhance their performance in reading classes. This shows that technology had a big effect on their reading

literacy improvement (M=3.87, SD=1.14). While 65% of the respondents concurred, that technology facilitates their ability to engage and comprehend texts (M=3.61, SD=1.11). Additionally, 42% demonstrated a favourable disposition towards the incorporation of diverse technologies in reading classrooms (M=3.72, SD=1.15). As well, 77% of the respondents indicated that technology influenced their willingness to engage with communities (M=3.42, SD=1.10). Figure.9 displays respondents' perceptions of technology efficiency.
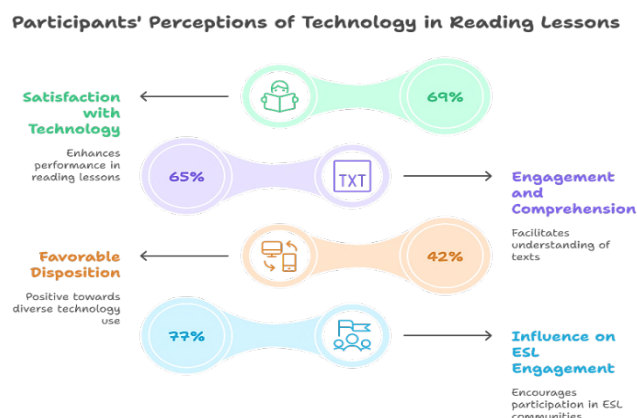

Figure.9 Respondents' Perception of Reading Technologies

Table.7 indicates that respondents demonstrated a notable proficiency in utilising technologies for reading comprehension and language acquisition (M=4.34, SD=1.12). The results indicated 75% of respondents were able to utilise technology for information analysis during reading tasks (M=4.24, SD= 1.21). Similarly, 71% of the respondents reported proficiency in utilising technologies inside and outside classrooms (M=4.10, SD=0.97). While 69% of the respondents are able to establish preferences for certain technologies that align with their needs for language acquisition tasks (M=3.84, SD=0.97).

Table.7 Ability to Use Technology

No.	Mean	Std. Deviation	Std. Error Mean
351	4.342	1.121	.108

* **Mean**=1-2.13 **Low** ability, 2.14-3.27 **Moderate** ability, 3.28-5.0 **High** ability.

Table.8 illustrates impacts of reading technology for learners in facilitating comprehension and language acquisition tasks. On the other hand, 72% of respondents indicated a tendency to use technologies for expediting the understanding of materials during reading tasks (M = 4.22 and SD = 0.90), reflecting increased cognitive processing throughout the reading process for the underlined thoughts and structure in the written texts. These findings pertain to the prior responses, indicating that an additional 74% demonstrate favourable effects of specific technologies, like smartphones, on language acquisition (M=4.24, SD=0.91).

Table.8 Usefulness of Technology

No.	Mean	Std. Deviation	Std. Error Mean
351	3.945	.458	.144

* **Mean**=1-2.13 **Low** ability, 2.14-3.27 **Moderate** ability, 3.28-5.0 **High** ability.

Table.9 displays the effects of technology implementation in classrooms on respondents' academic behaviour. The analysis indicated that 86% of respondents plan to use technologies in their future reading lessons (M=4.43, SD=0.89), along with 92% of respondents' confidence in utilising technology. Accordingly, the addressed conclusions contribute to visualising a clear image of the future of implementing technologies in educational contexts for developing reading literacy in translation and English language classes.

Table.9 Effects on Academic Behaviour

No.	Mean	Std. Deviation	Std. Error Mean
86	3.420	.378	.119

* **Mean=1-2.13 Low** effects, **2.14-3.27 Moderate** effects, **3.28-5.0 High** effects.

6. Discussion

Technologies in the educational field had shown noteworthy growth in learners' academic literacies, likely in traditional English reading classrooms. Whereas technological devices such as computers, smartphones, interactive whiteboard and digital learning platforms, which are expected to offer potential support to meet the requests of the learners. The findings of the present investigation indicate that learners, especially in translation and English language classes, get benefits from technologies in developing their reading fluency, vocabularies and texts' comprehension, particularly when technology is employed to extend lessons beyond classroom settings. Consequently, data analysis contributes to answering the present research questions and authenticating the proposed hypotheses. According to the data reported in the measurement model, the outer loadings were over the standard value of 0.7, which validates the usability of the research instrument. Also, all reported statistical indicators in the PLS-model showed the significances of the constructs as reported in R-square, Cronbach's alpha and AVE values.

Furthermore, the model's path coefficients and Importance Performance Map Analysis (IPMA) significantly validated the correlation between the proposed variables. These results contribute to authenticate the findings of the present study. The findings demonstrated a significant correlation between learners' ability to use technology, their perceptions of its usefulness, and its effects on their academic behaviour, respectively. These findings validated 1, 2, 3 hypotheses with significant values of mean scores, standard deviation and P-values, as shown in section five. Accordingly, the respondents showed positive awareness for using technologies that develop their competences and promote deep engagement in educational contexts. This finding contributes to fostering their literacy skills on further usefulness of technologies in reading activities. In addition, the respondents showed the ability to use different reading technologies that fit necessities in reading classrooms. These findings, in line with the conclusions drawn in Couch (2023), indicate that using various technological tools in classrooms can ensure a promising future for the generations to succeed in a creative and collaborative learning environment among varied technologies.

Likewise, the findings contribute to Awajan (2023), who reported that the positive influences of implementing multimedia technologies in classrooms motivate students to be positively engaged in educational practice and accomplish the target tasks; thereby, using technologies significantly influences learners' academic behaviours. These findings also are consistent with Awidi and Paynter (2024), who demonstrated that integration of digital technology enhances active student engagement in classroom activities and promotes collaboration among peers. The descriptive data analysis validated these effects, resulting in high preferences for various technologies in reading classrooms. These findings line up with the suppositions of Jameer and Narra (2024) and Khalaf et al. (2024), who identified the positive impacts of technologies in improving linguistic skills, understanding and motivation among language learners.

Moreover, the findings demonstrated that respondents effectively utilised specific technologies in reading classrooms more than others, which improved their ability to immediately identify essential information during reading practice. These findings contribute to validating the fourth hypothesis of the present investigation. In addition, it supports the findings of Michaelsen et al. (2023), indicating that incorporation of technology in team-based learning has resulted in an interactive learning practice characterised by enhanced engagement with technology. These findings were verified by the respondents' responses, that the integration of technology in reading classrooms enhances their comprehension during reading tasks. In contrast, the findings were not aligned with the findings of Altameemi and Al-Slehat (2021), which suggested that learners' proficiency in educational technologies is not influenced by their academic qualifications or field of study.

Respondents' feedback on the usefulness of technologies showed positive outcomes in improving learners' comprehension and linguistic abilities, leading to enhanced reading skills, better academic performance, and more convenient reading experiences. These findings aligned with previous findings proposed by Hasin

and Nasir (2021) about improving learners' academic performance. The findings are further supported by the previous studies that found advanced implications of technologies on learners' comprehension and reading skills presented by (Al-Obaydi et al., 2024; Bin Abdul Samat, 2020). Even though learners' perceptions for continuous use of reading technologies showed two distinct perspectives. First, the previous findings showed significant influences of reading technologies on learners' academic behaviour. The respondents thus demonstrated a propensity for constant technology use both within and outside of reading classrooms.

The findings regarding learners' perceptions of the future of reading technologies, such as implementation, use, and behavioural intents, had significantly influenced their willingness to continue using them, which validated the fifth hypothesis proposed by the present study. These findings confirm the conclusions reported by Abdul Razak et al. (2020), who found that the implementation of technology contributes to building a "conducive environment for effective teaching and learning" (p. 79). Similarly, Ali et al. (2024) identified that learners positively perceived the implementation of technologies through intensive and extensive use of reading technologies. On the other hand, the sixth hypothesis was not validated regarding learners' preferences influencing their continued use of reading technologies based on their abilities to use them. However, the findings of the present investigation showed varied perceptions of using reading technologies as validated in hypotheses 1, 2, and 3. These perceptions significantly influenced learners' motivations based on their abilities to use specific technologies. These findings are consistent with Rico-Juan et al (2024), on the usefulness of technologies "connection between autonomy, technological proficiency, and academic performance" (p. 1). Thus, a learner's future use of reading technologies is highly connected to the usefulness of these technologies in fostering the learner's academic behaviour, including, comprehension of texts, reading skills and outcomes.

7. Conclusion

Technologies are considered essential tools for enhancing learners' linguistic literacies through facilitating personalised learning experiences and enabling learners to progress at their pace while providing immediate feedback and targeted practice. Numerous studies in the previous literature discussed the implications of technologies in developing learners' academic literacies, including reading literacy. But only a small number of studies discussed these issues from the beneficiary's side, especially in developing nations, second language, and Arab contexts. The present study invested in examining learners' perceptions of reading technologies, particularly in undergraduate reading classrooms in the context of Iraqi higher education. The study identifies a higher tendency of learners to use some technologies in reading classes more than others due to the ability to use them, usefulness, fast access and easy of using those technologies, as shown in Figure.8.

Additionally, the study identified significant influences of learners' perceptions on using reading technologies. It mapped the correlations between learners' perceptions, easy of use and the usefulness of technologies in reading classes. The effects of technologies on students' academic behaviour and intentions showed that they were more interested in how useful technologies were than in how to use them to improve reading and comprehension in the classroom. Moreover, the present offers an alternative approach for assessing the efficiency of technologies in enhancing learners' academic literacies. Thus, it represents a dual-route model that incorporates learners' perspectives on active engagement in reading practices, as supported by interactive reading and transactional reading theories. Lastly, the findings displayed a high tendency among the respondents to use technologies in performing varied educational tasks, especially for second language acquisition.

8. Implications and Future Studies

The correlations proposed in the research's conceptual framework had been validated in terms of significance and trustworthiness. Thus, the research's implications are classified into two parts, the first related to the constructive theory. The tested model confirmed the ability of constructive theory to understand and describe the influences of learners' perceptions on the usefulness of technologies in reading classrooms. Also, the main constructs of the ability to use technology, usefulness, and learners' academic behaviour offered more in-depth understanding of the influences of learners' previous knowledge and experience, proposed in constructivism, on using technologies in developing reading literacies. Furthermore, how technology influences access and dissemination of information necessitates educators to modify their traditional teaching conceptions to promote critical thinking and literacy skills pertinent to contemporary educational practice. Thus, designing a multi-

dimensional model based on learners' perceptions contributes to developing academic content to fit learners' personal interests based on the collaborative nature of constructivism.

Second, the present findings can assist educators and policymakers in understanding learners' insolences regarding the implementation of some technologies in classes, thereby enhancing interactive learning experiences. It is advantageous for educators to select appropriate technological tools that con enhance the language learning experience and learners' comprehension, especially in language reading classrooms. This, in turn, fosters the usefulness of reading technologies in the classes by motivating learners for continuous use of those technologies in future tasks. Lastly, the present study offers policymakers detailed understanding of the facilitating factors that control technology acceptance in the educational contexts, including learners' specific needs. Addressing these issues can help policymakers to develop technologies that improve literacy and educational equity for learners. However, the stated implications of the present study, further investigations are required involving a larger number of learners, diverse research contexts, alternative methodologies, and longitudinal studies to achieve a comprehensive understanding and uncover additional findings regarding this phenomenon.

Availability of Data and Material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Acronyms Map

Demographic Questions = **DQ**
Perception of Technology = **PT**
Ability to Use Technology = **AUT**
Usefulness of Technology = **UT**
Effects on Academic Behaviour = **EAB**
Motivations for Continuous Use = **MCU**

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