

Developing Flipped methods for Teaching – a summary of the project activities and results

ANITA TÓTH-BAKOS – TÍMEA MÉSZÁROS – ATTILA MÉSZÁROS

Abstract

Flipped classroom method (FC) is a pedagogical approach in which the conventional notion of classroom-based learning is inverted, so that students are introduced to the learning material before class with classroom time then being used to deepen understanding through discussion with peers and problem-solving activities facilitated by teachers. The study presents the activities and results of Erasmus+ project Developing Flipped Methods for Teaching. The study focuses on the aims, context and the objectives of the project, the research activities, intellectual outputs, developed materials and results.

Keywords: flipped classroom method; innovation in education; project; research; educational materials

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Introduction

As in all fields today the only thing in education that is constant is change. The elements, requirements, environment, possibilities, circumstances, tools, content and methodology of education are constantly changing and evolving. There are also changes in the members involved in education, students, educators, institutions and other contributing institutions, parents and other partners. Accordingly, teaching methods and their practices should also follow major trends in change. One possible alternative to this is a method or approach that can be varied individually so that it can be continually adjusted to changing requirements. The toolbox of pedagogical innovation is almost inexhaustible, constantly implementing new progressive methods. One of these is the flipped classroom method. The biggest innovation of the method is that it uses already known elements, but in a new approach, in a new order, which provides a wide range of applications on demand. According to one of the creators of the method, Aaron Sams states “Reflecting the classroom is more about thinking: it shifts the focus from the instructor to the learner and the learning.” (Sams, Bergmann, 2012)

1. What is flipped classroom method?

Flipped classroom (FC) is a pedagogical approach in which the conventional notion of classroom-based learning is inverted, so that students are introduced to the learning material before class with classroom time then being used to deepen understanding through discussion with peers and problem-solving activities facilitated by teachers (Bodnár, Csilliko, Daruka, Sass 2017). Although using FC methods has multiple benefits and a growing popularity, researchers and practitioners indicate that among impediments of widespread usage of FC methods are the additional time and technological support in relation to development of flipped learning activities. The flipped approach often involves the investment of significant time and energy on the part of instructors (e.g., recording video lectures; designing additional in-class activities). It is therefore recommended for teachers flipping their courses in team. By working in teams teachers can share their experiences of implementing flipped classrooms as well as their teaching resources (McLaughlin et al., 2014).

The inverted class is characterized by online and offline sections. Passive learning and gaining knowledge takes place in combination with active learning sections outside the classroom in an online space. The methods of the inverted class are as follows (Ollé, Ruzskai, Hülber, 2017):

1. The teacher makes available material in the form of a video (usually his/her own), which students can watch at home. An important aspect is that students are able to engage in contact work in the classroom only if they already have preliminary, pre-acquired knowledge of the topic.

2. The elaboration of the curriculum follows in the form of a group form of active contact work in the classroom where the teacher participates as a facilitator and supports the work of students, taking into account their individual abilities as well as their educational needs. With this method students become equally responsible for the acquired knowledge and skills. The teacher can answer students' questions not only during the contact lesson, but can also share professional materials, resources, multimedia material, e-books or videos for homework.

3. The next contact lesson can take the form of a discussion, interview or workshop. The teacher's presence in the class can support, lead and thus contribute to the creation of a real product or the achievement of a result (Hamden et al., 2013). Conversely, difficulties such as fatigue or loss of motivation, mistakes or misunderstood details can occur during independent work at home.

4. The last stage of the method is the productive phase in which students present their own results, solutions or elaboration of the curriculum, for example in a presentation or in other type of formats, then evaluate and reflect together on their own creative work (Sams at al., 2014).

The Four Pillars of F-L-I-P:

F – Flexible environment: Providing fluid timelines for student work and comprehension. Teachers should adjust to the pace of their students in the class.

L – Learning culture: A rich environment that allows students to delve further into topics and provides them with opportunities for self-reflection and hands-on activities.

I – Intentional content: Teachers decide ahead of time what direct instruction to pair with in-class activities. Students should feel challenged, but able to understand the material on their own.

P – Professional educator: Teachers monitor students during lessons and offer feedback to ensure there are no gaps in students' knowledge.

2. Description of the project

The “Developing Flipped Methods for Teaching” (DFM) project aims at developing all the necessary flipped learning pedagogical material (out-of-class tasks, pre-assessment tools, in-class activities) for teaching a discipline (psychology) covering a whole academic year course. The project aims at overcoming the difficulties of elaborating multiple materials for teaching with flipped classroom design. By collaboration of six education institutions an entire discipline is covered with FC materials in seven languages (English, Romanian, Hungarian, Portuguese, Bulgarian, Slovakian and Greek), tackling a gap between educational research and practice.

One of the project partners, The Mihai Eminescu National Pedagogical High School (Romania), is a secondary-level educational institute. Due to the particularities of the Romanian education system they offer teacher and kindergarten teacher training programs, whereby graduates receive a teacher-kindergarten teacher degree. In Romania psychology is part of the secondary-level school curricula, so high schools can also benefit from educational materials translated to Romanian. Their main role in the project is to translate the developed educational methods by the higher education institutes (HEIs) from the partnership to test and adapt it to the Romanian requirements. The partnership is composed from other six Higher Education Institutes with Teacher Training Faculties who have important experience as partners or leaders in Strategic Partnership projects and educational innovation.

3. Results and outcomes of the project

The main intellectual output of the project are the pedagogical materials for teaching an entire course of psychology with flipped classroom (FC) methods (materials for 30 courses), available in seven languages. Each pedagogical material is composed of an instructional video, out-of-class work plans (online activities) associated with Low-stakes, formative assignments as well as in-class activities and assessment tools. A questionnaire for surveying data regarding using FC methods in teaching social sciences were also developed. Survey results are reveal the FC methods and sources used by teachers and academic staff from six partner countries. Results can be used as sources for developing pedagogical materials. Moreover, by publishing the results a source of inspiration will be available for teachers and policymakers for introducing flipped methods in the teaching practice. Teachers from higher and secondary education institutes will have all the necessary materials for teaching the subject of psychology with flipped classroom methodology.

Project results are expected to facilitate the use of FC practices in teaching psychology. Studies indicate that when changing traditional methods to flipped classroom students' performance and satisfaction will improve. FC methods increase students' motivation, their self-confidence as well as their commitment to learning. Considering scientific evidence the project contributes in general to improving the quality of education and digital literacy and also to competences of teachers and students.

The achievements of the project includes five intellectual outputs, which are the questionnaire survey, the report of the survey results, the developing of educational video materials, the creation of assessment tools and writing, and the compilation of a teacher's manual and guidance. The project also focuses on the publication of completed outputs in the form of scientific publications and presentations at conferences, as well as sharing its own YouTube channel and its own website¹.

Outputs and results of the project therefore approach the topic of the flipped classroom method in a complex way, striving for a scientific approach and pedagogical applicability, so that its results are available to both the professional audience and the audience interested in the topic.

3.1. Intellectual output 1 - Research: flipped classroom practices in teaching social science

In order to gain a better understanding of higher education teachers' views on flipped learning (with a special attention on social sciences), a survey was conducted in the DFM project using an online questionnaire. The questionnaire used in this survey is the translation of the English version of questionnaire of *Faculty Focus* (USA) from 2014². The survey sought to find out who's flipping, who's not, and the barriers and benefits to those who flip. The questionnaire used was developed as part of a previous study initiated by Faculty Focus (an online publication) in 2015 (used with permission) (Faculty Focus research report, 2015). The online questionnaire was translated by DFM project partners to local languages in order to identify flipped classroom methods used by individual higher-education teachers across seven countries: Bulgaria (BG), Cyprus and Greece (GR+CY), Hungary (HU), Portugal (PT), Romania (RO) and Slovakia (SK). The questionnaire was promoted by calls of completion sent to the main higher education institutes of the seven countries, explaining the goal of the survey and where the data will be used. Subjects were recruited with accidental and snowball sampling - existing subjects were called to recruit more subjects into the sample, so the collected data are not representative for the included countries. Subjects were asked to provide description of the flipped classroom methods used, including the source and nature of online activities used, difficulties they experienced, and recommendations for like-minded teachers. In order to document insightful case stories subjects were also asked if they have success stories to share. Data collection was conducted

¹ The website of the project: <https://pk.kre.hu/dfm/>

² Available at: https://www.facultyfocus.com/wp-content/uploads/2015/08/Flipped-Classroom-Trends_FF-Report-2015.pdf

between September 2021 - March 2022. From all the participated six countries the number of the respondents was 479, the respondents by countries are illustrated at the next table (Table 1):

<i>Country</i>	<i>Number</i>
<i>BG – Bulgaria</i>	97
<i>GR+CY – Greece and Cyprus</i>	41
<i>HU - Hungary</i>	69
<i>PT - Portugal</i>	59
<i>RO - Romania</i>	118
<i>SK - Slovakia</i>	95
Total number	479

Table 1: Number of participants in research

Other results of the research³

First, one of the aims of the research was to find out to what extent the FC method is known among university teachers. As the next table shows, there are significant differences between the surveyed countries (Table 2):

<i>Country</i>	<i>Yes</i>	<i>%</i>	<i>No</i>	<i>%</i>
BG	83	86	14	14
GR+CY	28	68	13	32
HU	36	52	33	48
PT	48	81	11	19
RO	38	33	79	67
SK	73	77	22	23
Total	306	64	172	36

Table 2: Knowing of FC method

Then the participants were asked if they have ever flipped a class, or their intention to apply this method. Although some scholars were not familiar with the flipped classroom concept, after reading the definition provided in the survey they indicated that in fact they were using the method before. Results are presented in Table 3:

<i>Country</i>	<i>Yes</i>	<i>I tried it, but I do not plan to do it again</i>	<i>No</i>	<i>No, but I plan to flip the next year</i>	<i>Yes + I tried it, but...</i>	<i>%</i>
<i>BG</i>	65	0	5	25	65	67,01%
<i>GR+CY</i>	28	4	9	41	32	78,05%

³ The source of the published research results is, on the one hand, the summary reports prepared by the project partners, and the publications listed in subsection 3.2.

<i>HU</i>	9	10	10	7	19	27,54%
<i>PT</i>	32	3	8	16	35	59,32%
<i>RO</i>	23	3	3	10	26	22,03%
<i>SK</i>	38	2	24	23	40	42,11%
<i>Total</i>	195	22	59	122	217	54,52%

Table 3: FC tried

The survey also investigated the reason why respondents do not use the FC method. As it was found in the results of the survey, the most common answer was that they do not have enough knowledge about flipping. These results justify the actuality of the project which states that there is a need to develop and share information and tools on the flipped classroom.

Respondents who had experience in flipping their classes – even if they indicated an intention to not do it again – were asked details about the flipping experience: how would they rate the experience for them and their students? Total results are presented in Table 4 (as it seems from the results, these questions were not compulsory to answer, therefore the total number of answers are different):

	Frequency	%		Frequency	%
<i>Positive for them</i>	170	35,5	<i>Positive for students</i>	154	32,2
<i>Neutral for them</i>	28	5,8	<i>Neutral for students</i>	42	8,8
<i>Negative for them</i>	13	2,7	<i>Negative for students</i>	12	2,5
<i>Total</i>	211		<i>Total</i>	208	

Table 4: Experiences of the respondents

Respondents also indicated their degree of agreement regarding a range of possible effects on students when applying the flipped classroom method. The most indicated answers were that students become more engaged, students are comfortable using the technology and they are more collaborative. Respondents were also asked about the perceived benefits they experienced in general when implement FC methods. The survey offered participants 10 different choices and the option to select multiple answers. Most of the respondents indicated that flipping positively influenced student engagement and the teaching has become more student-centred. Moreover, the FC method improved students' learning.

3.2. Intellectual output 2 - Report: Initiatives of teaching social science with flipped classroom strategy

Country-level research results of the „Flipped classroom practices in teaching social science” research were prepared and published for researchers and practitioners. Research report provided quantitative data about social science teachers using flipped methods, the types (and frequency) of out-of-class activities, in-class

activities, tests used and experienced difficulties. Cases of good practices of using flipped classroom methods were selected from „Flipped classroom practices in teaching social science” research. Interviews were made with selected people and case studies of effective practice were conducted. Results were published in publications with the profile of promoting pedagogical methods and also on the project homepage. The analysed cases can provide a source for professionals in elaborating teaching materials and training programs. The data can be used by schoolmasters and policymakers, as well as the teacher training faculties of higher education institutions for initiatives related to developing digital competences and skills for teachers in improving education.

Project partners presented their local results first of all on the transnational project meetings (Budapest - Hungary, Nicosia – Cyprus, Burgas – Bulgaria, Coimbra – Portugal, Kecskemét – Hungary) and on conferences (International Scientific Conference of J. Selye University, Komárno – Slovakia – 2022, International Scientific Conference The Black Sea – Doors And Bridges, Burgas – Bulgaria – 2022, InPACT Conference in Lisabon – Portugal – 2023). The results of our project research were also published:

Mariya Aleksieva, Tatyana Kotzeva, Krasimira Mineva, Veselina Zhecheva, Gergana Kirova, **FLIPPED CLASSROOM TRENDS IN BULGARIA: RESULTS FROM THE SURVEY**, In: The Black Sea - Doors and Bridges: International Scientific Conference. Burgas: Burgaski svoboden universitet, 2022, ISBN 978-619-253-017-4.

Judit Neszt, **DEVELOPING ENVIRONMENTAL AWARENESS AMONG YOUNG SCHOOLCHILDREN**, In: The Black Sea - Doors and Bridges: International Scientific Conference. Burgas: Burgaski svoboden universitet, 2022, ISBN 978-619-253-017-4.

Piedade Vaz Rebelo, Graça Bidarra, Valentim Alferes, Carlos Reis, Carlos Barreira, István Zsigmond, **FLIPPED CLASSROOM TEACHERS' CONCEPTIONS IN PORTUGUESE HIGHER EDUCATION**, In: The Black Sea - Doors and Bridges: International Scientific Conference. Burgas: Burgaski svoboden universitet, 2022, ISBN 978-619-253-017-4.

Tímea Mészáros, Anita Tóth-Bakos, **THE FLIPPED CLASSROOM METHOD IN UNIVERSITY TEACHER TRAINING PRACTICE**, In: The Black Sea - Doors and Bridges: International Scientific Conference. Burgas: Burgaski svoboden universitet, 2022, ISBN 978-619-253-017-4.

István Zsigmond, **FLIPPED LEARNING, AS A TOOL FOR COLLABORATION ACROSS COUNTRIES AND REGIONS**, In: The Black Sea - Doors and Bridges: International Scientific Conference. Burgas: Burgaski svoboden universitet, 2022, ISBN 978-619-253-017-4.

Tóth-Bakos Anita, Mészáros Tímea, Svitek Szilárd, **FLIPPED CLASSROOM, TRENDS IN UNIVERSITY EDUCATION IN SLOVAKIA**, In: The Black Sea - Doors and Bridges: International Scientific Conference. Burgas: Burgaski svoboden universitet, 2022, ISBN 978-619-253-017-4.

Maria Alexieva, Milen Baltov, Tatiana Kotseva, Veselina Zhecheva, Klasimila Mineva, Gergana Kirova, **EDUCATIONAL TRANSFORMATION, AIMED AT ESTAB-**

LISHING NEW E-DISTANCE LEARNING MODELS (THE FLIPPED CLASSROOM), In: 14th International Conference of J. Selye University Komárno: Univerzita J. Selyeho, 2022. ISBN 978-80-8122-447-8

Melinda Sajgó, TÜKRÖZÖTT OSZTÁLYTEREM A JÖVŐ ISKOLÁJÁBAN. A MÓDSZER GYAKORLATI ALKALMAZÁSÁNAK LEHETŐSÉGEI, In: 14th International Conference of J. Selye University Komárno: Univerzita J. Selyeho, 2022. ISBN 978-80-8122-447-8

István Zsigmond, TÜKRÖZÖTT OSZTÁLYTEREM A ROMÁNIAI ÉS MAGYARORSZÁGI FELSŐOKTATÁSBAN, In: 14th International Conference of J. Selye University Komárno: Univerzita J. Selyeho, 2022. ISBN 978-80-8122-447-8

István Zsigmond, Piedade Vaz-Rebello, Anita Tóth-Bakos, Eleonora Papaleontiou-Louca, Veselina Zecheva, Constantina Demetriou, András Szilágyi, FLIPPED CLASSROOM TRENDS: A SURVEY OF COLLEGE FACULTY IN EUROPE, In: Psychological Applications and Trends 2023. Lisabon (Portugal): InScience Press, 2023. – ISBN 978-989-35106-0-5. – ISSN 2184-2205. – ISSN (online) 2184-3414

3.3. Intellectual output 3 - Pre-class materials

One of the main outputs of the project is O3 developing pre-class materials. The flipped classroom approach is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by students at home before the class session, while in-class time is devoted to exercises, projects, or discussions. Flipped classroom consists of two main parts: interactive group learning activities inside the classroom, and direct computer-based individual instruction outside the classroom. Preparing these materials requires increased workload for the instructors and it is of crucial importance for flipped classes: students will have time to process and reflect on concepts and increase their knowledge base before coming to class to apply their learning. According to research results there are significant differences in students' learning experiences in a flipped course when the pre-activity materials are prepared in a format with videos associated to textbooks.

In the DFM project 10-15 minute video segments were created for each flipped learning class. Educational videos and narrations were created around the same design principles with the program Renderforest. The essence of the collaboration is to develop these video presentations around the same design principles and to explore each partner's strengths in covering specific subjects and designing pre-class materials. Video materials are available for teachers online on the YouTube channel called *Flipped Methods in Psychology*. Subtitles are available in seven languages (English, Romanian, Hungarian, Portuguese, Bulgarian, Slovak and Greek), increasing considerably their transferability potential. All together 30 educational videos were made (each partner developed 6 video materials) that covered basic topics of psychology: *Stress and Coping, Problem Solving, Theory of Mind, Child and Adolescent Mental Health, Interpersonal Communication, Causal attributions and outcomes control expectancy, General intellectual ability – intelligence, Multiple intelligences, The Context of Family: Relationships,*

Communication & Functioning, Emotions, Aggression: Nature, Causes and Control, Motivation, Attachment Theory, Encouraging Education, Nonverbal communication, Prejudice and discrimination, Theory of Cognitive Dissonance, Language and Cognition, Memory and Imagination, Early Childhood Development, Social Influence, Learning styles, Psychosocial Development in Adolescence, Mental health and wellbeing, Children's Socioemotional Development, Groups in Social Psychology, Cooperative learning, Identity, Expectations in the classroom: The Pygmalion effect, Metacognition. The partners developed video materials in their local languages and created subtitles in English. Then the partners translated all English subtitles to their local languages. As a result, all 30 topics are now available in all seven languages on the above mentioned You Tube channel.

3.4. Intellectual output 4 - Assessment tools

As part of flipped classroom design before the in-class session both the instructor and the students have to assess if the students are adequately prepared for the in-class activity. This is a starting point for calibrating in-class activities in accordance to students' needs and difficulties they experience. Short self-assessment quizzes or low-stakes online tests (3 to 4 questions) and short assignments were developed in concordance with each video and topic developed with the scope of assessing if students are adequately prepared. Tests include questions that provide an opportunity for students to apply what they have learned rather than questions that merely test factual knowledge. Reviews indicate that the benefits of testing are robust and likely to enhance performance regardless of how it is carried out—something difficult to say about many techniques. Tests and assignments can also be applied at the beginning of the in-class portion of the flipped class. Learning and assessment are interconnected: low stakes or formative assessment is a valuable learning tool for students. The quizzes and assignments are available on the project site in the appendix of the teacher guidance material and can be used in various educational contexts.

Each partner developed pre-test and post-test to their 6 educational video materials. The pre-tests include at least 8 multiple choice questions, the post-tests include at least 4 open ended questions. The partners developed their assessment tools in local languages and translated them to English. The partners also translated all the tests from English to their local languages and by doing this all the tests became also available in every project language – a total of 420 assessment tools. Instructors can incorporate them in regular classes or use them in designing new educational materials and assignments.

3.5. Intellectual output 5 - Guidance material for in-class activities

The major problems of using flipped classroom approach include teachers' considerable workload of creating flipped learning materials. Classroom-based group learning activities (for example group discussion and collaborative tasks) were elaborated, focusing on applying the knowledge learned from video lectures and solving advanced problems under the supports of teacher and peers. Effective

in-class activities for promoting deep learning were described, creating opportunities for peer-to-peer learning, student-instructor dialogue, and opportunities for active learning. The objectives of an activity were clearly linked to course objectives and assessments; activities were designed in order to encourage students to be creative and make discoveries (and errors) in a relaxed and low-risk environment. Nevertheless, teachers can still offer hands-on exercises for students' individual practices since problem-solving independently is also important for their learning. The output of this work is an electronic book (teacher's guide) *Teaching Psychology in Flipped Classroom Settings - A guide for in-class activities*, with the description of in-class activities in accordance with each topic, videos and assessments developed in this project. The book is available on project website (<https://pk.kre.hu/dfm/teacher-s-guide/>). The guidance covers all 30 topics, describes the background and the rationale of the topics, the key topics of the field, learning objectives, pre-class, in-class and post-class materials and activities for the topics, useful notes for the lecturers and advices for further readings. All the activity descriptions follow a consistent scheme including the main objectives of the activity, duration, number of participants, presentation of the type of work, list of tools needed and description of the activity procedures. The guidance includes the availability of the educational videos, the You Tube channel of the project and in the appendix all the pre-tests and post-tests. The guidance were translated into all the local languages of the project partners, so it is available in seven languages, first of all in English and in the local languages of project partners.

Summary

The theme of the DFM project is a learner-centred method - the flipped classroom method. The method, although not entirely new, is less well known and used. Despite the literature, it has many advantages and positive aspects. The literature also highlights the difficulties encountered in its application. Everything justifies a scientific approach to the method - within the framework of the international project presented in this study. The project approaches the flipped classroom method from several perspectives, its results and outputs focusing on both scientificity and the promotion of pedagogical application. Its research provides a view of attitudes towards the application of the method among university lecturers, explores experiences of application and identifies possible reasons for non-application. On the other hand, it helps to facilitate the application of the method by developing and sharing educational materials, inspiring and motivating teachers to use the method in practice. The guidance materials developed draw on the main pillars of the method (F-L-I-P), its benefits, and seek to reduce the difficulties and obstacles encountered in using the method.

The project is based on international cooperation, which allows the research results to be widely disseminated and evaluated. An international team of professionals worked on the outputs, so the multidisciplinary perspective of the team adds to the professional value of the outputs. The materials are accessible to a

wide audience and available in seven languages, so they can be used in a wide variety of ways.

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Literature

Bodnár É., Csilliko O., Daruka M., Sass J. (2017): *Varázsszer-e a tükrözött osztályterem?* In. Budapest: Budapesti Corvinus Egyetem. <http://unipub.lib.uni-corvinus.hu/3068/1/TukrozottOsztalyterem2017.pdf>

Hamden, N., et al. (2013): *A Review of Flipped Learning* www.flippedlearning.org

MCLaughkin, J. E., et al. (2014): *The flipped classroom: a course redesign to foster learning and engagement in a health professions school*. *Academic Medicine*, 89(2), 236-243.

Ollé J., Ruzskai N., Hülber L. (2017): *A tükrözött osztályterem módszertana és tanulásszervezése*. in: (Hülber László, szerk.) *A digitális oktatási kultúra módszertana*. Eger. Eszterházy Károly Főiskola. 85-126.

Sams, A., Bergmann, J. (2012): *Flip your classroom: Reach every student in every class every day*. Eugene, OR.; Alexandria, VA.: ISTE ; ASCD. ISBN: 978-1564843159

Sams, A., Bergmann, J., Daniels, K., Benett, B., W. Marshall, H., M. Arfstrom, K. (2014): *Flipped Learning Network. The four Pillars of F-L-I-P. Definition of Flipped Learning*. URL: <http://bit.ly/1kQYCfn>