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### **Case-study technology and flipped classroom approach to teaching engineering students**

The paper gives an overview on the implementation of the case-study technology integrated into the flipped classroom and investigates its potential for both teachers and learners. The authors present the outcomes gained from the experience of the case-study technology implementation in physics. The research shows that the use of the described technology enhances students' motivation and improves their academic achievements.

Keywords: flipped classroom approach; case-study technology; learning environment; student's motivation; academic achievements; involvement.

Nowadays the «flipped» approach to teaching has become particularly attractive because of availability of vast internet resources among which video and audio that can easily adopt to any discipline. The integration of ICTs empowers teachers and learners, transforming teaching and learning process from being highly teacher-dominated to student-centered and offers them many opportunities to study anytime and anywhere.

According to the flipped classroom approach, what is usually done in class and what is usually done at home is shifted or flipped. Instead of learners listening to lectures on, say, Physics in class and then going home to work on a set assigned problems, they read materials and watch videos on physics before attending class and then involve in class in active learning using labs, case-studies, or experiments. A main principal of the flipped classroom is that work usually done as homework (e.g. synthesizing, problem solving, analyzing, essay writing) is better undertaking in class with the guidance of the teacher. Watching videos or listening to lecture is better carried out at home. Thus, the term flipped or inverted classroom [2, p. 54].

A literature review helps us observe the benefits of using the flipped classroom approach to the teaching and learning process as follows: learner goes at his or her own pace; doing «home assignment» in class gives teachers deeper

insight into learners difficulties and their learning styles; time in class can be used more efficiently and creatively; teachers using the technology tell about increased standard of learners achievements, interest, and involvement; learning theoretical material supports the new approaches [1, p. 63].

We surveyed the physics teachers of School of Energy and Power Engineering as well as School of Computer Science and Robotics who used case-study technology in a flipped classroom and they cited additional benefits of using this approach, including the following: there is much more time to spend with learners on authentic study; learners have more time working with training equipment that is only available in the educational laboratories; students who skip the class can watch the lectures while at home; the technology «stimulates thinking inside and outside the study room»; learners are actively engaged in the learning process and liked it. However, in the meantime, they reported some difficulties with approach.

Firstly, they pointed out that students new to the technology may be originally resistance because it demands that they do assignment at home rather than be first presented the subject matter at the university. Therefore, they may be unprepared to their class to participate in the active learning part of the course. Thus, faculty deal with this problem by giving a short quiz either in class or online or by requiring homework that references material that can be taken from the outside videos or reading material. Secondly, the home assignment must be carefully done for the learners in order to prepare them for activities in class. Many teachers regard videos as the way of choice for delivering the out-of-class part of the instruction. Nevertheless, in our survey, teachers said that finding good quality videos is sometime a big problem for them.

We suggest the model of the class in physics using case-study technology in a flipped classroom. The teacher assigns an introductory video podcast beforehand, before the class in which the material (case) will be presented and posted to (e.g. YouTube) for students to view. Students receive a set of guiding questions related to podcast to answer before class. In class, students get the first part of the case-study to work on and apply what they learned in the previous day's podcast. After they complete the first part of the case-study, a second podcast is often shown in class to stimulate discussion, after which students are given the second part of the case. Another podcast may be assigned that day covering information students will need to continue with the next part of the case in the next class period. These steps are repeated as need until the case-study is completed.

Despite the many ways to implement case-study in a flipped classroom, we've found that the most successful flipped classroom typically have three main features: the in-class learning environments are highly organized (carefully planned); the in-class activities have a great number of quizzes, problem

solving tasks and many other active learning activities, making learners to recall rapidly, apply, and extend knowledge gained outside of class and these activities are often slightly easier than those tackled outside of class, and are directly relevant to the out-of-class work; learners are heavily incentivized through grading, in-class activities, and teachers' expectations to complete out-of-class work and attend in-person meetings.

Finally, it is worth noting that teachers have always struggled to get learners to study on their own, either ahead of time or as home assignment that is when the real learning happens, not when the teacher is lecturing. The flipped classroom, with its use of videos that engage and focus student learning, offers us a new model for case-study teaching, combining active, student-oriented learning with content mastery that can be applied to deal with real-world problems.

Our research showed that the integration of case-study technology and a flipped classroom into the education process leads to an increase of students' motivation and interest for studying physics. Moreover, it has positive impact on students' self-discipline and self-directedness because learners are responsible for their own way of learning and it has great pedagogical potential for both teachers and students.

### **Литература**

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### **Стратегии лингвокультурной адаптации художественного текста**

Статья посвящена проблеме выбора стратегии лингвокультурной адаптации художественного текста при переводе. Рассмотрены основные различия между стратегиями слабой и сильной адаптации, а также условия их применения и способы реализации.

Ключевые слова: перевод; лингвокультурная адаптация; стратегия адаптации; имена собственные; реалии; фразеологизмы; паремии.