INTEGRATION OF INFORMATION TECHNOLOGY INTO THE CURRICULUM OF THE BIOLOGY DEPARTMENT AT NIS SHYMKENT

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ABSTRACT

In view of the recent developments that have taken place in the realm of technology, it is of the utmost importance for today's educators to be able to facilitate learning that is both effective and efficient through the utilization of various forms of technology in the classroom. This study's objective was to investigate the many kinds of technological tools that biology instructors include into their lesson planning and lecture presentations. In this specific piece of research, the descriptive approach is utilized using observation as well as an interview that is only partially organized. All three of these participants are biology teachers in NIS, Physics and Mathematics, Shymkent, Kazakhstan they are participating in this study. These three educators are now responsible for teaching pupils at the 9th to 12th level in their respective fields of study. The findings of the study were evaluated by applying the technology integration criteria that had been developed by Britten and Casady to the process of putting technology to use in learning and teaching. This evaluation was done by using the technology integration criteria that had been developed by Britten and Casady. Because of this, the findings of the study were able to be represented in a manner that was more accurate. According to the findings of the research, many of the technologies that are used in the biological material of Animalia biology are included in the technology that promotes learning by making use of

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conventional processes or lectures on the biological material of the Animalia Kingdom. This is the case for most of the technologies that are used in the biological material of Animalia biology. This technology was one the limited talents of teachers, the tough subject matter, and the learning style that is adopted by pupils. It should come as no surprise that educators in Indonesia require training to improve their capability of incorporating a wide variety of types of of the several technologies that were available. When using technology to teach biology, teachers have several issues that they need to keep in mind. These considerations include the limited facilities, technology into the content of the lessons they teach. This is because there are a wide variety of approaches that educators are contemplating adopting in order to integrate technology into their lesson plans.

KEYWORDS: ICT, Augmented Reality, Simulation, Integration, Future Education, verbal-linguistic intelligence.

1. INTRODUCTION

Because of the rapid advancement of information technology in the modern world, it is necessary for educators to possess a diverse set of skills to implement education in a manner that is not only effective but also very efficient. This is the case because it is impossible for educators to keep up with the pace of technological change. It is vital for both students and teachers to have the capacity to make effective use of the numerous technological developments that have occurred in recent years [1] to better one's education. This applies to both students and teachers. Teachers need to have a strong understanding of both the pedagogical technique and the knowledge that goes along with it for them to be able to organize and implement learning that is both successful and efficient [2]. In addition to this, it is essential to have a solid understanding of the ideas that are being conveyed throughout instruction. Within the conceptual framework of TPACK, which was derived from the conceptual framework of PCK, the integration of technical skills, pedagogical content, and pedagogical material was envisioned. The conceptual framework of PCK was utilized to derive this framework. Lee Shulman [3]. This framework is constructed on the interplay of three fundamental knowledges of technology, pedagogy, and content to produce successful learning by integrating technology [4]. The term "technology, pedagogical, and content knowledge" (also written as "technology, pedagogical, and curriculum knowledge") refers to a framework that is constructed

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on the interplay of these three fundamental knowledges. The phrase "technology, pedagogical, and content knowledge" is referred to using the acronym TPACK.

The TPACK concept is comprised of seven separate aspects, each of which may be split down into the following categories: The first is technological knowledge, the second is pedagogical knowledge, the third is content knowledge, the fourth is knowledge of technology content, the fifth is pedagogical knowledge of content, the sixth is pedagogical knowledge of technology, and the seventh is pedagogical technology. The first is technological knowledge, the second is pedagogical knowledge, the third is content knowledge, the fourth is knowledge of technology content, the fifth is pedagogical knowledge of content, and the sixth is A certain level of familiarity with the material being discussed. The findings, on the other hand, indicate that educators who have participated in a TPACK development plan are more likely to acknowledge the significance of technology integration and restraint as a component of TPACK development [5]. This is indicated by the fact that these educators are more likely to acknowledge the importance of TPACK development. The fact that these educators are more likely to acknowledge the significance of TPACK development is an indication of this. The findings of past studies, which imply that the technological knowledge aspects that teachers possess are the components that have the most influence on TPACK, match the conclusions of this research. TPACK is an acronym that stands for "technology, pedagogy, content, and instruction" (TK). The capacity of teachers to use their knowledge and talents within the framework of the use of technology is one of the most significant factors that goes into determining TPACK [6].

It is essential, for the purpose of achieving one's educational goals, to make efficient use of the technical resources that are at one's disposal [7]. The instructors for today are now in this challenging predicament.

so that teachers can increase their own capacity for learning by making use of technology that has been developed expressly to meet the needs of the students who are enrolled in their classes Because there is not equality in the availability of technological resources and obstacles in Kazakhstan. educators in Kazakhstan are required to modify how they use technology to accommodate the atmosphere of their schools or homes. This is the case regardless of whether they teach in public or private institutions. It makes no difference whether they instruct students in public or private schools; this is always the case. The term "local technology" refers to the numerous pieces of machinery that are use in a number of different environments or locations in order to accomplish

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a wide range of different goals in a variety of different domains. These goals can range from simple to complex, and they can be accomplished in a wide variety of different ways. The material that came before this one centred on the various pieces of apparatus that are included in the lessons that are taught in Kazakhstan's Senior High School curricula to facilitate a better understanding of biological concepts on the part of the students. Instruments such as thermometers, spectrometers, and microscopes are examples of these types of pieces of equipment. As a direct consequence of this, the objective of this research was to identify the type of technology that is deployed by educators working in the field of teaching.

2. EXPERIMENTAL METHOD

This research is a descriptive study that attempts to characterize the type of TPACK technology that NIS teachers utilized in biology teaching in relation to the theme of the Kingdom Animalia. The research was conducted at NIS. Teachers of biology who were employed at NIS, Physics and Mathematics in Shymkent, Kazakhstan, were given the opportunity to participate in the research project. The NIS school, which is widely considered to be one of the most prominent educational establishments in Kazakhstan, is the place of employment for each teacher who contributed to this research project. Teachers of this study are responsible to teach from grade 9th to 12th their curriculum is very similar to Cambridge A level programme, NIS school was selected for this assessment. The reason for this choice was explained as follows: The students might choose from one of three different teachers at any given time. When determining the academic programs that would be offered, both the physical location of the educational institution and the capacity of its faculty to take part in the various activities were taken into careful consideration.

The data for the study were collected with the help of an observation sheet of instructional learning. The research that was carried out by Harris, grandgenett, and Hofer [8] led to the creation of this sheet, and it was followed by interviews that were semi-structured. The process of gathering information was carried out three times in a relatively short amount of time. In addition, semi-structured interviews were carried out with each biology teacher to collect any extra data that may have been relevant to the research that was being carried out. These interviews were conducted with the goal of acquiring any and all pertinent information. After gathering the data, Britten and Casady [9] performed the analysis on the data with the assistance of an analytical tool that they had

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developed and dubbed Rating Technologies. This tool was used to perform the analysis on the data. The data were analyzed with the help of this tool (TIAI).

3. RESULT AND DISCUSSION

The findings of the research that was carried out in the field are detailed in Table 1. Most biology teachers in NIS, Physics and Mathematics schools in Shymkent, Kazakhstan is already connecting their classes to the internet using various forms of technology, such as whiteboards and mobile phones. Adjustments were made to the other technologies that are employed to make them compatible with the facilities and the infrastructure that were already existing in the NIS school. These modifications were carried out so that the technologies could be used in the NIS school. The use of the Internet by way of the school network utilized teachers as the source and means of learning and continued to apply the more conventional method of instructing, which is to educate students. This was done so that students might enjoy the benefits of both options simultaneously. Because practically all the students had access to an HP that is capable of conducting internet searches and locating relevant information, it was decided that the usage of a variety of information technology resources as a learning support tool would be the best option. The use of AR (augmented reality) in educational settings, on the other hand, is not carried out by the teachers themselves; rather, it is the sole duty of the students. It was revealed throughout the course of the interviews that were conducted to research the usage of augmented reality by educators that AR is only utilized by educators for the purpose of personal communication. This was one of the findings of the investigation.

When it comes to conducting research and developing new instructional materials, teachers almost universally agree that utilizing a technology that is based on a computer is the best approach to take. According to the findings of the observations, the two types of AR Learning activities that students engage in the most frequently are searching and resource gathering.

Resourcing the purpose of learning as a teaching resource or information repository for information and data relevant to the teaching topic, while at the same time focusing on the process of searching for information to finish the learning resource materials that will be given to pupils is called trying

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to search. Resourcing the purpose of learning as a teaching resource or information repository for information and data relevant to the teaching topic.

Utilizing the goal of education as a teaching resource or information repository for knowledge and data that is connected to the course materials (also known as "resourcing the aim of learning") Because the information that is being sought is information that is not yet known, the search for information is being conducted by making use of search engines, which is one of the facilities that is offered in an application to search for the information that we want to search for. During the search, the information that is being sought is information that is currently unknown. Google is currently the most widely used application search engine in Kazakhstan; nevertheless, many other apps are provided by specialized websites such as Yahoo, Alta Vista, and others [10].

In the present day, most people in Kazakhstan utilize Google as their preferred application search engine. Google is by far the most popular application for use with search engines, and the vast majority of the county's students as well as their teachers make use of it.

Teachers are of the opinion that if they give students permission to use their own mobile devices to access the internet, it will give those students the opportunity to seek out a range of sources more actively of material that can be used in educational endeavour's. If they give students permission to use their own mobile devices to access the internet, teachers are of the opinion that it will give students permission to use their own mobile devices to access the internet.

According to the findings of the research, Sistriyani [11] believes that making use of the Internet as a medium to discuss issues pertaining to the material kingdom is beneficial. Students may have an easier time comprehending the material, as well as increasing their activity level and their level of enthusiasm, when they are exposed to animalia.

This helps to ensure that students do not become bored while they are engaged in educational activities. In this way, we can assure that our students will not become bored while they are engaged in activities designed to further their education.

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Table 1. Various technologies used by teachers in learning as much as three times meeting on the concept of Kingdom Animalia

Participants	Technology Used
Participant 1	Mobile phone AR Whiteboard & marker Textbooks
Participant 2	AR/internet Simulations colouring apparatus Whiteboard and markers
Participant 3	Projector Infocus Internet / AR Textbooks

The whiteboard was the second technology tool that was utilized by the biology teacher at the NIS School. Whiteboards are hardware items that are referred to as media, message, or materials that are provided in conjunction with software [12]. Projectors and laptops are two more items of technology that are utilized by the teacher. The projector was used as a vehicle for channelling messages or knowledge that was learned, like how a whiteboard is used. The provision of a comprehensive experience of something concrete to abstract and the arousal of students' drive to learn is an additional advantage of using various forms of media or techniques of directing messages in the educational process.

According to the findings of an investigation into the application of several learning technologies through the utilization of the technology integration assessment instrument (TIAI) in the implementation of the use of technology in learning and teaching developed by Britten and Cassady [9], it was discovered that the application of learning technology in the NIS falls under the category of technological components that help to support the actual process of learning. The use of

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technology makes learning biology easier, but educational goals can be accomplished even without the assistance of technology. The findings of the investigation indicate that teaching is accomplished with the assistance of technology in the form of a computer, a projector, and a whiteboard utilized by the teachers. The teaching technique is a traditional approach to education in which the instructor simply relays the information that is found in the textbook or on the slides that are displayed by an in-focus projector [13]. According to the teachers who participated in the interview, they mentioned that the restricted facilities that were available in the NIS school were the reason why the teacher could not always use technology. The lack of skills among teachers in using technologies such as application usage search in the search for of materials and installation of technological devices such as projector infocus is another barrier that can be found when it comes to the use of technology. This makes it necessary to spend a lot of time in learning, which necessitates spending a lot of time preparing lessons.

One of the reasons why there is not a maximal integration of technology in learning is a lack of knowledge and abilities on the part of instructors in the application of computer-based technology or AR. Results from three out of four teacher interviews suggest that computer-based technology skills are limited to using only Microsoft Word, Excel, and PowerPoint, in addition to using search google apps; nonetheless, this technology is used for personal reasons. While AR-based technologies are used by educators for communication via messenger or social media, this does not involve learning as a purpose for these tools. a lack of knowledge because educators at the school and district levels have not received training on the use of technology in education.

The Role of Instructional Media is the Role of Technology in Learning That Can Simplify and Accelerate the Work of the Students It can also be Fun for Students to Interact with Colours, Images, Sound, Video, and Instant Something The Role of instructional media is the role of technology in learning that can simplify and accelerate the work of the students. Because it can elicit favourable feelings throughout the learning process, the use of technology emerges as a factor that is of critical significance for efficient learning. [5] [14]. The various technologies that will be utilized in the classroom will play different roles depending on the subject matter that will be covered by the instructor. The material can be broken down into two categories: invertebrates and vertebrates, and it comes from the kingdom Animalia. The common traits of each phylum, the basic grouping of Animalia, instances of animals, and the significance of animals in the world are some of the important concepts that teachers believe students of the material kingdom Animalia should be

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familiar with. This is according to the teachers. The teachers believe that the lesson has not been effective yet by using technology in the form of a projector, whiteboard, and the AR in Animalia idea. However, the teachers have not been able to generate media based on tools or technology. There are many various types of media technology that have been developed by several scholars and used in materials such as handouts about the kingdom Animalia that are illustrated with a map of the concept [15], interactive multimedia flash-based electronic books, and so on. [16], the Cue Identification Card of Animalia [17], and a pop-up version of media books [18]. [15] [16] [17] [18] [15] electronic book that includes interactive multimedia material and content based on flash [16] Students' verbal-linguistic intelligence should improve as a result of the development of the media, which can help students understand the concept of the Kingdom Animalia, increase motivation and student activity during learning, and improve students' verbal-linguistic intelligence after they have been given media books that pop-up on the concept of crustaceans. These benefits can help students understand the concept of the Kingdom Animalia, which can help students understand the concept of the Kingdom Animalia, which can help students understand the concept of the Kingdom Animalia, This is due to the fact that the end product of the development of the media can assist students in comprehending the idea of the Kingdom Animalia, which in turn can assist students in comprehending the idea of the media, which in turn can assist students in comprehending the idea of the media.

4. CONCLUSION

In the city of Shymkent, Kazakhstan, teachers of biology in NIS School of physics, and mathematics have their classrooms supplied with a wide variety of technical instruments and materials. Some of these technical breakthroughs have been created with the goal of piqueing the interest of students in the topics that they are currently learning about. Whiteboards, augmented reality (AR) devices, projectors, and laptop computers are just a few examples of the various sorts of equipment that may be found at the facility. Additionally, there is technology as well as other tools that have been developed specifically to cater to the specific educational requirements of the folks who will be using the facilities. When it comes to the incorporation of technology, however, there are still a great many challenges to be met and conquered. These problems include the provision of content that is difficult to understand, the implementation of challenging instructional methods, and the provision of access to a restricted number of technology resources. One of the

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most major issues is that many teachers lack the knowledge and experience necessary to effectively utilize and grow technology as a media and biological learning resource. This lack of knowledge and expertise is one of the most critical challenges. Because of this, the researchers concluded that there is a prerequisite for the development of teacher competency in the NIS School build technology as a media and learning resource that is adapted to the technology that is already present in the educational setting. This conclusion was reached because of the findings presented in the previous section. This conclusion was arrived at because there is a prerequisite for the development of teacher competency in the NIS School build technology as a media and learning resource. As a result of this fact, we concluded that there is a prerequisite for the development of teacher competency. This was the conclusion that could be reached because of the investigation's findings; this was the inference that could be formed from those results.

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