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NOVICE/PRESERVICE ENGLISH LANGUAGE EDUCATORS' TECHNOLOGICAL PEDAGOGICAL AND CONTENT KNOWLEDGE IN MATERIALS DEVELOPMENT: A CASE STUDY

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ABSTRACT

This study examines how novice English language teachers can effectively integrate ChatGPT into English Language (ELT) material development using the TPACK framework. Through qualitative methods, including semi-structured interviews and checklist creation, the research highlights the importance of well-structured prompts in leveraging ChatGPT's capabilities. By focusing on the pedagogical, content, and technological aspects, this study explores teachers' perceptions of Chat GPT in material development. The findings emphasize the strategic design of prompts as essential for ensuring the quality and relevance of AI-generated ELT content. This research aims to illuminate the intersection of ChatGPT and teaching methodologies, underscoring the value of the TPACK framework in contemporary language education. The insights gained will contribute to understanding how AI tools can enhance teaching practices and support the development of innovative educational materials.

Keywords: ELT, TPACK, Technology based learning, AI, Prompts.

INTRODUCTION

The Generative Pre-trained Transformer language model has been particularly trained to generate text in response to inputs in natural language. ChatGPT, a variant of openAI's GPT-3 artificial intelligence language model, was launched in 2021. It is designed to generate conversational and human-like text and is applicable in various fields such as chatbots, virtual assistants, and language translation systems. This model, highlighted by Bozic in 2023, has garnered significant attention in the media and technology sectors, as noted by Brown in 2020. Built on the transformer architecture, first introduced by Vaswani in 2017, GPT-3 is renowned for its extensive applications in natural language processing. With 175 billion parameters, it is one of the largest language models available and is distinguished by its ability to perform a wide array of language tasks, like translation, summarization, question answering, and text generation, with minimal or no specific task training.

In the middle of its diverse applications, GPT-3 has shown exceptional capability in area such as language translation and content creation. Its proficiency in summarizing complex documents and executing accurate language translations is noteworthy. Moreover, its development in the realm of chat bots has enabled these digital assistants to interact and respond to user inquiries effectively, showcasing GPT-3's adeptness in understanding and processing natural language. Amidst this, its potential to produce realistic and coherent text has drawn considerable attention and sparked discussions, particularly concerning implications in language processing (Floridi, 2021). On another front, as shipway noted in 2023, GPT-3 is also being explored as a tool for automating monotonous

content creation tasks and aiding writers and content creators with idea generation and overcoming writer's block, further demonstrating its multifaceted utility.

In recent discussions, the ethical considerations around ChatGPT have mainly centered on its impact on academic writing, research papers, editing, and similar applications. However, this paper aims to redirect the spotlight to a unique skill of ChatGPT and its ability to create teaching materials for English language instruction using different prompts. The use of materials in language learning and instruction is critical in the discipline of English Language Teaching (ELT). However, until recently, this feature has not received as much attention in ELT publications and research. The term 'materials for language learning' encompasses a broad range of resources intended to support language acquisition. This includes, but is not limited to, course books, videos, graded readers, flashcards, games, websites, and mobile phone interactions. While acknowledging the diverse nature of these materials, it's important to note that much of the existing literature predominantly focuses on printed materials. These language learning materials serve various purposes, such as being informative, instructional, experiential, eliciting, and exploratory. They inform learners about the target language, guide them in practicing the language, provide experiences of the language in use, encourage active language usage, and assist learners in making discoveries about the language (Tomilson, 2012). The significance of language-learning materials is noteworthy, considering their crucial role in the language-acquisition process.

The role of education in achieving sustainable development, particularly through SDG 4, is a critical and complex one. Didham (2015) emphasized the need for a more integrated and inclusive approach to education, with a focus on quality and transformative learning. This involves aligning educational objectives with the principles of SDG 4, such as promoting lifelong learning opportunities and fostering awareness of global citizenship and sustainable development. Vargas (2000) further underscores the importance of an interdisciplinary approach, teacher training, and curricula based on the three pillars of sustainable development. Didham (2013) adds that education for sustainable development should encompass increasing access and attainment, improving educational quality, and inspiring transformative learning. These insights highlight the vital role of curriculum and text development in creating learning environments that empower students to understand and address global challenges, ultimately contributing to a more sustainable and equitable future for all.

ChatGPT has been programmed to produce responses that correlate to the given prompts. Due to its nature, it is extremely receptive to the information that prompts can offer (Vaswani, 2017). Existing literature predominantly highlights the application of AI and tools like ChatGPT in various academic contexts. However, there appears to be a notable gap in research specifically focusing on materials development through ChatGPT, especially in the context of prompt generation guided by the TPACK (Technological Pedagogical Content Knowledge) model. This gap suggests an unexplored potential in leveraging the ChatGPT for more nuanced/ pre-service educational purposes. The study assumes that novice/pre-service English language teachers with structured AI training and a high level of TPACK are more effective in using ChatGPT for ELT material development. Therefore, the study aims to investigate how the design of prompts impacts the quality of AI-generated content, aligning with ELT objectives. Considering these assumptions of the study, the following section states the problem under investigation.

The previous research in the domain of the use of technology for materials development studies challenges the use of ChatGPT for the education system for instance the study *Chat GPT – A Technological Remedy or Challenge for the Education System*, written by Sharma (2023), looks at the major effects of ChatGPT, a state-of-the-art AI chatbot, on several different sectors. Not only can this AI system produce essays and other types of content, but it can also have conversations just like a person would. I argue that teachers can make use of this technology for material development. Considering Sharma's (2023) question about its entry into the educational system, though, begs important questions: is it a good thing or could it cause disruptions? Further, the urgent question of whether ChatGPT can be used as an effective teaching and learning tool in the educational system is addressed in this research, which helps me establish my study proposition about its role in teachers' lives. Using a conceptual approach, the

study makes use of secondary data found in a thorough survey of the literature. The study's conclusions strengthen my argument that, despite Chat GPT's early stages of development; it has the potential to be an effective teaching and learning tool. Further, Sharma underscores the importance of responsible utilization of this technology, indicating that educators and students alike should acquire the essential skills and knowledge to effectively employ it within an educational setting.

Mikeladze's (2019) article, *Creating Teaching Materials with ChatGPT*, explores the impact of AI tools, particularly ChatGPT, on teaching practices and the evolution of English language course book development. The article highlights AI models like ChatGPT for their ability to augment language learning through generating responses and aiding in material creating. Mikeladze's study involved a month-long trial with adult B2 level language learners to access ChatGPT's capabilities in creating customized teaching materials. However, there remains a notable gap in research: integrating ChatGPT with specific TPACK-based prompts to develop bespoke educational content. Our research aims to venture into this unexplored area, striving to bridge these gaps. By doing so, we aim to fully leverage TPACK-based prompts for crafting context-relevant teaching materials, thereby enhancing teaching effectiveness and alignment with the requirements of both educators and learners in the dynamically evolving domain of technology-infused education.

In *exploring the usage of ChatGPT in Higher Education*, Fiania (2023) investigated how instructors are utilizing ChatGPT. The study's goal is to understand their perspectives and interviews as its methodology. The results indicate that ChatGPT serves various purposes, including aiding in idea generation and information retrieval. However, the study identifies a gap in providing clear guidelines for content creation. The research suggests that while ChatGPT can enhance productivity and learning efficiency, its effectiveness is maximized when users engage in critical thinking and verify information from trusted sources.

With the advancement of information and communication technologies, the presence of artificial intelligence (AI) in education is increasingly noticeable. This trend offers possibilities for streaming administrative duties and fostering individualized learning experiences. Opara's (2023) literature review, titled *ChatGPT for Teaching, Learning, and Research: Prospects and Challenges*, delves into the role of AI in educational settings, focusing particularly on OpenAI's ChatGPT. The study highlights ChatGPT's rapid response capabilities and its proficiency in mimicking human language. However, it also points out the issue of AI-generated content often lacking proper citations and references. One of the key suggestions from the study is to enhance reference mechanisms to uphold academic integrity in AI-supported educational environments

In a study, Almaududi (2023) examined the evolving role of technology in classrooms, particularly how it is reshaping the traditional role of the teacher as the primary source of education. The study highlights the rapid advancement of technology, as exemplified by ChatGPT, and its substantial influence on global educational standards. It conducts a qualitative analysis to assess ChatGPT's capability to supplant the teacher's role in educational settings. The methodology involves attentive listening, detailed data recording, and analytical procedures like data reduction, data visualization, and drawing conclusions. The findings underscore the importance of recognizing that while technology, such as ChatGPT, can be the effectively role. Consequently, my study focuses the importance of integrating technology thoughtfully into educational systems and equipping educators with the skills needed to manage technology-enhanced learning environments effectively.

This study employs a qualitative approach guided by an interpretive paradigm to explore the studies phenomenon. In this research, we perceive reality as being constructed through individual's interactions and perceptions. The research focuses on comprehending the experiences and viewpoint of participants through techniques such as interviews and observations. The objective is to gather in-depth, context-specific information. The researcher acknowledges their influence on the research process, which aids in gaining a deeper insight into how personal experiences are distinct and shaped by environmental factors.

For the above stated research problem, this study sets the following questions:

How do the novice/pre-service English language teachers demonstrate Technological, Pedagogical, and Content

Knowledge in structuring ChatGPT prompts for materials development?

What types of educational materials and for what specific purposes do novice/pre-service English language teachers develop using prompts on ChatGPT for English language teaching?

What are the benefits of use of ChatGPT for novice/pre-service English language teachers?

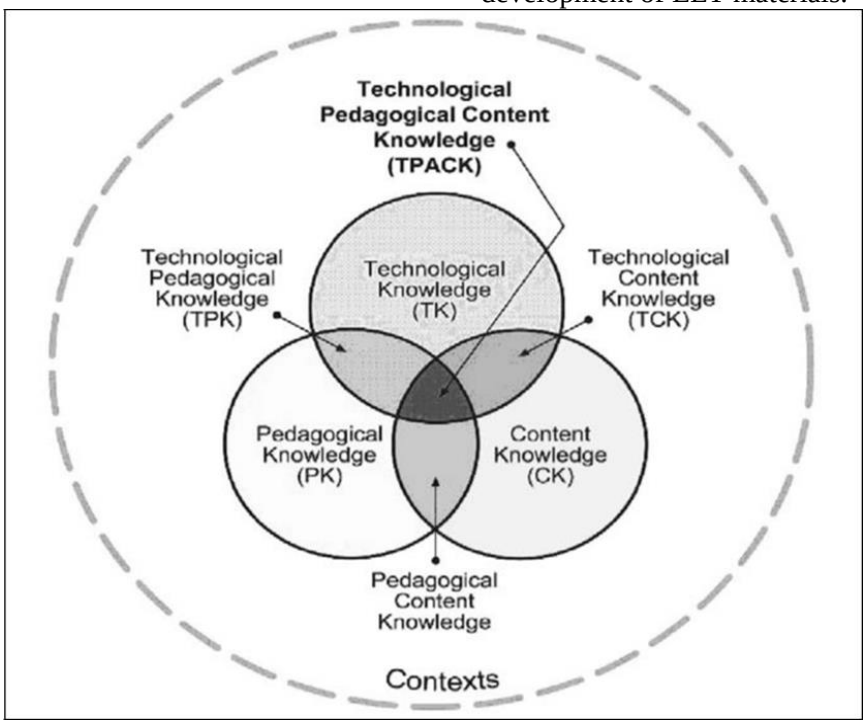
Research Methodology

Theoretical Framework

The TPACK framework can be used as a guide for understanding the skills teachers require to effectively utilize any technology (Herring et al., 2016). It is important to note that the TPACK framework is not limited to specific technologies. TPACK focuses on the integration of technology, pedagogy, and content.

This project's theoretical framework focuses on the incorporation of generative artificial intelligence, particularly ChatGPT, in developing English Language Teaching resources. Central to this framework is the Technological Pedagogical Content Knowledge (TPACK) model, which guides the creation of prompts for ChatGPT, this model is instrumental in generating a range of educational materials, such as lesson plans, course content, and academic contents, specifically designed for ELT applications.

In this methodology, the TPACK model, formulated by Koehler and Mishra in 2006 (see Figure 3.1), plays a pivotal role. It aids in devising prompts that align with considerations related to technology, pedagogy, and content, guaranteeing that the resulting materials adhere to the TPACK framework. This approach promotes a harmonious interplay between technology, pedagogy, and content, which is vital for the effective integrations of GenAI in the development of ELT materials.



Source: Mishra & Koehler (2006)

This theoretical framework, centered technological, pedagogical and content knowledge of teachers, provides a solid foundation for examining the potential applications of GenAI, especially ChatGPT, in ELT materials development.

Data Collection Procedure

For data collection in our research, we contacted English language teachers and novice/ pre-service teachers, offering them comprehensive overview of our research goals. Subsequently, consent was sought from those instructors actively involved in English Language Teaching. We informed these instructors about the specifics of the data collection process and what it entails. They were be requested to share screenshots of the prompts they have used in their interactions with ChatGPT straightforwardness, clear, systematic guidelines on how to take and securely submit these screenshots were provided to the instructors. After we gathered these screenshots, we carefully sorted and arranged the information to prepare it for further study and conducted in depth interviews. Our examination involved categorizing the different kinds of prompts that were used, checking the purpose behind them, and understanding how they influenced the development of teaching materials for English. Throughout this whole process stuck to strong ethical guidelines. We got permission from all the participants involved, and we kept the identities of the instructors completely confidential. The data we collected was only used for research purposes.

Data Analysis Procedures

To analyze these prompts, we created a checklist containing all the aspects of the TPACK separately.

Development of Checklists and Coding for Materials Development Analysis

Coding was used to facilitate analysis procedures. We developed two checklists for the analysis of the prompts, one for the analysis of prompts through TPACK and the other for the types of materials developed for ELT.

1. TPACK Coding

TPACK coding is done by the already established model. All the seven aspects are given as follows:

TK: technological knowledge
PK: pedagogical knowledge
CK: content knowledge
TPK: technological pedagogical knowledge
PCK: pedagogical content knowledge
TPACK: technological pedagogical and content knowledge

2. Coding of prompts

The code used for prompt is PR and it continuous with the number of prompts i.e. PR1, PR2..

3. Codes for analysis

We created a code of “0” and "1.” 0 means that the prompt does not have a specific feature and 1 implies that it has that specific feature.

0 = No
1 = Yes

Table 3.1
Analysis through TPACK framework

Prompt number	TK	PK	CK	TPK	TCK	PCK	TPACK
PR1	-	-	-				

The second checklist included the reasons for which were given to the ChatGPT.

Table 3.2
Types of Materials developed

	General lesson plan	Activities	Assessments	Quiz	Text
Prompt 1					
Prompt 2					

Analysis

Discussion and Findings

The analysis of the prompts used for materials development in English Language Teaching (ELT) by students of Air University, enrolled in the technology enhanced language learning course, offers valuable insights into the integration of technology, pedagogy and content knowledge (TPACK). This comprehensive study highlights the effectiveness of the TPACK framework model in creating engaging and comprehensive ELT materials.

Integration of Technology in lesson plans

The analysis of the prompts revealed a consistent emphasis on incorporating various technological tools to enhance the learning experience. Commonly used tools included YouTube, online games, digital applications, and interactive presentations. These tools served multiple purposes, such as:

Engagement

Digital games and videos were frequently employed to make lessons more interactive and engaging, capturing students' attention and maintaining their interest.

Accessibility

Technology facilitated easier access to diverse learning materials and resources, enabling differentiated instruction tailored to individual student needs.

Interactivity

Interactive tools such as PowerPoint presentations, YouTube videos, and educational apps helped create a dynamic learning environment where students could actively participate and engage with the content.

The use of these tools aligned with the course objectives, which aimed to enhance technological literacy among future educators and equip them with the skills to integrate technology effectively into their teaching practices.

Pedagogical strategies and student engagement

Pedagogical knowledge (PK) was central to designing activities that were student-centered and interactive. The prompts demonstrated the use of various instructional strategies, such as flipped classrooms, gamification, and collaborative learning, to enhance student engagement. Key pedagogical strategies identified included:

Interactive activities

Many prompts emphasized designing activities that encouraged student participation, such as group discussions, role-plays, and interactive games. These activities promoted active learning and fostered a deeper understanding of the material.

Flipped classroom

Several prompts incorporated the flipped classroom model, where students explored content independently outside the classroom, allowing class time to be used for interactive and application based learning. This approach facilitated deeper learning and improved student outcomes.

Engaging methods

Creative and engaging methods such as storytelling, simulation games, and ice-breaking activities, were used to make learning enjoyable and relatable to students. These methods helped create a positive learning environment and motivated students to engage with the content.

The pedagogical strategies highlighted in the prompts were aligned with contemporary educational theories that emphasize active learning, student engagement, and the importance of creating a supportive learning environment.

Content knowledge and curriculum design

Content knowledge (CK) was crucial for ensuring that the material was accurate, relevant, and aligned with curriculum requirements. The analysis showed that the prompts focused on essential language skills such as grammar, vocabulary, writing and reading comprehension. Key aspects of content knowledge included:

Clear objectives

Each lesson plan and activity had clearly defined objectives that aligned with curriculum goals, ensuring that the content taught was relevant and comprehensive. This alignment helped students achieve desired learning outcomes.

Contextual relevance

The content was designed to be contextually relevant to the students' proficiency level and learning needs, making the lessons more effective and impactful. By considering the students' backgrounds and interests, the prompts created meaningful learning experiences.

Diverse topics

The prompts covered a wide range of topics, from basic grammar to advanced writing skills, catering to different learning levels and interests. This diversity

ensured that students were exposed to various aspects of learning language.

The emphasis on content knowledge ensured that materials were pedagogically sound and aligned with educational standards, contributing to a comprehensive language learning experience.

Technological Pedagogical Content Knowledge (TPACK)

The TPACK framework was effectively employed in the prompts to create comprehensive ELT materials. The integration of technology, pedagogy, and content knowledge ensured a holistic approach to materials development. Key findings included:

Enhanced learning experience

By integrating technology with pedagogical strategies and content knowledge, the prompts created a more engaging and effective learning experience for students. This integration facilitated active learning and improved student outcomes.

Innovative teaching methods

The use of innovative teaching methods such as gamification, flipped classrooms, and interactive activities helped make the lesson more dynamic and student-centered. These methods promoted active participation and fostered a deeper understanding of the material.

Comprehensive lesson plans

The prompts demonstrated how TPACK could be used to develop detailed and comprehensive lesson plans that catered to diverse learning needs and preferences. This comprehensive approach ensured that students received a well-rounded education.

The effective use of the TPACK framework in the prompts highlighted its potential to transform traditional teaching methods and create engaging, technology-enhanced learning environments.

The prompts analyzed in this study demonstrate the potential of the TPACK framework to transform the traditional teaching methods and create technology enhanced learning environments. As future educators continue to explore the integration of technology in their teaching practices, the insights gained from this analysis can serve as valuable guidelines for developing effective and engaging ELT materials.

Interview findings

The integration of technology in education has become increasingly important, and this is evident in the course of technology enhanced language learning (TELL) at Air University. To explore the effectiveness and applicability of technology, particularly the use of ChatGPT in materials development interviews were conducted with 17 students enrolled in the course . the following discussion synthesizes the key findings from these interviews, focusing on the usefulness of ChatGPT for creating lesson plans, quizzes, assessments and the application of TPACK framework for structuring the prompts.

Usefulness of ChatGPT in materials development

The interviews revealed that the students found ChatGPT to be a highly useful tool for developing educational materials. Several key benefits were identified;

Efficiency and convenience

Students appreciated how ChatGPT streamlined the process of creating lesson plans ands assessments. The AI's ability to generate content quickly and accurately saved them significant time and effort. One student mentioned, "ChatGPT helps me draft lesson plans in minutes which would otherwise take hours."

Diverse content generation

ChatGPT's capability to provide varied examples and explanations was particularly valued. Students highlighted that the AI could generate multiple versions of quiz questions, explanations, and even entire lesson plans tailored to different learning levels and styles. This diversity allowed them to create more engaging and inclusive educational material.

Enhancing creativity

The AI tool was also noted for its ability to spark creativity. Students found the ChatGPT's suggestions often led to the innovative ideas for lesson activities and assessments. One interviewee said "Using ChatGPT, I came up with interactive and fun activities that I wouldn't have thought on my own".

Importance of the TELL course

The course of technology enhanced language learning helped in equipping students with the skills of integrating technology effectively, into their teaching practices. The importance of the course was emphasized in several ways:

Technological proficiency

The course provided students with hands on experience with digital tools and platforms, including ChatGPT. This proficiency is essential for modern educators who need to incorporate technology into their classrooms seamlessly.

Pedagogical insights

Beyond just technical skills, the course also focused on pedagogical strategies for using technology to enhance learning. Students learn how to design activities that were not only technologically advanced but also pedagogically sound.

Real world application

The TELL course emphasized practical application, preparing students to use technology in real-world teaching scenarios. This approach ensured that students were ready to implement what they learnt in their future teaching careers.

Application of TPACK in structuring prompts

The TPACK framework was integral to the course, guiding students in the effective integration of technology, pedagogy and content. The interviews highlighted several ways in which TPACK was applied:

Balanced integration

Students learned to balance technological tools with pedagogical strategies and content knowledge. This balance ensured that technology was used not just for its own sake but to enhance the educational experience. One student noted, "The TPACK framework helped me understand how to use technology meaningfully in my lessons."

Structured prompts

The prompts developed by students were structured to incorporate all three components of TPACK. For example when creating a lesson plan, students ensured that the content was accurate and relevant (CK), the pedagogical approach was effective (PK), and the technology was appropriate and enhanced learning (TK).

Reflective practice

The course encouraged reflective practice, prompting students to consider the impact of their choices on student learning. This reflection was guided by the TPACK framework, ensuring all the aspects of lesson design were considered.

Conclusion

This study aims to show that beginner English language teachers, equipped with specialized with specialized AI training and a deep understanding of the TPACK framework, can successfully utilize ChatGPT for creating ELT materials. It illustrates the importance of aligning prompts with ELT goals to maximize the effectiveness of AI-generated content. The research demonstrates that teachers, using their combined knowledge of technology, pedagogy, and content, can develop not only innovate but also educationally robust materials. It highlights the significant impact of AI in language education, especially when coupled with thoughtful and strategic prompt creation. Additionally, the study stresses the necessity for ongoing education and adaptation in the fast-evolving field of AI and educational technology. The anticipated results makes a substantial contribution to discussions about incorporating AI tools like ChatGPT into educational environments, shedding light on how technology can improve teaching methods and learning methods and learning experiences in language education. This research serves as a resource for future educators to effectively incorporate AI into their teaching, preparing them to navigate the challenges and opportunities that technological progress brings to education.

References

Angwin, J. (2023, January 28). *Decoding the hype about AI – The Markup*. Themarkup.org. https://themarkup.org/hello-world/2023/01/28/decoding-the-hype-about-ai

Božić, V., & Poola, I. (2023, April). *Chat GPT and education*. Researchgate, 4(3), 76-89. https://www.researchgate.net/publication/369926506_Chat_GPT_and_education

Didham, R. J., Ofei-Manu, P., & Nagareo, M. (2017). Social learning as a key factor in sustainability transitions: The case of Okayama City. *International Review of Education*, *63*(6), 829–846. https://doi.org/10.1007/s11159-017-9682-x

Firaina, R., & Sulisworo, D. (2023). Exploring the usage of ChatGPT in higher education: frequency and impact on productivity. *Buletin Edukasi Indonesia*, *2*(01), 39–46. https://doi.org/10.56741/bei.v2i01.310

Floridi, L., & Chiriatti, M. (2020). GPT-3: Its nature, scope, limits, and consequences. *Minds and Machines*, *30*(4), 681–694. https://doi.org/10.1007/s11023-020-09548-1

Herring, M. C., Mishra, P., Koehler, M. J., & Firm, P. (2016a). *Handbook of technological pedagogical content knowledge (TPCK) for educators* (2nd ed., Vol. 2, p. 338). Routledge. https://doi.org/10.4324/9781315771328

Illich, I. (1996). In the Vineyard of the text: A commentary to Hugh's didascalicon. *Amazon* (3rd ed , p. 162). University of Chicago Press. https://www.amazon.com/Vineyard-Text-Commentary-Hughs-Didascalicon/dp/0226372367

Kayişli, K., Sevindik, T., & Hazar, H. (2013). The online journal of distance education and e-Learning. *The online journal of distance education and E-Learning*, *1*(1), 1–7. https://www.tojdel.net/journals/tojdel/volumes/tojdel-volume01-i02.pdf

Mahmoodzadeh, M. (2011). Talebinezhad, M. R. & Mahmoodzadeh, M. (2011). Re-evaluation of internationally and locally-developed ELT materials in Iran: A bimodal approach to material development. *Journal of language teaching and research*, 2(6), 1204-1216. https://www.academia.edu/7219848/Talebinezhad_M_R_and_Mahmoodzadeh_M_2011_Re_evaluation_of_Internationally_and_Locally_Developed_ELT_Materials_in_Iran_A_Bimodal_Approach_to_Material_Development_Journal_of_Language_Teaching_and_Research_2_6_1204_1216

McLeod. (2019, July 30). *Quantitative vs Qualitative Research*. Retrieved from Simply Psychology: https://www.simplypsychology.org/qualitative-quantitative.html

McGrath, I. (2012). English language teaching materials: Theory and practice. *ELT journal*, *67*(1), 141–143. https://doi.org/10.1093/elt/ccs071

Mikeladze, T. (2023). Creating teaching materials with ChatGPT. *13th International research conference on education, language and literature*, *3*(2), 29–36. https://www.researchgate.net/publication/370864534_Creating_teaching_materials_with_ChatGPT

Mishra, P., & J. Koehler, M. (2008). Introducing technological pedagogical content knowledge . *American educational research*, *3*(2), 123–130. https://www.researchgate.net/publication/242385653_Introducing_Technological_Pedagogical_Content_Knowledge

Opara, E., Mfon-Ette Theresa, A., & Aduke, T. C. (2023). ChatGPT for teaching, learning and research: Prospects and challenges. *Social science research network*, *5*(2), 33–40. https://doi.org/10.36348/gajhss.2023.v05i02.001

Richards, J. C. (2001). *Curriculum development in language teaching* (2nd ed., p. 345). Cambridge University Press. https://www.academia.edu/8489269/CURRICULUM_DEVELOPMENT_IN_LANGUAGE_TEACHING._By_Saidna_Zulfiqar_bin_Tahir

Robert James Didham, & Ofei-Manu, P. (2013, January 1). *Advancing Education as a Goal for Sustainable Development*. Semantic Scholar. https://www.semanticscholar.org/paper/Advancing-Education-as-a-Goal-for-Sustainable-Didham-Ofei-Manu/468cad998d34eeb7d5c353167359a314b221c400

Sharma, S., & Yadav, R. (2022). Chat GPT – A technological remedy or challenge for education system. *Global journal of enterprise information system*, *14*(4), 46–51. https://www.gjeis.com/index.php/GJEIS/article/view/698#:~:text=Teachers

Stephanie E.L. Bengtsson, Barakat, B., & Raya Muttarak. (2018). *The Role of Education in Enabling the Sustainable Development Agenda*. Routledge. https://doi.org/10.4324/9781315142708

Tomlinson, B. (2012). Materials development for language learning and teaching. *Language teaching*, *45*(2), 143–179. https://doi.org/10.1017/s0261444811000528

United Nations. (2023). *Goal 4 | Department of Economic and Social Affairs Sustainable Development*. United Nations; United Nations. https://sdgs.un.org/goals/goal4

University, O. (2023, June 26). ChatGPT and other AI tools: Implications for teaching and learning. *Center for teaching and learning*. https://ctl.oregonstate.edu/resources/chatgpt-and-other-ai-tools-implications-teaching-and-learning

Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, L., & Polosukhin, I. (2017, June 12). *Attention is all you need*. ArXiv.org. https://arxiv.org/abs/1706.03762

VargasC. M. (2000). Sustainable development education: Averting or mitigating cultural collision. *International Journal of Educational Development*, *20*(5), 377–396. https://doi.org/10.1016/s0738-0593(99)00081-4