The Role of Artificial Intelligence in Enhancing English Language Teaching and Learning in Higher Education Institutions in Oman: A Conceptual Paper

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ABSTRACT

The aim of this paper was to develop a conceptual framework that has the potential to assist researchers and policymakers in building holistic picture of factors influencing successful integration of AI into ELT in HEIs in Oman. In developing this framework, the study identified four constructs or variables influencing AI integration in the Omani context, namely Instructor Readiness (IR), Student Engagement and Autonomy (SEA), AI-Enhanced Pedagogical Integration (AEPI), Socio-Cultural and Institutional Context (SCIC). Three of these variables (IR, SEA, AEPI) are theory-driven, relying on TAM, constructivist learning theory, and pedagogical technology integration models respectively, while SCIC is context-driven and identified through literature review as representative of Oman's unique socio-cultural and institutional context that may influence integration of AI. Through this multi-directional engagement the proposed framework has the potential to inform policy and practice in the field of integrating AI into ELT in HEIs.

KEYWORDS

Artificial Intelligence, English Language, Teaching, Learning, Higher Education, Conceptual

1. INTRODUCTION: CONTEXTUAL GROUNDING & PROBLEM EXPLORATION

Artificial intelligence (AI) can be defined as a computer system or machine that is able to accurately and independently perform tasks that typically require human intelligence such as reasoning, learning, and problem-solving [1]. Therefore, AI systems involve aspects of many other fields including computer science, linguistics, and psychology. Artificial intelligence used within education specifically can be referred to as multiple technologies [2]. These technologies can include intelligent tutoring systems, natural language processing, and learning systems that can mimic or think like humans [2]. ELT-related AI can include technologies, methods, and tools that help learners utilize the English language. Examples may include speech recognition, automated feedback, and natural language processing used to help students learn to speak, write, or comprehend using the English language [3], [4]. Other forms of AI used within ELT may be able to simulate human conversation and learning by providing a more personal learning experience for students [5]. Therefore, artificial intelligence used within ELT can be thought to operate like a virtual assistant/teacher.

Artificial intelligence for English Language Teaching in Oman's higher education context can be defined as a computer system or computerized program that is able to think simulate aspects of human cognitive tasks in order to teach or assist students in learning English. As mentioned before, this may include many different types of AI systems and technology. In the context of higher education in Oman, AI for ELT may focus on technologies like generative chatbots, natural language processing, and automated assessment and feedback tools [6], [7]. Additionally, AI could be used in digital textbooks, online courses, and other language learning applications to help students with course material. The EFL context may also impact how AI is defined in terms of ELT for students in Oman. Lastly, since we want our students to use English to think critically about how they can use the English language to help progress Oman in a way that aligns with our culture and traditions, AI for ELT may help students utilize the English language in a way that furthers the goals and ideals of education in Oman.

In Oman's higher education context, the implementation and use of AI in ELT may still be in the early stages, with ongoing exploration and experimentation with AI technologies and their potential applications in English language teaching and learning. Although AI tools such as ChatGPT have been reported to be known by Omani university students and teachers [8], their usage has not been found to be at a level that contributes to the pedagogical and educational goals and national values.

AI use in English language teaching in Oman's higher education system may be investigated with respect to stakeholders' attitudes, perceptions, and beliefs. From the teacher perspective, a study by Kohnke and Ulla [9] sought to elicit EFL teacher attitudes and beliefs about AI use for the teaching and learning of English and found EFL teachers to be generally interested in AI. Teachers generally have positive attitudes toward AI, with over 70% in a survey reporting their belief that AI can have positive implications for the language classroom [10]. One study showed that students thought that AI might replace the

teacher's role [2], but there is no general agreement on this view, as research has found teachers to potentially be more supportive of shifting from a traditional instructional role to one of learning facilitators when teaching is supported by AI [2]. In another study, students reported AI as "assistive and friendly" and reported they were interested in using AI as a tool to support their practice [11]. However, in this same study, ethical concerns, specifically cheating and plagiarism, were raised by the participants [11]. A third study of university students' attitudes to AI from Central Asia, a region similar to Oman in many ways, found that most students did not know how to use AI tools responsibly and ethically and raised additional concerns about cheating and academic integrity [12]. Therefore, students appear to both accept and show interest in AI but also express ethical concerns [11], [13], [12]. Administrative stakeholders may be interested in issues related to the need for training for instructors, possible IT support, and policies related to the integrity of student work and examinations. In their review of research, Polakova and Klimova [14] identify the need for computer infrastructure and support as well as institutional policies for the successful implementation of AI.

As with secondary sources, primary sources highlight risks and concerns related to the ethical use of AI, protection of privacy and security, and cultural and religious sensitivity [15]. The grey literature source of data also mention more practical challenges, such as the need for teacher training and preparation and a lack of technical infrastructure. Emerging themes based on triangulation of the sources above include: (1) Readiness and training; (2) Mixed or ambivalent attitudes; and (3) Infrastructure and governance.

2. RESEARCH GAP

Despite growing global interest and research in the field of AI for language learning, Oman's specific context remains under-explored. While a significant body of empirical work on AI in ELT has emerged in recent years, most studies to date have been published in East Asia, Europe, and North America with very few in the Middle East [2], [16]. In Oman, there is very limited localized research on Oman-based instructors' and students' perceptions or experiences using AI tools in ELT, while global literature still lacks a comprehensive, usable framework to guide and inform AI implementation in ELT. As observed by Sharadgah and Sa'di [2], current research has not yet matured past fragmented discussions with no clear sense of best practice or next steps, and many issues remain open such as, the treatment of non-verbal communication and a clear definition of what educational AI is. This lack of a clear, universally accepted framework for effective AI integration in ELT highlights a critical gap for context-specific conceptual understanding.

3. PROBLEM STATEMENT

In Omani higher education institutions, to date, no clear and elaborated framework or theory of how to effectively and sustainably use AI to support ELT has been developed or adopted. As a result, a great deal of potential of the use of increasingly available AI tools for language teaching and learning has not yet been fully seized or realized, even as most teachers and students are using them in an ad-hoc and unsystematic way, not sure what they could or should be doing with them [8], [7]. Without a well-developed, overarching model or a specific conceptual framework that brings different aspects under a unified perspective and proposes how these different aspects fit together and should be implemented, instructors and students are likely to underutilize technology and resources that can benefit their teaching and learning or to use them in an unhelpful, uninformed, or unproductive way. Moreover, the lack of a model or a framework also means that different stakeholders (policymakers, ELT instructors, students, IT developers, tool vendors, etc.) may not be able to fully grasp the impact of, and how the different factors at play (teacher readiness, student engagement and autonomy, tool efficacy, fit with pedagogy and curriculum, etc.) may interrelate to support or impede effective and desirable ELT through AI [9].

4. PURPOSE OF THE STUDY

The present study has the following purpose: to develop a conceptual framework, which unites and integrates three theoretically existing and developed variables (Instructor Readiness, Student Engagement and Autonomy, and AI-Enhanced Pedagogical Integration) with one emergent and context-specific variable (Socio-Cultural and Institutional Context) as a framework and guidance for the effective integration of artificial intelligence in English language teaching in higher education institutions in Oman. The overarching theoretical framework or framework for conceptualization is thus meant to lead the adoption and further development of AI for ELT to be well-aligned and consistent with the national vision and related strategies and initiatives for education, on the one hand, and national culture and values, on the other [17].

5. RESEARCH QUESTIONS

How do Instructor Readiness, Student Engagement and Autonomy, AI-Enhanced Pedagogical Integration, and the Socio-Cultural and Institutional Context interrelate to support the effective integration of AI in English Language Teaching in higher education institutions in Oman?

6. METHODOLOGY

The present paper leverages a descriptive-deductive methodology (DDM) to explore the integration of Artificial Intelligence (AI) in English Language Teaching (ELT) within higher education institutions (HEIs) in Oman. This methodology allows the development of a theory-based and contextually informed conceptual model [2], [3] by utilizing extant literature, conceptual frameworks, and empirical findings on AI and its intersection with language instruction.

The first phase of this DDM comprised an integrative literature review of studies on educational technology, second language acquisition, AI in pedagogical settings, and higher education policy. Consequently, three a priori variables were identified from extant literature and theory based on evidence and recurring themes: Instructor Readiness (IR), with a theoretical basis in the Technology Acceptance Model, supported by studies on this topic [8], [6]; Student Engagement and Autonomy (SEA), with an a priori theoretical basis in the constructivist theory of learning, supported by recent empirical studies [10], [13]; and AI-Enhanced Pedagogical Integration (AEPI) based on empirical research on AI in language learning or more widely in education [5], [4]. Next, during the analysis of national policy frameworks (e.g., Oman Vision 2040), institutional and strategic reports, as well as qualitative studies, on AI and technology adoption, a fourth variable was extracted based on emerging themes: the Socio-Cultural and Institutional Context (SCIC). This a posteriori theoretical construct represents the contextually specific factors or variables that may impact AI adoption, and was further identified in related literature [18], [15], [12]. These include teachers' and students' views and perceptions of AI and teaching in general, cultural trust or distrust in AI, teacher-student relationships, institutional support, professional development, and existing digital infrastructure.

Furthermore, to increase the contextual relevance and validity, the findings of stakeholder-based studies were extracted, such as the experiences, expectations, or issues perceived by faculty and students and, in particular, studies on AI adoption in similar contexts (regions, resource levels, etc.) such as Central Asia or the Middle East [9], [14], [11]. These studies further highlighted practical barriers and enablers such as inequities in access and resources, ethical or security concerns, readiness or skill gaps, professional development, institutional policies, and funding.

In the second phase, the deductive component of this DDM, a conceptual model was designed by identifying and aligning the relationships between variables. The model posits that instructor readiness affects AI-enabled pedagogical integration (e.g., selection, design, and use of AI technologies and strategies), which, in turn, can influence student engagement and autonomy in learning. The SCIC is understood as a moderator of these relationships, influencing the pedagogical integration of AI and, by extension, teacher readiness and student outcomes. It is suggested to moderate the effectiveness and the ethical or safe use of AI.

A set of directional propositions are based on the proposed model, as for instance, when teachers have confidence in using AI tools, and the supporting institution provides infrastructure and guidance, the use of AI in the ELT classroom is likely to lead to increased student engagement and learning gains. In a less resourceful context with a lack of clear policy or infrastructure, even teachers with high readiness might not be able to use AI [7], [19].

In sum, the DDM led to the development of a conceptual model based on theory, a posteriori evidence, and was contextualized to the Omani higher education setting, addressing an area that has remained largely unexplored despite international focus and investments. It is, however, conceptual and based on a limited body of literature on a complex and evolving subject. As such, this conceptual model and the DDM are open to further research and elaboration and can serve as a practical foundation for empirical studies and policy-making towards sustainable and value-adding AI integration in ELT.

7. LITERATURE REVIEW

AI integration in ELT is likely to depend on a number of interrelated factors or theoretical variables. We identified three from the literature and one emergent contextual variable considered critical for Omani higher education. They were chosen due to frequency in global literature and their fit for Omani EFL higher education. The three theoretical variables are instructor readiness and attitudes toward AI; student engagement and learning autonomy; and AI-enhanced pedagogical integration (strategies and practices). The one contextual variable is socio-cultural and institutional context. Each is defined and justified with the gap it aims to fill below.

7.1. Teacher Readiness and Attitudes towards AI

The readiness and attitudes of instructors or teachers are a foundational variable that affects AI integration. Readiness entails digital and AI-specific technical competence, pedagogical knowledge, and dispositions towards AI's use for ELT. Teacher perceptions and preparedness are key for the practical implementation of AI in education. The teacher is an important and active technology user and mediator in the classroom. Their ability and willingness to use AI are a big factor in success or lack thereof. For example, [6] showed that even when instructors were familiar with AI applications, their confidence, knowledge, and perceived benefits in these areas were low without proper training. A UTAUT-informed study with EFL instructors in Iran found performance expectancy and social influence were determinants of their behavioral intention to use AI in ELT. In other words, their use was linked to support and influence from their institutions and colleagues [8].

Notably, a high level of AI-specific TPACK was found to have a negative correlation with the intention to use. In other words, the more technical know-how an instructor had, the lower their intention to use AI in class [7]. This could be a paradox, where a tech-savvy instructor is more realistic about AI's limitations, more likely to be cognizant of ethical or pedagogical issues, or simply more intimidated to use it. A study in Thailand found instructors were open to the idea of AI and willing to change their role from "lecturer" to "facilitator" but that the resources did not include ethical, pedagogical, or curriculum-related advice [9].

The importance of instructor readiness in education is well-documented in the literature. However, few studies analyze it alongside other variables that make up the integration process, such as student outcomes or contextual factors. In the proposed framework, instructor readiness is a modifiable and essential point of departure for analysis, as well as a point of linkage to other institutional and learner-based variables.

7.2. Student Engagement and Learning Autonomy

This variable is concerned with student outcomes and experiences, particularly the engagement, motivation, and autonomy learners show when they are taught using AI tools or data. Learners are the ultimate beneficiaries of educational technologies and their core metrics are their level of positive engagement, sense of progress, and satisfaction. AI's main draw is that it's assumed to enhance engagement by being adaptive, real-time, and interactive. In the UAE and Saudi Arabia, the integration of ChatGPT for 12-week EFL courses was found to significantly increase students' engagement and English proficiency [3], [18]. Students reported they found the AI-augmented course usable, beneficial, and confidence-building.

Other studies similarly found increased time-on-task, better conversational skills, and peer feedback with the use of chatbots and speech feedback tools [14]. In a 12-week study, [10] found an AI-intervention (adaptive grammar and vocabulary tools, online writing feedback, etc.) significantly improved learner autonomy, precision, and fluency. He noted the capacity of AI to support self-directed learning in EFL education.

On the other hand, there are problems with overdependence, loss of critical thinking, and academic dishonesty if AI is not framed carefully or guidance is not provided [13]. An example of this was in Uzbekistan where students lacked clear ethical norms for using AI such as ChatGPT. This led them to be over-dependent, disinclined to think critically about assignments, and prone to using AI responses without attribution [11].

This variable was selected because of its centrality to the success of educational programs. There is no gap to fill with this variable in terms of its importance. However, the relationship between it and the other key variables on student experience (engagement) and application (teacher input) is not clearly articulated in most studies. Our framework helps to connect how student engagement is mediated by teacher input and institutional norms, and how it links to AI usage outcomes (intention, meaningful engagement vs. superficial dependence).

7.3. AI-Enhanced Pedagogical Integration (Strategies and Practices)

AI-based pedagogical integration is not just about methods of AI utilization but also includes the consideration of curricular alignment of AI tools. The methods and strategy of AI use–the pedagogy–are what will determine its impact on learning. Across studies, AI tools have been used to support a wide array of ELT objectives: pronunciation improvement, writing feedback, assessment, chatting and playing games. These tools have seen variable success based on quality, appropriateness, and sound pedagogical design.

Language learning can be improved or hindered by AI tools. If applied thoughtfully and with careful teacher preparation, AI can be used to empower learning. AI-generated videos using the Fliki tool were used in one study to promote increased interactivity and student satisfaction via a constructivist learning approach [5]. ChatGPT was used to supplement writing instruction, fostering both increased expression and personalized language learning [4].

How teachers use AI is of the utmost importance: well-planned integration will lead to better results than will a casual approach. Teachers should view AI tools as…tools. Meaning that their use should be governed by the larger lesson structure and learning

objectives laid out by the teacher. While this is understood in the literature, researchers have yet to come to consensus on the best way to integrate AI across language learning studies. This framework aims to fill that void by connecting pedagogical strategy and implementation to teacher skill and learner outcomes.

7.4. Socio-Cultural and Institutional Context (Emergent Variable)

One contextual variable we identified is perhaps the most important for framing AI integration in Oman. It's the socio-cultural and institutional context, encompassing the social and physical environment where education happens. This includes broad factors like societal attitudes to AI, language education policy, available institutional infrastructure and resources, and ethical or social norms. The implementation and success of AI use are context-sensitive and must align with cultural and institutional norms to succeed.

For instance, [8] found that the socio-cultural and institutional contexts in Iran are barriers to AI adoption in education. In a study in Oman, participants showed a high regard for teachers that could lead to skepticism of using AI as an alternate source of knowledge [9]. The same Thai study showed that while AI was received positively for things like grading and administrative tasks, educators maintained a strong view of the teacher as the center of instruction, with ethical and professional guidelines needed.

Institutional policy is another part of context. When universities lack AI guidelines, fail to encourage AI use, or fear it will lead to plagiarism, integration is difficult. Supportive infrastructure and attitudes, whether in the form of investments in tools and training or professional and ethical codes, enable adoption. The literature abounds with studies showing that institutional AI policy and infrastructure—availability of AI-related internet access and equipment, faculty workshops, and policy clarity—play a big role in use [15], [19]. A recent study in Uzbekistan shows that participants expect institutional AI guidelines and policies to include digital literacy training and ethics codes [12].

The socio-cultural and institutional context is a contextually emergent, or highly specific to a given setting, variable and one we see as critical to adaptation. In Oman, these include challenges like bilingual modes of instruction, religious sensitivity, and unequal access to digital resources. While many studies mention the context, this factor is often glossed over in favor of focusing on direct theoretical variables of integration. Our framework includes it to show the ways in which local cultural norms and institutional capacity shape, constrain, or enable integration and use of the other three variables.

8. CONCEPTUAL FRAMEWORK DEVELOPMENT

8.1. Definitions and justifications of variables

Building on the above-mentioned, this is a conceptual framework depicting the theory underlying the use of AI to support EFL pedagogy in Omani higher education. The three variables A, B, and C are the theoretical constructs and D represents the (emergent) moderating contextual variable(s). The arrows R1-R6 represent the postulated relationships.

8.1.1 Instructor Readiness and Attitudes

This factor encompasses all aspects of a teacher's intention and capacity to use AI. It is a tridimensional construct consisting of knowledge (about AI tools and their use in language learning), skills (technical and pedagogical), and attitudes (openness to innovation, perceived usefulness, and self-efficacy). Teachers high on this variable have a greater capacity to integrate AI into their teaching for purposes such as designing tasks, facilitating feedback, managing ethical concerns, etc. [6], [7].

This is a core part of the use process and since many Omani teachers are not likely to have been previously exposed to or familiar with AI for educational use, it must be there before meaningful application can be done. As demonstrated by literature, teachers are gatekeepers to AI's enabling effects and influence students' beliefs and behaviors about AI both directly through their own readiness and integration efforts and indirectly through the environment and interactions they create [8], [9]. Therefore, this is a prime target of intervention for AI adoption through training, incentives, knowledge sharing, and other strategies.

8.1.2 Student Engagement and Autonomy

This factor captures the extent to which students in AI-enhanced classrooms engage in learning activities and take responsibility for the learning process. The primary manifestations are the non-obligatory use of AI tools, effort, and strategic self-directed behaviors. Theoretically, AI can increase motivation through personalization, gamification, and interactive features [3], [10].

In Oman where students are often used to a more teacher-centered education culture and learning deep cultural and social structures, AI may be a way to enable greater learner agency and engagement. Engagement is a crucial mediating variable between availability of AI tools and educational outcomes. The ultimate consumers of AI must be convinced of the benefits of the tools in order to use them fully [13], [18]. For example, engaged students using AI chatbots will ask questions, practice, and interact with AI in a way that will further their learning, while unengaged students will let AI do the work for them.

8.1.3 AI-Enhanced Pedagogical Integration

This construct conceptualizes how AI is incorporated into instructional practice. By AI pedagogical integration we mean how well it is connected to learning goals, classroom routines and environment, and teacher instruction. If leveraged intentionally by educators for instructional goals such as formative assessment, feedback, differentiated homework, writing practice, etc. AI can enhance student learning experiences and outcomes [2], [4].

The rationale for including this construct in the model is that the value of AI from an educational standpoint depends not only on access but also on the type of use. AI as it is commonly known, does not improve learning by itself – it must be harnessed to enhance and support the process [5]. Thus, this variable is the channel through which teacher readiness will determine student outcomes, and it is the necessary piece which connects a tool and what it can do to its application in practice [20].

8.1.4. Socio-Cultural and Institutional Context

Context represents a set of emergent extraneous (environmental) variables such as norms and attitudes, infrastructure, ethics, leadership, policies, and so on. It can be seen as moderating the relationships between the other factors above. Thus, each effect or influence noted in R1-R6 is true to a different degree under different circumstances, the variance explained by this added factor or set of factors [15], [19].

In the specific case of Oman, there are many elements of culture, policy, and digital ecology that will affect how AI use is adopted and executed. Language policies, social attitudes to teacher authority, institutional inequalities, ethical uncertainty, and any number of other conditions will need to be taken into account for meaningful integration. Thus, an institution's readiness in terms of administrative and operational parameters of policies, training, leadership, infrastructure, and digital access (among other things) will either amplify or dampen the effect of AI interventions [12], [14]. Context should not be thought of as a background or secondary consideration but as a key concern for any work seeking to be practically relevant.

8.2. Relationships between the Variables

- **Relationship 1: Instructor Readiness → AI Pedagogical Integration:** Teacher readiness (attitudes + capacity) is the most predictive factor for quality and quantity of pedagogical use of AI [6], [8].
- **Relationship 2: AI Pedagogical Integration → Student Engagement:** AI integration improves student experience through interactivity, immediate personalized feedback, adaptive learning paths, motivation and interest, and other factors [10], [5].
- **Relationship 3: Instructor Readiness → Student Engagement (indirect):** Teacher modeling and scaffolding, plus their affect and enthusiasm for AI will prime students to appropriate use of AI and engage more with AI learning [9], [7].
- **Relationship 4: Student Engagement → Learning Outcomes:** Students who interact with AI tools and work to improve in more self-directed ways will demonstrate gains in language proficiency [3], [13].
- **Relationship 5: Context → Instructor Readiness and AI Integration (Moderation):** Sociocultural and institutional conditions impact whether teachers will be able to act on their readiness and integrate AI [15], [18].
- **Relationship 6: Context → Student Engagement (Moderation):** Context also influences whether and how students engage with and trust AI especially where there are gaps in policy [12], [19].

8.3. Dimensions of Socio-Cultural Moderating Variable

The following are definitions of dimensions of socio-cultural moderating variable which influence the above relationships:

Institutional Support and Policy: Institutions make possible what can be done and give guidelines for teachers and students. The presence of adequate support in the form of training, resources, leadership, and rules to work by allows both groups to engage with AI in a safe and exploratory way. In their absence, adoption will often be haphazard or done with fear [14], [19]. In fact, literature has found increased integration where specific training programs and administrative support via leaders have been present [8].

Cultural Attitudes and Tech Acceptance: The beliefs and values about AI and technology in society and educational institutions will drive how they are received by teachers and students. Omanis are often torn between tradition and modernity and embrace or resist depending on their worldview. This will affect their comfort with taking risks, trying new pedagogies, and using certain tools [9], [12]. Shifting beliefs is possible through the same or other teachers demonstrating advantages and benefits.

Ethical and Regulatory Environment: AI can be misused or avoided if there are no rules or norms to follow. Such ambiguity may cause AI to be used in a way that replaces rather than augments human instruction and interaction, especially by students [11]. For instance, students are sometimes known to use AI to have entire essays written for them rather than using it as a supplementary tool. Clear ethical guidelines are needed to ensure responsible use of AI.

Infrastructure and Access: Internet connectivity, device availability, and compatibility of AI tools and interfaces with local languages are among key enablers of use. If these are not present then even the most eager teachers and students will be effectively precluded from using AI. Furthermore, such access may be inequitable across different public and private institutions, a disparity which must be recognized and considered when integrating AI [15], [18].

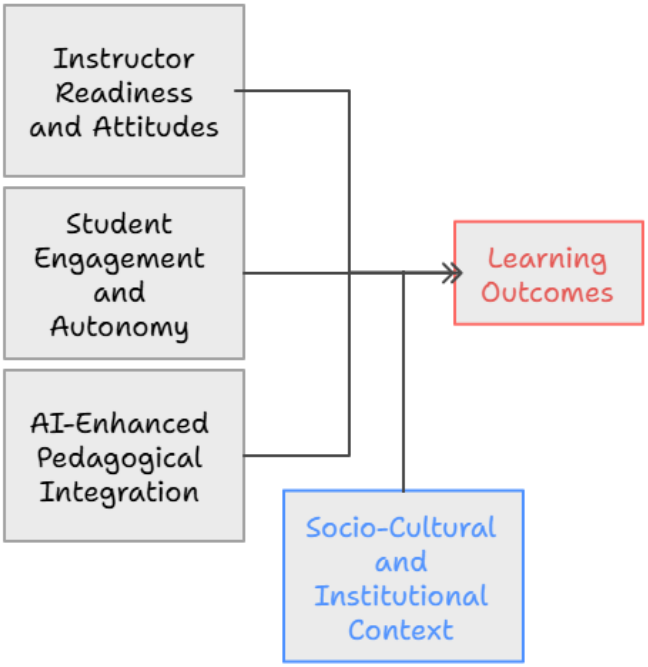

Figure 1: Conceptual Framework

9. CONCLUSION

In conclusion, this paper aimed to conceptualize a framework that would allow researchers to examine how Artificial Intelligence can be leveraged and maximized to enhance English language teaching and learning. To this end, a review of the literature and analysis of contextual factors pertaining to the Oman higher education and ELT contexts guided the development of an integrative framework that combined several constructs into one logical and complete model capable of explaining and predicting how AI may affect ELT outcomes [2], [6].

The overall logic of the framework is that AI has a positive and meaningful effect on ELT when it is used by instructors who are well-prepared and pedagogically-savvy to enhance student engagement, which leads to improved learning outcomes, language proficiency and overall learning experience [3], [10]. This positive effect, however, is conditional on and influenced by the broader socio-cultural and institutional context, which can provide the necessary support, infrastructure, policies and guidelines [18], [14]. We have defined three theoretical variables: Instructor Readiness, Student Engagement/Autonomy, and AI-Enhanced Pedagogy; and one contextual variable: Socio-Cultural/Institutional Environment. We have then explained the directional relationships between them, with clear rationales and supporting evidence (or logical reasoning) for each. For example, we have shown that instructor readiness, operationalized as familiarity and confidence with AI tools and methods, as well as positive attitudes and intentions towards their use, leads to more creative and appropriate use of AI for pedagogical purposes (e.g., AI-driven interactive activities, formative assessments, personalized learning paths), which in turn elicits and sustains student engagement and autonomy in learning (e.g., using AI for extra practice, personalized feedback, English conversations with AI chatbots), resulting in better mastery of ELT skills and content [9], [7]. We have also identified several potential moderators in the relationships, such as institutional or cultural factors (e.g., the presence or absence of clear and

supportive policies can either strengthen or weaken the success of AI integration in the classroom, while their lack can lead to misuse or resistance) [8], [19].

There are at least three ways in which our framework makes a scholarly contribution. First, our framework helps address what we see as a gap in the literature: provide learners and educators with a unified and contextual framework for conceptualizing and adopting AI for ELT, while past studies tended to focus on narrower or isolated pieces of the puzzle, were preliminary in nature or lacked an explicit lens or perspective through which AI for ELT was viewed [2], [17]. Second, our framework synthesizes two bodies of literature that haven't been much connected before – educational technology adoption models TAM/UTAUT and language teaching/learning theories – we broaden TAM and UTAUT to account for AI use for pedagogical purposes, and we align with research supporting the use of AI under the larger umbrella of active learning [21]. Third, in attending to contextual factors such as the socio-cultural and institutional setting as a separate-but-related construct, our framework also answers recent research calling for culturally-responsive and flexible EdTech. Ultimately, our framework can help inform practitioner decision-making and implementation. For instance, some practical key takeaways from our framework include: prioritize cultivating teachers' readiness and competence with AI use; encourage teachers to implement AI tools and strategies for innovative, pedagogical purposes (i.e., not just for presentations, but to help students reach their learning goals); allow students to take advantage of AI to direct their own learning where possible (i.e. using AI chatbots for supplementary practice, personalized feedback, English conversations, but also teaching students how to effectively, responsibly learn with these tools); and ensure you have some degree of infrastructure and policies in place to enable AI use for ELT [12], [15].

In the context of Omani higher education, our framework has also illuminated the fact that successful and sustainable AI integration in ELT is not only a matter of acquiring and deploying new technologies, but a more holistic process of change that involves preparing and supporting people, adapting and enriching pedagogies, and aligning and managing cultural expectations.

10. DIRECTIONS FOR FUTURE RESEARCH

While the paper is theoretical in nature, we see it as providing a foundation for empirical studies. Needless to say, the most obvious next step would be validation of some or all of the constructs and relationships outlined in the proposed framework as operationalized in the proposed research plan, within live classroom environments. This might take the form of designed experiments in which one or more colleges in Oman agreed to participate in the development and implementation of an AI-enhanced ELT curriculum (i.e., integrate technology such as AI chatbots for extra English conversations, AI systems providing adaptive language correction feedback, AI-curated articles for reading on topics related to the curriculum, etc.), while other colleges would act as control by continuing their regular lesson plans. Administering pre- and post-intervention surveys of students' ELT skills and motivation and conducting interviews to gather qualitative information about students' and teachers' experience using AI tools in ELT could provide support for (or not) the assumed benefits of AI on ELT outcomes, and support for (or not) the framework as a whole [10], [4]. Qualitative study could also add complexity and detail to the framework itself by investigating teachers' and students' experiences with AI in ELT. Depth interviews could uncover additional perspectives on readiness and engagement. Cross-cultural studies would help to explore whether the framework works in other settings. While this current study focused on Omani colleges and thus other GCC countries would be the most directly relevant, there is no reason why the framework cannot be applied to students in other regions or countries. There would hopefully be sufficient similarity in context to test the framework without redundant modifications. Should meaningful differences in results be found based on the institutional and/or cultural setting of the study, it would allow further development of the context variable and/or modifiers. Lastly, it would be interesting to longitudinally track the students who participated in the AI-ELT integration at longest duration to see if the hypothesized effects endure over time and transfer to other areas (e.g., do students retain their EL2 skills and enthusiasm for the language in future courses? Does it open them up to continue learning with technology throughout their lives?) and to continue keeping tabs on AI technology as it continues to evolve and improve (e.g., more specialized AI tools for language learners) [17].

To wrap up, First, The framework is seen both as a mirror and as a map. It is a mirror because it reflects where we are right now in our knowledge and understanding of how AI can and should be used/studied for ELT in higher education: what factors are important, how they relate to each other, what facilitates or impairs their productive orchestration, etc. However, it can also be a map that educators/policymakers can refer to when trying to make sense of the fast-paced and often confusing nature of AI in education and make smart decisions about where to begin with and what elements to prioritize. The framework indicates that in order for AI to be used successfully for teaching and learning English language, we need to not only acquire and provide suitable technologies, but also care for the people (instructors/students) and the context in which they will operate. If applied, we think that the framework offered here can help educational institutions in Oman (and beyond) steer clear of new tech solutions and, instead, translate their efforts to use AI into actual positive changes in how English language is taught and learned in higher education. Furthermore, we genuinely believe that English is a priority learning outcome in Oman, as it is indeed the language of scholarship and employsability across disciplines worldwide. As such, anything that can be done to improve English learning and teaching through the conscientious adoption of AI should be not just considered, but actively pursued. However, as we have emphasized throughout the article, and as the metaphor of the map also

illustrates, technology is not a silver bullet that can fix any pedagogical challenge we face. Instead, it should be one piece of the larger puzzle of educational change, one that is guided by pedagogical theory and contextualized within the Omani culture. We hope our framework underscores that point while also making the why and how as digestible as possible for anyone looking to explore the use of Artificial Intelligence for English language education.

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