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TOOLS SUPPORT E-LEARNING: A REVIEW

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Abstract:

Nowadays, the internet is becoming more user-centric, allowing for two-way information exchange. The term of Web 2.0 means internet applications which allow sharing and collaboration opportunities to people and help them to express themselves online. e-Learning is a term used in education to describe web 2.0 technologies and applications into educational and institutional activity. In the meantime, providing complete strategy to provide an effective learning environment that includes various courses, software, and infrastructures. Meanwhile, e-Learning is a popular method of imparting training in today's world. However, a large percentage of e-learning content fails to fulfil successful teaching and learning standards, emphasizing the need for guidelines on how to structure online resources for effective learning. Therefore, this paper has reviewed tools such a Gamification, Learning Management System (LMS), HTML-5 package (H5P) that will support e-learning to develop effective learning.

Keywords:

E-Learning, Gamification, LMS, H5P

Introduction

Computers have been used for educational purposes since the 1960s and 1970s, but with the help of the Internet, they were used more enthusiastically among e-Learning volunteers,

students, and educators in 2000 (Alowayr & Badii, 2014). Furthermore, the computer is in the second row in the efficient e-learning process in terms of providing technical improvement, either with the assistance of the latest hardware and software. Thus, technology has the potential to alter education. It can assist instructors and students develop and progress their relationships, reinvent our approach to learning and collaboration, close equity gaps, ensure long-term accessibility, and customise learning experiences to match the needs of all students (US Department of Education, 2016). Moreover, through individualized learning, technology is becoming a prominent trend in education. Students can pick what they study, how they learn, and how their learning is displayed via technology. Teachers and students can respond to vulnerabilities and enhance strengths during the learning process using formative research aided by digital resources (Mohd et al., 2020).

e-Learning is concerned with distributed learning, online learning, interactive learning, web-based or networked learning, and testing and determining the best reviews, involvement, and interaction between the teacher and the learner in e-learning environments through specific channels (Alowayr & Badii, 2014). Three primary interactions underpin e-Learning instruction: student-student interaction, student-instructor interaction, and student-content interaction. These three interactions are the foundational relationships that make an e-learning environment run smoothly (Luo et al., 2017). Besides, e-Learning is widely employed as a new method of delivering instruction around the world. However, a large percentage of e-learning content fails to meet the criteria for effective teaching and learning, stressing the need for guidance on structuring online resources for effective learning. With that in mind, numerous tools for e-learning support have been discussed in the literature review section.

Literature Review

Gamification

Although gamification is not a fundamental aspect of adaptive learning, gamification can successfully organise and increase learning engagement (Mahfuzah Mohamad et al., 2019). Gamification plays a vital and positive role in such a complex situation. Teachers can apply game elements to non-game situations to engage pupils in problem-solving and improve their motivation and academic performance. Students who participate in games gain more intellectual ability than those who do not. According to research, this boosts their motivation and academic achievement (Antón-Rodríguez et al., 2020).

Furthermore, gamification could develop as a valuable, cost-effective, and efficient technique for educators to improve learning outcomes (Sanchez et al., 2020). Gamification is applying game design features (e.g., points) and game characteristics (e.g., assessment, challenge) to generate positive outcomes in non-game environments. Gamification is a phrase that refers to the usage of game-based concepts and practises outside of leisure activities to enhance participant motivation and enhancing results (Salen, K. and Zimmerman, 2003). Gamification has been investigated as a means of increasing motivation and engagement in educational and work-related settings (Hamari & Sarsa, 2014). In this regard, there have been earlier examples of gamification approaches being used in both official and informal learning situations (Lee & Hammer, 2011).



Figure 1:Example of Gamification in Web

For instance, Figure 1 has illustrated the gamification in learning tools like Moodle. Poondej & Lerdpornkulrat (2019) described the gamification planning in Moodle. These five elements of game mechanics have identified that used extensively in the learning context.

Five Elements of Game Mechanics

Experience Points (XP)

Students can gain XP points in two ways: when they finish the quiz, and when they perform a specific action in an e-learning course, such as checking in, posting in forums, or accessing reading materials. The quantity of XP awarded varies based on how much effort is required to complete the task.

Levels

May employs an exponential technique to dynamically calculate the level based on the XP required to get it to estimate the number of levels. There are 20 level computations in this system.

Badges

Badges are divided into two categories. To inspire students, you could establish some activities that they must perform to get a badge, such as engaging in forums, asking smart questions, and working hard; second, you might build a badge that they earn each time they fulfil a specified task.

Leader Boards

To provide a visual representation of how students in each endeavour can use the level board system at the peer level. This allows pupils to compare their progress and performance to those of their classmates.

Progress Bars

Use the progress bar to show how far students have progressed to the next level. Giving pupils feedback can help them study more effectively.

According to the LMS Industry User Research Study (Brian Westfall, 2020), gamification is the first Learning Management System (LMS). Besides, incorporating gamification elements

into e-Learning would also raise user motivation and engagement during the learning process and enable users to use the e-Learning for a longer time (Nurul & Mohamad, 2018).

Learning Management System

The uses of technology in the learning process are to disseminate, illustrate, communicate, or maintain students and teachers in activities designed to sustain learning. The application of technology in learning is expected to increase the effectiveness of learning (Gunawan et al., 2019). Moodle is one of the most widely used open-source course management systems in online education right now. It is a PHP-based free and open-source learning management system published under the GNU General Public License. Moodle, based on pedagogical concepts, is used in schools, universities, workplaces, and other sectors for blended learning, remote education, flipped classroom, and other e-learning projects. It is used to develop private websites with online courses for educators and trainers to meet learning goals, and it has customised management tools. Using community-sourced plugins, Moodle (acronym for Modular Object-Oriented Dynamic Learning Environment) enables for the extension and customization of learning environments. Moodle's source code is built in PHP, a popular open-source programming language that was designed to create dynamic Web pages. The Moodle trust oversees the platform's core development, but the software is meant to be very flexible, and throughout the years, several individuals and organisations have produced plug-ins and other add-ons to expand capabilities.

Strength

- **Open-Source:** It is free and simple to use for teachers.
- **Flexible Learning:** Moodle's eLearning platform allows students to access courses and information at any time.

Learners can access materials from anywhere they have Internet access, allowing them the flexibility to learn at their own pace.

- **Mobile Compatibility:** Moodle provides mobile eLearning, which makes learning on the go more convenient. Mobile eLearning is viewed as a valuable addition to the learning process because it allows students to access course content from any mobile device.
- **Multilingual:** Moodle is available in over 100 languages, making it accessible to students all over the world. As a result, you will be able to offer your courses in as many languages as you like.

Weaknesses

- In some web browsers, you will not be able to embed stuff.
- There are no instructions or assistance on how to use specific functions.
- Without substantial code work, the interface design does not provide many possibilities for rebranding and modifying its appearance and feel.
- Many major corporate clients want a full-featured competency development and management toolkit, which Moodle lacks. Moodle suffers in certain markets where strong competency management is a must, despite workarounds that provide some competency monitoring and reporting.

Despite these drawbacks, Moodle is an excellent Learning Management System (LMS). Its concentration on simplicity makes it excellent for groups with little resources, such as schools, non-profits, small companies, and local government agencies.

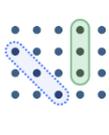
Integration of H5P Activities

H5P, or HTML-5 Package, is a plugin solution that enables educators to create and run interactive content and video within a learning management system (LMS) or any e-Learning browser. H5P has the following advantages: open-source, free to use, HTML5 compliant, responsive, and accessible. The Learning Environment Team identified the open-source tool 'H5P' as a suitable tool with a large suite of interactive objects that used to present to students and engage them in a variety of activities (Lambda solution, 2020).

To support a Learning Tools Interoperability (LTI) was created to incorporate the H5P tool into the LMS, allowing academics to design their own online interactive lectures and learning activities quickly and efficiently. H5P (HTML-5 package) is a tool for creating rich interactive HTML-5 e-learning content that can be shared and reused. Several authors have emphasised the necessity of implementing interactive activities to enhance meaningful and active learning (Singh & Scholz, 2019). Table 1 has summarized the type of interactive content of H5P.

Table 1: Type of Interactive Contents Of H5P (Lambda solution, 2020)

Image	Descriptions / Functions
	To create time-based arithmetic quizzes
	To create text-based turning cards
	To create a presentation with interactive slides
	To create drag and drop tasks with images
	To create task with missing words in a text
	To create stylish and modern flashcards
	To create an image with a question and answer

Image	Descriptions / Functions
	To create text-based drag and drop tasks
	To create flexible multiple-choice questions
	To create personality quizzes
	To create a questionnaire to receive feedback
	To create a sequence of various question types
	To create grid word search game
	To create True/False questions
	To create videos enriched with interactions

Conclusion

Students have a variety of learning styles. For example, some people learn best through graphics, while others prefer writing and reading. Others may learn through experimentation and example, while others may deal with theory. e-Learning is a step ahead of inefficiently securing future educational demands with new teaching aids. The discussion about the tools that support e-learning, such as gamification, with their element of game mechanics can give a sense of motivation and engagement. Meanwhile, Moodle is an open-source platform that sustains online learning. H5P also assisting thru a large suite of interactive objects and a variety of activities. These features of integrating or embedded with another system are the great advantage of H5P. In future planning for online education, e-learning can be developed by

Moodle as a platform and add the activities of courses with gamification tools and H5P activities.

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