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Benefits and Limits of Flipped Classroom Implementation in Higher Education

Abstract

This theoretical study explores the flipped classroom concept as an innovative teaching method within higher education. The main aim is to present the benefits and limits of implementing the flipped classroom in the Czech higher educational context. The authors evaluate problematic areas of implementing the flipped classroom based on a content analysis of research studies from selected European countries and specify possible bottlenecks affecting its implementation in the Czech university environment. Referring to the results, the flipped classroom concept promotes student-centred learning, the activation and development of students' competence to learn, but its effective implementation in the university environment is contextually conditioned.

Keywords: *university teaching, organisational form of teaching, blended learning, flipped classroom*

Introduction

The supranational and national strategic documents for higher education (EHEA, 2015) describe the efforts of contemporary educators to promote student-centred learning. Teachers at universities are looking for new methods to deliver the curriculum in ways that consider students' needs and encourage them to be independent and responsible for their own learning process. In this study, the

authors explore the concept of the flipped classroom as a specific combination of face-to-face and online teaching and learning that could, under certain conditions, offer teachers a suitable alternative for organising teaching activities.

The literature provides quite inconsistent concepts of the flipped classroom as a didactic category. It is often referred to as a "pedagogical approach" (Abeysekera & Dawson, 2015; Feniser et al., 2018), a "model" (Staker & Horn, 2012), a "teaching strategy" (Capone et al., 2017) or a "method" (Bergman & Sams, 2012; Rivero-Pérez et al., 2019). This inconsistency of terminology is also evident in the Czech translation. Very few authors have attempted to theoretically anchor the concept. In this regard, the authors of this paper rely on the argument of Špilka (2016), who understands the flipped classroom as an organisational format of education characterised by a complex of individual options for how the educational process is (or can be) organised and the specific definitions of the different actors' roles in this process.

The term flipped classroom, according to Lage et al. (2000), refers to the relocation of the activities that traditionally take place during class time to go beyond the face-to-face teaching process and vice versa, whereby the technology potential can be effectively utilised. In terms of organisation, the teaching time in the flipped classroom can be divided into two basic parts. During the preparation stage, students work independently at their own pace in a multimedia environment where the content of the curriculum is delivered mostly in the form of videos, podcasts, web pages, and texts. This section essentially replaces the teacher's transmissive interpretation. During face-to-face teaching in the presence of the teacher, the knowledge and skills acquired during preparation are subsequently deepened through appropriate teaching methods.

Staker and Horn (2012, p. 8) classify the flipped classroom as a rotational model of blended learning (Figure 1), where students move between different formats within a single teaching unit according to a given schedule or the instruction of the teacher:

> "A Rotation–model implementation, in which within a given course or subject (e.g., math), students rotate on a fixed schedule between face-to-face teacher-guided practice (or projects) on campus during the standard school day and online delivery of content and instruction of the same subject from a remote location (often home) after school".

In neither the Czech nor the international literature is the role of the teacher in the flipped classroom specified; most often, we encounter the labelling of

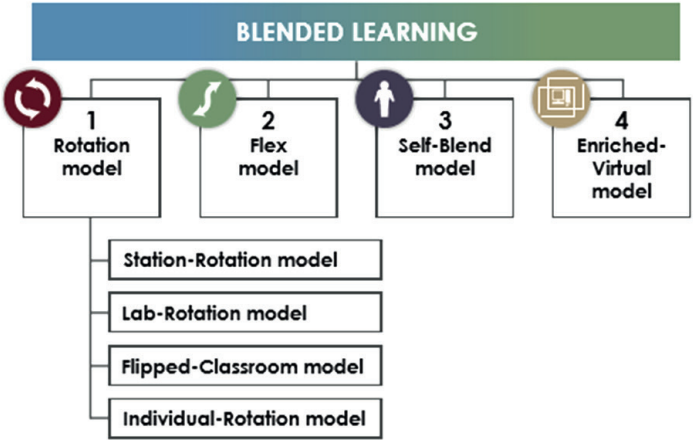

Fig. 1. Models of blended learning (Staker & Horn, 2012, p. 8)

the teacher as a "moderator" (Bergman & Sams, 2012), "facilitator" (Riedsema et al., 2012; Abeysekera & Dawson, 2014; Capone et al., 2017) or "guide" (Boronat-Navarro et al., 2018; Feniser et al., 2018).

The currently predominant way of teaching at Czech universities is mass teaching organised in a frontal way, focused on the transmission of the educational content to the students, who work in a unified way. Putting educational change into practice requires rigorous preparation by all stakeholders, with a key role played by a change to their mindsets and understanding the benefits of the change (Fullan, 2007).

Research Methodology

The study's main aim is to present the benefits of, barriers to and limits of implementing the flipped classroom in the Czech university educational context based on an evaluation of the problematic areas of its implementation. For this purpose, a content analysis was conducted of available research on the Bologna Process-linked countries from selected databases, according to the recommended procedure (O'Flaherty & Phillips, 2015):

- identification of research questions,
- identification of relevant studies and their selection according to time, language, content, and location criteria,

- data analysis and categorisation,
- summary of results.

Key concepts were developed to capture literature on implementing the flipped classroom in higher education from Czech and international perspectives. The selected criteria reflected the research questions and covered studies from EHEA countries not more than three years old, in English or Czech, dealing with the implementation phase of this teaching and learning approach.

The chosen methodology should contribute to the possible replication of the research strategy and increase the reliability of the findings.

Research Results

A report by the European University Association states (Gaebel & Zhang, 2018) that out of 303 European universities surveyed, 54% perceive the flipped classroom in university education as fully or partially beneficial for students and their learning. It also highlights the fact that some countries are not familiar with this teaching concept at all. The available research mainly focuses on flipped classroom effectiveness and its pros and cons from the teacher and the student perspectives.

Research that evaluates the pros and cons of the flipped classroom from the perspective of the teacher (Bergman & Sams, 2012; Smith & McDonald, 2013; Špilka, 2016; Boevé et al., 2017; Feniser et al., 2018) points in particular to the increased time required to prepare e-learning materials and specific rules that the teacher should follow when creating them.

Based on qualitative research on the pros and cons of a pilot implementation of the flipped classroom in the teaching of the pedagogic-psychological sciences, authors from the University of Groningen in the Netherlands (Boevé et al., 2017) evaluated the preparation of the online part of the teaching as the most demanding phase of the teaching process, primarily in terms of time spent to prepare the teaching. The same conclusions are visible from the results of qualitative research focused on the effectiveness of implementing the flipped classroom in engineering courses at selected Spanish universities (Feniser et al., 2018, p. 5029): "The FC technique is not easy and demands more dedication from the teacher (includes aspects such as preparation of e-learning materials, manuscripts, learning objects, individual student follow-up".

The conclusions of the research from the Polytechnic of Porto, Portugal (Lopes & Soarez, 2019, p. 0464) on promoting academic success mention that: "These challenges (to implement flipped classroom course) also include a huge increase in

the time spent in the course preparation to find or create quality online interaction resources".

Researchers at the JAMK University of Applied Sciences, Finland (Agyemang & Laitinen-Väänänen, 2018), who focused their mixed research design on teacher and student experiences of piloting the flipped classroom in a Technical Drawing course, assess the teacher preparation activities as challenging but worthwhile in the long run because high-quality videos can be used many times.

When organising the flipped classroom, the teacher expects the student to accept full responsibility for the process and management of his studies. This basic requirement is mainly related to the development of the personality from being dependent to being self-directed and the development of one's internal motivation at the expense of an external one (Lysgaard, 2018).

These factors influence student engagement in the subject and his/her learning achievements. The topic of the impact of the flipped classroom implementation on student engagement in the subject and learning achievements has been addressed in recent years by many quantitative and qualitative international research studies (Boevé et al., 2017; Feniser et al., 2018; Rivero-Pérez et al., 2019, and others). While some research studies have noted increased student engagement in the subject after implementing the flipped classroom, others have suggested that this factor may vary across different study groups and that low engagement affects student readiness and performance during direct teaching.

For example, research on the implementation of the flipped classroom at the Polytechnic of Porto, Portugal (Lopes & Soarez, 2019) reports that although the group of students participating in the flipped mathematics classroom achieved demonstrably better results at the end of the course than the other group attending a traditional lecture, students struggled to accept their new role in the flipped classroom and did not devote enough time to preparatory activities, especially in the beginning. Students of Environmental Technology at the University of Basque Country (Feniser et al., 2018) and Food Biotechnology at the University of Burgos (Rivero-Pérez et al., 2019) also assessed the online part of the course as too tiring and time-consuming. On the other hand, they highly appreciated the active involvement in the face-to-face teaching itself.

Positive acceptance of a flipped course is reported in qualitative research undertaken at the University of Patras, Greece (Karalis & Plota, 2019). As early as during the introduction of the new organisational format of the course and the flipped classroom principles, students' interest in this subject increased threefold. In the final evaluation of the course, almost 87% of students reported that the new course organisation had intensified their active engagement and encouraged them

to think critically. Qualitative research at Universitat Jaume I in Spain has produced similar results (Boronat-Navarro et al., 2018), where student engagement in learning increased significantly and the implementation positively impacted their autonomous and continuous learning.

Quantitative research on a sample of 254 students from the University of Murcia (Carrasco-Hernandés et al., 2018) on the impact of the flipped classroom implementation on learning achievement shows that older students and international students, in terms of statistics, performed significantly better in the flipped classroom mode than those in the reference group.

The ambiguous results of research from different universities suggest that the success of the flipped classroom depends on the local context of a particular university, which, according to Schiltz et al. (2018), mainly includes the local culture of education and learning, existing assessment requirements, and the design of the curriculum. In conclusion, Lysgaard (2018) sees as one of the main conditions for the fulfilment of a successful flipped classroom the assumption that a university student must be an individual who is willing to learn and accepts full responsibility for his/her own learning.

When considering the benefits and limits of the flipped classroom, the authors are primarily positive about the fact that it combines the benefits of both online and face-to-face teaching, using digital technologies as tools for a more flexible learning environment that better adapts to the individual needs of students and supports the development of their competence to learn in the following contexts:

- autonomous learning in an online environment allows students to receive transmissive exposition at their own pace, and the regular scheduling of homework supports continuous learning,
- by assuming responsibility for the learning process, students support their ability to organise their studies and manage their time and information effectively, both individually and in groups,
- students gain an awareness of their own learning processes and needs while strengthening their ability to overcome obstacles to succeed in learning.

The possibility of proceeding at one's own pace is also positive regarding the inclusion of disadvantaged students, such as students with special educational needs or international students. Gifted students or students with an eminent interest in the subject may choose their own pace and appropriate difficulty.

Flipped classroom activities during the face-to-face phase of the course also support current trends in student-centred learning and activation. The contact part of flipped classroom teaching enables the implementation of teaching using the essence of social learning and peer-group collaboration. It contributes to

developing transferable skills such as critical thinking, creativity, problem-solving, social and communicative skills, etc.

One of the main disadvantages of implementing the flipped classroom is the time-consuming preparation of the electronic study materials and the subsequent feedback. Zubitur and Sanchez (2018) propose a gradual flipping of the course at the beginning of the implementation, i.e., a gradual increase in the proportion of flipped classes compared to traditional teaching within one course. At this point, we consider it necessary to mention that not all educational content is suitable for flipping. Therefore, the organisational format of the flipped classroom can just be a supplementary, rather than the main, form of education.

A limiting factor may be seen in the fact that the flipped classroom may not be suitable for all types of students, as some do not feel comfortable being active participants in the educational process who accept responsibility for their own learning. The main reason for this may be the students' learning habits from their previous education or the current educational culture of the institution. In this case, it must be stressed that students must understand each activity's purpose and be aware of its main goal. Using continuous assessment, the teacher guides and motivates the students toward continuous learning.

Discussion

In the Czech environment, we encounter many specific factors affecting the implementation of the flipped classroom, which are partly related to the problematic areas and concern, particularly the academic motivation of Czech students, the system of evaluating the pedagogical competencies of university teachers, and the willingness of teachers to change their conception of teaching.

The results of quantitative research (n = 403) focused on the academic motivation of Czech university students, and the use of their character strengths shows that respondents exhibit a more extrinsic motivation to study (Slezáčková & Bobková, 2014). This type of motivation is unstable and supports a rather utilitarian approach to learning that leads to memorisation without deeper understanding. Thus, when implementing the flipped classroom, the teacher may be faced with a lack of interest in active engagement among students in the course.

Another specific factor in the Czech context is the lack of mechanisms for evaluating the quality of university teaching itself. The development of university teaching competencies has not yet become the subject of compulsory training in the Czech context, which might be associated mainly with an emphasis on the

research productivity of university teachers rather than their teaching excellence. The organisation of the flipped classroom is time-consuming, and most university teachers would not see a return on their investment in its implementation.

Despite a relatively high degree of autonomy associated primarily with the academic freedoms of research and teaching, according to Stefani and Elton (2002), the traditionalism of the academic profession can be a barrier to the development of innovation in higher education. In contrast to the traditional concept of the academic, the author builds the concept of the reflective professional, which refers to the dynamics of the professionalism of the university teacher on the new dimensions of the objectives of tertiary education, the requirement of innovation, and the use of information and communication technology. Preparing digital materials and providing feedback in an online environment requires a certain level of technical competence on the part of the teacher. In addition, adopting a new role and creating specific teacher-student relationships can make it difficult for some teachers to implement the flipped classroom.

Conclusions

The present study demonstrates that, in some ways, proper implementation of the flipped classroom can meet current educational trends supporting innovative approaches to education, student-centred learning, activation of students, and the use of digital technology in the teaching and learning process.

However, the conclusions herein point out that the effective implementation of the flipped classroom as an organisational format in higher education is contextually conditioned, and for this reason, there is no single right way to "flip" a particular course. Before the actual implementation, the teacher is in the role of the initiator of specific changes in teaching. Therefore, the teacher must be professionally prepared and motivated to make this change, as the lack of his/her preparedness to put the flipped classroom into practice effectively leads to the trivialisation and reduced effectiveness of this approach.

The authors believe that the flipped classroom offers a potential that can be used in the teaching and learning process at Czech universities and that the possibilities of, limits of and barriers to its implementation should be subjected to further scientific research.

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