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RESEARCH ARTICLE

FEATURES AND APPLICATIONS OF NANO-LEARNING MODEL

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ABSTRACT

The small scale of the training content allows participants to access the content easily, at their own pace, and most importantly, at the appropriate time. On the other hand, the fact that nano-learning is more focused increases permanence by preventing unnecessary information confusion. As the content focuses on several learning objectives, the students can reach what they look for. In the study it is aimed to determine whether nano-learning or micro-learning is effective fort he students who are bored with traditional distance ecucation. We gathered information about nano-learning and tried to find out availability, usability and applicability of Nano-learning for those who have difficulties concentrating on courses in classroom environment. It is concluded that the primary purpose of nano courses is to impart a large amount of useful information in a short time. This is particularly appropriate in the context of continuous learning, as a person can constantly acquire new information without having to spend a lot of time. It is concluded that there is a great decrease in the attention span of students, and therefore nano-learning becomes more applicable in our coutry.

Key words: Nano Learning, Educational Management, Lifelong Learning, Micro-learning

1. INTRODUCTION

The COVID-19 pandemic, which brought the world to a standstill, not only changed the way students study, but also forced the Education Technology sector to raise the bar. Technologies in the classroom have consistently been an opportunity and an advantage for schooling, enabling personalized, mastery-based learning, saving time for teachers and equipping students with digital skills that will be needed in the 21st century (Kayalar, 2021; Kayalar and Kayalar, 2020). During the pandemic process, hundreds of thousands of schools, millions of teachers and students all over the world had to switch to remote classrooms and adapt to it almost overnight. Meanwhile, educational technologies have made things easier by making traditional teaching methods better. Economically, by 2025, the e-learning market is projected to grow to a value of $325 billion, indicating its highly positive trend.

The education industry has embarked on a process of change that can cause schools to inject more project-based learning into their lesson plans, data-driven decisions to create new policies, and innovative solutions to everyday problems for students, parents, and educators. The educational technology industry is already beginning to explore gamification strategies that will soon be a key element in our approach to education.

With all the changes we've experienced since March 2020, innovation in problem solving has proven to be an extremely valuable but uncontrolled commodity. Processes such as design thinking provide opportunities for innovation, especially in crisis situations that require effective solutions quickly (McCombs, 2015; Davidson-Shivers, Rasmussen, & Lowenthal, 2018; Branch, 2018). In the near future, it is expected that the digital literacy of teachers and students will accelerate, and technologies including micro-learning and nano-learning models will be used to encourage interactions and cooperation in a way that will transform every classroom into a student-centered study area thanks to the large investments made by schools in technology infrastructure.

Nano-learning makes learning faster, easier and more favourable for professionals and students who seek constant updates in various fields but cannot keep up with the latest developments due to lack of time. In other words, nano-learning is a tailor-made solution for 21st century students who cannot adapt to long hours of learning in their fast-paced lives. Moreover, studies show that there is a great decrease in the attention span of students, and therefore nano-learning becomes more applicable (Fahey & Ramos, 2015).

2. NANO-LEARNING

In the Cambridge Dictionary, Nano is defined as one billionth of the specified unit and is extremely small. Nano learning capsules can be used for studies, education, etc. It is one billionth of the books/hours that need to be spent on it.

Nano Learning is defined as learning at bite size, that is, at a very small scale. It is a continuous learning process in which the student acquires knowledge without spending long hours. Nano-learning offers shorter

and more intensive learning capsules. For example, a two-minute interaction with an expert will remove ambiguities and increase your knowledge quotient. Or, short reading materials will be helpful in understanding the reasoning behind a concept or formula.

The National Association of State Boards of Accountancy (NASBA) has defined nano-learning as an educational program designed to allow a participant to learn a specific topic in a ten-minute period using electronic media and without real-time interaction (NASBA, 2017).

Nano-learning is a teaching method that incorporates small-scale learning content into daily lesson plans. It aims to attract students' attention with short-form content in formats such as videos and text messages. Also, the concept of nano-learning can be used to design modules, create infographics using text, audio, music and all sorts of engaging strategies. These ingredients take two minutes or less to absorb. Nano-learning is the manifestation of the saying “less is more”. It can be an alternative to longer videos lasting two to three hours, sometimes longer. Nano-learning is a model that helps students access information more easily and quickly. With nano-learning, teachers are much more than ordinary educators; they also become curators as they use online tools to create and share this very small size of learning content. Educational institutions can also work with creative people to successfully organize nano-learning lectures and similar events.

Nano-learning is a quick way to access information when it is needed; It is precise and essential content scaled down to the smallest bytes for quick and effective assimilation of skills and knowledge. Nanolearning is not limited to videos. It includes a variety of content such as texts, infographics, interactive games and quizzes, audio, presentations and flashcards.

Today's employees often multitask an average of 8 hours a day to complete their tasks, leaving little time for learning. Smart companies have incorporated nano-learning into their daily plans and programs to ensure the continued development of their workforces. To make it more exciting, employees can absorb small information even on the go using smart devices.

2.1. Features of nano-learning

Due to less time required to absorb knowledge, students become more productive through nano-learning. They will likely be mindful throughout as they don't have to spend at least 3 hours trying to absorb what they see. Pieces of content used in nano-learning are an effective way to retrieve and store information. Additionally, students can easily break down learning objectives into small chunks, helping them feel less overwhelmed and bored. This ensures effective learning and increased productivity in students.

Nano-learning aims to reduce the time students spend on learning. Three hours of content can now be split into two minutes. However, for this to be effective, more research, practice and expert guidance is needed. Due to the transition to online learning, students and teachers now need to use their computers for at least 8 hours a day. Therefore, looking at screens for longer periods of time can cause eye strain and headaches. With the help of nano-learning, screen time can be reduced to help both students and teachers experience screen fatigue.

Nano-learning consists of short pieces of content through videos, animations, illustrations, infographics and more. They use online platforms that kids are familiar with, such as TikTok, Twitter, and Messaging Apps. With this, students feel more interested and excited about coming to their classes. In addition, while introducing the concept of nano learning, students' attention spans are also taken into account. To grab their attention from start to finish, lessons are now broken down into smaller chunks that take less time to absorb.

Students will swipe their screens from top to bottom as they access their nano-sized modules using online platforms. This enables faster and easier access to content through nano-learning. Teachers can also limit lesson objectives to make them shorter and more effective. In addition, nano-learning can provide ways for students to get immediate feedback from their modules.

Both teachers and students will benefit from nano learning very effectively when they install the application in the classroom environment. It will not only be useful and efficient, but will also provide teachers and students with an additional set of digital skills. Keeping up with the rapid development of technology is extremely important for contemporary education. All educators need to be flexible and adapt to these changes. This is the most effective method of educating students through student-centered teaching.

A nano-learning program differs from a Self-Study program in that it typically focuses on a single learning objective and is not paper-based, and is not a substitute for comprehensive programs that address complex

topics. Nano-learning is not a group program. Typically, nano learning sessions are between 2 and 10 minutes long.

It is undeniable that technology simplifies life and makes things easier in every field, but skeptics have always been skeptical of technological advances. They described advanced technology, especially digitalization, as a bubble that will burst soon, but on the contrary, digitalization has become a reality. The same is true for nano-learning, and it's a relatively new concept. Lessons powered by text messages are accessible, yet effective and easy to create. Therefore, students became aware of the benefits of advanced technology and digitalization. Considering the futuristic trends and the overwhelming response, experts always say that nano-learning is permanent.

Ryan Laverty, co-founder of Arist, a text messaging learning platform that operates through SMS and WhatsApp and pioneers education, envisions a brighter future for nano-learning, with students more likely to be from Snapchat than school, YouTube more than libraries, and the New York Times. He says he will learn more from TikTok than he does. Ryan says that students will get their information from voices that are short enough to hold the attention spans of minutes for a generation who never knew life without smartphones (ARIST, 2021). Nano learning is done in a matter of seconds, either via platforms such as Twitter, TikTok or text messages, or by voice. Arist works with leading organizations to transform learning strategies using text message-based training.

Elliott Masie (Masie, 2021), president and CLO of The Masie Center Learning Consortium and CEO of The Masie Center, says that nano-learning can be applied in various fields such as Medical Nano-learning, Leadership Nano-learning, Client Nano-learning, Tourism Nano-learning, Coaching Nano-learning

Other features of nano-learning are as follows;

- ✓ Duration can vary from one to 15 minutes
- ✓ It is highly targeted as it is for a single purpose.
- ✓ This model is also called the “self-contained model” because the person learns through progress at his own pace.
- ✓ It offers small pieces of information
- ✓ It is viewable and easy to find on a range of devices
- ✓ It can be learned through diversified electronic learning mode consisting of text, video, audio, image, etc.
- ✓ It is goal-directed learning as it provides immediate benefits from learning.
- ✓ It provides students with flexibility to consider determinants when applying nano-learning.

In order for these features to be efficient and effective, teachers should examine the relevant student groups, keep the modules short, set learning goals and gather them in a single goal, and provide phone or tablet access to student groups. In addition, teachers should assess students' desirability in the context of audio or video-based learning and encourage a culture of sharing learning as many students engage in informal learning through social media platforms.

2.2. Nano-Learning for Lifelong Learning

Lifelong learning means continuing to develop professionally and personally. After an intensive academic education at universities or colleges, the knowledge gained by students who graduate during this period can quickly become old. Many modern professions require the ability to develop one's knowledge and abilities in order to keep up with research, new developments and breakthroughs in the field (Drakidou, 2018). Many people are faced with some problems in continuous learning that can be easily solved with nano-learning. It is quite easy for students to lose their motivation during a long learning process. In most cases, the reason for this is that the person is tired and fed up with long lessons and the time that should be spent learning (Longworth, 2018). The primary purpose of nano courses is to impart a large amount of useful information in a short time. This is particularly appropriate in the context of continuous learning, as a person can constantly acquire new information without having to spend a lot of time.

Many people don't have time to learn when they have other things to do, such as jobs or household chores, and eventually quit this practice. Nanolearning solves this problem as it becomes easier to fit new and exciting information into an adult's busy schedule. Another problem related to continuing education is the economic difficulties that will arise. The creation of full-fledged educational activities is very costly as it

requires a lot of human resources (Lee et al., 2020). In the case of nano-education, the creation of such an event does not require costs such as the creation of educational environments and teacher expenses. Nanotraining is a pre-built and recorded program that can be reviewed and re-edited multiple times without requiring new resource inputs. The cost of this type of training is thus significantly reduced and makes this lifelong learning very practical.

2.3. Similarities between Nano-learning and Micro-learning

The issue of whether micro-learning and nano-learning are the same or different has created many disagreements and debates among educational scientists. Micro-learning is a mode of e-learning that includes micro-bursts of highly engaging and interactive information presented to students mostly from a short-term learning perspective. Nano-learning, at the other, is an e-learning module designed to enable students to learn a specific content in a 5-minute timeframe. Both micro-learning and nano-learning focus on providing students with a learning experience that spans a short period of time and meets students' just-in-time learning goals. Both have almost the same learning objectives, design style and handling of content, but nano-learning is generally shorter than Micro-learning, thus making it more attractive than micro-learning. Normal microlearning time ranges from five minutes to fifteen minutes, while nanolearning is between three and five minutes.

Common features of micro-learning and nano-learning;

Both micro-learning and nano-learning are based on the common Pareto principle. Both micro-learning and nano-learning take minimal information at a time and build it into catchy nuggets (Madan, 2021). Both models focus on a single learning goal. However, nano-learning focuses more on a very specific learning goal due to its even shorter study time. Students have full control of both micro-learning and nano-learning

- ✓ They can decide what, when and how much to learn,
- ✓ It supports “learning on the go” feature.
- ✓ It helps students know the immediate feedback and correct the error instantly, thus closing the knowledge gap
- ✓ It has rich multimedia features such as text, video, image, picture and sound.
- ✓ It appeals to all types of students and students of all ages enjoy them because of their flexibility.
- ✓ It helps students complete modules efficiently, resulting in retention rates and better course completion.
- ✓ It is perfect for today's students.
- ✓ It is successful model in formulating to transfer knowledge effectively.
- ✓ Micro-learning and nano-learning are based on the Pareto principle, so applying 20% of the effort in a learning activity can result in 80% of the learning.
- ✓ It encourages spaced repetition.
- ✓ It contributes to budget-friendly learning options

2.4. Advantages of nano-learning

Fragmented content, less focus, visual fatigue and other inadequacies in the learning-teaching process have led to the collapse of learning and attention span in learners. This scenario has brought new challenges to the entire education system on how to conduct smooth and effective teaching-learning activities that will help achieve learning outcomes in a busy time frame. Therefore, a number of requirements arise to present the content in a very small bite size. Here, the hero, that is, the "Nano-learning" model, which is conceptualized as "Little Miracle" in today's education system, has placed itself in the first place among all learning models. Nano-learning application will help to enjoy the following advantages.

- ✓ It meets the learning needs of the student, as it is learner-centered.
- ✓ It can be repeated in a short time to reinforce learning, as it is short and fast,.
- ✓ Inclusion of multiple modes will help learning with text, audio, video, image, etc.
- ✓ It helps to relieve learning fatigue, as learning is in short modules,.
- ✓ It is extremely convenient and perfect for today's students.

- ✓ It is designed for constructive knowledge transfer.
- ✓ It encourages spaced repetition.
- ✓ It provides budget-friendly learning options. Modules created under this are suitable for users with tools such as animation, interactive learning, etc..
- ✓ It is a purposeful learning as it provides immediate benefits from learning.
- ✓ It is suitable and ideal for the gradual assimilation of the digital audience.
- ✓ It minimizes time associated with learning.
- ✓ It is advantageous for all types of students with different learning skills.
- ✓ It makes it possible to learn at any time in the daily workflow.
- ✓ It provides better learning experiences.
- ✓ More accessibility and flexibility features have been added.

3. CONCLUSION AND RECOMMENDATIONS

It is clear that both teachers and students will benefit from nano learning because of the many advantages it offers. Not only will it be useful, but it will also give teachers and students additional digital skills. It is important to keep up with the rapid development of technology in this age. It is inevitable for all educators to be flexible and adapt to these changes in order to be successful in their profession and to meet the educational needs of students. With the nano-learning model provided by technology, it is becoming increasingly important to educate students through student-centered teaching. Some ideas and suggestions on how to incorporate nano-learning into course designs can be listed as follows;

Knowing what students need is extremely important. While nano-learning is a faster learning path, it may not be for everyone. It is important to first ask what students prefer. They need to be told the advantages of nanolearning and full content.

The whole essence of nano-learning is to split an hour of content into two minutes or less. In order for students to grasp the whole concept of nano-learning, it is necessary to look for ways to keep lesson plans as short as possible.

The nano-learning model works well with Learning Management Systems software applications such as Live-Learning, BlackBoard, Edmodo, Moodle, and Schoology. The features of these applications that support nano-sized content need to be explored. It is extremely important for teachers to educate themselves in different types of media for greater student participation. Nano-learning is for creating images, illustrations, videos, audio, etc. They can also develop students' digital skills as well as cognitive skills.

Nano-learning will enable to plan and restructure instructional strategies. It is one of the modified solutions aimed at helping students who cannot keep up with speed learning. Academic institutions must design a future where education is made accessible to all. In this way, ways such as nanolearning can be considered to make education more efficient, effective and engaging.

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