

Online education bridges the paradigm of education

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Abstract. The new situation with the online teaching as a must in the Covid-19 pandemic, requires indicating clear directions on how to change the classical approach of everyday teaching. It is a great challenge to adapt to the new situation both for the teachers and pupils. Teachers who have been teaching in a certain way for years, have to change their concepts to deliver more productive teaching. It is impossible to teach online in a class of thirty pupils and not face various challenges, ambiguities and issues when teaching online classes such as lack of discipline, pupils' carelessness, technical problems, financial assistance needed for online teaching, reliability of online program, time required to complete the online program, etc. pupils. This paper addresses this situation by presenting an experiment in online learning environment done during the Covid-19 pandemic in R.N. Macedonia. The experiment resulted in determining good practices in remote teaching that are present in this paper for primary and secondary school pupils.

Keywords: COVID 19, Online learning, online education, technology.

1 Introduction

In the past year, the teaching profession has undergone a paradigm shift. A single virus has altered all human interaction aspects: social, political, economic, or educational. Like all other sectors struggling for their survival, the education sector has found refuge remote teaching mode. While the teachers and pupils who are tech-savvy have easily adapted to the new teaching and learning environment, those with the unavailability of infrastructural resources struggle hard to keep pace with the changes [12]. Moreover, despite the availability of all necessary resources like computer systems, internet connectivity, and bandwidth, this new learning environment has several limitations.

The online teaching promotes innovation and transparency [3]. Whether it is an online class or an online course, pupils expect teachers to make their learning more exciting and easier to understand [7]. Pupils are introduced to a new dimension of learning where they will explore the Internet and learn new things related to the subject being taught [15]. Everyone involved in the current remote teaching has an equal chance to

learn from each other, focusing on the same topic. All participants are free to ask any questions, to explain their viewpoints, to discuss issues.

Pupils adapt more quickly to the remote teaching, develop creativity, communicate using internet, and build critical thinking in teaching compared to teachers. [16]. This is due to the fact that pupils spend more time on their computers than teachers. With this teaching method, the participants no longer need a teacher as the primary provider of facts since they can access information on their own, anytime and anyplace. The role of a teacher in online learning environment is changing.

Teachers cannot conduct effective teaching in the online environment because online education is new for them. They are hindered by technology, experience, submission of student materials, non-existent electronic version of the subject textbook [17]. The teaching concept should be changed due to different pupils learning habits and online teaching flexibility and adaptability to the needs of the student [18].

The audience's focus is even essential in the online classroom than in the regular classroom [19]. The teacher should consider establishing a relationship to help each student on an individual level [20]. The teacher leadership role will be assessed by criteria for the use of ICT technology [21]. Teachers have to leave the central place in the classroom to stand next to the pupils because online teaching changes the dynamics of the class. On the other hand, this also requires changes in the approach to the learning process.

Pupils' biggest shortcoming in online classes is the lack of interaction with other pupils and teachers [22]. Human to human social connection and relationship missing in online learning, making learners deprived of the benefits of learning with peers [22]. Many studies supported the view that lack of direct communication might also cause isolation and loneliness among learners using online learning platforms [22]. For pupils, the biggest advantage of online learning is convenience and flexibility, while the biggest disadvantage is lack of interaction [22]. The participants have to be given a chance to experiment and fail instead of being assessed only based on their test results. Participants should use an inexhaustible collection of resources and tools, more importantly, design their own personalized learning experience. These customized learning materials are shared with the entire Internet community for free, and the pupils should use them in the online classes where they will explore and learn more. Also, that allows them to develop their educational experience in a way that suits their needs.

In this paper, we want to point out the digital tools that teachers can use in the online classes. The main challenge is to develop media literacy (understanding, searching, and selecting information). For that purpose, we present an experiment we have done with two classes using an inverted or flipped classroom and a remote teaching approach for both classes in an online learning environment. We will try to draw some conclusions based on the results and clarify the dilemma of teacher's adaptation to the new situation with the online teaching and how to make it productive and interesting for the pupils.

At the beginning of second section we will present how technology enhances online teaching and we will end with tips and tricks for teachers and pupils. Then, in section three, we will explore the problems and essence of online teaching, looking at the teacher as someone who needs to adapt to the new environment. We will mention

examples of methods and practices that will help in conducting online classes. At the end of section three we will describe the pupils' point of view on today's online teaching. At the beginning of section four we will describe the undertaken research methodology. Then in the second sub-chapter of section four we will see the results we got from the research and in the last sub-section we have a discussion and conclusion about what has been done. At the ending of section four we will present the conclusions from similar experiments in other papers. In the last section, section five we will conclude the paper.

2 Technology enhanced teaching during Covid19

The new way of conducting the class through online teaching should teach pupils that today's world is changing in an unprecedented space and will hardly slow down. The best way to deal with unstable reality is to develop the ability to adapt quickly to new conditions. Lifelong learning is an essential part of this adaptation, especially as it is impossible to provide people at the beginning of their professional life with all the knowledge and skills they will need throughout their lives. New tasks and new problems appear - in entirely new environments, one will need constant learning. It is the ultimate goal we want to achieve through the new online teaching concepts. Shared access to technology makes lifelong learning more accessible than ever before. Education does not have to be location-specific or time-consuming and can happen anytime, anywhere.

Education is compulsory, with learning being a matter of personal choice. With the new online teaching, pupils should be given more freedom to explore what interests them concerning the subject. Using problem-based learning, they will learn more through research because they will be more interested in the problem at hand. Human beings are genetically programmed to learn, and we are constantly learning in many ways. This process occurs when we perform our daily tasks both at work and in our free time. It should come naturally to pupils in their daily lives. The teacher should try not to require any preparation or planning in advance. It is how most pupils acquire skills and knowledge. Many pupils enjoy learning but do not want to be formally educated. In the whole situation with online teaching, the teacher can try to transfer the knowledge to the pupils in a non-standard way that will interest them, and distract them, before they realize whether they want to learn it or not [11].

It is crucial to identify technological issues as they can create an instant, significant influence on learners and the teachers. While the teachers may lose control of the class, the pupils may lose interest and enthusiasm if repeated technical glitches hinder the flow. Being an online education novice, one has to do a substantial degree of self-driven investigation and practice. Before incorporating it in the online class with the pupils, it is essential to figure out how everything works.

The following scenario is a typical case of online teaching in the Covid-19 situation in R.N. Macedonia. The teachers were given short instructions on the platform-tools they are obliged to use when teaching. They started the class not fully prepared for the challenges of the new platform and possible situations. During the initial classes, the

class dynamic's control was lost solely due to the unfamiliarity with the software's nuances. It was not easy to track whether all pupils were following the class. Other challenges with the technology deployment were the control of the pupils' microphones to avoid noise and disturbance. It was possible to handle by planning the presentation details, muting all pupils when the teacher speaks, and allowing them to answer or ask questions when the interaction is needed. Compared with European Union countries such as Romania, where schools were closed for an average of 32 weeks between 2020 and 2021, received only 6 out of 10 pupils online education, which contributed to inequalities in education among Romanian children.[27] In the United Kingdom, one in five pupils could not access online classes but still adapted faster than in Romania. While some countries like Sweden have proven to be better equipped to meet the challenge. The government there developed distant and hybrid forms of education even before the pandemic and teachers were already trained with those platforms and such a method of working with pupils.

A great deal of the knowledge acquisition that takes place in virtual classrooms is self-directed. The lesser we consider learners as detached audiences, the greater the knowledge acquisition happens in online mode. The pupils must be actively involved in all the lesson delivery practices in order to achieve the high quality of their studies [1]. One direction is the pupils can be motivated if they take charge of their own learning by making them an integral part of the teaching process and providing them with reinforcements in various forms. In this era of attention loss caused by the Internet, it is increasingly necessary to realize that learning by personal research is the only option. There are some easy ways that teachers can leverage the tendency for pupils' enthusiasm in online classes, such as to encourage the pupils to improve their inquiry by giving them time to use multiple sites to find answers. They would be more excited about the subject and would develop a genuine interest. Online pupils may have several other windows open in front of them while they attend the class. They may study a lot of the topic simultaneously on the chosen sites.

Additionally, the talkative pupils can make the class challenging to handle. The attentive pupils may feel neglected and gradually lose their interest and excitement. Nevertheless, we believe that the time needed to address the pupils' questions may be tactfully turned into instructional time. It is an opportunity to create a personal connection with those pupils in the online classroom. Listed situations are the reason we suggest considering different teaching methods in the online classroom.

Special cases are the younger pupils with less developed ability of independent learning. Following the current online teaching, they are lost, demotivated, and often suffer with lack of concentration. Generally speaking, the complete transition to online teaching from the classical on-site teaching, found most of the pupils unprepared - not all teachers gave them independent online research assignments before. Those pupils need to change their approach to learning. We think that every pupil should find a motivation scheme that will help her/him to learn and improve the learning skills, whether it will be a daily study schedule, calendar, videos, games, and more.

3 Remote teaching in online class

The following scenario is the typical opening of most online classes in R. N. Macedonia - the teacher and the whole class are present, and their faces are seen on the monitor. Each pupil's name is visible. The teacher leads the class on her/his subject. She asks questions, the pupils one by one get involved and answer. Discussion is slowly developing. However, our main question is, what activities are suitable for the rest of the class?

Pupils can be sent a quiz to solve during the class; they can be given to explore the subject's next lesson. They may also be allowed to do more research on the topic of the present lesson. There are online tests that can be answered in real-time and the teacher keeps a record of the scores. It is a good challenge for both teachers and pupils.

Teaching classes is starting to change to the right direction, but we can introduce even more modifications in order to create productive and valuable teaching for our young pupils. We present several ideas.

A flipped or inverted classroom is an instructional strategy and a type of blended learning, which aims to increase pupil engagement and learning by having pupils complete readings at their home and work on live problem-solving during class time. Usually pupils watch pre-recorded videos before the class and gain some basic knowledge. It is a great way to impart knowledge to pupils. In this mixed learning approach, face-to-face interaction interferes with independent learning through technology. The jigsaw puzzle method represents a cooperative learning technique that reduces pupil conflict, promotes better learning, improves pupil motivation, and increases learning enjoyment. In project-based learning, the pupils work on a project over an extended period from a week to a semester that engages them in solving a real-world problem or answering a complex question. They demonstrate their knowledge and skills by creating a public product or presentation for a real audience [14]. As a result, pupils develop deep content knowledge as well as critical thinking, collaboration, creativity, and communication skills. Project-based learning unleashes contagious, creative energy among pupils and teachers.

4 Experiment

4.1 Methodology

In order to explore these ideas and the current predominant way of remote teaching, we encountered the following case study.

We engaged two classes of primary education in their final year, the pupils from IX-2 and IX-3 grade from the primary school "Lazo Angelovski - Skopje".

In this experiment, the first topic was taught to both classes in the standard online classroom and then they were tested. In the same classes, another topic was held in a flipped classroom model. Afterwards, the pupils were tested again. At the end of both classes, the pupils opinion about the classes was taken and the results of the pupils'

knowledge was obtained. The testing was done at the end of each lecture, utilizing an online quiz platform (<https://www.flexiquiz.com>). The quiz contains 7 to 10 questions.

Lessons that were being processed:

- a. Standard online classroom: "Civic organizations and groups of representation" Thursday 04.02.2020 (For both classes)
- b. flipped classroom: "Culture and cultural identity" 11.02.2020 (For both classes).

The following two tables presents the realization plans for both used models, given in details about the time schedule, used methods, techniques and forms and the lesson objectives. The standard online classroom is presented in Table 1 and the plan for the flipped classroom – Table 2.

Table 1. Plan for the standard online classroom

Traditional online class 35 minutes	Methods, techniques, and forms	Objectives of the lesson Ability of the pupil ...
Preparation for class. 35 minutes	Lecture	to identify types of civil society organizations and associations
The first 5 minutes is an introductory part of the class	Discussion	to explain the role of civil society organizations in society
the central part of the class in which the teacher presents the main content through a presentation of 15 minutes	A storm of ideas	to recognize specific situations in which citizens can influence the improvement of the community life through association and organization
The final part (Giving pupils directions for research activity for the flipped classroom) 5 minutes	Group discussion	to explore examples of civic initiatives
Evaluation test 10 minutes		

Table 2. Plan for the flipped classroom

Flipped classroom 35 minutes	Methods, techniques, and forms	Objectives of the lesson Ability of the pupil...
<p>The pupils were told by the teacher to make presentations for their next class.</p> <p>The teacher monitors and guides the pupils in the virtual classroom during the lesson.</p> <p>Pupils will have to make short presentations on culture and cultural identity from 3 to 5 slides that have been given to them in the previous lesson. They will research and come to their conclusions.</p> <p>The first 15 minutes will be presented by three random pupils of 5 minutes each.</p> <p>Discussion and questions between pupils 5 minutes 10-minute evaluation through test</p> <p>Five minutes Survey for the two held classes.</p>	<p>flipped classroom</p> <p>Group discussion</p> <p>A storm of ideas</p>	<p>to understand the impact, function, and culture of their community</p> <p>to explain the elements that make up cultural identity</p> <p>to explore and present different cultures from their environment</p> <p>to be able to define the term cultural identity through a concrete example</p>

4.2 Results

In this section we give analysis of the experiment after the completion of the activities. Table 3 contains the survey questions that were given to the pupils in order to undertake a quantitative analysis of their impressions and aspiration to continue with the blended model with flipped classroom, together with their answers.

At the end of this section, we enabled the pupils to give narrative answers to the question “Do you have anything to add or correct to the previously held classes?”

The details about the classes where the experiment was undertaken:

- a. 23 pupils in class IX-3, of which 12 are female, and 11 are male.
 - i. 21 pupils with an average grade of 3.09 (60%) answered the first test with a standard (classic) classroom;
 - ii. 21 pupils with an average grade of 4.71 (95%) answered the second test with an overturned classroom;
- b. 27 pupils in class IX-2, of which 12 female and 15 male pupils.
 - i. 20 pupils answered the first test with an average grade of 3.3 (74.1%);
 - ii. 25 pupils answered the second test with an average of 3.64 (67.72%);

The survey was answered by 48 pupils.

Table 3. Results of the questions

Question	Flipped classroom		Standard classroom
Did you like better the lesson in a flipped classroom where you are researching on your own and know in advance about the topic that will be covered in the lesson or the way of standard teaching?	48,4%		51,6%
Where do you feel you have learned more?	47,4%		52,6%
Would you like to have classes with a flipped classroom more often?	Yes	No	
	71,6%	28,4%	

Question: “Do you have anything to add or correct to the previously held classes?”

Pupils answers:

- Pupil 1: "I liked both classes with both types of lectures."
- Pupil2: "It is more interesting when more children present because we all have different ideas."
- Pupil3: "I am obsessed with the way the teacher teaches, but a flipped classroom is better in my opinion; we follow the lessons better."

- Pupil 4: "No, but my opinion is that classes with an overturned and standard classroom should be held for the greater interest of the pupils."
- Pupil 5: "No, everything is great. "I just liked the class that we pupils are preparing because it is something different from the other 'ordinary' lecture, and I think we should have more such interesting activities."
- Pupil 6: "I think we learned the material well in both types of classes, but I like the classic class a little more, just because that way more pupils can debate, while in an flipped classroom there is time only for a few pupils to teach."

4.3 Discussion

The pupils are equally satisfied with both teaching methods; they want to have classes with a flipped classroom more often, and they claim that the classes with a flipped classroom were more interesting because they were more engaged. The IX-3 test proved to be drastically more successful in the flipped classroom than in the standard one. While in the IX-2 test, it proved to be a little more successful in the flipped classroom than in the standard class.

Online learning accentuates individual contact. The motto of a school is "love opens doors to teaching". However, the older the pupils are, the love is replaced by etiquette. The teacher should give more value to the evidence of learning events than to the formal performance. If the teacher can prioritize learning and not the grades, it will provide better instruction and substantial knowledge [13]. We want to emphasize that the teachers should build trust and motivation among the pupils, by setting reasonable expectations during the online lessons.

4.4 Similar trials to ours in the past

The purpose of these studies was to evaluate the effectiveness of the traditional lecture-based curriculum versus the modified "inverted classroom" curriculum. In all papers, lessons were taught and pupils were tested with both teaching methods. The difference between the research in the papers shown in Table 4 and my research is that the research in Table 4 was done face-to-face at school, while my research was done online.

Table 4. Results of similar trials to ours in the past

Scientific papers	Conclusions
Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course" [23]	The final results of the study indicate much more efficient teaching and better test results in the inverted teaching method compared to the traditional teaching method.
"Flipped classroom model improves graduate student performance in cardiovascular, respiratory, and renal physiology." [24]	Projects and homework have played a major role in motivating pupils and they believe that the inverted teaching model should be combined with the traditional teaching model.
"Looking at the impact of the flipped classroom model of instruction on undergraduate multimedia students at CSUN." [25]	The conclusions from this study showed greater engagement of pupils in the inverted teaching method compared to the traditional method. After the research, the surveyed pupils answered that their habit of studying on their own has increased.
"Student learning and perceptions in a flipped linear algebra course." [26]	The learning of the material is measured in the performance of the exams, the pupils from the lectures in the inverted classroom have a more significant increase in the results of the exams compared to the traditional part. In the end, the surveyed pupils showed that they like the new teaching model and appreciate the innovation that has been invested by teachers.

5 Conclusion

This paper explores the existing problems in the Covid-19 provoked situation with the online teaching. It proposes some guidelines and practices that teachers can use to better navigate online teaching today. An experiment in a primary school in R.N. Macedonia was conducted, to illustrate the need of introducing the model of flipped classroom in online learning environment. The experiment has shown that the pupils became more engaged with the flipped classroom model used in an online learning environment. Also, the average score of the conducted tests after the classes were held using standard remote teaching and flipped online classroom was in favor of the flipped classroom.

In the questionnaire presented in this paper, the pupils clearly stated that they prefer blended teaching where monotony of the remote teaching will not prevail. The flipped classroom model can only help and improve the online teaching process and should therefore be used more frequently. The teacher needs to catch up with the latest technology, develop different approaches and use different digital tools.

We are facing a great transformation in the education system and we believe that the approach discussed in this paper can help in this ongoing process.

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