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APPLICATION OF TPACK TECHNOLOGY IN TEACHING THE SCIENCE OF "COMPUTER ANIMATION"

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Annotation:
The development of professional competencies in teaching students how to create computer animation, the use of an e-learning system in teaching computer animation requires a new approach from the future computer science teacher. This article highlights the implementation of these approaches in teaching students the subject of "Computer Animation" based on TPACK technology.

Keywords: computer animation, TPACK technology, e-learning, future computer science teacher, content-technological and pedagogical knowledge, technological and pedagogical knowledge.

Аннотация:
Талабаларга компьютерли анимацияни яратишни ўргатишда касбий компетентликларини ривожлантириш, компьютерли анимацияни ўқитишда электрон таълим тизимидан фойдаланиш бўлажак информатика ўқитувчисидан янгича ёндашувни талаб этади. Ушбу мақола талабаларга "Компьютерли анимация" фанини ўқитишда айнан мана шу ёндашувларни амалга оширишда TPACK технологияси асосида ўқитиш ёритилган.

Калит сўзлар: компьютерли анимация, TPACK технологияси, электрон таълим, бўлажак информатика ўқитувчиси, технологик педагогик мазмун билими, технологик педагогик билимлар.

Аннотация:
Развитие профессиональных компетенций в обучении студентов созданию компьютерной анимации, использование системы электронного обучения в обучении компьютерной анимации требует от будущего учителя информатики нового подхода. В данной статье освещается реализация этих подходов в обучении студентов предмету «Компьютерная анимация» на основе технологии TPACK.

Ключевые слова: компьютерная анимация, технология TPACK, электронное обучение, будущий учитель информатики, содержательно-технопедагогические знания, технологико-педагогические знания.

When teaching students computer animation knowledge in an e-learning system, it is reasonable to assume that intensive e-learning may require more skill than a given student's competence. Developing student knowledge, skills, and competencies is a process that requires planning and consideration when considering transitioning to advanced online degree offerings, so it is important to develop students'

computer animation knowledge and ensure students enjoy a quality education, suggested by Punya Mishra and Matthew J. Kohler We offer Technological Pedagogical Content Knowledge (TPACK) technology. This provides a useful framework for viewing student proficiency at multiple levels, and we can use this technology to assess and monitor student computer animation knowledge in an online environment.

TPACK stands for Technological Pedagogical Content Knowledge. It is a theory developed to explain the body of knowledge that teachers need to teach their students about science, teach effectively, and use technology [1].

Technology has become an increasingly important part of students' lives outside of the classroom, and even in the classroom, it can help them increase their understanding of complex concepts or encourage collaboration among peers. Because of these benefits, current educational practices suggest that teachers use some form of technology in their classrooms—but many teachers struggle to do so. Cost, accessibility, and time are often major barriers to classroom implementation, but another barrier is a lack of knowledge about how technology can benefit students in a variety of subject areas.

Punya Mishra and Matthew J. Kohler's 2006 TPACK framework focuses on technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) and offers an effective approach to the many challenges teachers face when implementing educational technology (edtech) in their classrooms. By distinguishing between these three types of knowledge, the TPACK framework establishes that content (what is taught) and pedagogy (how the teacher delivers that content) must be the basis for any effective edtech integration. This arrangement is critical because the technology being implemented must inform the content and support the pedagogy to enhance the student learning experience.

According to J. Abbitt's research, according to the TPACK system, special technological tools (hardware, software, applications, relevant information literacy practices, etc.) are used to guide and develop students' better and stronger understanding of the subject. Thus, the three types of knowledge - TK, PK and CK - are combined and recombined in different ways within TPACK. Technological pedagogical knowledge (TPK) describes the relationships and interactions between technological tools and specific pedagogical practices, while pedagogical content knowledge describes the similarity between pedagogical practices and specific educational goals; finally, technological content knowledge (TCK) describes the relationships and intersections between technologies and learning objectives [4]. These triangles then form the TPACK.

Michigan State University researchers Mishra and Kohler developed TPACK in the absence of any other adequate theory to explain or guide effective edtech integration. Since its publication in 2006, TPACK has become one of the leading theories of edtech and edtech integration: research and professional development activities both use it extensively [2].

However, according to K. B. Courtney, TPACK has remained such a powerful principle for almost 12 years because the complex components described above make room for a number of specific educational settings. Any effective implementation of technology in the classroom requires recognition of the dynamic, transactional relationship between content, pedagogy, and incoming technology in the specific contexts of different schools, classrooms, and cultures. Factors such as the individual teacher, specific grade level, classroom demographics, and more mean that each situation requires a slightly different approach to edtech integration. No monolithic combination of content, pedagogy, and edtech

applies to every setting, and TPACK leaves room for researchers and practitioners to adapt its framework to different situations [3].

This flexibility can be seen in the various intersections and relationships already expressed in the acronym TPACK.

Content knowledge (CK) describes teachers' own knowledge of the subject. CK may include knowledge of concepts, theories, arguments, and organizational frameworks within a given subject; may also include industry best practices and established approaches for delivering this information to students. CK also varies by discipline and grade level – for example, high school science and history classes require less detail and scope than undergraduate or graduate courses, so the CK of their different teachers may differ, or the CK each class assigns to their class. students are different.

Pedagogical knowledge (PK) describes teachers' knowledge of practices, processes and methods related to teaching and learning. As a general form of knowledge, PK includes educational goals, values and objectives and can be applied to more specific areas such as understanding students' learning styles, classroom management skills, lesson planning and assessment.

Technological knowledge (TK) describes teachers' knowledge of and ability to use various technologies, technological tools, and related resources. TK is about understanding edtech, considering its potential for a particular subject area or classroom, learning to understand when it helps or hinders learning, and constantly learning and adapting to what new technology offers.

Pedagogical content knowledge (PCK) describes teachers' knowledge of key areas of teaching and learning, including curriculum development, student assessment, and outcomes reporting. PCK focuses on promoting learning and tracing connections between pedagogy and the practices that support it (curriculum, assessment, etc.) and, like CK, varies by grade level and subject. However, in all cases, PCK seeks to improve teaching practice by establishing a strong connection between content and the pedagogy used to communicate it.

Technological content knowledge (TCK) describes teachers' understanding of how technology and content interact and oppose each other. TCK involves understanding how a topic can be delivered through a variety of edtech offerings and considering which specific edtech tools may be best suited for specific topics or classrooms.

Technological Pedagogical Knowledge (TPK) describes teachers' understanding of how certain technologies can transform the teaching and learning experience by introducing new pedagogical possibilities and constraints. Another aspect of TPK relates to understanding how such tools can be used alongside pedagogy that is appropriate to the discipline and development of the lesson.

TPACK draws from these and the three core areas of content, pedagogy, and technology to create an effective framework for teaching using educational technology. For teachers to use TPACK effectively, they need to be open to some key ideas, including:

concepts in the taught content can be expressed using technology;

pedagogical techniques can deliver content in different ways using technology;

different content concepts require different skill levels from students, and edtech can help address some of these demands;

students will have diverse backgrounds in the classroom, including prior educational experiences and exposure to technology—and lessons using edtech must take this into account;

educational technology can be used in conjunction with students' existing knowledge to help them reinforce previous epistemologies or develop new ones [1].

Because it takes into account the different types of knowledge needed and how teachers themselves can develop that knowledge, the TPACK framework becomes an effective way to consider how students integrate educational technology into the classroom. In addition, TPACK can serve as a measure of student learning, which can influence instructional and professional development offerings for teachers at all levels of experience. Finally, TPACK is useful for ways to explain the kinds of knowledge most needed to make technology integration successful in the classroom. Teachers do not need to be familiar with the entire TPACK technology to benefit from it: they just need to be content and pedagogically sound in their teaching practices.

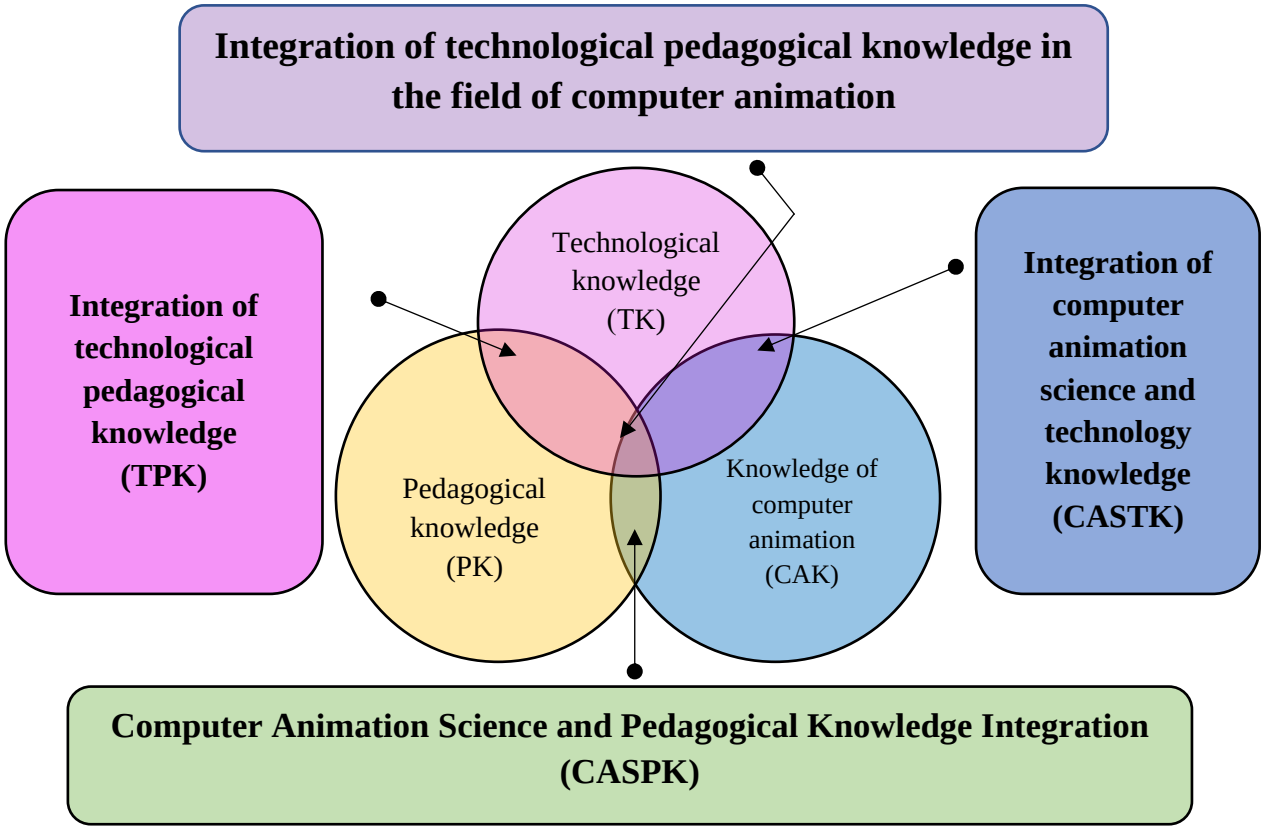

Figure 1. Application of TPACK technology to the science of "Computer animation".

The application of TPACK technology in teaching computer animation is based on the following contents.

Knowledge of Computer Animation Science (CASK) - knowledge of computer animation. They are included in the elective subject "Computer animation":

Pedagogical knowledge (PK) - this includes knowledge about teaching methods.

Technological knowledge (TK) - based on knowledge of the use of electronic systems, various technologies, technological tools and related resources:

Computer Animation Science and Pedagogical Knowledge Integration (CASPK) - describes students' knowledge of the use of various educational methods in teaching computer animation,

assessment of students, and reporting results. The acquisition of this content includes the following factors [5]:

Integration of computer animation science and technological knowledge (CASTK) - teaching computer animation knowledge through an electronic system and posting lectures, practical, laboratory tasks on computer animation topics on the platform, entering and checking control work. The acquisition of this content includes the following factors [5]:

Technological Pedagogical Knowledge (TPK) – controlling the suitability and application of different educational methods to computer animation topics given on an electronic platform. In TPK, it is possible to apply methods on the electronic platform and ensure that they correspond to the topics. The mastery of this content includes the following factors:

In computer animation science, technological, pedagogical knowledge integration (TPACK) refers to knowing and understanding the relationship between KAFB, TB and PB in the use of e-learning technologies to teach and understand computer animation. This technology involves understanding the complexity of the relationship between students, teachers, computer animation content, methods and technologies.

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