# A Technologically Supported Differentiated Flipped Classroom (Fliperentiation) in Vocational Education

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**Abstract:** Most of the teaching time in the traditional teacher-centered teaching methodology is spent to the transfer of knowledge from the teacher, while students are passive. In this paper an alternative innovative blended teaching/learning model which combines the flipped classroom model with the differentiated instruction, implemented with the support of the educational technology. We propose a blended learning model which can provide more opportunities for active participation of students in the learning process as it responds more effectively to the diversity of the student potential of a class with the support of educational technology. This model combines the pedagogical model of the "Flipped Classroom" with the teaching strategy of "Differentiated Instruction", one of the most popular teaching strategies, which means that teachers adjust the curriculum for a lesson, unit or even entire term in a way that engages all learners in various ways. To investigate its effectiveness, an educational intervention in Vocational Upper Secondary Education was designed and implemented. The results are considered very encouraging, thus they provide the teacher with a more effective alternative way of organizing the learning process and give the students a richer educational and learning environment, adapted to his/her learning needs and experiences.

**Key words:** flipped classroom, flipped learning, differentiated instruction, LAMS, blended learning, fliperentiation

## 1. Introduction

Vocational Upper Secondary Education (VUSE) differs from the General Education mainly in terms of the focus that gives on the dimension of the practical application of the knowledge provided to students. However, according to a limited number of studies concerning vocational education in Greece (Ministry of Education, Research and Religions, 2011), the main findings show that students of Vocational Upper Secondary Education: a) present a low learning performance, b) find it difficult to attend theoretical courses c) mainly come from a weak socio-economic environment with low levels of education while they finally d) prefer to "learn" through engaging

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in individual or group activities. In addition, students of formal education appear with different interests, preferences, learning styles, readiness, skills and abilities (Ziskos & Papadakis, 2015). However, the education provided in the classrooms usually follows the traditional way of teaching. Most of the teaching time is devoted to the transfer of knowledge from the teacher mainly through the "lecture" focusing on the average school student performance, and thus not taking into account the multifaceted nature of the student potential. As a result, this method of teaching does not allow the most active involvement of students in authentic experiential activities within the classroom due to limited time remaining.

This study proposes that using a blended teaching/learning model that combines distance — out of the classroom — education (from home or work, etc.) with the experiential learning within the classroom with the use of technology, the learning process can be more easily implemented and differentiated. The main purpose of the current research was to study whether the proposed combinatorial model found in the international literature with the term "Fliperentiation" (as was coined by Joe Hirsch, an educator at the Akiba Academy in Dallas TX) can solve some weaknesses of the traditional educational process to improve the quality of teaching and facilitate of learning, with respect for diversity, equipping students with the knowledge, skills and abilities that will be necessary for their professional rehabilitation in the 21st century. The contribution of the present study to both the theorists of education and for the teachers is important, due to: a) the originality of the subject, providing new research data in Greek and international literature and b) the creation of interactive educational material as well and the design, development and implementation of two sequences of learning activities (digital courses) for the subject of "*Informatics*" taught in the 1st grade of Vocational Upper Secondary Schools. These sequences are posted in the LAMS Central international repository, allowing them to be shared, reused and adapted by teachers around the world, offering their students rich learning experiences.

The action research was the methodology chosen to answer the following research questions:

1) How (with the help of e-learning tools) can the teacher plan, develop and supervise inverted classroom learning sessions with Differentiated Teaching?

2) If and to what extent, a learner can develop reusable learning activity sequences based on the proposed combination model and to what extent can his / her participation in the learning processes be enhanced?

3) If and to what extent is there an improvement in learning outcomes after the implementation of the new model compared to the traditional way of teaching and learning, in the case of the first grade of a Vocational Upper Secondary School?

In the following sections, the theoretical framework of the "Fliperentiation" model is presented, which can be supported in its implementation by technology, then the methodology of the research process, the evaluation of the results obtained from the implementation of the two digital courses according to the new pedagogical model in a department of the A' class of VUS school while, at the end, the conclusions are presented as well as the proposals for future research in the field.

## 2. Literature Review

### 2.1 The Flipped Classroom

The concept of a flipped classroom is not new (Pardo et al., 2019). The questioning of the effectiveness of traditional teaching models as well as the highlights of modern learning theories that constitute the most active involvement of students in the learning process as well as the cultivation of communication and collaborative

skills to successfully respond to the increased demands of the 21st century, make the need for the application of innovations in education such as the application of the didactic model explored in the present work. According to Joe Hirsch, the instigator of the internationally called "Fliperentiation" mixed learning teaching model, combining its two components (Inverted Classroom and Differentiated Teaching) enables teachers to quickly and effectively engage learners in appropriate learning activities, enriching their learning experiences and facilitating the learning process (Hirsch, 2014). The following figure (Figure 1) presents the acronym of "FLIP" term. Other researchers (Bishop & Verleger, 2013; Milman, 2012; Toto & Nguyen, 2009) also conclude that the term of a flipped classroom refers to a student-centred learning method consisting of interactive learning activities during lesson helping students to prepare themselves for the lesson by watching videos, listening podcasts and reading articles. Flipped classroom is an approach that increases active learning activities and gives opportunity for student to use his knowledge in class with guidance of teacher.

| F (Flexible Environment) | I provide my students with different ways to get in touch with the course content and demonstrate what they have learned. |
| --- | --- |
| L (Learning Culture) | I give my students the opportunity to engage in activities that make sense to them, without the teacher being at the center of the educational process. |
| I (Intentional Content) | I apply differentiation of teaching to make the content of the course accessible and relevant to all students. |
| P (Professional Educator) | I conduct continuous formative assessments during the course through observation and recording data that will be used in future redesign of the course |

**Figure 1    The Flipped Model**

As we can see from the above Figure 1, with the term "flipped classroom", Jon Bergmann and Aaron Sams described the implementation of flipping the educational process. Flipped classroom according to Ozdamli and Asiksoy (2016) is an active, student-centered approach formed to increase the quality of period within a class. The approach of flipped classroom attracts the attention of educators and researchers in a variety of disciplines recently. In other saying, the flipped classroom model (FC) is a blended learning model that transfers the presentation of content in traditional classroom environment to an online platform, and it also brings learning activities which are planned to be carried out by students at home to the traditional classroom, under the guidance of the teacher (Demiralay & Karataş, 2014). Since 2012, Bergmann argues that the flipped classroom model should be called "flipped learning" (Bergmann, 2012), since neither the space, i.e., the classroom, is inverted the context, nor the time but the way students "learn" (Talbert, 2012), utilizing in a more efficient way the time in the classroom with differentiated individual or group activities. This approach allows the instructor to use classroom teaching time in a variety of ways, such as allocating time based on where students need help. Students in turn can engage in discussions within a specific topic or receive corrective help and assessment on things they have not been able to learn on their own. In addition, students should attend class only if they need help other than that provided by other learning resources, thus saving time for those who do not need help in the classroom (Hughes, 2012). The number of educational researches at international and national level that have as subject the application of the Inverted Class mainly in the Theoretical Sciences, in Technology, in Engineering, in Mathematics is constantly

increasing. The "Four Pillars of Inversion" as defined by the "FLN" community, must be considered for each successful application in teaching practice and are: 1) Flexible Environment, 2) Learning Culture (Student-centered approaches) for deepening knowledge), 3) Intentional Content (Carefully selected or designed educational material), 4) Professional Educator (FLN, 2014) and they are presented in Figure 2.
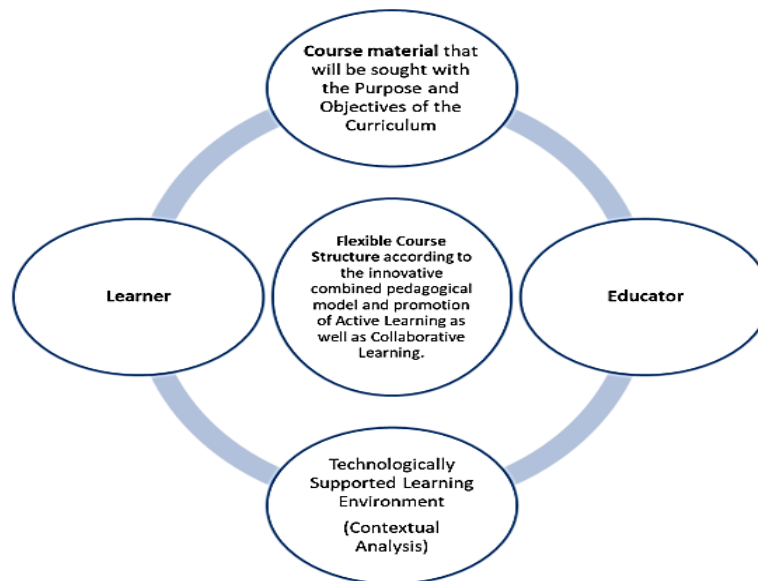


**Figure 2    The "Four Pillars of Inversion"**

### 2.2 Differentiated Instruction

Differentiated instruction is sometimes mistakenly confused with the term "individualized instruction". The internal differentiation of teaching as a human-centered and anthropoplastic pedagogical proposal in which students' biographies guide and interactively prescribe the course of teaching can be the answer to the problem of continuing school in mixed capacity classes under certain conditions. As Davies, Dean, and Ball (2013) point, traditional classrooms cannot always provide this type of differentiation, which has led some educators to recommend a blended learning environment (Dziuban Hartman & Moskal, 2004; Garrison & Kanuka, 2004; Cornelius & Gordon, 2008; Verkroost et al., 2008; Patterson, 2012), which incorporates technology (Bergmann & Wilie, 2012; Friedman & Friedman, 2011). The planning of the differentiated course of a teaching is determined exclusively by the teacher, who after taking into account the level of readiness, the learning profile, the interests, the socio-economic level but also the self-image of the students of his class, proceeds to differentiate the content, the process , the result (product), the learning environment and/or the evaluation in order to satisfy the learning needs of his students, to provide them with various learning opportunities as well as to guide-support them on their way to acquisition of knowledge and skills in a safe, enjoyable and comfortable learning environment.

### 2.3 The Use of Information and Communication Technologies

Advances in technology allow educators to provide online instructional tools such as videos etc. and to benefit from online assessment systems (Friedman & Friedman, 2001; Woolf, 2010). The significant contribution of technology and more specifically of Learning Management Systems (LMSs) such as LAMS, in the effective implementation of Differentiated teaching is recognized in Greek educational research provided that teachers are trained, the and students to become familiar with the use of LMSs as well as to improve the logistical

infrastructure that exists in most schools in Greece. Therefore, the "logical match" (Carbaugh & Doubet, 2016) of the Inverted classroom with Differentiated teaching and support in its application by educational technology, we assume that can improve the quality of educational work, reducing any inequalities in the learning process. After an extensive review in the international literature, a limited number of articles were identified, related to the model under investigation which mainly focuses on its description, while proposing good teaching practices that can be adopted by teachers during its implementation. It belongs to the blended learning approaches while applying various pedagogical theories (constructivism, collaborative learning, exploratory learning, active learning, behaviorism, socio-cultural theories for Vygotsky's knowledge). It can be implemented more effectively with the use of different media, educational technologies and Internet systems so that, among other things, learners are provided with multiple and diverse teaching and learning options - possibilities.

According to the learning model "Fliperentiation", the course is organized and conducted in three (3) Phases. During Phase AD, students are provided with a variety of educational content (websites, texts, audio files, video files, photos, etc.) for study From Home that should be relevant to their planned individual or collaborative experiential activities which are prepared by the students, in the school class at Phase B. Each learning plan is completed with Phase C, where participants are provided with alternative assessment activities, which can be carried out at Home or School and can be formally or informally assessed (Carbaugh & Doubet, 2016). Differentiation can be applied with the help of technology in any Phase of the model, enhancing the possibility of choice that is a key feature of Differentiated teaching. Information and Communication Technologies (ICT) as well as the Internet either as tools that facilitate and support Teaching/Learning Design or as learning environments such as Internet learning platforms can give education great opportunities, but under strict conditions. As teachers utilize technologies to automate or eliminate time-consuming tasks, they are able to more effectively differentiate the instruction (Davies et al., 2013). More specifically, their utilization must be surrounded by a pedagogical framework and serve specific goals and skills. The use of ICT with the parallel support of the Internet has contributed to the adoption of new educational opportunities through distance education. E-learning environments — online blended learning platforms that enable both synchronous and asynchronous communication have been developed, providing the technological tools that take advantage of blended learning. This type of learning provides students with opportunities for autonomous learning, flexibility, freedom of choice, learning motivation (Zaka, 2013), responds to the different learning needs of a mixed ability class since learners can access multiple learning channels (Gogos, 2014), while, allows the use of various teaching techniques and contributes to the achievement of the intended learning objectives (Vaughan 2007). Learning Management Systems (LMS) are tools to support both distance education and other hybrid forms of education such as blended learning and flipped classroom. A LMS has different tools (Forum, Chat, Collaborative tools, etc.) at different levels of its architecture that are integrated into a single system offering multiple benefits to the learning process (Παπαδάκης, 2010). LMSs are used at all levels of education as well as in training. The main reasons for choosing LAMS (Learning Activity Management System), as the technological tool that could support the application of the pedagogical model "Fliperentiation" in teaching practice, were the following: a) meets basic criteria to support its implementation methodology of Differentiated Teaching (Ζήσκοςand Παπαδάκης, 2015), b) supports the principles of Learning Design, c) is an online, free open source software while, d) has been used by teachers of many primary and secondary schools Secondary education.

## 3. Research Methodology

The type of educational research chosen to investigate the research questions of the present work was the action research. Action research is an iterative approach, combining theory and practice (Avison et al., 2001; Baskerville & Wood-Harper, 1996) and has been widely used in education. Recent publications prove an increasing interest in the dissemination and implementation of teacher research and action research (Rovegno & Pintos, 2017; Banegas & Consoli, 2020; Yuan et al., 2016). As a research methodology, action research is about transformation of social practices (Banegas & Consoli, 2020). Initially, the consent of all those involved in the research was sought, followed by the planning of a small-scale intervention in the operation of a public Vocational Upper Secondary School in Thessaloniki (Greece), its implementation in action, the elaboration of the results, the evaluation of the process by students and finally, the critical reflection of the action, utilizing various techniques of collecting research data. As part of the intervention, two sequences of learning activities (digital lessons) were designed, developed and finally implemented on the online LAMS platform. The first one included an introduction to familiarize students with the online learning environment of LAMS and the reversal of the educational process, while the second one used the mixed combined pedagogical model of "Fliperentiation" to teach a unit of General Education "Informatics" of the 1st grade of VUSE.

The sample of the research was the 20 students of a 1st grade class who were studying during the school year 2017–2018. The sample was small but it can provide useful information for the investigation of a "defined system" which in this case was the Vocational Upper Secondary School. The students, after the preparation of the introductory sequence entitled "Familiarity with the pedagogical model of the Inverted class" in the LAMS environment through the Learning Activities Service on the server of the Greek School Network, were asked to complete the questionnaire before the action where, among other things, an attempt was made to detect the learning styles, interests and previous knowledge of the participants, about the HTML language. The introductory sequence of learning activities is posted in the LAMS Central international repository at: https://lamscommunity.org/lamscentral/sequence?seq_id=2284551 and was prepared entirely in the School of Informatics laboratory. The Pre-Action Questionnaire (Pretest) is available online at: https://goo.gl/VPC1Xf. Then, based on the collected data and the objectives of the Curriculum, learning objectives of the unit "11.1 General Introduction to HTML", a sequence entitled "General Introduction to HTML v 2.0" was designed, developed and implemented according to the following investigation, pedagogical model. The specific digital lesson was conducted in two separate two hours, since the twenty (20) students were divided into two groups, according to the operating conditions of sections A' and B' class of the VUSE.

### 3.1 Required Technological Conditions and Infrastructure for the Proper Operation of the Model

No particularly demanding equipment is required to conduct an online course according to the model under investigation. The presence in the School of Informatics laboratory of various digital devices such as video camera, microphone and speakers, would facilitate the elaboration of the learning activities of Phases B 'and C' of the model. Critical factors for the effective execution of the courses are: a) the possibility of access to the Internet of the trainees both from home and at school, b) each trainee has a personal computer (PC, laptop) or a smart mobile device for remote access to the lesson, c) the familiarity of the students with the pedagogical model but also with the use of the selected Learning Management System (LMS) and d) the satisfactory speed of the internet connection of the computers of the School laboratory.

### 3.2 Sequence — Outline of the New Pedagogical Model

In order to create a "guide" for the new model, which would be useful to any interested teacher, a model of a sequence of learning activities with this model was designed and developed. The sequence is posted on LAMS Central (lamscommunity) under the name of the innovative combined pedagogical model "Fliperentiated" instruction-Fliperentiation, at: https://lamscommunity.org/lamscentral/sequence?seq_id=2284358.

### 3.3 Learning Design of the Section "General Introduction to HTML v 2.0"

The educational scenario created in the framework of the intervention follows the principles of Learning Designing, while it was designed and developed to be implemented in three (3) Phases: From *Home (Phase A), At School (Phase B) and At Home or at School (Phase C)* (using the "License Gates" of the LAMS platform). Recognizing the diversity of students in a mixed ability class (such as the one in which the action was conducted) as well as identifying the learning profile, interests, pre-existing knowledge and experience, the level of readiness and previous learning performance of students in "Informatics", influenced the design and course of the teaching and learning process (Willis & Mann, 2000). The basic principles of Differentiated Teaching were taken into account when designing the sequence, choosing to differentiate: the content, the process using the modern collaborative Think-Pair-Share (TPS) technique, the learning environment to be easy to use and enjoyable with more technology support as well as the pace of learning by providing students with the flexibility to carry out Phase C activities at Home or School. The video tutorials that can be used for the presentation of the content but also as diagnostic tools of the degree of understanding of the concepts of the course, or are retrieved ready from free video distribution sites (such as Youtube EDU, Teacher Tube, Khan Academy, iTunes U etc. a.) as happened in the intervention learning plan, or are created by the class teacher with software called Screen Recorders (such as the popular online tool Screencast-O-Matic). The duration of the video lessons was careful not to exceed 10 minutes in order to maintain the interest of the viewers. Then, they were enriched with comprehension-consolidation questions, using the online service Edpuzzle to enhance the interaction of the learners with the learning content. The interactive video lessons, after being prepared on the Edpuzzle platform, were integrated in the LAMS learning activity sequences, facilitating the immediate feedback of the students and the teacher. At the same time, ready-made educational material was created or selected for the supplementary presentation (Supporting material) of the theoretical part, utilizing various means such as websites, the textbook, texts or presentations, in order to satisfy the different learning profile of the participants. Based on the topic, the desired learning outcomes, the conduct environment and the preferred teaching and learning techniques, the tools for the creation of the learning activities of the course were selected. The elaboration of the activities was sometimes done individually or in pairs or in groups of four and sometimes concerned the plenary session of the students of the class, allowing through the tools of LAMS, their flexible grouping (basic principle of Differentiated teaching). According to the principles of Differentiated Teaching, the evaluation of the achievement of the expected learning objectives must be detailed and continuous. Thus, in the learning plan created for the intervention, diagnostic assessment was used during Phase A' of the model (through the questions included in the interactive video lessons), formative assessment (self-assessment, hetero-assessment, group practice) during Phase B in the School laboratory and final-overall assessment (self-assessment) during Phase C at School or at Home. Also included, during Phase C, was a learning process evaluation activity entitled "Reflection", promoting the cultivation of a reflective learning culture and providing appropriate feedback to the teacher/lesson planner to redesign the action.

### 3.4 Implementation of the Learning Design in LAMS

The sequence of learning activities applied in the context of the intervention is posted (see Figure 3), so that it can be used-adapted by other teachers, in the repository of the global community LAMS Central and is accessible from the URL: https://lamscommunity.org/lamscentral/sequence?seq_id=2285326.
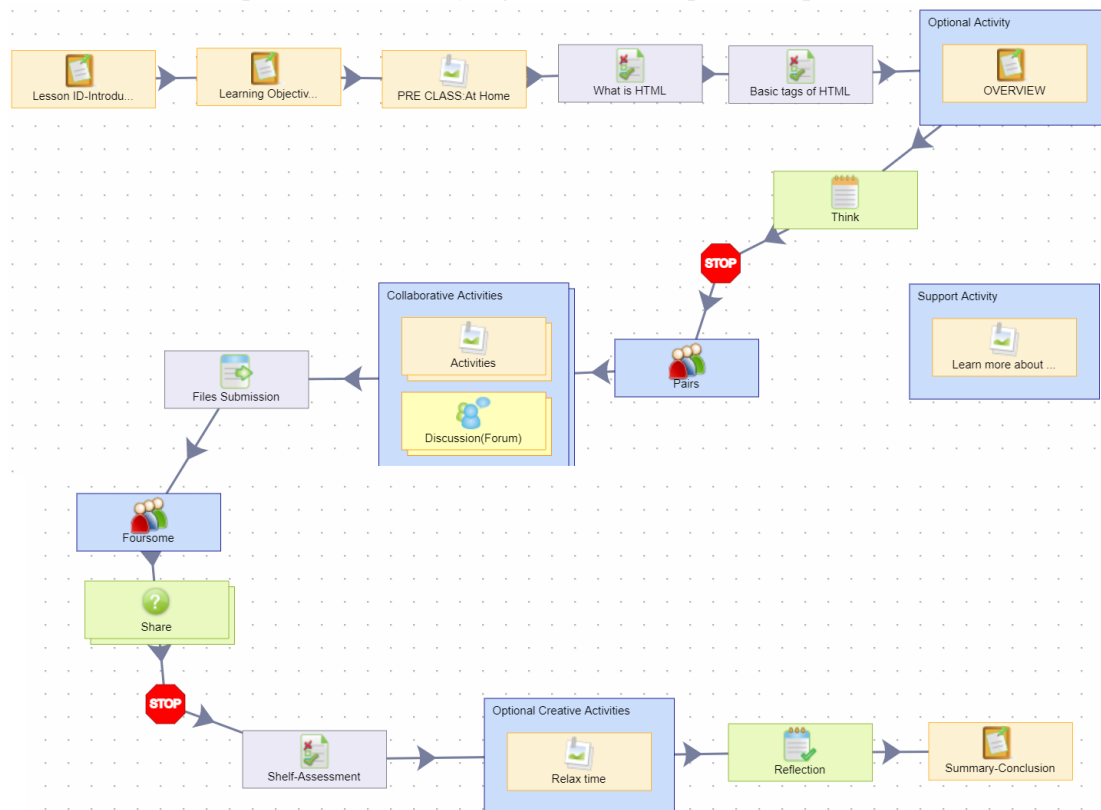


**Figure 3    The Sequence of Learning Activities Applied in LAMS**

The Figure 3 presents the flow chart of the sequence of learning activities developed during the research activity. The application of the TPS technique begins during Phase AD with the assignment of an individual comprehension task ("Think" activity) while, during Phase B, students work in pairs, giving them the opportunity to select the team members so that the interaction, the communication (through Forum) and the cooperation to be done in a comfortable and safe environment with the division of the roles in the group, to be assigned again by them. The pairs undertake together the elaboration of two collaborative experiential activities, an understanding-consolidation task and a web development task (group internship). The submission for grading of each task on the LAMS platform is undertaken by a team member (responsibility development). Finally, in groups of four (randomly generated from the LAMS environment) students present and share the knowledge and experiences gained from their participation in previous collaborative activities. Very interesting are the provided Optional activities, of Phase C, entitled "Relax Time" that utilizes creative web 2.0 tools (Tagxedo Creator and Padlet). The new educational approach proposed in this paper does not in any way alienate the teacher from the trainee, nor does it replace him. Instead, it allows the adaptation of the conventional learning process, providing more time to develop a creative and meaningful relationship between teacher and students but also between the students themselves, promoting collaboration and interaction. Learners can receive progressively scaffolding as

well as immediate feedback from the supervisor, throughout the course through the Supervisor's Learning Management System interface. Also, in LAMS, the teacher-supervisor is allowed the Live Edit of the sequence with immediate adjustment of the activities and their content.

## 4. Results

The most appropriate research tools were the Questionnaires (Before the Action and After the Action) completed by the students participating in the action, the Teacher's Diary kept by the researcher/class teacher during the action, the School Unit Archive and the "My school" Information System, the evaluation of the educational process by the trainees, at the end of the digital intervention course as well as the Log files from the Supervision environment of the online platform LAMS. After the implementation of the intervention, the methodological triangulation followed, while the research results are presented in detail in the following paragraphs. The combined learning model "Fliperentiation" significantly "satisfied" the students and less "excited" them, while most said it was an "interesting" educational approach, and that result also agrees with the findings of literature review.

Teacher-centered teaching is the basic model of learning according to the views of students with immediate effect as supported in other research to require a sufficient period of time to familiarize them with the different way of organization and with the requirements arising from the application of the new pedagogical models. The students were very positive in relation to the use of technology as a supportive tool of learning while, in respective questions they expressed the view that they quickly became familiar with the learning environment of LAMS, proposing its integration in teaching/learning and other cognitive subjects.

The benefits, from the utilization of the new educational approach in the context of the action research conducted in a public Vocational High School of the country, are summarized in the following:

1) It facilitates the understanding and consolidation of basic concepts of the subject "Informatics" by watching interactive video lessons that promote self-regulation and autonomy, while enhancing students' confidence before attending the school workshop to develop the Phase B model.

2) It recognizes the diversity of students in a class, promoting differentiation: a) in the pace of learning by providing flexibility in handling the teacher of the initially planned course flow, b) in the content using multiple media and utilizing ready-made or produced by the class teacher , interactive video lessons, c) in the learning process by providing alternative learning paths, d) in the presentation of the final result and e) in the evaluation that is continuous, through individual and group work (preferred by students) but also by self-evaluation or hetero-evaluation.

3) It enhances the more active involvement of students in the learning process in relation to the traditional process, in various ways, such as: a) by assigning experiential learning activities which students described as "satisfactory" for their own learning needs but also " b) by using sequences of learning activities that allow the design and development of very well organized courses, c) by modifying the content of the activities, where required, to be adapted to the needs of students, using the Live Processing service (Live Edit) in the LAMS Supervisor environment and finally, d) through interactive video lessons.

4) It enables the effective management of teaching time within the classroom due to the reversal of the educational process. All the planned activities of the course were completed by the participants in a

shorter time than the initial planning, allowing some of the activities of Phase C to be carried out in the School Informatics laboratory.

5) It supports students in their learning process either through the provision of continuous and immediate feedback (answers and comments through the LAMS platform) from their classmates but also from the class teacher, or through the gradual support-guidance (scaffolding) from the teacher.

6) It promotes collaboration and the application of modern collaborative techniques such as Think-Pair-Share. According to the students, "interesting" collaborative experiential activities were developed in the context of the intervention, in a calm and creative atmosphere, utilizing the available tools for collaboration and grouping of the LAMS e-learning platform. Also, flexible grouping was implemented, while the distribution of roles in the groups was done by the students themselves without conflicts and fuss. Finally, the students stated that they prefer to work with a mixed model that will combine the regular meetings in the school laboratory and the use of the LAMS platform.

7) It strengthens the interaction and communication between students and the teacher through the use of teamwork activities in the learning environment LAMS. A sufficient number of messages were sent among the students in the Forum, while they themselves claimed that the interaction and communication through the platform facilitated them significantly in the completion of activities, in the deeper understanding of concepts, in mutual support and in strengthening relationships among team members.

8) It allows the interaction with the educational material and the repetition of study/monitoring of the material "to be studied", without space-time constraints, before the elaboration of the activities of Phase B of the model.

Finally, there was an improvement in learning outcomes without achieving a significant improvement in the school performance of students participating in the action after maintaining their average overall performance in the subject "Informatics" and after the implementation of the innovative combined pedagogical model or large-scale could have better results.

## 5. Conclusions

Based on the research results of this small-scale intervention carried out in a public Vocational High School of the country, we conclude that the utilization of the new combined pedagogical model of mixed learning provides the possibility: a) to the teacher through the utilization of the LAMS e-learning platform and recognizing diversity to plan, develop and supervise inverted classroom learning periods with Differentiated Teaching, making more effective use of teaching time as well as receiving ongoing feedback to successfully respond to students' ever-changing learning needs through appropriate learning support (scaffolding), while, b) to learners, to develop reusable sequences of learning activities through the platform, with an observed enhancement of their active involvement in the learning process, strengthening of interaction and communication community between the people involved (students, teacher) and promoting collaboration between team members, skills that are required in the 21st century. Although there was an improvement in learning outcomes after participants at the end of the intervention expressed the view that "*it is the learning model that facilitates the acquisition of knowledge and promotes the cultivation of skills*", their average overall performance in the subject "Informatics" was maintained before and after the experimental procedure. An important factor, according to the views of the students that contributed to the achievement of the initially set objectives of the research was the provided interactive

educational material (mainly the interactive video lessons).

In order to take advantage of this educational approach, it is considered necessary for the teacher/designer of the digital lesson as well as for the students to undertake some tasks. Teachers wishing to apply the "Fliperentiation" model should be familiar with the use of ICT and the use of the LAMS e-learning environment for the design, development and supervision of courses or the updating of ready-made sequences from the international repository of LAMS Central. Students must watch the interactive video lessons included in Phase AD of the From Home model so that, when they arrive at school, they have already mastered the basic concepts of each unit, which they are then asked to apply in practice. It is considered useful to dedicate time and implementation of students' activities with the philosophy of the method as well as with the undertaking of the obligations that accompany them it is considered necessary for the successful application of the model in the teaching practice.

It is recommended the implementation of similar actions with a larger sample of students, in formal education as well as the utilization of the pedagogical model in more cognitive subjects, for a longer period of time in order to check and generalize the collected research data. Finally, the creation of an international community of "Fliperentiation" teachers, would help to spread the innovative pedagogical model in the educational community as well as its evolution through the exchange of ideas, communication, sharing of digital interactive educational material and reusable sequences/designs. courses that utilize the pedagogical model.

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