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THE IMPACT OF GAMIFICATION ON STUDENT ENGAGEMENT AND LEARNING OUTCOMES

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Впровадження елементів гри в освітнє середовище може підвищити мотивацію майбутніх логістів і покращити результати їх навчання. Такі інструменти, як Kahoot, Coursera, Udemy, та Google виступають ключовими платформами для створення інтерактивного та захоплюючого навчального процесу. Поєднання конкурентних, самостійних та елементів групової роботи створює динамічне середовище, яке сприяє кращому засвоєнню знань та активній участі студентів. Попередні результати показують, що ігрові стратегії покращують навички вирішення проблем, підвищують залученість та мають великі перспективи в сучасній освіті.

Gamification, the application of game-design elements in non-gaming contexts, has become a popular approach to increase student engagement and motivation in educational environments. With the advent of digital tools like *Kahoot*, *Coursera*, *Udemy*, and *Google's* suite of tools such as *Jamboard* and *Forms*, lecturers now have multiple platforms to make learning interactive and dynamic.

Previous research [1, 2] has shown that gamification can significantly impact student engagement, particularly when it is integrated into technology-driven environments. Tools like *Kahoot* [3] provide an immediate feedback mechanism that turns quizzes into competitive, fun experiences, helping students reinforce knowledge in real time. *Kahoot* has become a popular tool in European universities for enhancing student engagement, motivation, and performance. It was first tested at the Norwegian University of Science and Technology [4], where *Kahoot* was used as part of classroom experiments to boost engagement. Since its launch in 2013, it has been adopted in various courses. Later, universities across Europe, (for example: Warsaw Management University, Wroclaw University of Economics and Business, Klaipeda and Vilnius Universities,

Baden-Wurttemberg Export Academy, ESC Clermont Graduate School of Management etc.), utilize Kahoot! for interactive quizzes and gamified assessments, especially to help students review their knowledge. Sessions often take place at the end of each academic block or before final assessment, enhancing both participation and retention. Students appreciate the competitive and interactive aspects of *Kahoot*, which helps in maintaining concentration during lectures .

Similarly, learning platforms like *Coursera* [5] and *Udemy* allow for personalized, self-paced learning, which, when coupled with gamified elements like badges and progress bars keeps students motivated.

Coursera [6] offers numerous benefits for students seeking to advance their education through flexible, accessible, and high-quality online courses. One of the key advantages is the variety of courses available, covering a wide range of subjects from business to specific logistics and supply chain development. *Coursera* partners with top universities and institutions, such as Stanford, Yale, and *Google*, ensuring that learners receive education from experts in their fields. This global accessibility means students can learn at their own pace, on their own schedule, making it an ideal platform for working professionals or those with other commitments.

Another major benefit of *Coursera* is the ability to earn recognized certifications and degrees. Many courses offer certificates upon completion, which can boost a student's resume or LinkedIn profile, providing tangible proof of their newly acquired skills. With interactive learning features such as quizzes, peer-reviewed assignments, and discussion forums, students are also able to actively engage with course materials and receive feedback, helping to reinforce their learning experience.

Udemy [7] and *Coursera* [6] both offer robust online learning platforms, but they differ in several key aspects, particularly in terms of course structure, accessibility, and pricing.

- *Udemy* allows anyone to create and sell a course on its platform, offering a massive variety of courses across a wider range of subjects, often including niche topics that may not be available on *Coursera*. This model encourages a broader pool of instructors, from transport industry professionals to independent experts, offering practical logistics skills training. *Coursera*, on the other hand, partners exclusively with accredited institutions and universities, which results in a more standardized and academic focus on course content.
- *Udemy* operates primarily on a pay-per-course model, where students purchase courses individually, and they retain lifetime access to

those courses. *Coursera*, in contrast, offers both free courses and subscription models, where students gain access to a wide range of courses for a fixed monthly fee, but access to some of the material is time-limited. The lifetime access model of *Udemy* appeals to users who prefer to learn at their own pace without time constraints.

These differences make *Udemy* ideal for those seeking flexible, affordable, and practical courses, while *Coursera's* structure is better suited for learners looking for formal education and accredited certificates from renowned institutions.

Earning additional certificates from platforms like *Udemy, Coursera* etc. offers significant benefits for students looking to advance their careers. These certificates serve as proof of newly acquired skills, which can enhance a student's resume and make them more competitive in the logistic job market. They demonstrate a commitment to continuous learning and professional development, which is highly valued by employers. Furthermore, certificates, issued in collaboration with prestigious universities and companies, add recognition to the qualifications. For instance, earning a certificate in a specialized field such as logistics can open up new job opportunities. On *Udemy*, students have the flexibility to learn niche skills quickly, giving them an edge in industries that value practical, hands-on expertise. These additional certifications help professionals stay updated with transport industry trends and gain skills that may not be covered in traditional academic programs.

Gamification is based on cognitive and behavioral theories, such as self-determination theory [8] and constructivism [9]. These theories suggest that learners are more likely to engage with content when they have autonomy, feel competent, and are given opportunities to collaborate. Gamified learning environments meet these needs by offering flexibility through self-paced online platforms [6,7], recognition of achievements through badges and certificates, and social engagement through competitive elements in tools like *Kahoot* or *Google Forms*.

Lecturers can implement gamification in education to create interactive and engaging learning experiences. By incorporating tools like *Kahoot* for real-time quizzes, they can foster competition and collaboration among students, making learning dynamic and fun. These quizzes can be used to review material, check understanding, or introduce new concepts in an interactive way. Platforms like *Coursera* and *Udemy*, with features such as progress tracking, badges, and peer interactions, allow to motivate students with achievements and recognition for their efforts. *Google* tools like *Jamboard* can also be used for collaborative projects, where students can work together to solve problems or brainstorm, while *Google Forms*

provides a quick and gamified way to conduct assessments. Through these tools, gamification can transform the learning process by making it more engaging and motivating for students.

Conclusion

Preliminary results show that students who engage with gamified tools tend to have higher retention rates, more positive attitudes toward learning, and improved problem-solving skills. The integration of game-like elements, such as challenges, points, and immediate feedback, provides a structured yet enjoyable way for students to absorb information and apply it in real-world scenarios.

Gamification, when applied through digital tools, has a transformative effect on the educational process. It not only enhances student engagement but also promotes deeper learning and collaboration. The implications for the future of education are significant, as more transport institutions begin to adopt these strategies to cater to the evolving needs of modern learners.

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