

Using Serious Games to Improve the Preparation of Pre-Service Teachers in Bulgaria

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Abstract—This paper presents the outcomes of a qualitative study which aims to investigate the pedagogical potentials of serious games in the preparation of future teachers. The authors discuss the existing problems and barriers associated with the organization of teaching practices in Bulgaria as part of the pre-service teacher training, as well as the attitudes and perceptions of the interviewed academics, teachers and trainees concerning the integration of serious games in the teaching practicum. The study outcomes strongly confirm the positive attitudes of the respondents to the introduction of virtual learning environments for the development of professional skills of future teachers as a supplement to the traditional forms of education. Through the inclusion of serious games it is expected to improve the quality of practical training of pre-service teachers as they overcome many of the problems identified in the existing teaching practices. The outcomes of the study will inform the design of the educational simulation software which is part of the project SimAula Tomorrow's Teachers Training.

Keywords—pre-service teacher training, serious games, virtual practicum, simulations

I. INTRODUCTION

TODAY the meaningful inclusion of technologies into learning offers new possibilities for supporting future teachers in the process of their professional development and establishing of professional knowledge, skills, and competencies; more specifically, the educational computer games known also as “serious games” reveal new opportunities for supporting the learner when practice is concerned. The good practices shared by educators and researchers around the world show that serious games provide opportunities for students who are expected to participate in internship and practicum courses to get better prepared for this learning experience. There is also evidence that serious games support learners’ professional and personal development in a way which is consistent with the demands of the modern information society. Exactly these potentials of serious games draw researchers’ and educators’ interest towards their effective application for practicum and internship training. The research in this area shows that the meaningful application of serious games into the learning process improves motivation and personification; it guides learners to focus on key aspects of the learning content, to develop practical and professional skills, in addition, serious games provoke learners’ cognitive and emotional activity [1, 2, 3, 4].

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According to a number of scholars such as Aldrich, Foreman, Gee, Prensky, Squire and Jenkins, the application of digital games and simulations in teacher training is supported by the positive evaluation of the benefits which games and simulations offer for meaningful and active learning [cited in 5]. It is considered that the digital tools can be used to create a good simulation of real-life learning situations. Such digital learning experience will prevent the trainees from making mistakes in real classroom settings, it would allow them to go over the same situations, settings, contexts multiple times in a low-stress environment which promotes experimentation with various techniques and allows meeting learners’ individual needs, interests, and abilities. The simulation software supports the transfer of acquired knowledge and skills from the controlled educational setting to the real classroom, it stimulates the heuristic thinking, professional skills and competences related to planning, implementation, assessment, and management of the learning process and its results. According to Gibson, serious games support the readiness of future teachers to enter the classroom because these games give them the opportunity to engage in various virtual situations; they can develop specific skills in the process of participation in various learning environments and situations presented in the simulation [5]. Even more, there is evidence that the opportunity to work in a virtual environment and be exposed to different situations and settings supports learners’ development because they can be exposed to a much greater variety of situations than they could be exposed to when they are engaged only in a regular face-to-face internship [6]. Further, there is evidence that the experiences gained in virtual classroom environment is transferable; thus, simulation environments provide the opportunity for development of professional skills and their transfer to new settings and contexts [5]. In addition, the opportunity to practice certain strategies multiple times supports the development of trainees’ confidence. Yet another benefit which serious games offer is that learners are motivated by participating in them which undoubtedly supports students’ learning; this higher motivation is achieved by various factors such as the diverse scenarios and the competition elements that some of the scenarios offer, the opportunity to receive immediate feedback, as well as the rich multimedia learning environment recreated in the context of the game. This power of the games to motivate makes them a good tool for learning [4]. However, we need to emphasize the fact that serious games should be designed in a way that would assure meeting specific learning objectives because, if learning objectives have not been taken into account, the game itself may raise students’ motivation but it would be ineffective in supporting their learning.

It is viewed that the constructivist paradigm offers a good framework for the effective development and application of serious games for students majoring in the field of pedagogy.

A number of researchers acknowledge the role of serious games to support active learning by engaging students and encouraging them to involve in research, experimentation, and collaboration with peers [1, 6, 7, 8]. Wilson [7] claims that modern computer games could be viewed as a constructivist learning environment in which a space for collaborative work and problem solving is provided; this is a space in which learners can support each other, use various tools and informational resources in order to solve specific problems and achieve educational goals. According to Sara de Freitas [1], the digital games, which are based on the main principles of the constructivist paradigm, have the great potential to support and stimulate the in-depth learning of teachers in training. Moreover, they have the potential to transform the traditional "transmission" models of learning into more active learning which is oriented towards creating connections between theory and practice. The inclusion of serious games allows for individualization of the learning experience based on the needs of each learner; such individualization provides a great opportunity for social interactive learning and active engagement of the learner with the learning process, in addition, in such learning settings, the learner becomes an active co-author of the learning content.

It should be noted, however, that these advantages of the serious games do not eliminate the limitations – these limitations are mainly related with the difficulty to recreate the learning environment in its real-life complexity and dynamics, to reveal in all the details the teaching and learning process. This is why we suggest that these games cannot replace the teacher training in its entirety but can be a useful addition. This leads us to look closer into the issue of the place of serious games in the context of teacher training.

II. AIMS AND OBJECTIVES OF THE RESEARCH

The main goal of the current study is to identify the most typical difficulties and problems in the process of organization and conducting of practicum sessions and teaching internships; in addition, the aim was to identify the attitudes and beliefs of academics, resource teachers, and students about the inclusion of serious games in the internship activities. The study aims to set a framework for the development of educational simulation software which would allow the future teachers to practice in a virtual 3-D environment in order to master their teaching skills and ability to manage the learning process; we view this tool to be an adequate addition to teacher training process that would allow students to receive professional preparation adequate to the demands of modern education.

The conducted study aims to answer the following research questions:

- What are the goals and objectives of teachers' internships and what are the difficulties met in the process of achieving these goals and objectives?
- What are the typical strategies which interns apply in their teaching?

- What are the most typical problems which interns experience in their teaching?
- Which of these problems could be solved with the inclusion of virtual internship settings and experiences?
- Which of the classroom learning activities can be simulated through serious games?

III. PARTICIPANTS

There were three different groups of participants included in the study: (1) six academics – faculty members from Sofia University "St. Kliment Ohridski", (2) six resource school teachers who mentor interns, and (3) 12 interns from Sofia University. The faculty members are closely engaged with the organization and teaching of the internship courses in the three of the largest faculties involved in future teachers' preparation: The Faculty of Education, The Faculty of Biology, and The Faculty of Chemistry. The internship mentors are resource teachers who host interns in the process of their internship in elementary and middle school. These resource teachers teach the following subjects: Bulgarian Language and Literature, English Language, Mathematics, Homeland, and Informational Technologies in elementary school; in middle school the resource teachers teach the following subjects: Biology, Chemistry, and Environmental Studies. The interns who participated in the study were taking their internships while teaching the following classes: Bulgarian Language and Literature, Homeland, and Mathematics (elementary school), Biology, Health Education, and Chemistry (middle school). They had the following majors: Pedagogy, Biology and Geography, Biology and Chemistry, Chemistry and Informatics, Teacher in Chemistry (Computer Chemistry).

IV. PROCEDURE

In order to answer the research questions posed in this study, semistructured interviews were designed and conducted with all three groups of the participants: the academics, the resource teachers, and the interns. The interviews included the following groups of questions:

(1) Questions, related to the main problems and barriers which university faculty members, resource teachers, and interns meet in the process of the organization, conducting, managing, and assessing future teachers' internship.

(2) Questions related to the main pedagogical characteristics of future teachers' internship: typical teaching strategies, used by the interns in their teaching and the reasons for choosing these strategies; typical characteristics of the classroom settings in which the internships take place; types of relationships which interns develop with their pupils during the internship.

(3) Questions investigating the opinion of all three groups of participants about the possibilities which virtual learning environments provide for overcoming the difficulties and barriers that they have experienced during the different stages of the internship.

V. RESULTS AND DISCUSSION

The three groups of participants take place in the internship process in a different manner, holding different tasks and demonstrating different competencies; therefore, each group views the internship process from a different angle and identifies different specifics and problems. This allowed the research team to identify the common issues and the differences in the opinions of the participants.

First of all, the researchers focused on the opinions of the three groups of participants about the main goals and objectives of the internship. The interview outcomes revealed that the faculty members view the following learning goals not being met or being met to a lower extent in the current internships:

- Providing interns with the opportunity to gain initial experience in engaging into activities related to action research such as investigating their own teaching methods, including and experimenting with new teaching approaches in a particular classroom.
- Developing skills related to effective work with individual pupils and with parents.
- Developing the necessary skills for effective work as a homeroom teacher responsible for the advisory work with a particular group of pupils.

The resource teachers defined the following difficulties experienced by interns:

- The sound pedagogical interaction with pupils.
- Being independent in the meaningful and creative application of the knowledge and skills acquired during their university studies (both subject knowledge and teaching psychology and methods related skills).
- The development of teachers' in training overall professional competencies.

A. Problems related to the internship organization

The main problems/barriers related to the internship were related to the following areas: administration barriers, organizational barriers, and problems related to interns' motivation level, active involvement and preparedness.

1. Administration barriers

- The collected data revealed lack of good coordination between the university and the resource schools when planning and conducting the internship. There is often lack of synchronization between the schedule of the resource teachers and the interns which leads to serious problems related to the time of school visits and completion of internship requirements.
- The lack of an adequate number of resource teachers poses serious difficulties for the effective organization of the internship. The interviewees identified the unwillingness of school administration to collaborate with the University when internship arrangements are made due to the low payment which the resource teachers receive and the organizational

difficulties caused by the interns working at the school. The choice of the resource teachers is also recognized as one of the difficulties. The academics are not directly involved in this choice. Usually, the school principal is the one to choose the resource teacher and the choice is frequently made based on formal criteria such as the number of years of teaching experience etc.; however, such formal criteria do not always guarantee the professional qualities of the teacher and especially his/her preparedness and ability to mentor interns.

- There are also a number of administrative procedures that pose difficulties and delays when the internship is arranged such as signing papers and contracts.

2. Problems related to the internship organization

- There is a lack of adequate facilities in some of the resource schools which requires extra efforts on the side of the University faculties to provide additional materials and resources.
- The interns are ready and show willingness to use ICT in their teaching; however, the schools are not well equipped in order to provide them with this opportunity.
- The number of interns in one group is high, usually between 20 and 25 students; this requires dividing them into smaller groups. Therefore, the number of hours in which the same resource teacher is engaged with interns increases. Finally, the school schedule which involves teaching in two shifts poses additional difficulties.
- Another barrier is the remote location of some of the resource schools; a considerable amount of time is required for commuting.

3. Difficulties related to the internship content

- There is no common framework of criteria and indicators for the state internship assessment.
- The expected requirements are often limited to the preparation of a monthly lesson schedule and lesson planning for only two types of lessons for two subjects.
- The interns experience difficulties with the application of interactive student-centred teaching approaches.
- The schools are not able to supply the interns with the necessary textbooks, handbooks, teachers' reference books and study notebooks and the interns are not willing to invest in buying these materials.

4. Difficulties related directly with the interns

- The outcomes of the interviews revealed that many of the interns are not motivated to enter teaching as their future occupation. Often, it is not their first or even

second choice to become an educator and only few of them see teaching as their future professional career.

- Most of the interns start their internship with the feelings of uncertainty, fear, and resistance.
- Interns show low level of mastery of the terminology related to didactics and teaching methods; in addition, their basic knowledge of subject content is weak and this requires investing additional time in compensating for these shortcomings.
- The interns experience difficulties with the application of innovative methods of teaching and learning; the main reason is that they do not have well-formed skills that would allow them to make active and meaningful connections and transfer between theory and practice.
- The interns also show lack of skills for the application of pedagogical approaches that would promote a variety of class tasks and activities. They prefer applying frontal teacher-centred approach in their teaching and engaging pupils in individual learning tasks. They avoid involving pupils in group tasks and do not often provide them with choices during class activities.
- The interns also show difficulties in the application of approaches and activities which would promote individualization of the learning process.
- They have limited skills for helping pupils who are behind their peers.

The opinions which the resource teachers share about the internship barriers show some differences as compared with the opinions of the university faculty members. Most of the resource teachers claim that there are no administrative difficulties and difficulties related to the content mastery, the main draw-back they point out is the insufficient time dedicated for the internship. Only one of the interviewed teachers shared as a difficulty the interns' lack of knowledge and mastery of modern teaching and learning methods and computer-enhanced teaching and learning approaches. Similarly to the university faculty, the resource teachers point out as a very serious problem the lack of motivation which interns demonstrate during their practicum.

In addition to the data presenting the opinions of the university faculty members and resource teachers, data revealing interns' opinions were collected. The following problems became evident based on the analysis of these data:

- Most of them are experiencing difficulties when working with all pupils in a given class; it is easier for them to work with the pupils who are more active and show interest. They share that working with pupils who are gifted and learn faster than their peers requires a lot of effort and preparation on the side of the intern.
- They experience difficulties when using terminology that would be adequate for the age and knowledge level of their pupils.

- Part of the interns shared that they experienced serious difficulties when applying individualized methods of instruction. Others stated that they attempted using such methods but they felt that they did not have enough experience for the successful application of these methods.
- There is also a problem related to the class discipline; however, this problem may have deeper roots because even the resource teachers stated that they have difficulties with the discipline.
- Another difficulty shared by the interns is the lack of time they have for teaching preparation during the internship.
- The lack of well equipped classrooms that would offer a range of ICT, textbooks, resources books etc. is pointed out as a barrier as well.

Based on the comparison of the problems and barriers identified by the three groups of participants, we were able to make the following conclusions: there are common problems and barriers identified by all three groups, these barriers are related to the application of the theoretical knowledge related to pedagogy and teaching methods to practice. The most important ones are: the lack of knowledge and ability to apply approaches for interactive teaching and learning as well as teaching strategies that would promote group work, individualization and differentiation of the learning process. In addition, there is a relationship between the way interns work in class and the quality of the equipment they have access to during their internship. Another important problem which was identified is the class discipline; the low class discipline levels can be interpreted as the reason for interns to be more likely to use teacher-centred approaches on one hand and on the other – inadequate discipline can be a result of the application of such approaches. It can be assumed that these difficulties and problems cause interns to experience a higher level of anxiety, lower levels of confidence, and lack of motivation to apply teaching approaches different from the teacher-centred ones; thus, teaching approaches that present direct transmission of knowledge become the main approaches used by interns and pupils in their classroom play the role of passive observers. This low involvement of the pupils possibly triggers the discipline problems. In the interviews, the university faculty members made an attempt to identify the reasons for the discussed barriers:

- The internship takes place during a semester in which students are taking other classes; this makes internship scheduling very challenging.
- The time planned in the curriculum for internship is not adequate.
- Because the interns spend very short time in the resource schools, the pupils do not take them as part of the teaching team of the school which leads to discipline problems.
- The support the resource teachers offer to the interns is not always adequate.

The problems outlined above allow drawing the conclusion that the interns meet substantial difficulties related to the organization and delivery of their training when internship is concerned. It is necessary to look for strategies that would allow overcoming these problems and improving the quality of pre-service teacher training; high-quality of learning internship experience is a key factor for the acquisition and mastery of better teaching skills and approaches that would guarantee future teachers' successful entering into the profession. It is important to point out that the interns recognize their responsibility as future teachers, they identify the following specific measures that, in their opinion, may serve as a solution of the outlined problems: developing more skills and competencies that would support their teaching, getting involved in more observations and guided teaching, improving their access to teaching equipment and materials, formulating clear requirements to the resource teachers, interns, and pupils.

B. Key characteristics of the internship based on the view of the study participants

The quality of teaching is to a great extent defined by the ability of the teacher to use a variety of techniques for achieving different teaching goals; this motivated us to review the interns' preferred teaching strategies, the strategies that are avoided by the interns, and the reasons the interns make their choices of teaching strategies. The three groups of participants shared the same opinions related the teaching strategies: they perceive that the intern's preferred teaching strategy is the traditional way of teaching (i.e. the teacher fronted classroom). It appears that interns' use of innovative teaching approaches which involve problem solving, games, and group activities is limited.

The faculty members point out as the main reason for the adoption of the traditional models of teaching by the interns the wide application of such models in the Bulgarian schools. On one hand the interns repeat and multiply the techniques they were exposed to as pupils and university students, on the other, although they are introduced to innovative approaches to teaching which include peer interaction and collaboration, they prefer the traditional ones; it is easier to apply them in the classroom because they are established and bring the sense of security.

Another reason for choosing this approach to teaching is that resource teachers are often concerned with meeting the expectations of school principals and the ministry of education administration for planned distribution and covering of content during the term. Thus, it is not surprising that interns define resource teachers' guidance as one of the main reasons for using teacher-centred techniques which requires less time for covering the required content.

The university faculty members and resource teachers share that interns avoid using or use rarely constructivist approaches in their teaching such as module learning, team learning, learning through investigation and research, learning through engaging in case studies, project and problem-based learning.

According to them, the main reasons for this are as follows:

- Their unfamiliarity with the constructivist models of teaching and learning;
- The lack of resources that would support the application of constructivist models;
- The fact that some of the models are inapplicable for a younger learners;
- The lack of skills and competencies that would assure the effective use of these approaches in a specific pedagogical context;
- The low level of motivation shown by university students during their preparation for the internship and during the internship itself;
- The lack of adequate time for internship, which is a serious obstacle for the development of knowledge, skills, and competencies required for the effective and confident application of the discussed teaching methods;
- The difficulties which interns face when trying to organize effectively the learning activities flow and time;
- It is not possible to realize some of the constructivist approaches due to the fact that they are not popular in Bulgaria and the organization of the class time does not allow their application (for example module learning); therefore, if the intern tries to apply such approaches he/she will distort the class work.

The interviewed students articulated clearly the reason for choosing the teacher-fronted teaching strategy. They perceive that some of the popular teaching/learning models are not applicable in the Bulgarian schools, curriculum, and educational traditions. They perceive that some of the constructivist models such as learning through case studies, team learning, and experiential learning require more practice and specific skills both on the side of the teacher and pupils, they also require more time for teaching a specific topic or theme and this should be reflected in the curriculum.

In addition, the interns perceive that the learning environment in the schools as well as the available equipment and learning materials are often inadequate for the application of the constructivist approaches. The academics support this opinion and agree that there is a connection between the learning environment and the available equipment and learning materials on one side and the teaching strategies and pedagogical models on the other. According to them, the way the classrooms in the Bulgarian schools are organized, equipped, and function presents a number of obstacles for the application of constructivist methods. The constraints posed by the limited supplies and equipment of the resource schools determine the choice of the traditional approach for teacher-fronted knowledge transmission. The opinion which the university faculty shared is that many of the classrooms are not well equipped for group work, project-based work, active and collaborative learning.

Finally, the interviewed teachers also recognize the connection between the teaching methods applied in the classrooms and the way these classrooms are organized and equipped.

The lack of well equipped and flexible learning environments leads to the application of more traditional approaches to teaching; therefore, according to these teachers, the opposite can be also true – the well organized and equipped classrooms can support the application of constructivist approaches that place students in the centre of the learning process. However, some of the interviewed educators expressed the opinion that the environment and the way the classrooms are equipped cannot determine the lesson design and flow.

We view the limited application of a variety of teaching methods and approaches by the interns as rather worrisome: if they cannot master these ways of teaching during the lessons they conduct as part of their internship experience, the chance is that they will not master them at all and will not include them in their future teaching. Therefore, the outcomes of our study show the necessity of looking for new ways to overcome the identified problems: interns need more support in order to build knowledge, skills, and competencies, such support will help raising their motivation level, their awareness of effective teaching techniques and willingness to include those techniques into their teaching practices.

The resource teachers agree with the opinion shared by the interns about the importance of having well-equipped classrooms which would include communication technologies. The science teachers add to this the necessity of science laboratory equipment.

Therefore, the three groups agree that a successful learning process can be achieved in a well-equipped classrooms in which the necessary equipment and supplies are available. This, according to the participants in the study, would create a good basis for the development and application of approaches such as team learning guided by research of a particular issue and project-based learning. In addition, their view is that an essential criterion of quality classroom today is the access to computers, LCD projectors, and Internet connection. They see that the changes that should happen in the classroom should assure not only the equipment availability but the flexibility of the learning environment which will support the meaningful application of the available equipment.

C. The participants' view on the potentials of virtual practicum environments for the improvement of pre-service teacher training

The inclusion of serious games as virtual environments designed to support the development of teaching skills and competencies is an attractive but at the same time challenging opportunity. The complexity of the issue motivated us to investigate the opinions of the participants in this study because they are the representatives of the groups of potential users of such environments; they can foresee to what extent such software could support solving the problems they experience in their work and studies. We asked questions that would reveal their opinions about the kind of support this type of environments can give future teachers in the process of acquiring new professional skills, qualities, and techniques. Depending on their familiarity with serious games and virtual

environments, the participants formed their opinions which can be summarized in the following way:

The functions of the virtual practicum as seen by the participants:

1. *According to the academics, the virtual practicum can support:*

- the development of personal and professional qualities of interns;
- the development of professional knowledge about the teaching and learning processes and techniques, as well as the awareness of the existing varieties of techniques, approaches, and strategies aiming to support learners.

2. *According to the resource teachers, the virtual practicum can:*

- enrich interns' knowledge about the school regulations and professional requirements;
- provide opportunities for further learning about the content, lesson planning procedures and curriculum development requirements.

3. *According to the interns, the virtual practicum can:*

- support the development of the way the future teacher relates to the pupils in his/her classroom and youngsters in general;
- support further development of skills that would promote the content and technology readiness and terminological mastery as well as skills that would enable interns to support pupils and recognize their achievements and problems.

4. *All three groups of participants agreed that:*

- virtual practicum can support the development of skills related to class monitoring and assessment.

It is interesting to note that for most of the participants, the virtual environment is not suitable for:

- the development of communicative skills;
- acquisition of knowledge related to pupils' health and wellbeing.

Based on the outcomes of the interviews, we can conclude that the participants recognize the possibilities that virtual environments and simulations have for supporting the development of professional knowledge, skills, and competencies, and their ability to supplement and further develop interns' knowledge acquired in traditional face-to-face settings. They see the advantage of the virtual environments in the opportunity such environments give for repetition of key elements in various simulated settings; such opportunities are rare or do not exist at all in real-life internship. Some of the participants also see that the virtual practicum provides opportunities for the development of skills that would promote the ability to create supportive learning environment and implement collaborative work in the classroom.

VI. CONCLUSION

The current study presented the opinions of three groups of participants who play different roles in pre-service teacher training; these opinions revealed some of the key problems of this training. These problems are of a various nature: they are related to regulatory, organizational, administrative, and content issues, they are also related to students' experiences, motivation, and content and pedagogical knowledge. Some of these issues are objective, others are subjective. They affect all three groups participating in the pre-service teacher training process and more specifically in the internship part of it. These issues affect negatively the quality of the training as a whole and, which is especially important, the quality of this part of the training which assures the effective transition of theoretical knowledge acquired in academic settings to knowledge and skills to be applied in classroom settings.

The outcomes of existing research focusing on the use of serious games and virtual simulations of practices in professional contexts suggest that the simulation technologies can effectively support the development of specific knowledge, skills, and competencies; moreover, this development can be achieved in an environment that is not limited by organizational constraints which the real-world educational environments pose.

The outcomes of current research related to the use of serious games and virtual environments show that they have a great potential to provide opportunities for professional training in safe, multimodal, multifaceted, and personalised settings. A virtual classroom designed to include multiple components such as various classroom settings, equipment, resources, as well as various virtual participants (avatars) in terms age, personal, and psychological characteristics would provide interns with opportunities to select and practice a variety of teaching strategies and models. Thus, the inclusion of serious games as simulations of classroom environments would support solving the problem identified in the current study: the exclusive application of traditional teaching approaches and the avoidance of the constructivist ones. Further, the simulation scenarios can be played out multiple times, the interns can experiment with different types of strategies and behaviours in a safe environment and without affecting negatively the learning process of the pupils. This would support overcoming the high levels of anxiety which usually interns experience due to the possibility to make mistakes in their work with the pupils; in addition, the experiences gained in such simulative environments can promote interns' reflective learning. We view the virtual classroom environments to be instrumental for solving the problem of the current internships related to the lack of possibilities for the interns to gain access to diverse types of classrooms and observe different teachers applying a variety of techniques and approaches.

On the other hand, the virtual practicum does not depend on the limitations posed by the administrative and organizational requirements; in addition this format would help avoiding the time-related constraints. The interns will engage in internship

activities from their homes or from the university computer laboratories. The only requirement will be the access to the necessary software and hardware. One of the most serious issues identified in the current study is the low level of student motivation: students are not looking forward to becoming teachers which affects negatively their participation in the internship activities and the quality of the practical skills they acquire in the process. While the overall low motivation of young people to become educators is a complex problem which is beyond the scope of the current paper, in this context it is important to note that the research related to the application of serious games for learning reveals their great potential for improving learners' motivation.

The inclusion of the virtual practicum in the internship process would also support the effective assessment (both formative and summative) and students' self-assessment which is an integral part of the learning process. However, in order to realize this opportunity, it is of a crucial importance to create clear professional standards for teachers and comprehensible system of objectives and goals that would guide the process of pre-service teacher training. The results of the current study reveal that educators and students have positive attitudes towards the inclusion of serious games into the learning process for the development of pre-service teachers' practical skills as a supporting tool. However, the outcomes also show that the participants in the study have rather superficial understanding of the functionalities of the serious games and the opportunities they offer for learning in various contexts. This is not surprising – the simulation technology and its application in learning environments is still to be popularized. This leads us to the conclusion that the first step of the inclusion of serious games in teacher training should be an information campaign that would reach all professionals and educators involved in the process of design, organization, and implementation of teacher training and internships. This campaign will aim to introduce the opportunities which serious games offer for improving interns' learning experiences, it will inform the professional community about the research findings related to the application of serious games in educational contexts, and will demonstrate good practices related to the use of serious games for professional training.

In this context, the aims of the *SimAULA project – Tomorrow's Teachers Training* are ambitious yet consistent with the processes and the needs of the modern education in general and specifically of teacher training. The aims of the project are to create an innovative serious game for supporting the preparation of pre-service teachers. The design of this game will be informed by current research related to the application of serious games for professional training as well as by the research conducted by the project team as part of the software development.

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