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HIGHER EDUCATION TEACHERS SURVEY FOR ESTABLISH THE INOVATIVE ELEMENTS IN INSTRUCTIONAL TECHNOLOGIES[9]

Assoc. Prof. Tsvetelina Georgieva, PhD
Department of Automation and Mechatronics,
"Angel Kanchev" University of Ruse
Tel.: +359 82 888 668
E-mail: cgeorgieva@uni-ruse.bg

Assoc. Prof. Seher Kadirova, PhD
Department of Electronics,
"Angel Kanchev" University of Ruse
Phone: +359 82 888 741
E-mail: skadirova@uni-ruse.bg

Kathryn Cormican, PhD
Enterprise Research Centre,
National University of Ireland, Galway
Phone: +353 876 896 500
E-mail: kathryn.cormican@nuigalway.ie

Suzana Cândido de Barros Sampaio, PhD
Enterprise Research Centre,
National University of Ireland, Galway
Phone: +353 91 524411
E-mail: suzana.sampaio@nuigalway.ie

Manon van Leeuwen
EU & international bidding expert and independent consultant,
EOLAS.S.L., Spaine
Phone: +34 689 57 84 87
E-mail: eolas.manon@gmail.com

Prof. Özge Andiç Çakır, PhD
Engineering Faculty, Civil Engineering Department,
EGE University, Izmir, Turkey
Phone: +90 532 684 7647
E-mail: ozge.andic@.ege.edu.tr

Assoc. Prof. Firat Sarsar, PhD
Department of Computer Education and Instructional Technology,
EGE University, Izmir, Turkey
Phone: +90 505 778 7776
E-mail: firatsarsar@gmail.com

Assistant Prof. Nuno Pombo, PhD
Assisted Living Computing and Telecommunication Laboratory,
University of Beira Interior, Portugal
Phone: +351 275 329 953
E-mail: ngpombo@di.ubi.pt

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***Abstract**: The paper presents higher education teachers survey for establish the inovative elements in instructional technologies. The survey is done under the project "HE Teachers and Institutions and Instructional Technology (HIIT)", Erasmus+ programm; Action type KA220-HED - Cooperation partnerships in higher education. Planned activity in the project included conduct research; create educational initiatives; develop training; apply innovative approaches to teaching; provide teaching for staff; pilot test training; create an e-learning space based on instructional technology principles; disseminate and exploit the results; management activities; quality activities; team building activities. The main objective of this result (PR1) is to develop the curriculum, syllabus and learning approach for HE STEM teachers. Therefore, the first step is to define the skills and competence that these teachers need to be able to design, develop, use, manage, and evaluate the process of learning mediated by technology applications in their courses, i.e., the Instructional Technology skills and competences. The focus groups will take place with 10 teachers per focus group in each of the 4 participating HEIs. We reached to 13 STEM teachers for survey answers. They are from 4 Institutions and are specialists in 6 Areas of Higher Education: Automatics Engineer; Machine Engineer; Electrical Engineer; Transport Engineer; Physics Engineer and Information Technologies. The survey is organized in 6 main questions. All answers are analyzed. All the teachers from the focus group thing that the instructional technologies are promising and necessary.*

***Keywords**: Instructional Technologies, Survey, Innovative Approaches*

***JEL Codes**: C12*

INTRODUCTION

The results in the paper are based on the main task in the project HIIT "HE Teachers and Institutions and Instructional Technology" Erasmus+ program Action type KA220-HED - Cooperation partnerships in higher education.

The project will produce interim outcomes, results and formal project results (PRs). PR1 HIIT Instructional Technology Curriculum & Syllabus builds upon the analysis at proposal and preparation stages and based upon a solid methodological approach, will employ focus groups and surveys to refine the learning objectives, methodology, content and skills assessment method.

The participants in the project are: NATIONAL UNIVERSITY OF IRELAND GALWAY, Ireland; UNIVERSIDADE DA BEIRA INTERIOR, Portugal; EGE UNIVERSITY, Turkey; UNIVERSITY OF RUSE, Bulgaria and EOLAS S.L., Spain.

The main objective of this result (PR1) is to develop the curriculum, syllabus and learning approach for HE STEM teachers. Therefore, the first step is to define the skills and competence that these teachers need to be able to design, develop, use, manage, and evaluate the process of learning mediated by technology applications in their courses, i.e., the Instructional Technology skills and competences.

Planned activity in the project included:

- conduct research;
- create educational initiatives;
- develop training;
- apply innovative approaches to teaching;
- provide teaching for staff;
- pilot test training;
- create an e-learning space based on instructional technology principles;
- disseminate and exploit the results;
- management activities;
- quality activities;
- team building activities.

In the focus groups in the project are take place HE 10 teachers per focus group in each of the 5 participating HEIs & a survey of 150 teachers. - includes clearly presented learning outcomes described in terms of knowledge, skills, competencies – includes learning context in the participating countries, learning objectives and methodology to be used for skills assessment of the HE teachers. - includes the skills and competence that HE teachers need to be able to design, develop, use, manage, and evaluate the process of learning mediated by technology applications in their courses. - curriculum ready for both blended learning (face-to-face mentoring + use of online platform) and fully online learning.

MATERIALS AND METHODS

University of Ruse reached to 13 STEM teachers for survey answers. They are from 4 Institutions (University of Ruse; Trakia University – Stara Zagora; Faculty of Techniques and Technologies – Yambol; University of Food Technologies – Plovdiv) and are specialists in 6 Areas of Higher Education: Automatics Engineer; Machine Engineer; Electrical Engineer; Transport Engineer; Physics Engineer and Information Technologies. The survey is organized in 6 main questions. Our survey was translated into local language-Bulgarian before sharing with the participants. The answers received in Bulgarian were translated later into English.

Participants from Institutions and area of higher education are presented in Figure 1.

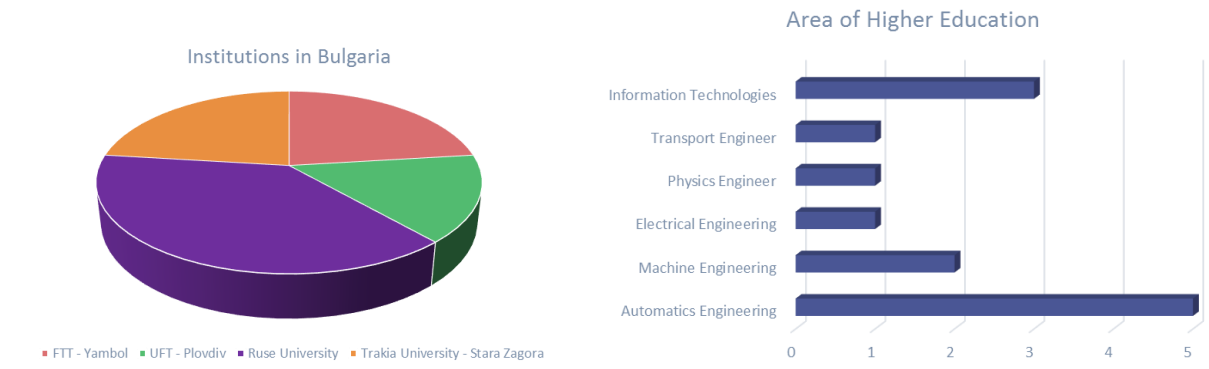

Fig.1. Participants from Institutions and area of higher education

Question 1: What is the rationale for using instructional technologies in your courses?

All the focus group meeting participants stated that educational technologies are necessary in order to improve the quality of the learning process and the effectiveness of learning.

"They help to implement modern forms of learning, such as dialogic lecture with case solving, discussion, debate, real-time experiment, project work, team work, etc.."

"Better presentation of the studied material, clarity and easy access for students to the information they need during their preparation in a given discipline."

"They make the content more interesting and accessible, create interest in the discipline.

E-learning systems can be used to build e-courses with a variety of e-resources and activities, personalization of the learning path, use of conditional activities, game visualization elements in the form of levels, leader boards and others."

"They increase the quality of education, demonstrate real problems and work in emergency situations."

Question 2: Can you provide examples of instructional technology tools that we use under each of the following categories: Plan?

The focus group is divided according to opinions into two groups: the first - used and satisfied with these educational technologies with specific examples; and the second - those who do not use them.

92% of the focus group fell into the first group.

"All learning materials text, video, multimedia are uploaded to the e-learning system. Students have 24-hour access to them."

„Using online lab bench simulations with internet communication."

„Video tutorials for each topic have been uploaded to Youtube. I use social networks for quick contact with students. "

„Online learning platforms, E-books and e-textbooks, Virtual classrooms, Facebook and YouTube, AR and VR."

„By preparing e-courses and video labs and presenting them in a virtual classroom."

„Using Canva.com to create presentations and other promotional materials, brochures, social media posts, business cards, invitations, etc. In this way, one goes outside the framework of established standard office applications and learns something new."

„Using Kahoot.com for greater interactivity, gamification and fun combined with learning."

Question 2: Can you provide examples of instructional technology tools that we use under each of the following categories: Use?

Some teachers from the focus group have long been applying instructional technologies tools.

The rest plan to use them or to expand their use to achieve the goal in the disciplines they teach.

Use:

"The flipped classroom method, elements of gamification, kahoot, creating video resources and uploading them to a video channel, working with cloud technologies, creating interactive learning aids with augmented reality."

"E-courses and e-textbooks, video materials and cloud technologies have long been used."

"The flipped classroom method with gamification elements is applied."

Plan to use:

"I plan to use them for a better understanding of only some aspects of the material."

"In the learning materials we are developing recently, we plan to use Augmented Reality (AR) and Virtual Reality (VR) tools to "break up" the learning material and allow students to access different video materials."

"I plan to continue using them for presentations and virtual classrooms."

Question 2: Can you provide examples of instructional technology tools that we use under each of the following categories: Evaluate?

All the teachers from the focus group thing that they are promising and necessary.

"Through these technologies, accessibility to learning materials is ensured. They allow remote work."
"Many of them are not easily/directly applicable, even for basic theoretical disciplines (in engineering sciences)."
"It makes for good flexibility and, in my opinion, better end results."
"As necessary in modern education."
"Educational technologies are developing and supporting teachers and learners. The goal is for them to encourage learners to be active, to have greater interaction, communication, collaboration. I appreciate each one of these technologies highly."
"Educational technology is developing at a rapid pace. They are a good means by which teachers can 'break up' the material being taught and encourage learners to be more active and open to working together. They support interaction and speed up communication both between teachers and learners, and between learners themselves."

Question 2: Can you provide examples of instructional technology tools that we use under each of the following categories: Evaluate?
There are the teachers from the focus group who thing that they are useful but it depended on course.
But:
"Much of this type of educational technology is good for distance learning, but not using it entirely."
"Some of them are suitable, others require ingenuity to be used for university purposes."
"I'm more reserved."

Question 3: What are the barriers to adopting instructional technology in your teaching?
There are the teachers from the focus group that have no problems with using modern educational technology.
But the others have different barriers.
"In the education of engineering students, more hands-on exercises are needed, and sometimes staggering in one direction or another does not improve the quality of education."
"It is necessary to stimulate teachers to use it. Promotion, conducting trainings, etc."
"Mainly technical."
"Quite often, their excessive use deprives students of adequate practical knowledge and skills in some of the disciplines."
"A bad internet connection leads to a low-quality learning process, the devices available to the students are not of the same class and thus a quality learning process is not carried out."
"Unfortunately, in software training, I have not found a suitable digital technology to replace at least a little face-to-face training."
"Quite often, their excessive use does not stimulate students to make greater efforts for self-improvement."
"They require time to learn and how to apply them, training teachers on how to use them is necessary."
"The need for "the hand to touch, the eye to see."
"Educators need to invest time in researching relevant educational technologies as well as developing relevant materials and resources."

Question 4: What skills and knowledge do you need to integrate instructional technology into your courses?
Some of the participants say that they do not need more specific knowledge and skills or they need standard job skills.
But the others have different opinion about the skills and knowledge.
"Examples of use in specific disciplines or possibly methodology are needed."
"Good computer skills, knowledge of internet platforms."
"The main thing is a good knowledge of the technologies in question, how they work and how they are perceived by learners."
"Knowledge in the field of pedagogy, approaches, teaching methods are required."
"Better digital literacy."

Question 5: What materials do you need to enable you in terms of each of the following?
- Instructional method [how do we deliver instructional technology?]
  - *Online multimedia courses. Short presentations."*
  - *"Training with e-platforms, applications and techniques."*
  - *"Work with different educational platforms."*
  - *"Accessible training materials regarding the various educational technologies."*
  - *"The teaching method in the disciplines I teach requires a classic way of presenting information."*

Question 5: What materials do you need to enable you in terms of each of the following?
- Content [what material do we need?]

  - *"I need materials to help me create virtual and interactive examples."*
  - *"Additional literature."*

- *"Learning the methods and way of teaching through the use of educational technologies of other teachers with similar disciplines to my own."*
- *"Knowledge of different platforms and their capabilities."*
- *"Modern literature."*
- *"I don't need materials in terms of content."*

Question 5: What materials do you need to enable you in terms of each of the following?

- Technology [what tools do we use to support instructional technology?]

The participants indicated the following tools that assist them with educational technologies:

- *1.e-learning system Moodle*
- *2. Mobile Learning Apps*
- *3. Electronic books and electronic textbooks*
- *4. Learning management systems*
- *5. Virtual classrooms*
- *6. Webinar and Webcasts*
- *7. Online simulations*
- *8. Social Media*
- *9. YouTube*
- *10. Smart boards*
- *11. Digital projectors*
- *12. Document cameras*
- *13. Audio and video conferencing*
- *14. Video sharing platforms*
- *15. E-books and e-textbooks*

According to the focus group, these tools must meet certain requirements.

1. Accessible to a greater number of students.
2. More modern equipment is needed to be able to conduct quality training through online platforms.

Question 6: Do you think that instructional technology can help students with learning barriers?

The teachers from the focus group are absolutely confident that that instructional technology can help students with learning barriers.

„Yes, there are specialized software and hardware solutions and technologies that are designed for people with special educational needs - braille keyboards, screen readers, text-to-speech software and vice versa. "

However, some of them are sure of this, but in the presence of certain circumstances.

„To be able to help, but with motivated learners. "

„Depending on the barrier, I believe that modern technologies in combination with classical methods offer great possibilities."

„To some extent - yes."

85 % from the teachers in the focus group are sure that they can use different approaches to receive the students opinion.

„ Through surveys to provide feedback."

"By covering a certain minimum of knowledge before moving on to the next topic/section."

"Mentoring and more."

"By the feedback we get from them and also by the results they achieve."

"This will be clearly seen when the trainees show positive results in assigned tasks."

"Without adequate feedback - we could not be sure."

"We can be sure of their achievements and through adequate feedback."

"By maintaining continuous contact with them, adequate feedback and the results they show."

15% of the teachers in the focus group also offer other approaches for student feedback.

„Through discussion with directly affected students."

„Through research."

„I don't think we can be entirely sure of that, but we could, through feedback and also through our own observation, get a good idea of the students' needs. "

CONCLUSION

The focus groups will take place with 10 teachers per focus group in each of the 4 participating HEIs.

We reached to 13 STEM teachers for survey answers.

They are from 4 Institutions and are specialists in 6 Areas of Higher Education: Automatics Engineer; Machine Engineer; Electrical Engineer; Transport Engineer; Physics Engineer and Information Technologies.

The survey is organized in 6 main questions. All answers are analyzed.

All the teachers from the focus group thing that the instructional technologies are promising and necessary.

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