



Beyond the Books: AI-powered Educational Scripting

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Abstract :

Pedagogical Scripting is the process of developing an educational scenario designed for a specific learning context between the professor and the learner. It is intended to make a complex learning situation more coherent and to integrate different resources and activities. This semantic proximity is an adjunct to the creative dimension, an essential part of the professor's work, and is aimed at designing teaching and learning situations. It is, however, rooted in various approaches to instructional design: approaches centered on the planning of teaching situations, knowledge, resources, activities, and interactions.

Pedagogical scripting in the age of artificial intelligence (AI) opens up new perspectives and opportunities for learning and teaching. The combination of pedagogy and AI makes it possible to create more personalized, adaptive and effective learning experiences; Sekeroglu, Dimililer and Tuncal (2019) stated that “artificial intelligence could help teachers improve personalized education for their students”. With AI-based scripting grounded in the logic of learning, the professor no longer delivers content, but mediates the learners' relationship with knowledge. In this paper, we will also discuss feedback from a comparison between two courses opting for one of two types of training: hybrid training and face-to-face training at the Faculty of Letters and Human Sciences, Oujda and Higher Normal School, Meknes. To carry out our study, we used a mixed-method approach: we developed a questionnaire and a semi-structured interview guide, which we sent to the professors at the two institutions under investigation. We also highlighted the communication and content production tools, as well as the professor-learner relationship, particularly the creative aspects of certain modules in the two training systems. This reflection will lead us to identify the characteristics of course scripting using AI in order to personalize learning.

Key words: Pedagogical Scripting, AI, Creativity, Personalized learning, Scenario, Design.

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INTRODUCTION

The word ‘intelligence’ finds its origins in the Latin term ‘*intelligentia*,’ which means the ability to choose the right thing and gain a good understanding of any situation. As for ‘artificial’, it comes from the Latin term ‘*artificium*’, where ‘*artifex*’ means possessing the expertise required to do any work. Currently, the word ‘artifice’ has taken on a negative connotation in the sense of enhancing or disguising a reality. In this respect, artificial intelligence, in its original sense of the Latin ‘*artificium*’ is a fine work of art.

Stephen Hawking, a renowned theoretical physicist, contemplates the dual nature of artificial intelligence as he states, “The creation of artificial intelligence would be the greatest event in the history of humanity. But it could also be the ultimate” (Hawking, 2015). Hawking underlines the significant value of artificial intelligence and its role in changing the history of humanity. The American entrepreneur and businessman Elon Musk and dozens of experts agree with Hawking on the benefits that society can derive from artificial intelligence.

The concept of artificial intelligence has emerged with the mathematician Alan Turing. According to him, it refers to a set of algorithms that give a machine the ability to adapt intelligently and autonomously to situations through analysis and decision-making, based on predictions drawn from data already acquired. To put it simply, artificial intelligence is a computer program that is not like other programs. Generally, traditional computer programs are designed to be used to carry out limited tasks with human intervention. Unlike traditional programs, AI cannot be programmed in the conventional sense, it can be ‘educated’. This ‘education’ is done using machine learning methods which are a necessary component of artificial intelligence.

The structure of this program is essentially a reasoning structure that breaks down a complex problem into simple tasks and sub-tasks, enabling it to be understood, solved, and mastered. This produces an effect of adaptation to its own environment that can surpass even our own qualities of intelligence.

AI is poised to revolutionize education in countless ways. With the ability to personalize learning experiences, AI can cater to the individual needs of students, making education more effective and engaging. Additionally, AI can provide valuable insights to improve teaching strategies and

student outcomes. It is clear that its integration into education will make a significant difference in how students learn and grow.

I. PEDAGOGICAL SCRIPTING AT THE AGE OF ARTIFICIAL INTELLIGENCE

In education, Bloom’s Taxonomy is a framework used to classify educational learning objectives into levels of complexity and specificity. Originally proposed in 1956 by Benjamin Bloom, the taxonomy has been revised over the years to reflect modern understanding of learning processes. In the AI era, where technology plays an increasingly significant role in education, Bloom’s Taxonomy has been revisited to incorporate the impact of artificial intelligence on those learning processes.

AI SUPPORTED LEARNING ACTIVITIES AND ASSIGNMENTS BASED ON BLOOM'S TAXONOMY

The following table is adapted from the table developed by Oregon State University Ecampus accessible via <https://ecampus.oregonstate.edu/faculty/artificial-intelligence-tools/blooms-taxonomy-revisited.pdf>. Attribution 4.0 International (CC BY 4.0). Distinctive human skills associated for each level are defined by (Anderson & Krathwohl, 2001, pp.67-68).

Faculty can refer to this table when designing learning activities and assessments that generative artificial intelligence (AI) tools can be applied.

	LEVEL OF THINKING	AI CAPABILITIES	DISTINCTIVE HUMAN SKILLS	LEARNING ACTIVITIES AND/OR ASSESSMENTS
HIGH	CREATE	<i>Suggesting a range of alternatives, enumerate potential drawbacks and advantages, describe successful real-world cases</i>	<i>Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.</i>	<i>A research proposal: AI can provide the draft of the proposal outline. Treatment plan: AI can provide the draft treatment plan.</i>
	EVALUATE	<i>Making rough judgements given rubrics; identifying pros and cons of various courses of action, develop rubrics</i>	<i>Making judgements based on criteria indicated in rubrics and standards through checking and critiquing. Engage in metacognitive reflection, holistically appraise ethical consequences of alternative courses of action</i>	<i>Peer review activity: AI can be used to review one students' work; or students are asked to critique AI generated response</i>
	ANALYZE	<i>Comparing and contrasting data and information, inferring trends and themes, computing, predicting</i>	<i>Breaking materials into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing</i>	<i>Case study: AI can be used to conduct an initial analysis of a case given the framework or guided questions</i>
	APPLY	<i>Making use of a process, model, or method to illustrate how to solve a quantitative inquiry</i>	<i>Carrying out or using a procedure through executing, or implementing</i>	<i>Quiz and exams: In some fields like Chemistry, students need to use a procedure to solve a problem in a quiz or exam question. AI might follow the same procedure to provide correct answers</i>
	UNDERSTAND	<i>Describing a concept in different words, recognizing a related example, translate</i>	<i>Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining</i>	<i>Quiz and exams: AI might provide correct answers to most of quiz questions. Instructors need to be cautious about this. Essay paper and discussions: AI can provide reasonable responses to prompts for essay paper and discussions. Instructors need to be cautious about this.</i>
LOW	REMEMBER	<i>Recalling factual information, list possible answers, define a term, construct a basic chronology</i>	<i>Retrieving, recognizing, and recalling relevant knowledge from long-term memory</i>	<i>Quiz and exams: AI might provide correct answers to most of quiz questions. Instructors need to be cautious about this.</i>

In the original Bloom's Taxonomy, students progress through these levels, starting from basic recall of information to higher-order thinking skills like evaluation and creation. The revised version in the AI era considers how AI tools can enhance learning activities and assessments across these levels. It emphasizes the importance of integrating AI tools to support self-regulated learning, goal setting, feedback, and personalization. In the same vein, students not only need to demonstrate knowledge and understanding but also develop critical thinking and problem-solving skills.

One aspect of AI in education that is particularly promising is pedagogical scripting. This form of educational scripting involves creating structured guidelines and frameworks to support professors in delivering effective instruction. These scripts are designed to optimize learning outcomes by providing professors with a roadmap for effective instruction. Pedagogical scripts can take various forms, including detailed lesson plans, prompts for classroom discussions, and strategies for addressing common misconceptions. By following these scripts, professors can ensure consistency in their teaching practices and more effectively engage students in the learning process.

The integration of pedagogical scripting in education offers countless benefits for both professors and students. One of the key advantages of pedagogical scripting is its ability to promote consistency in teaching practices. By following scripted guidelines, professors can deliver instruction in a structured and coherent manner, ensuring that all students receive consistent and high-quality educational experiences. Additionally, pedagogical scripting can help professors effectively address the diverse learning needs of students by providing strategies for differentiation and individualized support. It is also important to note that pedagogical scripting has the potential to enhance student engagement and motivation. By incorporating interactive elements and engaging activities into scripted lessons, professors can create dynamic learning experiences that capture students' interest and promote active participation. Moreover, pedagogical scripting can facilitate the integration of technology and multimedia resources into instruction, enabling professors to leverage the power of digital tools to enhance learning outcomes.

Educational scripting, also known as pedagogical scripting, can be closely related to the ABC learning types; as it can serve as a detailed guide for professors to incorporate various learning types into their lesson plans. The integration could be done in these different types as follows:

- **Acquisition:** The scripts can include specific readings, videos, or lectures that students need to engage with to acquire new information.
- **Investigation:** The scripts can prompt students to conduct research or explore certain topics, guiding them on how to gather and analyze data.
- **Practice:** The scripts can outline exercises or simulations where students can apply new concepts in a controlled environment.
- **Discussion:** The scripts can facilitate structured discussion, setting topics and questions that encourage students to articulate their understanding.
- **Collaboration:** The scripts can design group activities that require students to work together, solve problems, and learn from each other.
- **Production:** The scripts can direct students to create or construct something, providing clear objectives and criteria for assessment.

Also of important note is that implementing pedagogical scripting in the AI era is challenging. How can we as educators ensure that learning objectives are clearly defined and aligned with the different levels of Bloom's Taxonomy? That is a question, among others that should be addressed in this context. Training is key; educators should be trained to effectively use AI, balance technology integration with traditional teaching methods, in addition to regularly evaluating and refining the implementation process. Thus, there is a need for ongoing professional development to help educators stay abreast of new AI technologies and their applications in teaching.

On the part of AI developers, it is important to note that they may not have sufficient understanding of learning sciences; as a result, we might end up with tools that are not effectively aligned with pedagogical principles. In the same vein, there is often a disconnect between the expectations of AI end-users (educators) and the functionalities provided by AI applications. This can lead to tools that do not meet the practical needs of educators.

Many AI applications have this profit-driven nature; they can overshadow the educational goals and instead focus on financial gains rather than pedagogical effectiveness. This brings us to the aspect of ethical considerations about data privacy, student autonomy, to assure that AI-based tools enhance rather than detract from student engagement, in a sense that the technology should support interactive and personalized learning experiences.

II. METHODOLOGY

As educators navigating in the AI era, we aimed to investigate the extent to which professors use AI generated content in their pedagogical scripting. In order to avoid any limitations inherent in using one approach independently, we combined elements from qualitative and quantitative approaches. The mixed methods approach provides an expanded understanding of research problems; what Creswell (2009) describes as appropriate for multi-level analysis of complex issues improving validity of research through convergence and corroboration of findings.

We adopted for a mixed method approach where interviews and a questionnaire were designed to evaluate various aspects of AI integration in education, focusing on the following key areas:

1. **The use of AI Generated Content:** The first part of the questionnaire examines how professors incorporate AI-generated content into their teaching practices. This includes assessing the frequency and methods of using such materials in the classroom.
2. **The Pertinence and Efficiency:** The second part of the questionnaire delves into the relevance and effectiveness of AI tools in enhancing the teaching and learning process. Professors were asked to reflect on how AI-generated content contributes to student engagement and academic outcomes.
3. **The Quality and Limitations of AI:** The final section of the questionnaire addresses the quality of AI-generated content and highlights any limitations or challenges that professors may face when integrating AI into their curriculum. This section aims to provide insight into the potential barriers of using AI in education and ways to overcome them.

III. RESULTS & DISCUSSION

The results provide valuable insights into how professors perceive and engage with AI-generated content in university settings. The data indicated that 55% of participants were from the Faculty of Letters and Humanities in Oujda, while 45% participants were from Ecole Normale Supérieure of Meknes; this difference is explained by the large number of professors within the first institution. Furthermore, the data indicated that male professors demonstrated a higher tendency to utilize AI-generated content more frequently, with 70% compared to 30% for their female counterparts. In addition, the study suggested that younger professors show a greater inclination towards integrating AI tools in their teaching practices compared to older generations. These findings shed light on the evolving landscape of educational technology and its impact on the academic sphere. They suggest a growing trend in the adoption of AI technology within academic environments, highlighting potential variations in usage based on university affiliation, gender, and age among faculty members. This shift towards leveraging AI generated content underscores the evolving landscape of educational tools and resources in higher education institution

When asked about the use of AI-generated content to create educational scripts for online courses; 85% of participants reported using AI generated content. It is crucial to consider the significance of this percentage itself, as it indicates a strong trend towards embracing technology in education. This suggests that many educators are finding value in using automated tools to assist in creating teaching materials. It is essential to think about the implications of these findings for the future of education. The widespread use of AI generated content may signal a shift towards more personalized and efficient teaching methods.

In this particular survey, all participants indicated that they utilized AI-generated content for creating scenarios or dialogues for interactive activities. One key takeaway is the popularity and effectiveness of AI technology in fostering engaging and immersive learning experiences. The fact that all participants leverage AI for this purpose suggests a high level of acceptance and reliance on technology to enhance educational content. Additionally, 66% of respondents

confirmed that they also incorporated AI-generated content in lesson creation, underscoring the potential for growth in this area. The revelation that only a minority of participants reported using AI-generated content to address learners' questions raises interesting considerations about the integration of AI in facilitating student engagement and support. While this usage may be less prevalent, it highlights the potential of AI technology to personalize learning experience and provide targeted assistance to learners.

When analyzing the results of the survey regarding the relevance of AI-generated content in scripting courses, 23.5% of respondents confirmed that AI-generated content was very relevant, while 64.7% stated it was relevant. This indicates that the majority of participants, accounting for 88.2% (23.5% + 64.7%), found AI-generated content to be very relevant or relevant which points out a significant level of acceptance and acknowledgment of the value that AI-generated content can bring to the learning experience. Additionally, 5.9% were neutral, while 5.9% expressed that they found AI-generated content to be not relevant, highlighting a small but important minority viewpoint. It is crucial to recognize and respect diverse opinions and preferences when considering the integration of AI-generated content in educational settings. Understanding the reasons behind such perspectives can provide insights into potential areas for improvement or customization to better cater to the needs and preferences of all learners.

The survey results present a range of opinions on the adaptability of AI-generated content in education. Among participants, 27.8% confirmed that AI-generated content can be very adaptable to different subjects and teaching levels. Additionally, 55.6% of respondents indicated that AI-generated content was adaptable, highlighting a majority viewpoint in favor of utilizing such resources in educational contexts. The percentage reflects also a significant level of confidence in the adaptability and effectiveness of AI-generated content. On the other hand, 5.6% were neutral, and 11.1% of participants expressed the belief that AI-generated content is not adaptable. This minority opinion suggests that there are still concerns or reservations regarding the suitability and flexibility of AI-generated materials for educational purposes.

When investigating the impact of AI-generated content on students' learning experiences, 44.4% of the total participants surveyed expressed that the utilization of AI-generated content can significantly improve the student learning experience to a great extent, while another 44.4%

expressed it was significant to some extent. This suggests a considerable level of optimism regarding the impact of AI on learning outcomes.

Additionally, the survey results revealed that 76.5% of participants highlighted the value of personalized content tailored to each learner. This means that with AI technology, educational materials can be customized to suit the individual needs and learning styles of students, making the learning experience more effective and engaging, as elaborated in the first part of this paper. Furthermore, 82.4% of those surveyed emphasized the significance of AI in creating realistic dialogues and situations. By stimulating authentic scenarios, AI-generated content can enhance students' practical skills and critical thinking abilities, preparing them for real-world challenges. Additionally, 35.3% of participants mentioned the benefit of receiving instant answers to students' questions; this immediate feedback and explanations allow students to clarify doubts and deepen their understanding in real time. Lastly, 58.8% of respondents pointed out that integrating AI content improved learner engagement. AI technology can make learning more interactive, dynamic, and fun, motivating students to actively participate and remain focused throughout the learning process.

When interpreting the last part of the survey focused on the challenges and limitations of using AI-generated content to script online courses, several key points were highlighted. The first concern was the variable quality of generated content; 29.4% of participants expressed concerns about this aspect indicating that there may be inconsistencies in the accuracy, relevance, or effectiveness of the materials produced through artificial intelligence algorithms. The second concern was the risk of bias or errors in responses; 76.5% of the respondents mentioned the risk of bias in the AI-generated content. This highlights the importance of ensuring that the information provided is both accurate and unbiased to prevent misinformation or a skewed representation of facts. Additionally, 52.9% of participants noted the challenge of controlling the tone or style of the content generated by AI systems. This aspect is crucial as the tone and style of educational materials can impact the engagement and understanding of students. An overwhelming 88.2% of respondents emphasized the necessity for constant human supervision when utilizing AI-generated content for online courses. Human oversight is crucial to ensure the accuracy, appropriateness, and relevance of the materials produced by artificial intelligence

CONCLUSION

Pedagogical scripting is a method used to create educational scenarios tailored to specific learning environment. Its purpose is to simplify complex situations by incorporating various resources and activities. This approach enhances the creative aspect of teaching, emphasizing the design of effective educational experiences.

In today's ever-evolving world, the education sector is experiencing significant transformations. Educators must be willing to develop new skills to effectively tackle current and future challenges. This study has compared two different modes of training: the hybrid and face-to-face approaches, at two academic institutions, the faculty of letters and Human Sciences in Oujda and the Higher Normal School in Meknes.

Through a mixed-method approach involving questionnaires and interviews with professors, the research has aimed to evaluate how the utilization of Artificial Intelligence (AI) by professors can enhance their curriculum planning. Despite AI being widely recognized as a crucial aspect of academic life, it is evident that educators are not fully utilizing its potential. This realization prompted us to explore the specific requirements educators have regarding the effective incorporation of AI into their instructional planning processes. It is worth mentioning that little attention has been paid to the role of educators in the development of AI; they are among the crucial stakeholders in this field. That is why they need to be involved in the development process to a greater extent, and their views, experiences, and expectations need to be considered for a successful adoption of AI in schools and universities.

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