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“The role of SBVTs (Syllabus-based Video Tutorials) in personalized learning. A case study  
based on Flipped Classroom model “

MA thesis

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**Abstract:**

21<sup>st</sup> century learning paradigm sets new standards for educational systems (Ministry of Education and Research, 2017). Ongoing attempts of educators to enhance a student-centered academic process have raised needs for finding and adopting more instruments for promoting autonomy of learners and personalization of learning. In the era of technological transformations, theory of blended learning has given a push to emerging new models, combining traditional teaching and learning approaches with digital resources. One of such examples is “flipped classroom” and the integration of video resources into the academic process. It is becoming increasingly popular. More and more studies and reports (Johnson, 2015) emphasize its potential and positive impact. Despite many positive developments in the Georgian educational system in the first two decades of 21<sup>st</sup> century, flipped classroom model and integration of digital resources in teaching and learning has only been theoretically promoted. To the best knowledge of the author together with all parties of this project, there has not been any tangible example or study, where these methods have been piloted and/or observed in a real case and local context.

The present study is an attempt to explore the practical application of the flipped classroom model and a syllabus-based original video resource in the context of one private secondary school in Tbilisi, Georgia. This project explores how this methodology can impact students’ learning process and lesson-planning. The research was implemented on the academic year of 2018-2019. It covered the target group of 60 students from grade 8, under the subject of biology, with active participation of the biology teacher. The actual intervention – learning from video-tutorials in frames of flipped classroom model, lasted 3 months. The study provides analysis of the impact of the model based on changes in learning experiences demonstrated by focus group interviews, teacher’s interviews and classroom observations as well as changes in formative and summative assessments. It also discusses advantages and disadvantages of using this model from academic and practical perspectives. Derived from the findings, several recommendations are also given for the attention of educators wishing to use this methodology in the future.

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## **Chapter 1: Introduction**

### **1.1 Overall Background of Georgian Educational System**

Since the end of the 20th century throughout the first two decades of 21st, technological revolution has started to invoke dramatic shifts in various fields. Digital devices and the internet have rubbed out the boundaries, information and knowledge have become more accessible than it had been in the past. However, the education, as one of the most conservative/conventional areas, still struggles to catch up. The new approaches embedded in New Learning Paradigm (Ministry of Education and Research, 2017) are particularly hard to launch in developing systems, such as most post-Soviet countries. Georgia is among them.

Major transformations in the Georgian education system were initiated after the Rose Revolution in 2003, and consisted of the following dimensions: decentralizing educational governance and financing schemes, establishing a per capita funding formula, designing new curricula and textbooks with teaching materials, introducing new regulations regarding teachers' professional development, and introducing standardized assessments and national examinations. The aim of these reforms was to provide students with the better-quality education and to improve students' academic achievements.

### **1.2 What does the international assessment show?**

According to the Global Competitiveness Index (Schwab & Sala-i-Martin, 2018) out of 148 countries, Georgia has a very low rating for education. In the category of quality primary education, it holds only the 94th place (3.4 points). According to the quality of the education system in general, Georgia is in 105th place (3.2 points), with the quality of mathematical and scientific education on the 106th place (3.4 points).

Georgia participates in several international research projects, which monitor and evaluate the changes undertaken in the education system over a specific period of time: The Progress in International Reading Literacy Study (PIRLS), the Trends in International Mathematics and Science Study (TIMSS) and the Program for International Student Assessment (PISA). These projects have similar designs - all three are targeted at the two dimensions: (1) student assessment (testing) to check their progress and (2) factors that affect student performance (education system, school, teacher, family, etc.). With the help of student, teacher and school surveys, there is big data

on these factors. Research design and reporting methods are adapted so that governmental institutions find them easy to follow, and to subsequently take research results and recommendations into consideration.

PISA assesses students' competencies in science, reading and math. The PISA target population is 15-year-old students (OECD, 2009).

In science literacy - the main pillar of PISA 2015 (OECD, 2018), 15-year-olds in Georgia scored 411 points compared to an average of 493 points in OECD countries. Girls perform better than boys with a statistically significant difference of 16 points (OECD average: 3.5 points higher for boys). In Georgia, the average performance in reading of 15-year-olds is 401 points, compared to an average of 493 points in OECD countries. Girls perform better than boys with a statistically significant difference of 58 points (OECD average: 27 points higher for girls) (Bregvadze & Bakhutashvili, International Program for Students Assessment PISA - Georgia Report, 2017).

Under the PIRLS, which is administered in every five years and aims to identify all of the progress and shortcomings which fourth-graders (9-10-year-olds) all over the world have in terms of reading literature, Georgia was ranked 37<sup>th</sup> out of 45 participating countries. The indicator of Georgian students was 471 points. With this performance, Georgia significantly lagged behind the average figure (500 points) of literacy as measured by PIRLS. Only 2% of Georgian students managed to be among the highest performers, 15% achieved high results, 50% - average results and 82% - low results. Out of the participant students, 18% were unable to surpass the minimum competency level (Kutaladze I. , 2013).

In 2011, 63 countries with a total of 600,000 students took part in TIMSS - Trends in International Mathematics and Science Study. Georgia's performance among both - fourth-graders and eighth-graders did improve compared to 2007 with 2% of Georgian students having achieved scores within the highest results and 28% having failed to surpass the minimum threshold (Mullis, O'Martin, Foy, & Arora, TIMSS 2011 International Results in Mathematics, 2011)

In TIMSS 2015 Georgia had a better performance in every component, however, still very low compared to the overall TIMSS picture. The results showed that only 1% of Georgian fourth graders achieved scores at the highest level whilst 33% could not surpass the minimum level and

ended up below the subscale. Similarly, among the eighth-graders, only 1% achieved the highest level and 44% failed to surpass the minimum threshold. The average scale point for fourth-graders was 463 and for eighth-graders – 453. The number of students who failed to surpass the minimum threshold also dropped. Only 22% of fourth-graders and 28% of eighth-graders failed. In spite of this better performance, the average points for Georgian students were still much less compared to the world average (Mullis, O'Martin, Foy, & Hooper, TIMSS 2015 International Results in Mathematics - Eighth Grade Mathematics, 2015).

As a matter of fact, in 2007-2015, in this period of eight years, Georgian students were unable to reach even the average level. TIMSS studies demonstrated that at the present moment Georgian students are unable to compete with students of most of other countries in math and science (Mullis, O'Martin, Foy, & Hooper, TIMSS 2015 International Results in Mathematics - Eighth Grade Mathematics, 2015).

### **1.3 Where to look for reasons?**

Looking at the results above, combined with the low reputation and public trust of the secondary schools in Georgia, the need to identify main causes and explore potential solutions is obvious. The main factors, which may potentially have impact on the students' performance, need to be analyzed, including teachers, classroom and school environments, access to and quality of learning resources, methodology, etc.

One of the key challenges in Georgian general education is the critically low qualification of most school teachers. It is interesting to look at the data about the teachers' population in the country:

According to the Ministry of Education, Science, Culture and Sport, there are approximately 584,400 students studying at different levels of general education in 2,313 schools throughout Georgia. The majority of schools in Georgia are public (2,085), providing instruction to 500,000 students. There are 228 private schools in Georgia located predominantly in larger cities, where 60,400 students are enrolled. There are up to 67,000 teachers in Georgia, of whom 58,000 are female, 60,000 are employed in public schools, and 7,000 are employed in private schools (Ministry of Education, Science, Culture and Sport (MESCS), 2019).

Teachers certification exams began in 2010 and the results have been very disappointing. The former head of the National Assessment and Examinations Center (NAEC), Maia Miminoshvili, says in her official interview that most of the teachers could not pass the threshold in the certification exams in 2016. Since 2010, about 86% of teachers have failed to pass the threshold, in civic education - 82.6%, chemistry - 91%, biology - 77%, arts - 74%, physics - 96%. Better results are in history and geography - 57.2% and 49% accordingly (Miminoshvili, 2016).

There are also objective pre-conditions of the above-mentioned negative results found in the teachers' population, identified by the international research studies (TALIS). The study was launched in 2008 and Georgia joined the survey in 2013. Fieldwork in Georgia was conducted in the spring of 2014 and administered by the National Assessment and Examination Center with the participation of 440 school principals and more than 6,000 teachers (Andguladze, 2015). The main findings include:

- The average age of teachers is 48 years, which is 5 years higher than the average age in the TALIS countries;
- The percentage of teachers aged 60 and more is higher in Georgia (19%) than in any other participating country (TALIS average is 6%);
- Georgia also showed a lower percentage of teachers below 30. The share of young teachers in Georgia is 6%, which is twice less than TALIS average (12%);
- The percentage of teachers younger than 30 is only 4% among Georgian language and literature teachers, 13% among foreign language teachers, and 9% among ICT teachers;
- The majority of the basic and secondary education school principals identify the limited availability of a qualified/skilled teaching force as one of the detrimental factors of effective schooling: 61% of the school principals identified this factor as “very detrimental” or “somewhat detrimental” which is significantly higher than the international average (around 40%);
- Half of the school principals also stated the shortage or inadequacy of computer programs for instruction (49%); shortage or inadequacy of instructional materials (47%) and insufficient internet access (46%). Private and public schools in the urban areas experience the shortage of qualified teachers or resources to the same extent. Small rural schools particularly suffer from the lack of certain physical resources.

Although there is no evidence about a direct correlation between the age of a teacher and quality of teaching, still, the above-listed figures about teachers' age combined with the findings about their qualifications, in most cases translate into the lack of contemporary teaching skills (including digital ones), more practice of using traditional lecturing lessons, unreadiness for New Learning Paradigm (NLP) methodology and ignorance of personalization in learning process.

The first important recommendation about Georgian TALIS results 2015 was, “Incorporating a constructivist approach into teacher professional development activities. TALIS results have shown that the large majority of Georgian teachers can distinguish between plausible and ineffective teaching approaches. There is a strong agreement with the more constructivist approaches among Georgian teachers. This can be attributed to the teacher professional development activities implemented during the last few years. The next objective for the teacher professional development is a deeper internalization and mastery of the new teaching approaches. Further development of professional skills (internalization and mastery) is less likely to occur as a result of training, which was the most widely used strategy for teacher development in recent years. The research shows that non-diversified training focused on the transmission of knowledge is not productive. Teachers need TPD opportunities that allow them to experiment with new methods and strategies and analyze and reflect individually and in groups on their teaching” (Andguladze, 2015)

The challenge regarding teachers cannot be surmounted in a short-run. The system needs to prepare new generations of educators and make the profession more attractive. This takes years, not days. Meanwhile, the poor performance of Georgian students needs to be responded as soon as possible. Therefore, updated methodology, combined with more effective use of technology can be one of the rapid solutions. This study will strive to contribute to this development.

For the purpose of the current study, it is relevant to mention two important resources, available for Georgian students at this moment, which have become the motivators for the project.

The first important attempt has been offered by the company Silknet (JSC Silknet, Silk Road group's subsidiary, is the leading company in Georgia offering wide range of telecommunication products including Internet, TV, fixed telephone services and business telecommunication



services). This is an educational and cognitive project homeschool – “Silk School” (Silknet, 2016-2018). It’s a distance learning, or rather, home-schooling tool, which is accessible for everyone. Students can study as long as they have access to the internet – at home, on vacations or on their travel. With Silk TV, 1-12 grade students can practice topics of different subjects, access materials from previous classes, run research and create a list of favorite topics.

Second, and well-known resource is the Khan Academy, Georgian version. The Khan Academy offers practical exercises, video instructions, which allows pupils to learn topics outside the classroom (Khan Academy, 2019).

The both resources have been important assets for the secondary school students. They have been aimed to make the learning process more personalized, where youngsters can control the pace. They are given opportunity to compensate missed classes or topics unclear to them. The quality of explanations, content-wise, as well as quality of recordings, technical-wise, are reasonable. However, these video lessons are framed as alternative, and not supplementary for the school academic process. In other words, the content of these tools is based on a collection of school related topics, but not actual subject curricula, which, although supportive, makes them less effective for the use in daily learning. On the one hand, for students, motivation is not high because of the probable distraction of a topic between more than one videos or the lack of relevance to the school teacher’s/lesson focus. Plus, most videos are too long, usually more than 22-25 minutes, discouraging the students to watch. From the teachers’ perspective, as the videos are not adjusted to the curricula, they may recommend them for additional resource, but it is hard to embed them into the syllabus and make them part of the teaching and learning process.

#### **1.4 Defining Syllabus-Based Video Tutorials (SBVT)**

The definition of the core concept of this project refers to short videos (5-6 minute-long), prepared by school teachers based on their actual course curricula where they put an “explanatory” part of their daily teaching onto a sustainable technological source, which becomes available to students in a virtual platform before they come to the lesson.

### **1.5 Hypothesis and Justification - Gaps Potentially Targeted**

Syllabus-Based Video Tutorials, as short as 5-6-minute-long, can take the so-called “explanation” part out of the lesson and free up more time for more interactive and collaborative in-class process, where students engage in enhancing, analyzing, synthesizing and evaluating their knowledge. This tool can free-up space in teachers’ lesson plans and leave more room for active participation on the one hand, and more frequent assessment, on the other.

This project is expected to address the need for more personalization in teaching and learning at Georgian secondary schools. While currently lessons are still prone to be of traditional lecturing style, contemporary learners need more practical academic process with more inquiries, interaction, group-work, technologies, etc.

Not all students can adjust to all teachers’ pace and style of explaining new topics. Teachers in class should serve more as facilitators of learning and analysis rather than play a role of a pure informational source. Some students miss pieces of “explanatory” part at the lesson, which causes troubles for them in doing homework later.

Teachers sometimes lack concentration on all their students. The “in person” explanation in class cannot be done at the best level every time. Whereas, preparing this explanatory part in advance would make teachers prepare better to find the most optimal way of explanation methodologies.

Taking the “explanation” part out of the 45-minute lesson, can make teachers include more practical elements in class, such as discussions, group-work, presentations, simulations, etc. This point is particularly important in post-Soviet educational systems, where lecturing and the dominant role of the teacher prevailed for ages;

Especially in public schools in Georgia, where the number of students usually exceeds 25 in class, parents frequently complain about rare grading and weak monitoring of their children’s performance. Explanatory video tutorials would “free-up” a significant part of a lesson, which would increase students’ engagement in different activities in class. Teachers will have more tools to test more students and grade them more often.

Working with students who have missed classes remains an important challenge for schools. E.g. students having health problems are usually offered a few additional meetings to catch-up;

however, this still is not a solution. Under low compensation, teachers have less incentive for extra work that decreases the quality of this tutoring. On the other hand, if teacher misses classes, this is also partly compensated with the video tutoring.

Observing classes by the school administrators cannot be a permanent daily process. School heads always have a challenge in establishing mechanisms for monitoring teachers' performance. SBVTs create a clear and open platform for teachers to present themselves for all – their employers and parents.

Significantly, under the SBVT system, students do not have to worry if they missed a word or a phrase from their teachers' monologue. Instead, they can listen and watch the tutorials as many times as they wish and need.

Private tutors' system is one of the biggest challenges for Georgian schools nowadays. Most parents for a variety of reasons hire personal tutors to assist their children. SBVTs can decrease this incentive by providing additional home-resource for students.

### **1.6 Research Questions and the Purpose of the Study**

Consequently, the current research proceeds from the problem that Georgian students lack personalized learning resources and processes, and this deficit causes many negative implications in the system (described in the “Justification” part).

The main aim of this research is to find out how SBVTs (syllabus-based video tutorials) impact the students' learning process and learning outcomes. Within the study we will see how multimedia (video) resource, developed by a teacher, can be included in the curriculum and, based on the blended learning principles, established in a flipped teaching and learning system.

Proceeding from the aim the following research questions will be posed:

1. How can SBVTs change the learning process of a student;
2. How can SBVTs impact the learning outcomes;
3. How can SBVTs change the lessons in a flipped classroom model?

## **Chapter 2: Theoretical Background**

It is known that more and more daily tasks of both - individuals and organizations, are increasingly solved by computers and smartphones in the 21<sup>st</sup> century (Sutton, 2013). The development of technologies creates important changes in the field of education too. Especially, considering the fact that currently schools already deal with students from so called digital-native generation.

Conceptually speaking, one of the main principles of modern schools is desired to be the use of technology as an amplifier for learning, creating, connecting, communicating, and problem solving (Richardson & Dixon, 2017). Roblyer and Edwards (Roblyer & Edwards, 2000) assert that the use of technology in education contributes to the motivation of students, provides an effective use of time for the teachers, who teach in the classroom, and assists the students in gathering necessary information and acquire 21st century skills. It helps plan and implement activities that apply to multiple sense organs in educational environments, intended to provide a better-quality education. These types of activities are known to provide easy and sustainable process of learning.

In terms of modern teaching and learning methodologies with the use of innovations and technologies, most successful education systems, like Finland, started to look into the blended learning theory more and more deeply (Faculty of Social Sciences at the University of Helsinki, 2010). This study proceeds from the principles of blended learning to design the intervention and measure its efficiency while supporting the learning process in a school in Georgia.

### **2.1 Blended learning**

Blended learning, also, known as hybrid learning, is the learning that combines face-to-face and online learning. This term implies a mixture of learning. Thorne states it represents an opportunity to integrate the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning (Thorne, 2003).

Bersin defines blended learning as “the combination of different training “media” (technologies, activities, and types of events) to create an optimum training program for a specific audience. The term “blended” means that traditional instructor-led training is being supplemented with other electronic formats. Blended learning programs use many different forms of e-learning, perhaps complemented with instructor-led training and other live formats” (Bersin, 2004).

Many researchers point out that blended learning has certain advantages such as flexibility and comfort in learning environments, increased learning levels, increased understanding of learning, and increased interest in learning, quality and low-cost interactions (Graham, Dziuban, Picciano, & Moskal, 2015). Blended learning is important because it breaks down the traditional walls of teaching, ones that do not work for all students and now with access to present day technologies and resources we can tailor the learning experience for each student (Young, 2002). Blended learning also offers flexible time frames that can be personalized to each person, offering them the ability to learn at their own pace.

Blended learning impacts academic achievements and outcomes. Effect of blended learning on academic achievements was investigated with the middle school students, according to the academic achievement level and scores. As a result of a Turkish study from 2014-2015, it was concluded that blended learning environment had generated a significant difference in students' academic achievement in favor of experimental group (Ceylan & Kesici, 2017).

According to the case study - “Blended Learning Media in Biology Classroom” by Nurhikmah H. the use of blended learning in biology made the process much more simple, students had more visual materials and understood new topics more easily (Nurhikmah, Tahmir, Junda, & Bena, 2018).

In 2014, the research “Effects of Blended Instructional Models on Math Performance” had excellent results. The study was conducted with school students whose math skills were so low that they used to receive their instruction in special education resource rooms, about one third of students had a cognitive disability. This study showed how their engagement in the academic process and their results in math grew dramatically (Bottge, et al., 2014).

The relevance of the blended approach to improving the lesson process has been demonstrated by the study conducted by the Midwest small private school in 2014. This project aimed to fit individual approach into lessons needed to improve students' writing skills with the main focus on sentence structures. The study shows that blended learning has a positive effect on most students in class, it shows that students' learning outcomes were significantly improved with a blended learning environment. Blended learning allowed the instructor to work in small groups and with the face-to-face group (Camahalan & Ruley, 2014).

In terms of a statistical proof on the degree/extent to which blended learning can impact the students' performance, a study (Saritepeci & Çakır, 2015) for a course on social studies had a very tangible result. It aimed to analyze the effects of blended learning environment on middle school students' engagement and academic achievements. There were two - control and experimental groups and results were measured with pre- and posttests. According to the results, blended learning showed a medium level effect on students' academic achievement.

To summarize this part, available data about blended learning gives us several important conclusions that represent opportunities for this study:

1. Blended learning approach is relevant for the 21<sup>st</sup> century educational setting, which is filled with technological tools;
2. Blended learning can make the learning process more effective and adjustable to individual needs;
3. Blended learning approach can improve students' academic performance (at least, the group average);
4. Blended learning methodology gives instructors more room for creativity and productive work.

## **2.2 Flipped classroom**

The “flipped classroom” is a model of blended learning, in which students learn by watching video lectures or other educational materials at home, while the “homework” is done in the classroom with the teacher and students discussing and resolving queries (Nwosisi, Ferreira, Rosenberg, & Walsh, 2016).

Flipped classroom is a technology-supported pedagogical innovation, which has become popular in recent years. It consists of two components: first, direct computer-based individual instruction outside the classroom, and second, interactive group learning activities inside the classroom. In the out-of-class learning component, students watch instructional videos prepared by teachers. Students thus acquire some basic information before the face-to-face lesson. The in-class time is

then freed up for more interactive learning activities such as collaborative problem solving and receiving teacher’s individual assistance.

In traditional teaching, students listen to teachers’ explanations in class, receive tasks for homework, then read paragraphs from their text-books, learn the theories, solve problems or do exercises at home, then come to the next lesson and retell the learnt content. On the contrary to that, in flipped classroom students explore the content and problems of the next lesson at home on their own, usually through a video, which, at best, has been prepared by their teacher, or other available material, and once they come in classroom, they apply their knowledge by solving problems and taking part in experimental activities, where they test their inquiries. The teacher supports students exactly where they need. Its role is shifting from the traditional lecture to guidance, support and personalization (Bishop & Verleger, 2013). All these processes bring a teacher to the 21<sup>st</sup> century role – a class facilitator.

There are four pillars that teachers must incorporate into their practice in order to engage with flipped classroom: flexible environment (F), learning culture (L), intentional content (I), and professional educator (P) (Hamdan, McKnight, McKnight, & Arfstrom, 2013).

**F (Flexible Environment):** educators create flexible spaces in which students choose when and where they learn. They often physically rearrange their learning space to accommodate a lesson or unit and support either group work or independent study. Furthermore, educators who flip their classes are flexible in their expectations of student timelines for learning and in their assessments of student learning.

**L (Learning Culture):** in the traditional teacher-centered model, the teacher is the primary source of information. By contrast, the Flipped Learning model deliberately shifts instruction to a learner-centered approach, where in-class time is dedicated to exploring topics in greater depth and creating rich learning opportunities. As a result, students are actively involved in knowledge construction as they participate in and evaluate their learning in a manner that is personally meaningful.

**I (Intentional Content):** flipped learning educators continually think about how they can use the Flipped Learning model to help students develop conceptual understanding, as well as procedural fluency. They determine what they need to teach and what materials students should explore on

their own. Educators use intentional content to maximize classroom time in order to adopt methods of student-centered, active learning strategies, depending on grade level and subject.

**P (Professional Educator):** the role of a professional educator is even more important and often more demanding, in a Flipped Classroom than in a traditional one. During class time, educators continually observe their students, providing them with feedback relevant to that moment, and assessing their work. Professional educators are reflective in their practice, connect with each other to improve their instruction, accept constructive criticism, and tolerate controlled chaos in their classrooms. While professional educators take on less visibly prominent roles in a flipped classroom, they remain the essential component that enables Flipped Learning to occur.

Two chemistry teachers in Colorado, Jonathan Bergmann and Aaron Sams, were the first in the implementation and promotion of the model. They published their book "Flip Your Classroom: Reach Every Student in Every Class Every Day" (Bergmann & Sams, 2012) which is one of the most reliable guide for the implementation of the model. It starts with the realization that students need their teachers to respond to their questions and help them when they face difficulties, while they do not need to hear or watch a lecture. Thus, they collected the available material from the application of the model for interested teachers. Moreover, they founded the Flipped Learning Network community (Network, n.d.) providing modern information and helpful material for the application of the model.

Flipped classroom is a feasible strategy which caters to the needs of diverse learners.

(Hamdan, McKnight, McKnight, & Arfstrom, 2013). For example, if students do not understand the materials presented in the video lectures, they can pause or replay the instruction videos for revision. At the same time, high ability students can skip certain parts of the video lectures to save their learning time. As for the face-to-face lessons, since the in-class time is no longer occupied by direct teaching, more time can be spent on the teacher's one-to-one assistance and small-group tutoring for the less capable students (Bergmann & Sams, 2012), or problem-based learning and small-group learning activities which are suitable for high ability students (Matthews & Dai, 2014). However, Hamdan lament (Hamdan, McKnight, McKnight, & Arfstrom, 2013) that there is a lack of empirical study that investigates the use of flipped classroom for diverse learners. In fact, most of the existing studies of flipped classroom focused on flipping a particular course,



rather than explicitly examining whether flipped classroom can benefit underperforming or high ability students.

Many researches show that flipped classroom impacts study process, students' achievements, and outcomes (Burak & Tugba, 2018). show that teachers should be informed about the model and motivated to use technology. Seminars and workshops related to the model can be organized in order to make the model more widespread. They claim it is necessary to plan technical capacity of learning environment well in order to make the process in the class more efficient. If students have problems with accessing internet, course contents should be provided to them by equipment such as CD, DVD, portable memory, etc. They also suggest that in future studies on the flipped classroom model, the effect of the model should be studied in other education levels and courses. They add, “future studies can also include opinions of students and parents about the model” (Burak & Tugba, 2018).

For the purpose of the present project, it is most important to see the experience of similar studies. The most relevant one found has been a case study of biology teaching in a Greek high school (Gariou-Papalexiou, Papadakis, & MANOUSOU, 2013). The study was to investigate the application of the flipped classroom model as a complementary method to the school distance education in junior high school Biology. The experiment group comprised 17 freshmen students at junior high school. During the action research, it became evident that time management in the classroom was significantly improved. Furthermore, it was observed that students' involvement in the educational process was also improved. Students had already familiarized themselves with the content and main topic of the lesson before entering the class and they considered the learning process as an individual, personalized act, which does not only depend on the teacher. The most important conclusion of this study in reference to the present project is that the use of flipped classroom model actually challenged students more and increased their motivation to solve academic puzzles independently and explore specific topics more deeply. This automatically increased their engagement in class as well.

To summarize findings available in previous research, several conclusions can be made:

1. The flipped classroom model is based on the blended learning principles and share all the potential advantages it may have;

2. The flipped classroom drives the change in classroom environment and lesson planning;
3. The flipped classroom model increases teachers’ responsibility in leading the academic process effectively, and more importantly, in order to make it valid, the teacher needs relevant support in terms of procedural guidance as well as technological endorsement.

It is worth mentioning that, despite its increasing popularity, to the author’s best knowledge, flipped classroom model has never been tested in Georgia. This has been also confirmed by two well-known experts in the Georgian education system in their interviews (Lobjanidze S. 10/12/2018. Personal interview; Murghulia G. 13/03/2019. Personal interview).

### **Chapter 3: Methods**

The rationale behind selecting the appropriate methods is based on the two key parts of the research question – “impact on the students’ learning process and learning outcomes”. Therefore, the aim of the research was, on the one hand, to measure the experiential part from both the learner’s and the teacher’s perspectives (“process”), and, at the same time, measure the possible change in assessments (“outcomes”).

#### **3.1. Research Design and Data Collection Instruments**

The study represents an experiment with the following components:

- I. Pre-study – assessment of status-quo in the variables concerned;
- II. Intervention – implementation of the action;
- III. Post-study – assessment of the change (if any) in the variables concerned.

The project is based on qualitative methods described below.

Qualitative evidence was based on students’ and teachers’ personal experiences and observations. For this purpose, the following measurements were used:

- Focus group interviews with the sample and control groups of students – in pre- and post-study stages (Appendix 1);

- Personal in-depth interview with the teacher – in pre- and post-study stages, as well as in the middle of the intervention period (Appendix 2);
- Classroom observation – in pre- and post-study stages (Appendix 3);

The focus group interviews with the students covered the following topics: main obstacles in learning process, understanding a subject topic at the lesson and its hindering factors, sources to compensate missed classes or a topic misunderstood, reasons of asking for private tutors, technological tools previously used with their advantages and disadvantages (also, their use in academic setting), video resources usually used (with references to academic setting), perceptions of their assessment and its determining factors.

Teacher’s interviews were aimed to explore her experience in lesson plan development and implementation, obstacles of an effective/productive lesson, previous use of technologies (inter alia, videos) in classroom, video recording experience, approaches to personalization of learning process. The intermediary interview was specifically aimed not as much to assess any impact, but to identify possible challenges in the technical side and the teacher’s attitude towards the intervention.

Classroom observations were to assess the lessons from the perspective of experiential learning and constructivist approach. The key questions covered were: what is the degree of students’ involvement in class activities? How long time does the teacher need to spend on explaining specific topics? How much of the whole lesson time is spent on “lecturing”? How often students ask the teacher for further explanations or complain that they misunderstood anything and/or had not been able to perform homework?

### **3.2. Sample**

The sample of the study involved test and control groups – three groups of 8<sup>th</sup> grade of LLC “Buckswood International School – Tbilisi” and their biology teacher. The criteria of selecting this sample are the following:

- ⇒ Place: LLC “Buckswood International School – Tbilisi” is one of leading private secondary schools in Georgia, where the author has been serving as a Headmaster for last 6.5 years.

Due to his position, practical side of the research would be convenient to implement. In addition, although the school is private, it completely follows the national curriculum of Georgia, and since the aim of the research is to provide findings relevant for Georgian schools, this criterion is also met in this case;

- ⇒ Subject: recent results of international assessments clearly show that Georgian students are most vulnerable in STEM subjects. The recent recommendations often focus on the importance to improve teaching in sciences as the level of teaching in these disciplines are assessed low and most private tutors are demanded in these areas (Bregvadze, Formal general education and private tutoring as paralel systems, 2012` ). Therefore, the study was implemented in one of these most vulnerable fields. In addition to this importance, from the practical standpoint and in order to ensure the minimal possible probability of teacher's bias, the intervention needed to be implemented with the teacher, whose qualification is unquestionable, has an appropriate image in the school community and has enough experience in teaching not only in general, but specifically with the sample group. The teacher selected meets all of these criteria fully and, also, she holds the highest status (“Mentor”) among Georgian teachers together with 8 of her colleagues throughout Georgia;
- ⇒ The sample: as the main sample for the study, the 8<sup>th</sup>–grade students were selected. There are 4 main arguments for this:
- 1) According to the national examination policies of Georgia, secondary school students take centralized exams at the end of 11<sup>th</sup> and 12<sup>th</sup> grades. The optional examinations take place in grades 6 and 9. New pilot system, introduced by the current management of the Ministry of Education, Science, Sport and Culture of Georgia envisages the possibility to have the national examination at the end of 10<sup>th</sup> grade. For the purpose of the research, a group (and the teacher), which has less external pressure and constraints would be most convenient;
  - 2) Another criterion concerned the stability rate of the groups. The stability rate in this case translates into the number of students' mobility to and from the school. This factor is important for the research in order to avoid additional variables that may potentially change the class climate and/or impact on the academic performance of individual students (adaptation difficulties, group disintegration, disciplinary issues, etc). In case of 8<sup>th</sup> grade,

the school has had the least mobility over last several years, so the group has sustainable disciplinary norms and academic climate;

- 3) In order to avoid any constraints in the research process related to the teacher (e.g. new teacher in class, who needs to firstly get used to and get to know the group well), the biology teacher was selected because she had been teaching at Buckswood for last 11 years and these specific groups for last 3 years already;
- 4) For the purpose of more valid generalizations of the research outcomes, it was also considered important to select a group with balanced gender ratio. In this criterion, the 8<sup>th</sup> grade was also the perfect fit, with 31 male and 29 female students.

In sum, the study was implemented in 3 groups of 20 students each - a total of 60 students, ranging from 12 to 14 in their age.

Two groups, named “Galilei” and “Avogadro”, are so called experimental groups and the group “Darwin” was the control group for the comparison of results.

All three groups have the same academic program with the same daily schedule. Their biology class takes place twice a week, with 40 minute-lesson each.

### 3.3. Research Procedure

The research was implemented during the academic year of 2018-2019. The table 1 below shows the exact timeline of the study and specific activities.

Table 1. Timeline of activities

[illegible]

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Under the first component initial 6 focus group interviews were organized with each sub-group of students – 4 sub-groups from the sample groups and 2 sub-groups from the control group. One pre-interview with the biology teacher was conducted. At the same time, three classroom observations were conducted in all three groups.

### Component 2 - Intervention

The intervention had its preparatory phase. First of all, in coordination with the teacher, an appropriate technical equipment and software had to be identified and prepared. Both the hardware and software were supposed to be user friendly and easily accessible for any school teacher and student. Based on the teacher's request, the program had to have functions to record a video lesson together with the presentation file synchronically. Considering these criteria, a free screen recorder program Bandicam<sup>1</sup> was selected. The flexibility of Bandicam comes from its three modes. One is the 'Screen Recording' mode, which can be used for recording a certain area on the PC screen. The other is the 'Game Recording' mode, which can record the target created in DirectX or OpenGL. And the last is the 'Device Recording' mode which records Webcams and HDMI devices. Although the full program is not accessible free of charge, its free version has all enough functions to be used for the purposes of this project (Bandicam Company, 2008-2019).

After identifying the technology, a discussion with the teacher about the possibility of implementing the flipped classroom model was held. The teacher started to develop presentation files, recorded 3 pilot video tutorials according to the syllabus of the second term and the topics to be covered, and shared them to the groups. Upon launching the first three videos, the intermediary interview with the teacher was conducted to identify her attitudes and predictions about the projects, and any obstacles she might encounter.

The intervention lasted for 3 full months and the video tutorials covered all regular topics as determined by the syllabus. A total of 16 videos were recorded.

### Component 3 - Post-study

Upon completion of the intervention, the post-study activities were launched.

All the activities performed under the first component were repeated, except the focus group interview with the control group, as they underwent no intervention whatsoever.

The collected data were analyzed in the following way:

Focus group interview transcripts were analyzed by the three stages of “constant comparison analysis” (Onwuegbuzie, Dickinson, Leech, & Zoran, 2009), where the transcripts were coded (open coding), then categorized (axial coding) and then main statements and expressions were summarized (selective coding).

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<sup>1</sup> [www.bandicam.com](http://www.bandicam.com)



Analysis of the teacher’s interview followed a similar path to that of focus group interviews. All three interviews conducted with the biology teacher, were coded and key statements were identified and used for analysis.

Classroom observations were analyzed according to the variables related to the lesson structure and content with reference to the hypothesis and justification. The statements raised by the teacher and the students were compared to the observation findings.

The results of the post-study component are described in the next chapter.

## **Chapter 4: Results**

The results of the study are summarized for all measurements used for the research.

### **4.1 Focus group interviews – students’ perceptions**

The main goal of this measurement was to collect information about any impact on different aspects of the students’ learning experience.

*Personalization:* one of the first categories that was mentioned in these interviews was the issue of personalized teaching methods and the approach to individual qualities.

During the pre-study, around 40% of students mentioned that they often encounter difficulties to catch-up with the pace of the explanations at the lesson. Various factors, including being tired, noisy classmates or the difficulty of a particular topic, may hinder their understanding. 70-80% recognized missing classes as a big obstacle to academic performance, due to the fact that they find it hard to compensate. 90% of students mentioned the textbooks only cannot ensure them to understand new topics. Several students also mentioned that they ask their parents for private tutor mostly in two cases: after a long period of missing school and in the period before the end of year exams. The reason is, they are unable to understand new topics or at the end of a term, they do not remember explanations of every single topic. One student, who moved to the school at the beginning of the running academic year, (2018-2019) also mentioned that he found it very hard to catch up with the pace of the teacher and his groupmates as “they understand everything very quickly” and he “needs more time”.

At the post-study focus group interviews, 90% of students said they did not have a problem of missing biology lessons any more as they could understand the topic through the videos easily. Students mentioned that the best

quality of SBVTs was the ability to repeat any part of the explanation as many times as they needed. One student mentioned that “while watching video, she had a feeling that the teacher was talking to her in person”. 70% mentioned they have higher sense that they can control the pace of their weekly work in biology. More than half of the students agreed with their classmate’s statement that linking an academic resource to technology has increased their motivation to learn as opposed to spending time on textbooks, since they consider SBVTs more user-friendly and clearer than paragraphs from the book. Since the start of the intervention, they considered the learning process has become more productive, efficient, enjoyable and less boring.

*Time of homework:* After the intervention, 50% of students said the SBVTs alone were quite enough to have a good academic performance in the course, whereas, the rest of students underlined the necessity of combining the video resource with the book as well. The same percentage (50%) said that the time spent on doing the homework in biology has decreased dramatically from approximately 40-50 minutes to 15-20, because the videos made everything easier; around 30% said, the time increased because they were also reading books, and for 20% of students the time remained the same. In the pre-study interviews, the average time that students would spend on doing homework ranged around 35-40 minutes.

Interestingly, in the post-study, most students emphasized that in the time category the most obvious change occurred during the revision periods. E.g. if before the intervention, they could only revise a text-book ahead of any summative test and that would take 2-3 hours, now, SBVTs would simplify this task and the revision time went down to the period, which was needed to watch the videos covered in the pre-test period (usually, summative tests take place once in a month. According to the curriculum, biology course covers approximately 4-5 topics per month. This translates into 4-5 videos and, therefore, 25-35 minutes per pre-test revision).

*Lesson structure:* 95% of students indicated a significant increase of interactive activities in class. They mentioned the explanatory part had gone down to 5-10 minutes and the rest of lessons are devoted to group works, discussions, presentations, experiments, etc.

*Assessments:* 60-70% of students mentioned that SBVTs did not significantly impact their grades, however, 100% mentioned the number and frequency of assessments (mostly formative) increased dramatically. During the second term (since the start of intervention) their feedback has become more intense and they have to get prepared for every lesson more intensively.

*Practicality:* 80% of students mentioned the technical side of SBVTs were quite acceptable. In their opinion using Google Drive was the best way to share the videos. The main characteristics they found important was that they could open, watch and listen to the videos on their smartphones, which made the resource even more practical because they can use them at school buses on their way to school and revise the topic. 20% pointed to

the low quality of voice of the videos. One student suggested to try another program, OBS<sup>2</sup>, instead of Bandicam in order to improve the voice quality. In addition to that, students mentioned that the size and length of the videos were very convenient as opposed to the Silk School lessons, which they had tried before.

To sum up, the focus group interviews showed that SBVTs with flipped classroom model had a significant impact on some aspects of their learning experience, while in some categories for a part of students, there was little or no impact observed.

#### **4.2 Personal Interviews – the teacher’s perceptions**

This measurement was to reveal the impact of SBVTs and flipped classroom model on students’ learning patterns, as seen from the teacher’s point of view. Also, from the feasibility perspective, the interviews were to assess any changes in the teacher’s teaching experience.

*Lesson structure:* the teacher confirmed that she changed the lesson plans significantly. If before the intervention, she could spend 15 minutes on explaining a unit and 10-15 minutes more on questions and answers, with SBVTs this total time went down to 5-10 minutes, and the rest of the lesson was dedicated to group work, discussions, projects, presentations, etc. Also, she underlined that the number of topics that she could cover for a specific period of time increased. Before the intervention, she sometimes needed 2-3 lessons for covering one topic. Now she had an alternative to either cover more units, or to work on increasing quality and offer more complex activities to students. In addition, the teacher mentioned that she received less and less questions from students concerning points misunderstood by students from the newly explained units.

*Assessments:* As in the case of students, the teacher also confirmed that the number of assessments she gave to students increased over the last weeks that made them more mobilized for every lesson. Although the change in grades might not be sharp for the covered 3 months, she thinks that the students will feel the progress at the end of the year. Importantly, she mentioned that students with lack of interest in the previous period and low academic performance, participated in classroom activities more and more eagerly and they came to class prepared more and more frequently.

*Practicality:* from the teacher’s perspective, the recording process was very time-consuming. She needed twice more time on preparing one video than on preparing a lesson plan, which increased her job around three times. She found the Bandicam software as a convenient tool for this purpose.

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<sup>2</sup> <https://obsproject.com/>

In summary, the personal interviews with the teacher revealed obvious influence on the structure of the lesson and students' engagement in line with the hypothesis of the present study. At the same time, challenges concerning the teacher's workload were revealed.

### **4.3 Classroom observations**

This part of measurement was to observe potential changes in the students' learning patterns in class as well as the practical application and comparison of the old and updated lesson plans before and after the intervention.

All classroom observations show that post-intervention lessons in test groups were different from the pre-intervention ones by three elements:

Firstly, the time on explanations of the teacher was far shorter and it was not lecturing any more, but rather, based on open discussions entirely. In a typical pre-study lesson, the teacher would start the lesson by explaining a completely new topic, unknown to students before. Depending on the group and the difficulty of a topic, this explanatory lecturing part could last from 25 to 30 minutes (including the presentation of visual materials to students). In all observed cases, the teacher devoted the remaining time to clarifying questions and giving instructions for homework. On the contrary, at the post intervention lessons, the teacher started the lesson with opening a discussion on the topic of the SBVT uploaded in advance and the corresponding unit from the textbook. All the three lessons observed demonstrated that under the updated model, the teacher needed only 10 to 15 minutes for the explanatory session;

Secondly, linked to the above finding, the time period devoted to the interactive part of the lesson increased. The time resource for discussions, teamwork, experiment and other collaborative activities increased;

Third, the number of students participating in the lesson activities increased. During the pre-study observations, 2-4 students could participate in the in-class process, mostly by either raising a question or answering a direct question from the teacher. Upon the end of intervention, this number of students increased to 8-12 students. The activities mentioned above enabled the teacher to engage more students and assign different active roles to them; Therefore, classroom observations showed that the new model had an evident impact on the lesson plan and in-class processes.

## **Chapter 5: Discussion & Conclusions**

### **5.1 Findings of the impact**

The results of the present study show that the idea of Syllabus-based Video Tutorials combined with the flipped classroom model can have positive implications on students' learning experience. Based on the previous chapter, a number of important conclusions may be drawn.

First of all, the integration of SBVTs make the learning process more personalized. It gives students possibility to control the pace of understanding a new subject theme. It provides a flexible learning platform, which can be used any time during a day and any place with a digital device and internet access (the latter is needed only before downloading a video). Its personalization and flexibility provide a significant support to students who miss classes, as they are able to compensate the lesson by this distant learning tool.

Secondly, integration of SBVTs in curriculum frees up space in class for replacing a lecturing part by interactive activities, group work, discussions, presentations, experiments, etc. The time spent on explaining a new material decreases by around 50-60%. Therefore, teacher has more time and possibility to engage students and provide more intensive, complex and/or frequent feedback.

Thirdly, SBVTs increase the motivation of most students. For the category of students who tend to be lazy at a subject, main motivation is the opportunity to understand the main ideas regarding a given unit in 4-6 minutes, which is way less than they usually need through their lesson notes and a textbook. For the other category of students, who is already motivated enough to spend whatever period of time for achieving highest possible outcome, the motivation is still increased because the efficiency increases. In other words, this type of students has more diverse range of resources to do their homework and get ready for the next lesson.

The dramatic decrease of number of questions concerning new topics misunderstood, as shown in the results, makes a ground for suggestion that SBVTs lessen the probability of a need for private tutoring or any other external help for students.

Teachers, who spend more time on planning the lesson and its content, have more chance to teach their students better (Merritt, 2017). As mentioned by the biology teacher involved in the intervention, recording SBVTs require twice more time than preparing a regular lesson plan. Creation of one such video includes the stages of not only technical recording, but also, planning the flow of the explanatory statements, tools for effective and clear explanations and identifying the key parts from a given unit. From the perspective of the academic

administration, this can be seen as possibility to give teachers more time to think of and plan the content of every subject topic effectively.

## **5.2 Risks to consider**

In addition to the potential advantages derived from the study results, the research also identified potential challenges that educators should consider.

Intense integration of SBVTs in the curriculum may increase the risk for discouraging students from using printed books. Available educational research still argues that printed materials may be more effective as a digital learning tool (Mangen, Brønnick, & Walgermo, 2013). There is no evidence, including this study, that digital resources, like videos may completely replace the printed material. Especially, in the context of this project, SBVTs cannot be perceived neither suggested as an alternative to biology textbooks. Rather, it may serve as a complementary resource to increase the effectiveness of the learning and teaching process and enhance the personalized approach to students.

Besides, an appropriate motivation of teachers for developing and using SBVTs can be an issue. The biology teacher, who co-implemented this project, may not be a relevant example for her colleagues, especially in public schools, where teachers are offered quite low compensation. The time and effort required for developing SBVTs can decrease incentive without proper administrative and financial support.

## **5.3 Limits and gaps**

As mentioned earlier, to the best knowledge of the author, this study represents the first attempt to test the flipped classroom model in a Georgian school. The idea of short syllabus-based video tutorials is also pioneering. Despite this, the findings and conclusions may not be overgeneralized.

First of all, the study covered one grade (8<sup>th</sup>) at one specific subject (biology). The sample was not big enough to claim that SBVTs may be equally, more or less effectively used in other disciplines and/or other grades.

Secondly, the teacher had a key part in the success of this project. She is one of the most qualified biology teachers throughout the country by the time of this study. When it comes to the validation of the results at a larger scale, a question about the qualification of potential implementers of this project arises. It has to be explored whether syllabus-based video tutorial may have the same impact when it is recorded by a less competent teacher. Moreover, can the videos recorded under one curriculum be used for another? Or would students be receptive of SBVTs, which were not recorded by their own teacher?

Lastly, this study was implemented at one private school, which has all technical, administrative and financial resources to endorse such initiatives. This condition is also tied to the teacher’s motivation. Before interpreting results in this dimension, the feasibility of implementing flipped classroom model with SBVTs in other schools (particularly, public ones) should be tested.

#### **5.4 Recommendations for the use of SBVTs in similar context**

The outcomes of this study show that the idea of SBVTs in the flipped classroom model may have positive impact on students learning experiences. There are two important conditions, however, that school administrators should take into account while initiating such projects.

One of the key factors for success is the motivation of the teacher. Management of his/her expectation can either spill the whole positive potential over students, or undermine the whole idea. Therefore, it is essential for the administrators to clearly explain why this model is important, how it can improve students’ learning process and increase the teacher’s productivity.

At the same time, administrators should consider the importance of an appropriate technical support. The teacher should have appropriate internet and device as well as calm space and environment to record the videos. Depending on the teacher’s ICT skills, the involvement of an IT specialist is very desired in order to simplify the process.

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**Author's declaration**

*I hereby declare that I have written this thesis independently and that all contributions of other authors and supporters have been referenced. The thesis has been written in accordance with the requirements for graduation theses of the Institute of Education of the University of Tartu and is in compliance with good academic practices.*

Date: 27/05/2019

Signature: \_\_\_\_\_

A handwritten signature in blue ink is written over a horizontal dashed line. The signature is stylized and appears to be a cursive representation of the author's name.



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## **Appendix 1. Students' Focus Group Questions**

### **Pre-Study Interview**

1. What are the types of materials/resources that you use while learning biology?
2. Compare it with other subjects. Are the sources (the types) similar there too?
3. Can you remember of videos you have used in learning? What were they? And how did they help? How long were they? Did the teacher give the source or you looked it up yourself?
4. In general, what is your experience in watching short videos? What is the usual length of videos you watch and listen to the end (without skipping parts)?
5. If you compared a hypothetical video lesson recorded by your teacher, with reading an article or a book, what would you say? What are cons and pros you may suppose?
6. What can be a potential benefit of video tutorials in general, and in biology, in particular?
7. How often do you or your classmates ask the teacher to repeat the explanation of a specific topic? What are usual reasons for that? In this sense, what happens when you are absent (at the lesson, where new materials have been introduced)? How, with which tools and sources, do you manage to compensate the missed classes (missed explanations)? Do you think recorded video explanations could help?
8. In terms of academic performance, how important do you consider a revision process for you? How often do you have to revise previous materials? Is it often that you can't remember a specific topic explanation and you are unable to restore it through books? Has this happened in Biology or in other subjects? How often?
9. To your minds, if your teachers, e.g. in biology, would take the whole explanatory part out of the lesson, send that to you in advance through videos, ask for reading relevant materials and then, the lesson at the school would be entirely interactive activities (group-work, games, role-plays, discussions, debates, etc.), how would this affect your learning process? Do you think this is possible in all classes or in some? Why?

### **Post-Study Interview**

1. What was your experience with SBVTs? Would you recommend it for our school or not? Why?
2. What would you improve/change/update in the videos? Was the technical part satisfactory (volume, quality, etc.)?
3. How did it change your learning process? How did it affect the lesson itself? What were the main benefits and shortcoming of using them?
4. Compare it with other subjects. Would such videos be relevant and useful in other subjects?
5. If you compared the video lesson with reading an article or a book, what would you say? What are cons and pros to your daily experience?

6. Would it matter, if the video were recorded by any other teacher or university professor on the same topic? Why?
7. What did you use the videos for? Give specific examples;
8. If you compared the video explanations to the ones made at the lesson and during in-person communication with the teacher, did you feel difference? In what sense? Which was more effective and in what cases? Give examples.

## **Appendix 2. Teacher’s Interview Questions**

### **Pre-Study**

1. How often do students ask you for repeated explanation? What are the reasons in your opinion?
2. How do you work with students who often miss classes? Do they ask you for additional tutoring? Do they reveal difficulties in fulfilling tasks?
3. How much time do you usually spend on the explanation part form your lesson period?
4. In your opinion what variables determine the academic performance of your students?
5. What are the resources that your students use?
6. What digital sources have you used?
7. Have you used any video materials? Give specific examples;
8. Would you develop video resources for your students? If yes, why? What would be your motivation?

### **Intermediary:**

1. Having recorded first three videos, how convenient you find the process (technology, timing, etc.)?
2. On average, how much time do you need to record one video? Is this period the same for all three recorded SBVTs, or it varied? If it did, why you think that happens?
3. Do you think the software program for recording selected relevant? Was there anything you would wish to change?
4. What was the first impression of students? How they reacted on your first flipped classroom?
5. Do you think you need any specific support at this stage?

### **Post-Study:**

6. How would you evaluate SBVTs? What have been advantages and disadvantages?
7. Would you still use them next term? Why?
8. Was the software program for recording selected relevant? Was there anything you would wish to change?
9. Would you recommend it to colleagues? Why?
10. How did the SBVTs affect the learning process of your students? What are the variables they impacted? How?
11. After having used the video tutorials, do you see any changes in students’ behavior and/or academic performance after missed classes?

### Appendix 3. Classroom Observation Form (Scaled)<sup>3</sup>

Instructor \_\_\_\_\_ Observer \_\_\_\_\_

Course \_\_\_\_\_ Number of students present \_\_\_\_\_

Date/time of observation \_\_\_\_\_ Location \_\_\_\_\_

Outstanding	Well-Demonstrated	Satisfactory	Merits Further Development	Not Demonstrated	Not Applicable
5	4	3	2	1	N/A

#### Development of learning objectives:

- \_\_\_\_\_ 1. Are objectives for the class given verbally, written, or not at all?
- \_\_\_\_\_ 2. Are specific instructional outcomes used?
- \_\_\_\_\_ 3. Are objectives discussed at the end of class?

Comments:

#### Selection and use of instructional materials:

- \_\_\_\_\_ 1. Do films, websites, and other audiovisual materials have a clear purpose?
- \_\_\_\_\_ 2. Are handouts appropriate in number and subject?

Comments:

#### Educational climate for learning:

\_\_\_\_\_

<sup>3</sup> Instrument adapted from the Community College of Aurora’s Mentor Program Handbook and Staffordshire University’s “Guidelines for the Observation of Teaching.”

- \_\_\_\_\_ 1. Are students AND teacher interested and enthusiastic?
- \_\_\_\_\_ 2. Does the instructor use student names?
- \_\_\_\_\_ 3. Is humor used appropriately?
- \_\_\_\_\_ 4. Does instructor not embarrass or belittle students in any way?
- \_\_\_\_\_ 5. Is the atmosphere of the classroom participative?
- \_\_\_\_\_ 6. Did the instructor have eye contact with students?

Comments:

**Variety of instructional activities:**

- \_\_\_\_\_ 1. Does timing of classroom activities consider attention spans?
- \_\_\_\_\_ 2. Does instructor involve students in deciding what issues to discuss?

Comments:

**Preparation for class session:**

Provide examples that show preparation by instructor:

- \_\_\_\_\_ 1. Do students know what preparation (reading or other assignments they should have completed prior to class?

Comments:

**Instructional methods:**

List *instructor* activities:



- \_\_\_\_\_ 1. Did the opening gain the class’ attention? Did it establish rapport?
- \_\_\_\_\_ 2. Did the opening outline the topic and purpose of the lecture?
- \_\_\_\_\_ 3. Is the delivery paced to students’ needs?
- \_\_\_\_\_ 4. Does the instructor introduce topic, state goals, present material or activity effectively, summarize, and give assignment or suggest an idea to consider before next class?
- \_\_\_\_\_ 5. Could the instructor be seen and heard?
- \_\_\_\_\_ 6. Were key points emphasized?
- \_\_\_\_\_ 7. Were explanations clear to students?
- \_\_\_\_\_ 8. Were examples, metaphors, and analogies appropriate?
- \_\_\_\_\_ 9. Was the lecture stimulating and thought provoking?

Comments:

### **Opportunities for student participation:**

List *students’* activities:

- \_\_\_\_\_ 1. Does instructor encourage students to summarize and add to others’ summaries?
- \_\_\_\_\_ 2. Does instructor help quieter students interact with other?

Comments:

### **Individualization of instruction:**

- \_\_\_\_\_ 1. Are the emotional, physical, and intellectual needs of students met?
- \_\_\_\_\_ 2. Does the instructor prompt awareness of students’ prior learning and experience?
- \_\_\_\_\_ 3. Does the instructor offer “real world” applications?
- \_\_\_\_\_ 4. Is the instructor available before or after class?
- \_\_\_\_\_ 5. Does the instructor relate class to course goals, students’ personal goals, or societal concerns?

Comments:

### **Responsiveness to student feedback:**

- \_\_\_\_\_ 1. Is the instructor paying attention to cues of boredom, confusion?
- \_\_\_\_\_ 2. Does the instructor encourage or discourage questions (dissension)?
- \_\_\_\_\_ 3. Does the instructor provide students opportunity to mention problems/concerns with the class, either verbally or in writing?

Comments:

**Learning difficulties:**

- \_\_\_\_\_ 1. Does a student need assistance for a temporary or permanent disability?
- \_\_\_\_\_ 2. Are one or more students not motivated or unable to follow the class?
- \_\_\_\_\_ 3. Does the instructor show favoritism?
- \_\_\_\_\_ 4. Are students able to see visual aids?
- \_\_\_\_\_ 5. Does one group dominate discussion and hinder others' participation?

Comments:

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