PROVIDING CREATIVITY IN EDUCATIONAL ENVIRONMENT DURING THE EPOCH OF ARTIFICIAL INTELLIGENCE: PHILOLOGICAL PERSPECTIVES

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Abstract. This research explores the relevance and scientific novelty of conceptual features in the design of effective creative learning environments in the sphere of foreign philology. It emphasizes the often-overlooked extended intermediate phase of learning, proposing an advanced knowledge acquisition stage situated between initial creative learning and domain expertise. The article examines the interactive effects of contextual elements in various creative computer-based and AL learning environments while studying English language and addresses learning deficiencies associated with them. It underscores the importance of aligning learning and instruction with contextual factors.

The relevance of this research is determined by its exploration of innovative practices, including technology integration, project-based learning, and AI applications in foreign philology. By addressing deficiencies in advanced knowledge acquisition, the research aims to guide philology and other specialists in adapting to 21st-century challenges in education and fostering inclusive creative and impactful learning environments. T*he scientific novelty of the research* consists in its contribution into the educational field by proposing an advanced knowledge acquisition stage. It explores the dynamic interplay of contextual creative elements in computer-based learning, AI and hybrid educational environments while studying English language for special purposes, addressing learning failures and emphasizing the need for alignment with instructional design.

This article aims to explore the structure of creative teaching methods and assessment strategies employed into the studying process of Professional English; to investigate and emphasize the critical relevance and scientific novelty of conceptual features in designing effective learning environments. It explores the often-overlooked extended intermediate phase of creative learning and introduces the concept of an advanced knowledge acquisition stage. The research delves into the interactive effects of contextual elements in various computer-based learning environments and identifies learning deficiencies associated with them. Furthermore, the article upholders for the alignment of learning and instruction with contextual factors. *The methodology* involves a comprehensive literature review on cognitive differences, contextual elements, and recent innovations in education. The ultimate goal is to contribute valuable insights to guide educational institutions in adapting to the 21st-century landscape and fostering inclusive and impactful creative learning environments.

The purpose of this article is to investigate and underscore the critical relevance and scientific novelty of creative of using computer-based learning and Artificial intelligence in educational process, partially in studying Professional English, associated with conceptual features in the design of effective creative learning environments. This research aims to bring attention to the often-neglected extended intermediate phase of creative teaching and learning Professional English and introduce the concept of an advanced knowledge acquisition stage. Through an exploration of the interactive effects of contextual elements in various computer-based and AI creative learning environments, the article identify patterns of learning deficiencies. The methodology involves a comprehensive literature review focusing on cognitive differences, contextual elements, and recent innovations in education. Ultimately, the article provides valuable insights that reflects an experience of adapting to the teaching and learning Professional English in the epoch of AI.

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The methodology involves a comprehensive review of literature on cognitive differences between novice and expert learners, the interplay of contextual elements in learning environments, and recent innovations in education. The research also incorporates an analysis of patterns of deficiency in advanced knowledge acquisition and explores various strategies for incorporating innovations into university education.

Keywords: technology-enhanced learning, creative learning, flipped classrooms, blended learning, personalized, project-based, virtual reality, augmented reality, gamification, AI and machine learning, diversity, inclusion.

Methodology

The conceptual features aspect is crucial because a learning environment designed for uncomplicated and well-organized content areas might be entirely unsuitable for intricate and irregularly structured domains (Naimie, Z., Siraj, S., Ahmed Abuzaid, R., & Shagholi, R., 2010).

The second component encompasses the student's learning phase within a specific knowledge domain, along with the corresponding learning tasks tailored to various stages (Spiro, R. J., Coulson, R. L., Feltovich, P. J., & Anderson, D. K.,1988).

Examining various computer-based learning environments, such as computer-based drill, intelligent tutoring systems, and hypertext, necessitates the simultaneous examination of these two contextual elements. In other words, the interactive effects of these contextual elements must be taken into account. We will provide a brief introduction to these two elements and subsequently delve into research on learning failures associated with them. Despite extensive recent cognitive literature detailing novice/expert differences, the focus here lies on the interplay of contextual elements in computer-based learning environments (Spiro, R. J., Coulson, R. L., Feltovich, P. J., & Anderson, D. K. ,1988), ehe extended intermediate phase of learning, situated between the novice and expert levels, has been relatively understudied.

Recently, there has been a proposal suggesting the existence of an advanced knowledge acquisition or advanced learning stage. This stage occurs after the introductory phase of learning in a specific subject area but precedes the attainment of domain expertise, which is acquired through extensive study and experience Vosniadou, S., Brewer, W. F.,1987). While initial learning objectives often emphasize achieving a basic familiarity with key concepts assessed through recognition and recall tasks, advanced knowledge acquisition goals shift towards the acquisition of a more profound and comprehensive understanding of the content. The advanced learner is required to intelligently reason and flexibly apply the acquired knowledge in diverse situations, which may significantly differ from the conditions of initial learning, constituting a form of knowledge transfer.

Illustrating the significance of aligning learning and instruction with contextual factors, as discussed earlier, can be seen through an analysis of recent research. This research has unveiled notable patterns of deficiency in the learning outcomes of students during the advanced knowledge acquisition stage, especially in complex and ill-structured content areas (Spiro, R. J., Feltovich, P. J., Coulson, R. L., Anderson, D. K.,1989).

David Matsumoto's interpretation of culture encapsulates a comprehensive fusion of values, attitudes, traditions, behaviors, and language specific to a particular societal cohort, consciously transmitted from one generation to the next (Matsumoto D., 2008). Also, he stresses that while creativity is intricate and multifaceted, it can be delineated by three primary components: novelty (inventive ideas), quality (appeal of the idea), and relevance (appropriateness to the task and era) (Matsumoto D., 2008). Although creativity is complex and multi-faceted, it can be articulated around three major components of novelty (creative ideas are innovative), quality (appeal of the idea) and relevance (the idea is appropriate to the task and era) (Kaufman J. C., Sternberg R. J., 2010).

Creative thinking is an inherent cognitive capacity and cognitive process that can be contextually influenced (Sassenberg et al., 2022). According to Amabile's componential model of creativity, three fundamental elements play a crucial role in fostering creative

behavior: domain-specific skills, processes pertinent to creativity, and task motivation (Amabile, Pratt, 2016). These domains exhibit close interdependence, where domain-specific skills draw from an individual's knowledge base accessed through divergent (free-associative) and convergent (problem-focused) thinking, constituting creativity-relevant thought processes. The situational creative mindset, influenced by emotions and motivation to engage in a creative task, significantly impacts both thinking patterns. Interventions, such as stimuli inspiring and motivating creative engagement, can influence this creative mindset. Moreover, personal beliefs about creative abilities, particularly self-efficacy beliefs reflecting an optimistic outlook on tackling creative tasks, can elevate motivation and perseverance in creative endeavors (Karwowski, 2011). These theories lay the groundwork for subsequent in-depth examinations of literature pertaining to the situational factors influencing creative thinking behavior.

Various methods and approaches currently exist to foster creative thinking, including physical activity (Colucci-Gray, L., Burnard, P., Cooke, C., Davies, R., Gray, D. S. & Trowsdale, J., 2017)., meditation, and task-based primes (Haase, Hanel, 2022). In the context of digital work environments, primes or general stimuli hold particular relevance as they don't necessarily require physical activity and can seamlessly integrate into digital work systems. Information technology-based cognitive stimulation tools and creative support systems play a role in encouraging users to delve deeper and more expansively into their knowledge base, thereby enhancing creative problem-solving (Colucci-Gray, L., Burnard, P., Cooke, C., Davies, R., Gray, D. S. & Trowsdale, J. (2017). Although initial ideas may be commonplace, continued engagement with the problem in greater detail can lead to potentially more creative solutions. Cognitive stimulation tools such as mind mappers, process guides, and stimulus providers, especially those employing visual representations, have a broad and profound impact on creative problem-solving (Siemon, D., 2022). Bravo C., Duque R., Gallardo J. In 2013 introduced Idea Wall, a groupware system capable of comprehending human conversations and proposing visual stimuli based on spoken words. Their study revealed that participants found visual stimuli more helpful than text, as pictures can convey more meaning than words. Additionally, visual stimuli are processed and interpreted more effortlessly by the brain than textual information, facilitating the rapid and efficient generation of new ideas (Bravo C., Duque R., Gallardo J., 2013). Consequently, visual stimuli serve as a source of inspiration.

Inspiration, as conceptualized in a three-part framework involving evocation, transcendence, and approach motivation (Burnard, P. Craft A. and Grainger, T., 2006), illuminates the process through which visual stimuli can fuel creativity. Evocation marks the inception of inspiration, sparked by exposure to a specific stimulus and often accompanied by an emotional response or a revelatory "aha" moment, signifying the initiation of the creative journey. Transcendence involves the sensation of surpassing everyday experiences and limitations, enabling the exploration of new ideas and possibilities. In contrast, approach motivation embodies the determination to pursue and complete the creative endeavor, underscoring the significance of task motivation in the creative process. In the realm of visual stimuli, this three-part conceptualization implies that compelling images or artwork have the potential to elicit strong emotional responses, transport individuals to novel perspectives and ideas, and instill the motivation to engage in creative pursuits. By fostering expansive associations within the problem space, inspiring visual stimuli contribute to generating a multitude of ideas, including more fitting and innovative ones, thereby fostering heightened creativity. The three-part conceptualization of inspiration serves as a valuable framework for comprehending the intricate pathway from inspiration to creativity, offering insights for designing environments and experiences conducive to this transformative process for individuals and organizations alike.

In exploring the elements of imagery that effectively stimulate creative thinking, Brun et al. (2019) investigated the impact of incompatible knowledge and distant visual stimuli on idea generation. Visual stimuli have the capacity to prompt new associations and connections within an individual's knowledge base, thereby fostering the emergence of innovative ideas

and solutions (Siemon, D., 2022). Exposure to visual stimuli that, while not directly related to the problem at hand, still resonate with the individual's knowledge base has been shown to enhance idea generation. Additionally, Brun et al. (2019) delved into the role of ambiguous figures in creative problem-solving, revealing that exposure to such stimuli can heighten individuals' capacity for creative problem-solving. Ambiguous figures necessitate mental flexibility, compelling individuals to consider multiple perspectives. Aligned with the theory of inspiration, this peculiarity can evoke curiosity and intrigue in the viewer, capturing their attention and involving them in the creative process. The unconventional nature of odd or peculiar visual stimuli has the potential to disrupt habitual patterns of thought and perception, prompting the viewer to approach the problem space from a fresh perspective. Consequently, odd art emerges as a potent catalyst for inspiring individuals to generate distinctive and creative ideas.

As Esling Ph., David N. emphases, n the contemporary society, diverse cultural distinctions manifest due to both internal and external factors. External cultural differences arise from global influences, linguistic diversity, familial customs, educational foundations, and experiential backgrounds. On the other hand, as it was mentioned, internal cultural differentiations stem from variations in geographic regions, socio-economic strata, and societal standing. Notably, creativity involves social aspects, implicating individuals in a context and working within a set of existing patterns of meanings and symbols at a specific time in history (Esling Ph. David , 2020)

Das S. Mentions that incorporating innovations into the educational process at universities is crucial to keep up with the rapidly evolving educational landscape and to better prepare students for the challenges of the 21st century (Das S., 2022).

As generative AI systems see a rise in usage, it becomes imperative to grasp their potential influence on human performance, particularly in areas such as creativity. Engaging with these tools has the potential to elevate individual creative performances by enabling swift experimentation with new learning forms (DiPaola, McGraig, 2016). As generative AI systems see a rise in usage, it becomes imperative to grasp students' and teachers' potential influence on education, particularly in areas such as creativity. Engaging with these tools has the potential to elevate individual creative ideas and recearches by enabling swift experimentation with new learning forms (Das S., 2022).

According to mentioned above, some key areas where creative innovations can be applied into the educational process, partially into studying English, are distinguished. Therefore, technology-enhanced learning means integrating technology into the classroom can significantly enhance the learning experience. This includes using learning management systems (LMS) for course materials and assignments, as well as online collaboration tools, virtual rooms, and simulations to facilitate active learning and engagement. We consider to outline using some of them in creative learning environment and assessment. According to Gilbo M.B., Heinerichs S., Pazzaglia G., using flipped classroom, traditional lecture and homework elements are reversed. Students engage with course content outside of class (e.g., through online videos), and in-class time is used for discussions, problem-solving, and hands-on activities (Gilbo M.B., Heinerichs S., Pazzaglia G., 2015).

The flipped classroom, for example, represents a pioneering pedagogical strategy centered on learner-directed instruction. This report aims to showcase the implementation of the flipped classroom and outline student perceptions of this approach across two undergraduate nutrition philological courses. The provided template facilitates faculty in designing pre-class, in-class, and post-class activities, aligning with objectives across all tiers of Bloom's taxonomy. Among the 142 students who participated in the evaluation, a majority expressed a preference for the flipped method over traditional pedagogical approaches. The process delineated in this report proved successful for both faculty and students (Gilbo M.B., Heinerichs S., Pazzaglia G., 2015).

Also, blending traditional face-to-face instruction with online learning can provide flexibility and personalized learning opportunities for students. This approach combines the best of both worlds.

Personalized learning is leveraging technology and data analytics to tailor educational experiences to individual students' needs and abilities. Adaptive learning platforms and AI-driven tools can help customize content and pacing during studying Professional English.

For providing creative education the project-based learning can be used as a part of educational process. Encouraging students to work on real-world projects and problems can develop critical thinking, problem-solving, and teamwork skills. It also provides practical experience (Colucci-Gray, L., Burnard, P., Cooke, C., Davies, R., Gray, D. S. & Trowsdale, J., 2017). Using open-access textbooks and educational materials can reduce costs for students and increase access to quality learning materials.

Virtual reality (VR) and augmented reality (AR) as modern educational technologies can provide immersive and interactive learning experiences in fields like studying Professional English. For example, using virtual courtroom simulations during studying Professional English with the bachelor students of Education and Scientific Institute of Law of TSNUK , mean creating a virtual courtroom where law students can participate in simulated legal proceedings, such as trials or hearings. Learning outcome is to enhance legal vocabulary, courtroom etiquette, and communication skills in English through realistic scenarios.

AR legal document annotations has a goal to develop an AR app that overlays legal annotations or explanations when students view specific legal documents or texts through their mobile devices. Thus, learning outcome is to improve comprehension of legal terminology and document analysis skills by providing real-time explanations and interpretations.

One more example of using a VR experience is a designing a virtual tour of a law firm with allowing students to explore different departments, interact with legal professionals, and observe day-to-day operations. Thus, learning outcome can be to familiarize students with professional legal environments and enhance their ability to discuss legal practices in English.

Augmented Legal Research has a task to implement augmented research tools that enhance research materials, providing additional information, case summaries, or related articles when law students view legal texts or research materials through augmented research devices. In this case learning outcome is to improve research skills and facilitate a deeper understanding of legal concepts by providing supplementary information in real-time.

VR mock client interviews, which can be used during studying English, develop virtual scenarios for client interviews, where students can practice communication skills, gather information, and provide legal advice. They enhance oral communication and client interaction skills in English within a legal context.

Augmented research language translation tools provides making applications, when the task is to create an AR tool that translates legal documents or phrases into English when viewed through a mobile device, aiding students in understanding foreign legal texts. It helps to mprove language comprehension and legal translation skills in English.

VR legal case reconstructions use simulation which has a task to reconstruct historical or complex legal cases in a virtual environment, allowing students to explore and analyze the details of the case. It develops not only creativity, but enhances critical thinking and analytical skills by immersing students in the complexities of legal cases.

Creating AR legal vocabulary flashcards, indeed, develop an AR app that overlays legal vocabulary flashcards when students view specific legal terms in their textbooks or study materials. It helps them to reinforce legal terminology and language skills through interactive and visual aids.

These examples show how VR and AR can be leveraged to create dynamic and interactive learning experiences for law students studying Professional English, fostering a deeper understanding of legal concepts and enhancing language proficiency in a legal context.

As a creative way of studying Professional English as well as other subjects with a help of AI and computer-based learning gamification can be used. Thus, applying game

elements, such as points, badges, and leaderboards, to educational activities can make learning more engaging and motivating.

Also Online Courses and Massive Open Online Courses (MOOCs) platforms, which became to be specially popular in the COVID period and wide used nowadays in education, provide access to courses from universities and institutions worldwide, making education more accessible and flexible.

Using interdisciplinary and experiential learning in studying process as a way for developing creativity in computer-based learning environment encouraging students to explore a broad range of subjects and engage in internships, co-op programs, and research opportunities.

Peer learning and collaboration as a creative method of learning and assessment creates opportunities for students to learn from each other through group work, peer teaching, and collaborative projects. Using innovative assessment methods, such as e-portfolios, peer assessment, and automated feedback provides a more comprehensive view of student progress.

Artificial intelligence and machine learning is used in studying process for leveraging artificial intelligence and machine learning and tasks like personalized recommendations, grading, and data analysis to improve the educational process. As Colucci-Gray, L., Burnard, P., Cooke, C., Davies, R., Gray, D. S. & Trowsdale, J. mention, diversity and inclusion initiatives helps romoting diversity in curriculum, faculty, and student body to ensure a more inclusive and equitable learning environment (Colucci-Gray, L., Burnard, P., Cooke, C., Davies, R., Gray, D. S. & Trowsdale, J., 2017).

Data analytics and learning analytics helps in collecting and analyzing data on student performance and engagement to make informed decisions about curriculum and teaching strategies.

Universities need to adapt and embrace these innovations to meet the evolving needs of students, industries, and society. However, it's essential to approach these changes with careful planning, assessment, and ongoing support to ensure they are effective and provide meaningful improvements in the educational process. But the benefits of using technology for creative learning and assessment in studying Professional English are obvious as you Fifer 1 demonstrates.

Advantages of using technology in assessment

- consistency
- scalability
- cost-effectiveness
- improved accuracy
- greater insight
- accessibility

Conclusion

This comprehensive exploration emphasizes the critical importance of conceptual features in designing effective learning environments, particularly in intricate and irregularly structured domains. The discussion delves into two key components: the student's learning phase within a specific knowledge domain and the interactive effects of contextual elements in creative computer-based learning environments.

Thus, aligning learning and instruction with contextual factors is crucial, as highlighted by recent research revealing notable patterns of deficiency during the advanced knowledge acquisition stage, particularly in complex and ill-structured content areas. The integration of David Matsumoto's cultural interpretation and Esling Ph. David N.'s insights underscores the social aspects of creativity, emphasizing the influence of both external and internal cultural factors on individuals within specific contexts. Das S.'s emphasis on incorporating innovations into the educational process aligns with the evolving educational landscape, ensuring students are better prepared for 21st-century challenges.

The rise of generative AI systems prompts a discussion on their potential influence on human performance, particularly in enhancing creativity. Engaging with these tools allows for swift experimentation with new learning forms, showcasing their potential impact on education.

The subsequent focus on key areas for creative innovation in education, including technology-enhanced learning, flipped classrooms, blended learning, personalized learning, project-based learning, and the integration of AI, VR, and AR, underscores the diverse approaches available. Examples, such as the flipped classroom strategy and the application of VR and AR in studying Professional English for law students, highlight the potential of these innovations to provide immersive and interactive learning experiences.

Moreover, the discussion extends to gamification, online courses, interdisciplinary and experiential learning, peer collaboration, and the role of artificial intelligence and machine learning in personalized recommendations and data analysis. The emphasis on diversity and inclusion initiatives further contributes to fostering an inclusive and equitable learning environment.

The concluding remarks stress the necessity for universities to adapt and embrace these innovations to meet the evolving needs of students, industries, and society. However, a cautious approach, involving careful planning, assessment, and ongoing support, is essential to ensure the effectiveness of these changes. The evident benefits of using technology for creative learning and assessment in studying Professional English further underscore the transformative potential of these innovations in education. Moreover, the proposition of an advanced knowledge acquisition stage emphasizes the evolving nature of learning trajectories in creative teaching, learning and knowledge recreation, providing hight level of rethinking and creating new educational and ptactical ideas by students and teachers.

The suggested innovations, ranging from personalized learning to virtual reality experiences, present promising avenues for enhancing the educational process. However, it is crucial for universities to approach these changes with thoughtful planning, ongoing assessment, and comprehensive support. By doing so, institutions can effectively meet the evolving needs of students, industries, and society, ensuring a more inclusive, equitable, and impactful educational environment while studying foreign languages in particular.

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