Flipped Classroom and Independent Learning

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Abstract. The aim of this study was to investigate the possible ways in which the flipped classroom could promote independent learning. Two research questions were formulated: 1. What are the possible elements of independent learning that the flipped classroom can develop? 2. What are the possible skills required by teachers and students for independent learning that the flipped classroom can develop? The research was conducted in a secondary school in Cyprus. A mixed methodology was selected and the participants were invited to concurrently complete one quantitative and one qualitative questionnaire. The analysis of the answers has shown that the implementation of the flipped classroom can promote independent learning and develop, to a greater or lesser degree, its elements and the skills required by teachers and students. It has also revealed the strengths of this teaching method but also some weaknesses that must be considered. Future research that would periodically evaluate the degree of independent learning, diagnose needs and set new objectives is recommended.

Keywords: flipped classroom, independent learning, active learning, self-regulated learning.

Introduction

Aims and purpose of the study

The area of research of this study is the flipped classroom and the emphasis is given on the possible ways in which the flipped classroom could promote and enhance independent learning. The following research questions were formulated:

1. What are the possible elements of independent learning that the flipped classroom can develop?
2. What are the possible skills required by teachers and students for independent learning that the flipped classroom can develop?

Review of the literature

Independent Learning

Motta and Scott [16] quote Forster (1972) who defines independent learning as a process in which the student ‘acquires knowledge by his or her own efforts and develops the ability for inquiry and critical evaluation including freedom of choice in determining the objectives and placing increased educational responsibility on the student’ (p.89). Meyer [13] takes the stance that the concept of independent learning is associated with educational concepts such as personalized learning, student-centered learning and ownership of learning and argues that it is vital for the promotion of high quality education, lifelong learning, social equity and cohesion. Kesten [9] refers to several terms such as autonomous learning, independent study, self-directed learning, student-initiated learning, project orientation, discovery and inquiry, teaching for thinking, learning to learn, self-instruction and life-long learning. Paris and Paris [18] describe the characteristics of self-regulated learning and point
out that it ‘emphasizes autonomy and control by the individual who monitors, directs and regulates actions towards goals of information acquisition, expanding expertise and self-improvement’ (p.89). Zimmerman [25] describes self-regulation as a self-directive process by which learners can transform their mental abilities into academic skills. Furthermore, self-regulated learning is related with the increasingly important lifelong learning which is situated in a non-academic, more learner-oriented environment [23]. Researchers typically make a contrast between dependent and independent learners [1]. The dependent learner is described as a passive recipient of knowledge and sees his or her own role as subsidiary while the independent learner is active in directing and regulating his or her learning [13]. There is a lot of discussion and research [5; 7] about the effectiveness of active learning approaches compared with the traditional lecturing. Prince [20] states that active learning is generally defined as ‘any instructional method that engages students in the learning process’ (p.1) and argues that while this definition could include activities such as homework, active learning usually refers to activities that take place in the classroom. The fact that independent learning is a student-centered model of teaching does not mean that the teacher does not have an important role to play in the learning process by creating a suitable learning environment [14]. The literature suggests that independent learning is facilitated by factors that are both internal and external to learners. The external factors include the development of a strong relationship between teachers and students [1; 9] and the establishment of an enabling environment that includes the physical environment, the time environment, the peer environment, the material resources and the tutor resources [11]. The internal factors of independent learning are the skills that individual learners need to acquire and include cognitive skills, metacognitive skills and affective skills [13]. Affective skills are skills that relate to feelings and emotions and Meyer [13] argues that motivation is considered the most important affective skill which is directly associated with independent learning. Zimmerman [25] draws attention to the key processes that an individual learner must develop and refers to ‘goal setting, time management, learning strategies, self-evaluation, self-attributions, seeking help or information and important self-motivational beliefs such as self-efficacy and intrinsic task interest’ (p.64).

The Flipped Classroom

Flipped Learning Network [6] gives a formal definition of “Flipped Learning”:

Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.

As it can be deduced from the above, the flipped classroom could potentially provide the opportunity for the teacher to convert the class into a place where lecturing is reduced, students are not passive receivers but instead the teacher interacts with the students and provides guidance and feedback. Students’ perceptions of the flipped classroom are mixed but are generally positive overall even though a few students strongly dislike the change [2]. In a survey conducted among 203 students in flipped classrooms, Driscoll [4] reports that, close to 80% answered that they had more constant and positive interactions with their teachers and peers, they had more access to sources of information, they could work at their own pace, they had more active participation in how they can demonstrate their learning and they reported that their learning was more active. In the same survey, 100% of the teachers agreed that the
flipped classroom helped make students’ learning more active. Over 90% reported that positive interactions between teachers and students increased, students had more frequent access to course material and instructions, they had the opportunity to work at their own pace and to engage in critical thinking and instruction became more differentiated and personalized. On the other hand, 50% of the teachers that participated in the 12th Speak Up online survey expressed their concerns about students not being able to access videos at home [21]. Another concern is associated with the need of sufficient training to properly implement the flipped classroom [21]. Finally, as White et al. [24] argue, designing a curriculum that implements active learning approaches is relatively simple compared with creating a learning environment that truly engages students in high-order thinking and Mossop [15] points out that the implementation of new methods of delivery could be a waste of resources if the students fail to fulfill their own obligations as learners.

STEM Education

Active learning is related to student performance in STEM (Science, Technology, Engineering and Mathematics) subjects. A metaanalysis of 225 studies that reported data on examination scores or failure rates of student performance in STEM subjects under traditional lecturing versus active learning has indicated that the average examination scores improved by about 6% in active learning sections and that the probability to fail was 1.5 times larger in classes with traditional lecturing [7]. This is an important finding as it does not represent the personal experience of an educator but is the outcome of the analysis of a large number of studies to allow for reliable results. It also indicates how the implementation of the flipped classroom that promotes active learning in class could potentially improve student performance in STEM subjects.

Methodology and methods of data collection

A mixed methods approach (quantitative and qualitative) with a concurrent triangulation was selected, as the two different approaches were used in an attempt to confirm and cross-validate findings within a single study. The research tool was that of a survey. The school in which the investigation was conducted is a secondary school in Cyprus that has implemented the flipped classroom for one year. A questionnaire with a combination of 14 closed-ended and 4 open-ended questions was used. In the quantitative questionnaire the participants were asked to answer fourteen four-level modified Likert Scale questions which supplied the quantitative data for the study. In addition to quantitative data, it was also important to give the teachers and students the opportunity to express their thoughts in their own words and pick up ideas and themes that were not covered in the quantitative questionnaire. Thus, four open-ended questions were included in the study. The qualitative data gathered were analyzed looking for specific themes with the use of code words which were self-generating and thus allowing for reduced bias and increased validity.

Results

Qualitative Results

Q1: Which do you prefer: traditional teaching or the flipped classroom? Please explain your answer.

The majority of the teachers expressed the opinion that the best approach would be a combination of both traditional teaching and flipped classroom. The flipped classroom was described as a method that could foster independent learners more
effectively and could give students the opportunity to manage and monitor their own learning. Some teachers referred to how the flipped classroom could free classroom time and give students the opportunity to work at their own pace. On the other hand concerns were expressed about the fact that there is no way to guarantee that the students will cooperate, it is not always easy to make sure that all students have access to the necessary resources and that this model will increase the time spent in front of a computer screen. The relative majority of the students opted for flipped classroom but there was a significant amount that preferred either traditional teaching or a combination of both. The most important aspect that the students referred to was that the teacher can be with them when they need help and that it enables more effective communication with the teachers and among classmates. Many students pointed out that the flipped classroom helps them develop their responsibility and become more organized, it enables them to work at their own pace, it save class time and it promotes active learning. A number of students expressed the view that it does not help goal setting, it does not motivate and it does not work with all students.

Q2: In what ways do you think the flipped classroom has helped students/you improve their/your learning? Please explain your answer.

The majority of the teachers supported the view that the flipped classroom has helped students improve their learning by allowing them to learn at their own pace and by giving them the freedom to learn at their own style. A common theme that also emerged was that it develops a responsibility of learning from the part of the students by fostering ownership, freedom of learning and promoting self-discipline. It was also identified as a teaching strategy that allows for differentiation. The point that most of the students referred to was that it changes the way in which they access information and expressed the view that they can find information easier and when needed. They also reported that the flipped classroom is very useful when a student is absent so he can find his homework online and catch up. Another comment that students made about the flipped classroom was that it helps organize time and homework. Some students said that they enjoy learning with flipped classroom which is a factor that further stimulates learning and that it is more interactive.

Q3: In what ways do you think the flipped classroom caused problems in improving the students/your learning? Please explain your answer.

The main concern expressed by the teachers surveyed is related with the fact that if some students are not properly prepared at home before they come to class, they will be excluded from the teaching process. Furthermore, it was also reported that some students are not motivated which results in that they learn less. Another concern that was pointed out is that the teacher has less control of the class and hence is not in charge of students’ learning. Several students expressed the view that the flipped classroom hasn’t caused problems. Some referred to the fact that the flipped classroom results in an overuse of technology and the internet and a reduced use of books. Others proposed that the flipped classroom is not appropriate for senior students and for students who are preparing for external exams. The flipped classroom was also described as a teaching method that causes problems because it does not allow for the appropriate student motivation and goal setting. Finally, some students said that the implementation of the flipped classroom could cause technical problems.
Q4: What could you/your teachers suggest do to encourage your students/you to become more independent learners/learner?

The majority of the teachers suggested that the students could become more independent learners by finding their own way of learning. It was also proposed that different strategies should be implemented to fit different learning styles of different students. The value of researching knowledge was also pointed out and the use of multiple sources of knowledge was proposed. Finally, the development of independent learning was associated with the importance of feedback to the teacher so that he can effectively monitor the progress of his students. Many different ideas were expressed by the students surveyed. The most frequent answers referred to a class that would make students more active learners and promote independent learning by allowing students to find the answers by themselves. Some students proposed that independent learning could be enhanced by differentiating homework according to the needs and abilities of each individual student. The idea of making the students more involved in the learning process and giving them ownership of their learning was also reported in various ways.

Quantitative Results

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Table 1. Quantitative data
Analysis and discussion

Research emphasizes the significance of a strong relationship between teachers and students [9; 13]. The answers to Q1 revealed that there was an agreement between teachers and students and the majority reported that the flipped classroom helps the development of a stronger relationship between teachers and students. The majority among students reached a total of 68.4% of the students who either agreed or strongly agreed. The answers to Q8 showed that a significant majority of 75% of the teachers reported that the flipped classroom enables them to communicate more frequently with their students but this percentage is reduced to a 53% among students. Q3 was about whether the flipped classroom is more or less engaging than traditional teaching. The answers of the teachers were equally divided while 58.8% of the students reported that the flipped classroom is less engaging than traditional teaching. That was a very interesting finding as it appeared to be an anomaly with respect to the answers given by teachers and students in other questions that were clearly favorable for the flipped classroom. Silverthorn [22] discusses the issue of student reactions to innovative teaching methods that require the development of independent learning and proposes that the key to success is a gradual change with small steps and a constant communication with the students about what the teacher is doing and why. Q5 revealed an interesting anomaly. All teachers reported that the flipped classroom gives students the ability to work at their own pace but a significant 41.2% of the students reported that it does not. The difference could be explained if we take into account that some students reported negative experiences, for example technical problems or a dislike with the overuse of technology and the internet. The majority of teachers also reported that they prefer the flipped classroom because it allows students to work at their own pace and improve their learning. Research [19] has shown that students develop academically effective forms of self-regulated learning when they are involved in collaborative work and the answers in Q9 revealed that both teachers (75%) and students (82.4%) surveyed agreed that the flipped classroom gives students more opportunities to interact with their peers. More effective interaction with classmates was also reported as one of the reasons why students prefer the flipped classroom compared to traditional teaching. The importance of the use of sources of information for the development of independent learning is stressed by many authors [12; 22]. The answers to Q6 showed that the implementation of the flipped classroom provides a clear opportunity for the integration of the use of resources in the process of teaching and learning which is also enhanced by the fact that many students reported that one of the ways in which the flipped classroom has helped them improve their learning is that they can find information easier, when needed and faster. The answers to Q12 showed that a significant majority of 87.5% of the teachers reported that the flipped classroom enables them to provide feedback to the students in a more effective way while 58.8% of the students reported that the flipped classroom gives them more opportunities to ask their teachers for help. The fact that the teacher can be with the students when they need help was also the most important aspect of the flipped classroom that the students reported as it is also supported by the findings of other authors [8; 9]. The answers to Q11 showed that all teachers reported that the flipped classroom can give the students greater ownership over their learning while the same was reported by 64.7% of the students. Furthermore, a common theme that emerged from the answers of the teachers is that the flipped classroom develops responsibility of learning and fosters ownership and freedom of learning. However, it must be pointed out that the fact that the flipped classroom gives the students the opportunity to take greater ownership over their learning, as it was reported by the
teachers, does not necessarily mean that the students will actually cooperate and take over this responsibility. The answers to Q13 showed that both teachers (75%) and students (64.7%) believe that the flipped classroom helps them understand how students think and learn. This can be seen in parallel with the fact that many teachers reported that the flipped classroom has helped students improve their learning because it gives them the opportunity to learn at their own style and that finding their own way of learning could make students become more independent learners. Several students reported that they prefer the flipped classroom because it helps them become more organized. The notion of organization was also one of the themes that emerged when students were asked to explain the ways in which the flipped classroom has helped them improve their learning. Goal setting is described as a key skill of an independent learner [25]. Q2 revealed that 50% of the teachers and 57.9% of the students reported that the flipped classroom helps students set study goals. These findings should be seen in parallel with some of the answers reported by the teachers and students regarding the ways in which the flipped classroom caused problems in improving students’ learning. Some teachers said that they have less control of the class or that they are not in charge of students’ learning while students reported that they need goal setting from the teachers. Kyriacou [10] describes features of effective teaching and stresses the importance of pupils evaluating their own work and the work of others. Research has indicated that children develop academically effective form of self-regulated learning when they are involved in self-evaluation and self-assessment [8; 18]. Q7 indicated that 62.5% of the teachers and 64.7% of the students believe that the flipped classroom can help the students evaluate the quality of their own work. Meyer [13] describes the affective skills required for independent learning and takes the stance that motivation is considered ‘the most important affective skill and is directly associated with an increased capacity for independent learning’ (p.15). The answers to Q4 showed that 62.5% of the teachers reported that the flipped classroom enhances student motivation which must be seen in parallel with the fact that the majority of the students reported that they are happy with the flipped classroom. 58.8% of the students agreed that the flipped classroom increases motivation but there was a significant 41.2% who disagreed. Furthermore, some students referred to the lack of motivation in the flipped classroom when they were invited to explain the ways in which the flipped classroom caused problems in improving their learning. Various authors [10; 19] agree that independent learning is fostered when students make decisions about their learning processes and the criteria by which they are judged. Q10 showed that 62.5% of the teachers and 64.7% of the students reported that in the flipped classroom the students are more actively involved in the learning process. Furthermore, the majority of the students reported that their teachers could encourage them to become a more independent learner by making learning more active. The literature states that a crucial part in the development of students’ independent learning is the acceptance of the responsibility, which is related to improved self-concept, self-image and other indicators of emotional well-being [9]. The answers to Q14 showed that 64.7% of the students reported that the flipped classroom has made their role more responsible. Many of them also said that they prefer the flipped classroom because it develops responsibility. The answers to Q14 indicated that 87.5% of the teachers surveyed reported that the flipped classroom has not made their role less important, which is an important finding related with their job satisfaction as it is also reported by other authors [17].
Evaluation

Educational research is social research and hence it is not dictated by the principles of positivism like natural sciences. The findings and conclusions of this research are subject to the uncertainties of interpretivism which makes objectivity and rationality become rather relative concepts. The intention of this investigation was to gather data at this stage of the implementation of the method at the specific school chosen and analyze the possible ways in which the flipped classroom could promote independent learning. This means that this research is a snapshot of an ongoing process that could be followed by a longitudinal, long-term study in order to gather data over many years. A next step could involve structured observation of classes with an organized procedure and a set of well-defined observation categories that will focus on how the different elements and skills of independent learning are developed and one-to-one and group interviews with teachers and students that would supply valuable data for further improvement of the implementation of the method. This research could be the starting point of an ongoing procedure that would periodically evaluate and assess the degree of independent learning, diagnose weaknesses and set new objectives taking into account special needs and circumstances. The importance of this research also lies to the fact that it provides useful evidence and insight about how a specific learning environment, which is in this case the flipped classroom, can supply the necessary conditions and promote independent learning. So, even though the findings of this research are not based on large scale data from a wide population, patterns can be observed so that the implementation of a similar model in another school can have a more informed starting point and hence increase its effectiveness.

Conclusion

This investigation has shown that the implementation of the flipped classroom can promote and enhance independent learning because, it develops, to a greater or smaller degree, the elements of independent learning and the skills required by teachers and students. It has also shown that small well organized steps must be followed so that all students are engaged in the process and are properly informed about the characteristics and potential benefits of the method. Finally, it must be pointed out that the outcomes and findings of this study are drawn from the opinions of teachers and students and can only hold true within the specific time limits during which it was conducted and within the specific data limits that were generated, analyzed and interpreted.

References


