



E-Learning Platforms and Resources for Slow Learners in The Field of Biological Sciences at the Secondary Level.

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In the ever-changing field of education, incorporating information and communication technology has become essential for our learning process. The rise of e-learning platforms and tools provides a transformative solution for those who encounter difficulties in traditional learning settings, like slow learners. In the field of biology, where there are many complex ideas and processes, these tools offer customized assistance, interactive materials, and personalized learning opportunities for all students' varied needs. This article explores the importance of e-learning in improving the educational experience of slow learners in biological sciences, investigating the numerous advantages and creative methods that promote comprehensive and successful learning results.

Idea of E-learning

E-learning, also known as electronic learning, is an educational approach that uses electronic technologies to deliver educational content and improve communication between teachers and students. Digital tools such as multimedia presentations, online courses, virtual classrooms, interactive simulations, and web-based resources are utilized. In 1999, the concept of E-learning was first introduced during a seminar focused on Computer Based Training (CBT) systems. This approach enables students to access educational materials and engage in learning activities remotely, offering flexibility in terms of timing, location, and pace of learning. Two forms of online learning exist: asynchronous, where learners progress at their speed, and synchronous, involving immediate interactions with teachers and fellow students.

This educational system consists of various approaches and techniques such as online education, mobile education, computer-based education, and virtual classrooms. E-learning involves distributing material through the Internet, Extranet, audio and video tapes, satellite, and CD-ROMs.

This educational model includes different practices and methods like online learning, mobile learning, computer-based learning, and virtual classrooms. E-learning encompasses delivering content via the Internet, Extranet, audio and video tapes, satellite, and CD-ROMs.

E-learning, according to Elliott Masie, involves using network technology to create, distribute, choose, manage, and expand learning options. E-learning allows students to interact with educational resources and participate in learning.

Features of E-learning

Accessibility: Thus, e-learning offers learners the liberty to get the web page content from any place and at any time whenever they are connected to the internet. It presents an occasion where people outside the locality can have the opportunity to do it.

Flexibility and Convenience: Moreover, e-learning lets students choose whichever pace and time suits them. They can develop schedules that fit their convenience by finding time for their activities as well as work shifts or other previously assigned tasks.

Multimedia-rich Content: Digital learning usually features interactive multimedia tools like videos, audio recordings, animation, charts and graphs, and virtual reality. This engaging and dynamic engagement which is interactive in nature enriches that process of learning by complying with the different styles of learning.

Personalization and Adaptive Learning: E-learning sites might be customized to be more user-friendly for the personalized requirements of each learner. The system will use a data analytic tool and artificial intelligence to identify the learning strengths and weaknesses of the learner and create personalized content, recommendations, and learning pathways based on that.

Interactivity and Collaboration: Virtual learning provides space for interaction between learners, and instructors and for peer-to-peer collaborations. Forums, virtual classrooms, videoconferencing, and collaborative projects set possibilities students for the participate, in knowledge exchange, and active participation.

Immediate Feedback and Assessment: The e-learning system quite often brings in the assessment tools which among their functions provide feedback to learners immediately after finishing the quiz, task, or test. The speedy feedback enables quickly learned assessors to understand the place they are and places that require more improvement.

Cost-effectiveness: E-learning is a relatively cheap method of educational tool for students. It reduces the costs linked to building physical infrastructure, printing materials, and traveling expenses because it uses technology as the primary tool for learning.

Continuous Updates and Accessibility to Resources: E-learning materials get easier to update and correct which leads to access to the most updated content and resources for the learners.

Global Learning Community: E-learning supplies learners from different regions with an opportunity to build a network sharing ideas, as a global learning community of diverse perspectives and experiences is created.

Slow learner

'Slow learner' is a word that is very often used for students who constantly have to absorb a knowledge/competence less quickly than others who are of the same age/grade. According to the instruction of Savage and Hooney (1979), low-level students may be placed within the range of 75-80 IQ point. The studies they do face a limitation factor which is their relatively lower brain supplies. In some cases, the target students may require the instructions to be repeated or need tailored education to fully grasp the topics of the discipline and live up to their expectations in the studies. This distinction should be drawn between users who sluggishly learn subjects and subjects participants (people) who have learning disabilities or intellectual disabilities. In general their learning ability is similar, however, they may face certain problems caused by learning styles, attention disorders, or uninterested with subject matter.

At the point of avoiding slow learners getting marginalized, it is crucial that the specific factors that should be acknowledged and addressed, so that they can perform on par with their studied counterparts. Being the case, that the slow learners can have different strengths and weaknesses, teachers can develop a strategy that will match the learning pace for all the group helping all the group to be involved into the process that will lead to more clear and successful learning.

The recognition of the specificity of the slow learning traits such as the importance of acceptance, understanding, and differentiated student-learning needs the society. Providing them - recruitment resources, remedial programs or other alternative modes of education - would help them learn quickly and in the long run stem from it an enhanced self-esteem. Educators are those who should see the slow learners as the pupils who can learn only when they are equipped with necessary resources, support and encouragement, which will raise their moprall levels and change their paradigms.

Characteristics and Challenges of slow learners

Difficulty in Grasping Concepts: What is especially unfortunate is that these kinds of learners who have difficulties understanding, and processing new information frequently find themselves losing their one-and-many times motivation as well. Such students may need more time to get the content before you proceed to you to the individual who might have already understood the content. Since, this they can take more from a teacher such as, time of teachers and patience of teachers to understand all the concepts so that there will be no lack of understanding.

Limited Attention Span: It is quite obvious that the learners who are procrastinators tend to lose focus during classes and all related activities such as lectures and class engagements in respect to their slow learning nature.

Weak Memory: Learners with slower rate of processing may experience trouble in committing to memory patterns. This could mean that they have difficulty recalling information covered in previous units which is put them at the disadvantage when building a connection between subjects' principal concepts.

Inconsistent Performance: Students of the 'slow learner' type usually have different variability of academic achievements across the disciplines. However, for them, it could be a paradox as they can come out as experts in some subjects with a strong passion or have natural ability, but in other subjects they will have to overcome challenges which are difficult for them.

Lack of Motivation: The notions like frustration and low motivation can be quite common among slow-learners, this is especially due to their low self-esteem arising from the perception that they are however doing much worse than their fellows. Probably they are facing such a barrier because the routine of the accelerated programs keeps them lagging behind in the coursework.

Poor Organizational Skills: The same issue is with the so-called slow learners that find it difficult to collect, process and structure these things . This makes assignments impossible to finish on time, time management to be a problem and academic demands not to be deal with adequately.

Difficulty with Abstract Thinking: Learning speed can be an impediment, making it harder for slower learners to get grasp of concepts that encompass the abstract or complex, demanding higher-level thinking skills. They could own skills in the field that necessitates concrete and practical matters but they might be confounded when subjects are abstract and hardline.

E-learning Platforms and resources to learn Biology for slow learners

Learning Management Systems (LMS): LMS are greatly useful platforms that aid in the structuring and presenting online courses. In terms of Biology education, teachers have an opportunity to put their lecture materials, the interactive lessons, quizzes and the assignments onto the LMS. Students are empowered by these properly at their convenience so that they can learn at a pace that suits their needs. LMS platforms facilitate the interaction between the teachers and learners so supporting them becomes easier by giving immediate feedback and assistance. They are middlemen between students and course material and that's expands a structured and organized learning experience. Ex: Google-classroom and Adobe-learning manager.

Virtual Labs: Virtual laboratory simulations expands students' capabilities to carry out experiments and observations in a computer-simulated setting. Through these simulated environments, students will experience what feels like a real laboratory, where they can dive into biological processes, perform an experiment, and even analyze the data. Virtual labs allow students to experiment even if there are no or limited physical laboratories or for certain experiments that may not be done due to reasons related to safety or resource constraints. They are designed to provide protection and afford the perks such as having an inexpensive way to involve students in practical activities and scientific research. Ex: DIKSHA portal.

Multimedia Presentations: Multimedia presentations in Biology education integrate a composition of diverse media elements, including text, pictures, videos and animations. These interactive training deliver contents in an attractive and exciting approach that would be easily understood by students no matter how complex the biological concepts are. The media that are used for introduction of new concepts, illustrating complex processes, and reinforcing the main ideas are Multimedia presentations. They provide for different types of learner, through which students can use various types of modes in order to grasp ideas and information better or for long term remembering. Ex: MS power point, Canva and Keynote.

Online Quizzes and Assessments: Online tests and assessments are the utmost way to understand the knowledge of students in Biology. Those quizzes can be created to measure both knowledges of facts and critical thinking.

Students are frequently given access to prompt feedback that lets them identify the areas where they can improve and take measures for correction. Gamified quizzes, where students can earn points or badges depends on their performance, are instruments that stimulate students to actively face the challenge and to improve themselves.

Ex: Kahoot, Quizlet, and google forms are some of the digital platforms that are used.

Discussion Forums and Social Learning Platforms: Online discussions and learning platforms in social media create interactive information sharing experiences. Students can learn, by taking part in conversations, by asking questions, and by giving examples on the Biology topics. These platform provides a community aspect that enable students to assist each other, and to consult other peers and instructors if necessary. Togetherness learning expands learners' critical thinking and problem solving skills augmenting their involvement in the learning process.

For example WhatsApp and Facebook communities.

Virtual Reality (VR) and Augmented Reality (AR): VR and AR are two leading technologies in which biology education provided its students with a fully immersive learning experience. Through VR students can tour the 3D models of a biological tissue, an ecosystem and an organism in virtual reality. AR superimposes digital elements on real surroundings, therefore students can learn not only about physical world but also be able to use these virtual content. These technologies deliver a much deeper understanding of the matter of complex biological principles by letting the learner to see and experience the abstract or unaffordable phenomena. To take this instance students use VR headsets provided by Google for free in schools.

Mobile Apps: Mobile apps, which are invented to support Biology education, present students with the chance of education being available at all times. These apps provide the user with the use of interactive quizzes, flashcards, educational games and learning materials which can be accessed from mobile devices. Apps for mobile devices are in tune with students' modern lifestyle and support the consumption of course information in fractions, opening students the possibility to gain Biology skills on the go. Ex: Khan academy, Biology master, Biology dictionary etc.

Gamification: Gamification process can be easily implemented into the e-learning system and can have various elements such as badges, points and leaderboard. Through applying gamification, Biology education is provided with a possibility to create its atmosphere of friendly co-operation and drivers up the students' involvement. Through a recognition mode, students that do well in Biology classes are accorded awards for their success and this reinforces in them to concentrate more on the subject and try to keep up the pace in every lesson. Kahoot, Quizlet are some of the effective tools for gamification.

Webinars and Live Virtual Classes: Among webinars, which enlist two approaches, live and virtual classes allow students to "instantly" communicate with their instructors. We are doing live trainings as well throughout the workshops, and the basics are explained, questions and answers sessions are held where confusion is cleared, then lastly, there are collaborative activities to finalize what was learned. Due to the fact of the virtual meetings which are transmitted live students, who are studying the same subjects, have opportunities to speak with the teacher, to put questions and to get the answers at once. Ex: Zoom, Google meet, etc...

Open Educational Resources (OER): OER, which are the cost-free learning materials designed for general Biology teaching, can also be used for other science content. Example of such resources which may include textbooks, lecture notes, videos, or simulations are the class resources. OER promote open-access that has provided techniques of affordability, that bring about the ability of students to have access to knowledge of high standards at no extra charges. The teachers can benefit by integrating the selected OER into their course material or with providing varied and more self-study options.

Ex: Unacademy, BYJU'S, SWAYAM, DIKSHA etc.

The implementation of eLearning tools and platforms has demonstrated a markedly positive impact on the academic achievement of slow learners in the field of biology. By providing interactive, multimedia-rich learning experiences tailored to individual paces and learning styles, eLearning empowers these students to grasp complex biological concepts more effectively.

The flexibility inherent in eLearning allows slow learners to revisit challenging topics repeatedly until they achieve mastery, fostering a deeper understanding of the subject matter. Additionally, the integration of simulations, virtual labs, and immersive visualizations into eLearning environments makes abstract biological processes more tangible and relatable, enhancing comprehension and knowledge retention.

Furthermore, the personalized feedback and adaptive learning paths offered by many eLearning platforms enable slow learners to receive customized support and guidance, addressing their unique learning needs and bridging potential knowledge gaps. This targeted approach nurtures their confidence and motivation, ultimately leading to improved academic performance in biology.

Overall, the evidence suggests that eLearning serves as a powerful catalyst, empowering slow learners to overcome barriers and excel in the study of biology by providing a supportive, engaging, and tailored learning experience. Embracing eLearning as a complementary tool to traditional classroom instruction holds immense potential for fostering inclusivity and ensuring academic success for all learners, regardless of their pace.

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