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DigiComplex - "The hybrid future of scholar education. The digital skills we need to cope with complexity"

Erasmus + Strategic Partnership 2021-1-ES01-KA220-SCH-000027726

The Focus Groups Final Report

October 2022

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Introduction

This report is a compilation about all the focus groups carried out by each partner conducted in the framework of the Erasmus+ project “The hybrid future of scholar education. The digital skills we need to cope with complexity. (DigiComplex)”.

This focus groups discussion describes the results of several interviews to teachers and developers in all partners’ countries. We resume their attitudes, beliefs, and behaviors regarding the current state in the field of education in each partner country and the use of advanced technologies, their use in the process of developing learning materials, and their effective implementation in learning activities, as well in developing what are considered the fundamental transversal skills, students need for the future.

The duration of the discussion in all focus groups was between 1 hour and 30 minutes and 2 hours with a max of 7 participants.

In all focus groups, it was assured that the conclusions resulting from the discussions will contain no information that could be used to link someone to specific statements.

In some cases, moderators had permission to record the discussion, in other cases the assistant moderator kept notes and resumed participants’ opinions.

Portugal Focus Group

Introduction

This report is a part of the Project Result 1 "Curriculum & Training scheme" in the project "*The hybrid future of scholar education. The digital skills we need to cope with complexity. (DigiComplex)*", a European project funded in the frame of "Erasmus + Key Action 2- Strategic Partnership in the field of school education".

The survey has been produced and distributed among 5 Portuguese teachers from Vilela Secondary School in Vilela city and aims to investigate the importance of information technologies in new training dynamics.

We expect that this report helps the DigiComplex consortium to have overall portrait on the current situation of ICT supporting tools used in Turkey, resulting from the analysis of the teachers' survey results.

The report of the survey is presenting numbers of answers and in relevant questions there are also explanations. The duration of the discussion was 1 hour 30 minutes. One of the participants could not reach the discussion so we took answers from 4 teachers in the final. We recorded the discussion with permission of all teachers.

Gender

Female: 1

Male: 4

Age of respondents

Between 35 and 45 years old

The career position in the institution

All of the responders are teachers from different portuguese schools located in the north region of Portugal, teaching in different school levels.

The teachers are:

1. Mário Pinto: Teacher in the Informatics Department and Coordinator of the 1st cycle Degree in Technologies and Information Systems for the Web, at Porto Polytechnic Institute, Higher School of Media Arts and Design; co-author of a book published in 2022, intitled Gamification Applied to Organizations and Education
2. Patrícia Ferreira: Teacher in VET courses in the arae of ICT at Agrupamento de Escola (AE) de Vilela, <https://ae.esvilela.pt/> (grouping of schools Vilela)

3. Fernando Coelho: Teacher in the Grouping of schools (AE de Rio Tinto n.3) teaching in the following levels of education: 1st cycle, 3rd and 4th year of schooling; 3rd cycle, 9th year of schooling; VET, 10th year of schooling.
4. Eugenio Oliveira: Grouping of Schools Júlio Dinis - Gondomar. It is an elementary school, with students between 10 and 15 years old. A school located in the center of the municipality of Gondomar. The grouping of schools has around 1900 students and 170 teachers. It is part of a municipal management. The levels assigned to him this school year are: 7th, 8th and 9th grades.
5. MiguelCarneiro: Teacher in the secondary school of Gondomar (Unfortunately, due to personal problems, he could not participate).

School levels they teach

1. Mario Pinto: ISCED 5 (HEI, polytechnic – 1st cycle courses)
2. Patricia Ferreira: ISCED 3
3. Fernando Coelho: ISCED 1, 2 and 3
4. Eugénio Carneiro: ISCED 2

The subjects they teach

1. Mario Pinto: Computer programming
2. Patricia Ferreira: Teaching subjects related to ICT, mainly in VET courses
3. Fernando Coelho: In the 1st cycle, the subject is given in the complementary offer, split class, where the students work on the "initiation to programming", based on computational thinking activity and block programming supported by the SCRATCH platform. In the 3rd cycle is the subject of ICT - Information and Communication Technologies. In Vocational Education, some modules of Electronic Electricity, in the Professional Course of Electronics, Automation and Computers Technician.
4. Eugénio Carneiro: Teaching subjects related to ICT.

Questions for teachers

1. Do you know any kind of technology to use in classrooms to support active learning (PBL, game based learning, etc.)? For example:

- Virtual Reality, animation and 3D, mobile applications, gamification, etc.

2. Have you ever used any of them before?

- If yes:
 - How do you use it and what for?
- If not, would you like to learn how to develop this technology? for example
 - Virtual Reality - how to write learning scenarios;
 - Design of interactive animations and 3D modelling;
 - How to code mobile application;

- Principles of gamification and how to design educational games

Responses Resume of questions 1 and 2

One of the teachers said he uses PBL, but he does not use gamification. He said schools have some educational guidelines and innovation plans (DAC – Domains of Curricular Autonomy) which define as a priority the use of interdisciplinary approaches, using PBL-type strategies. He said, they also use 3D and mobile applications, namely ThinkerCAD with students of the 3rd cycle and VET, enabling the saving of resources that are scarce in schools.

Another teacher said students find it difficult to understand problems and adapt solutions to other problems. In his opinion, teachers use gamification a lot, taking into account the increased involvement of students and their motivation, seeking to develop their skills of collaboration and cooperation. He uses Moodle and its plug-ins, such as BADGES, which serve as student motivation strategies. Other tools used CABELUP and H5P, and other Open-Source tools such as Coding Game, especially in Programming, Data Structures and Oriented Objects Programming disciplines. They find that students' motivation increases substantially with the use of these tools. In his case, students require more work and resources, but teachers have lack time to respond to these requests in a timely manner.

Another teacher uses APP Inventor, MicroBIT in mobile applications. The use of these strategies depends heavily on the leadership of schools and the training of teachers in these strategies/technologies, and it was verified that the result of a training action for teachers, they began to use with their students.

Another teacher said they use PBL essentially in VET schools. In a school, there is a discipline in a VET course that focuses on learning virtual reality and the construction of objects. Schools have difficulty having learning resources using virtual reality.

Other teachers have a very low use of this type of technology. Just some computer teachers, but it is not transversal to other areas of learning. They use it on time, but not as a predefined strategy. It depends on the teacher's willingness to use this or that application. PBL yes, it is used transversely. Gamification, no. Just to perform one or another isolated activity. These are areas that involve a lot of individual work. And there is a lack of resources in schools, too.

3. What aspects influence teachers for the use/or not use of this kind of technology among students?

4. How might these strategies/technologies be applied to students' learning and what kind of obstacles should be considered?

5. What kind of pedagogies should be used when using these strategies for teaching?

Responses Resume of questions 3, 4 and 5

Sometimes some teachers use it without having the notion that they are using gamification and that there would be technology that could support this strategy. There is little autonomy for teachers to use. Little communication and sharing of experiences among teachers of the various disciplines. Teachers are afraid to get out of their comfort zone. A school culture greatly helps the use or non-use

of these technologies. The high age group of teachers does not help in this case. Schools which participate in e-twinning networks or Erasmus+ projects facilitate the knowledge of new strategies and their application.

Some teachers use gamification in order to develop students' soft skills (autonomy, autonomous work and evaluation) and their motivation. Get immediate feedback, by trial-error in programming (PlayGround tool). Beware of strategies not to cause the opposite effect when there are rankings and students can be discouraged by not being in the top places. Importance of knowing the students to customize a little the teaching-learning process, to increase their motivation and choose the strategies accordingly.

6. What kind of assessment do you use to evaluate these strategies?

Evaluation of students - direct observation allows the removal of most of the evaluation elements. Continuous evaluation, with more traditional strategies. Formative Evaluation, with quizzes, Kahoots, Project Evaluation, Public Presentations by students, self and hetero evaluation (peer review).

7. Is the use of these strategies empowered by your department (chiefs and pairs)?

8. Is the use of these strategies a way to motivate other teachers working collaboratively?

9. What kind of equipment for teaching these strategies do you use to motivate more students?

Responses Resume of questions 7, 8 and 9

There is a fatigue due to the proliferation of projects in schools. Sometimes they line up in the construction of some new project. There is not much sharing among teachers regarding new projects developed or under development, due to lack of time above all. If it exists, it is informally, because formally it does not exist. There are school principals who have the will and encourage participation in new projects, where these strategies are applied. Greater sharing in VET teachers, as there are no structured manuals.

10. Considering the following list, which are the 5 transversal skills that you think are more relevant for today's students?

1. Analytical Thinking and Innovation
2. Active learning and learning strategies
3. Complex problem-solving
4. Critical thinking and analysis
5. Creativity, originality and initiative
6. Leadership and social influence
7. Technology use, monitoring and control

8. Technology design and programming
9. Resilience, stress tolerance and flexibility
10. Reasoning, problem-solving and ideation
11. Emotional Intelligence
12. Troubleshooting and User experience
13. Service orientation
14. Systems Analysis and Evaluation
15. Persuasion and negotiation

11. Which strategies do you use to increase those soft skills?

Responses Resume of questions 10 and 11

Mostly 2, 4, 5, 9. Some teachers uses SCRUM methodologies (important to respect hierarchies, meeting deadlines, teamwork). They make many group and individual oral presentations, group work, participation in national and international projects (some in collaboration with companies), participate in competitions and use the PBL. They also use training in the context of work in VET students.

Spain Focus Group

Introduction

This report is a part of the Project Result 1 "Curriculum & Training scheme" in the project "*The hybrid future of scholar education. The digital skills we need to cope with complexity. (DigiComplex)*", a European project funded in the frame of "Erasmus + Key Action 2- Strategic Partnership in the field of school education".

The survey has been produced and distributed among 7 Spanish teachers from Iscar (Valladolid, Spain) Secondary school and School in and aims to investigate the importance of information technologies in new training dynamics.

We expect that this report helps the DigiComplex consortium to have overall portrait on the current situation of ICT supporting tools used in Spain, resulting from the analysis of the teachers' survey results.

The report of the survey is presenting numbers of answers and in relevant questions there are also explanations. For time issue was send to the teachers a form related to fill about questions

Age of respondents

Between 25 and 55 years old

School levels they teach

The subjects they teach

Spanish language and literature: 2

Mathematic:2

Economia: 1

Philosophy: 1

Biology: 1

Questions for teachers

1. Do you know any kind of technology to use in classrooms to support active learning (PBL, game based learning, etc.)? For example:

- Virtual Reality, animation and 3D, mobile applications, gamification, etc.

ANSWERS: All of them replied “yes” knowing mobile applications and Gamification.

2. Have you ever used any of them before?

- If yes:
 - How do you use it and what for?

ANSWERS: Mobile app for teachers to have better teaching, Kahoot for presentations, Nearpod (similar to flipped classroom), some interactive exercises online.

- If not, would you like to learn how to develop this technology? for example
 - Virtual Reality - how to write learning scenarios;
 - Design of interactive animations and 3D modelling;
 - How to code mobile application;
 - Principles of gamification and how to design educational games

ANSWERS:

- the teachers showed interested in how to use better gamification and how to create educative games
- Interest in Virtual reality (Metaverse too)
- And design of interactive animations and 3D modeling.

3. What aspects influence teachers for the use/or not use of this kind of technology among students?

ANSWER: Adequate Tools and enough knowledge to proper use the technology, time to learn and practice it.

4. How might these strategies/technologies be applied to students' learning and what kind of obstacles should be considered?

ANSWER: With the proper training could be possible to use these Technologies and the main obstacles are the lack of tools inside the classroom to use these Technologies.

5. What kind of pedagogies should be used when using these strategies for teaching?

ANSWERS: participative, active and that can rise interests in students

6. What kind of assessment do you use to evaluate these strategies?

7. Is the use of these strategies empowered by your department (chiefs and pairs)?

ANSWER: YES but sometimes the problem is the bureaucratic part that takes so much time to the teachers

8. Is the use of these strategies a way to motivate other teachers working collaboratively?

ANSWERS: YES but in some cases some professors can't be forced to change their teaching way after 30 years of teaching.

9. What kind of equipment for teaching these strategies do you use to motivate more students?

ANSWER: Just a few of them are using some strategies to motivate more the students using for example VR tools (basic) and other application to make students more engaged on the topic they are teaching

10. Considering the following list, which are the 5 transversal skills that you think are more relevant for today's students?

16. Analytical Thinking and Innovation
17. Active learning and learning strategies
18. Complex problem-solving
19. Critical thinking and analysis
20. Creativity, originality and initiative
21. Leadership and social influence
22. Technology use, monitoring and control
23. Technology design and programming
24. Resilience, stress tolerance and flexibility
25. Reasoning, problem-solving and ideation
26. Emotional Intelligence
27. Troubleshooting and User experience
28. Service orientation
29. Systems Analysis and Evaluation
30. Persuasion and negotiation

ANSWER:

- Creativity, originality and initiative
- Analytical Thinking and Innovation, Reasoning, problem-solving and ideation, Creativity, originality and initiative, Reasoning, problem-solving and ideation
- Reasoning, problem-solving and ideation, Complex problem-solving, Analytical Thinking and Innovation
- Reasoning, problem-solving and ideation, Complex problem-solving, Analytical Thinking and Innovation
- Emotional Intelligence, Active learning and learning strategies, Creativity, originality and initiative
- Analytical Thinking and Innovation, Reasoning, problem-solving and ideation, Creativity, originality and initiative, Resilience, stress tolerance and flexibility
- Technology use, monitoring and control, Analytical Thinking and Innovation, Reasoning, problem-solving and ideation

11. Which strategies do you use to increase those soft skills?

ANSWER: Participative methodology, Through interview and class discussions, Research in groups with Technologic tools.

Denmark Focus Group

Introduction

This report is a part of the Project Result 1 "Curriculum & Training scheme" in the project "*The hybrid future of scholar education. The digital skills we need to cope with complexity. (DigiComplex)*", a European project funded in the frame of "Erasmus + Key Action 2- Strategic Partnership in the field of school education".

The survey has been produced and distributed among 8 Danish teachers from 3 different schools on Fyn and aims to investigate the importance of information technologies in new training dynamics.

We expect that this report helps the DigiComplex consortium to have overall portrait on the current situation of ICT supporting tools used in Denmark, resulting from the analysis of the teachers' survey results.

The report of the online survey is presenting numbers of answers and in relevant questions there are also explanations.

The career position in the institution

The responders are a mix of teachers from private and public schools from the island of Fyn in Southern Denmark. The teachers work with both the younger students from primary, and with the older students from secondary. Some of them teach the students with special needs. Most of the teachers are familiar with various technological tools to use in the classroom, however some of the respondents are less familiar with the topic.

Questions for teachers

1. Do you know any kind of technology to use in classrooms to support active learning (PBL, game based learning, etc.)?

For example:

- **Virtual Reality, animation and 3D, mobile applications, gamification, etc.**

The majority of the responding teachers identified several technological tools they know of and use in the classroom with their students. They mentioned several animation and mobile applications such as Tinkercad, Pixton, Digipuzzle, King of Math, Math Fessor, Brain Breaks and Slap Puk.

2. Have you ever used any of them before?

- If yes:
- How do you use it and what for?

The teachers that mentioned tools they use have also the experience of using these in the classroom. They have various reasons to do so. For the teachers working with students with special needs, the intention of these tools is to give the students small breaks during the day, which is super helpful for the students with concentration difficulties. For other teachers it is used as a creative output for the topic they have worked on. It is therefore used as an add-on to the teaching and tasks. In other cases it is helpful for meeting the needs of the students, for example for students suffering from dyslexia.

- If not, would you like to learn how to develop this technology? for example
- Virtual Reality - how to write learning scenarios;
- Design of interactive animations and 3D modelling;
- How to code mobile application;
- Principles of gamification and how to design educational games

In this section, they stated that they wanted to learn about more tools. For the teachers in classes with students with special needs, they must be simple and be used by students with special needs, as what is on the market right now requires too much of them.

3. What aspects influence teachers for the use/or not use of this kind of technology among students?

There are many aspects that influence as stated by the teachers for this focus group. It is mentioned that the teachers do not have much time for preparation, and acquiring new knowledge about new tools is time-consuming. Especially if there are then also complications or technical issues once using it in the classroom. It is the lack of time and the worries about failure that influence some teachers in deciding not to use the technologies. Another aspect is the level of difficulty, which can be too high for some students. The teachers also mentioned the price on these programmes, and the technical requirements that their computers might not fulfill. It was furthermore mentioned that the design of these tools should be done nicely. It should be straightforward for both teachers and students, and teachers should be able to track the learning on these.

4. How might these strategies/technologies be applied to students' learning and what kind of obstacles should be considered?

All the teachers agree that these technologies would be very useful in students' learning, however, it is important to consider the design and purpose of the tools. It is important that

there is a strategy for the learning, it should not require too much introduction and it should keep them occupied so that the students don't start doing other things on the internet. It is important that the students try different learning methods, but it is also important that the tools can detect that the students understand the assignment. It could therefore be a good idea to have repetitive tasks for some students.

5. What kind of pedagogies should be used when using these strategies for teaching?

The teachers acknowledge the importance of teaching students about creativity, innovation and responsibilities. It should allow all students to participate and learn. It is important to create the perfect balance between play and learning. Cooperative learning could be useful in this matter, so that the "strong" students support others with more difficulties.

6. What kind of assessment do you use to evaluate these strategies?

The teachers responded that they see two ways of evaluating the students' learning. One option could be that the teacher could have insights on the learning of the students on the technological tools, so they are able to track their progress without interrupting them in their tasks. Another way is to set up halfway and final goals for the learning activity, and thereby evaluate the students on their understanding of the topic and the tools, as well as their motivation, focus, and engagement.

7. Is the use of these strategies empowered by your department (chiefs and pairs)?

Most teachers answered yes to this question. Only two teachers answered no.

8. Is the use of these strategies a way to motivate other teachers working collaboratively?

Seven out of eight teachers answered that these strategies could be a method and way to motivate other teachers.

9. What kind of equipment for teaching these strategies do you use to motivate more students?

Teachers said that they have smart boards in most classrooms in their schools and they have high-speed internet on these boards. Furthermore, they need access to computers and/or ipads, which also most teachers do already.

10. Considering the following list, which are the 5 transversal skills that you think are more relevant for today's students?

- Analytical Thinking and Innovation
- Active learning and learning strategies
- Complex problem-solving

- Critical thinking and analysis
- Creativity, originality and initiative
- Leadership and social influence
- Technology use, monitoring and control
- Technology design and programming
- Resilience, stress tolerance and flexibility
- Reasoning, problem-solving and ideation
- Emotional Intelligence
- Troubleshooting and User experience
- Service orientation
- Systems Analysis and Evaluation
- Persuasion and negotiation

1. Analytical Thinking and Innovation
2. Active learning and learning strategies
3. Creativity, originality and initiative
4. Reasoning, problem-solving and ideation
5. Emotional Intelligence/ Critical thinking and analysis

11. Which strategies do you use to increase those soft skills?

The teachers try to vary their tasks and assignments so that the students both get to try open tasks and self-studying, but also different versions of group-work. The teachers try to be creative when planning the learning activities, so that the students also get to train their soft skills.

Turkey Focus Group – Toroslar

Introduction

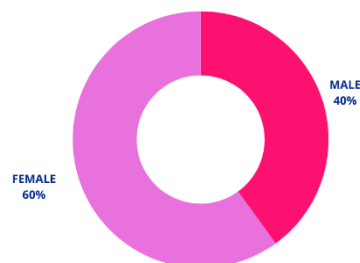
This report is a part of the Project Result 1 "Curriculum & Training scheme" in the project "*The hybrid future of scholar education. The digital skills we need to cope with complexity. (DigiComplex)*", a European project funded in the frame of "Erasmus + Key Action 2- Strategic Partnership in the field of school education".

The survey has been produced and distributed among 5 Turkish teachers from Ziraat Odası Secondary School in Mersin city and aims to investigate the importance of information technologies in new training dynamics.

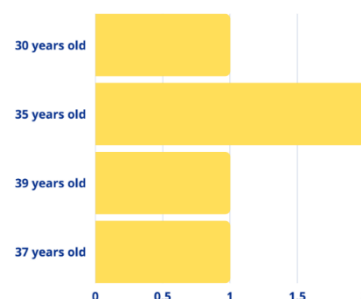
We expect that this report helps the DigiComplex consortium to have overall portrait on the current situation of ICT supporting tools used in Turkey, resulting from the analysis of the teachers' survey results.

The report of the survey is presenting numbers of answers and in relevant questions there are also explanations. The duration of the discussion was 1 hour 45 minutes. Two of the participants refused to be recorded during the discussion so the assistant took some notes.

Gender



Age of respondents



The career position in the institution

All of the responders are teachers in Ziraat Odası Secondary School. The teachers are:

#1 Maths teacher

#2 English language teacher

#3 Maths teacher

#4 ICT teacher

#5 English language teacher

Questions for teachers

1. Do you know any kind of technology to use in classrooms to support active learning (PBL, game based learning, etc.)?

For example:

- **Virtual Reality, animation and 3D, mobile applications, gamification, etc.**

a) #5: English lesson:

- mobile applications are used in vocabulary teaching,

- Animations are used for expressing the dialogues

b) #3: Mathematics lesson: mobile applications, game-based learning model is used

c) #4: Informatics Lesson: gamification technique is used

2. Have you ever used any of them before?

- **If yes:**
- **How do you use it and what for?**

It is used in lectures, subject repetitions, evaluation studies, and concept teaching. It is actively used in English, Mathematics and Informatics classes, especially in 5th and 6th grades. Since exam-oriented programs are applied in the 7th and 8th grades, the course contents are also exam-oriented, which makes the use of digital tools a bit unnecessary and difficult.

If not, would you like to learn how to develop this technology? for example

- **Virtual Reality - how to write learning scenarios:** None of the teachers used VR in their classes as there is no enough devices at schools. But all teachers would like to improve their abilities in VR Technologies.

- **Design of interactive animations and 3D modelling:** Especially in Maths classes, 3D modelling can be effectively used, however, Maths teachers in the group told they do not know and use 3D modelling.
- **How to code mobile application:** Informatics teacher mentioned that coding can be used both with computer and without computer. So it can be used in all kind of classes. English teachers use coding (algorithm) in teaching structure of the language. Maths teachers use algorithmic process in teaching calculations.
- **Principles of gamification and how to design educational games:** English language teachers use games in their courses, however all teachers would like to learn and improve their abilities in gamification.

3. What aspects influence teachers for the use/or not use of this kind of technology among students?

#3 Mathematics: The course requirements are important. Planning should be done by paying attention to what kind of gains should be achieved in that lesson.

#1 Mathematics: The technical and physical facilities of the school also affect us in using these methods. We cannot carry out activities with mobile applications or 3D modeling in schools that do not have sufficient equipment.

#4 Informatics: Attitudes of school staff and other teachers are also important. There may be teachers who are not willing to implement innovative approaches at school.

#2 English: The teachers' lack of knowledge about these methods and techniques can also prevent us from using these methods. There are also colleagues who think that we do not study and waste time while using the problem-based learning model in the classroom.

#5 English: Parent attitude and knowledge are also important. Sometimes we give them a task that they can do through the mobile application as homework. However, there may be parents who do not have the slightest idea about what their student is doing. There may even be parents who think that the student is playing games and not studying while doing homework and prevents the student from doing homework.

4. How might these strategies/technologies be applied to students' learning and what kind of obstacles should be considered?

5. What kind of pedagogies should be used when using these strategies for teaching?

6. What kind of assessment do you use to evaluate these strategies?

The respondents told that when they apply a game-based activity, it is difficult to assess the students' acquisition. However, they use some evaluation activities such as Project Works, homeworks, formative assessment tools..etc.

7. Is the use of these strategies empowered by your department (chiefs and pairs)?

All teachers answered yes to this question. In particular, they stated that the use of these technologies and strategies is encouraged in the guidebooks distributed by the Ministry of Education, to which they are affiliated.

8. Is the use of these strategies a way to motivate other teachers working collaboratively?

Yes, when a teacher sees a different method used by another teacher, she makes an effort to learn it. Information about the applied method is exchanged. However, the existence of prejudiced teachers cannot be denied.

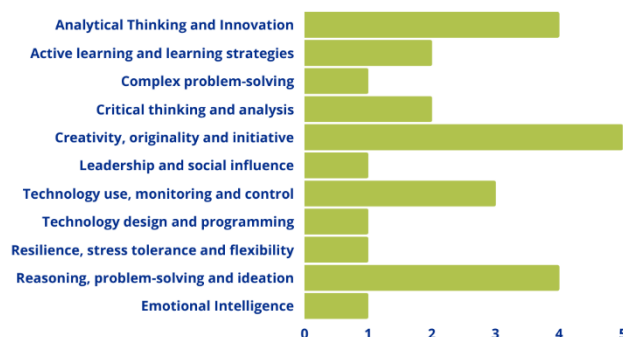
9. What kind of equipment for teaching these strategies do you use to motivate more students?

Smartboards, tablets.

10. Considering the following list, which are the 5 transversal skills that you think are more relevant for today's students?

According to the votes of the respondent teachers, the most important 6 skills are;

- a. Creativity, originality and initiative
- b. Analytical Thinking and Innovation
- c. Reasoning, problem-solving and ideation
- d. Technology use, monitoring and control
- e. Active learning and learning strategies
- f. Critical thinking and analysis



11. Which strategies do you use to increase those soft skills?

In addition to normal course activities, we try to develop problem solving skills and creativity skills by giving students different activities and tasks. For example; We focus on thinking skills, creativity skills and problem solving skills by asking questions such as “What would you do if you were the author?” in the exercises related to a reading passage in the English lesson. In the mathematics lesson, we ask students to prepare questions similar to the ones we have solved. In the informatics class, we ask students to code with or without a computer.

Turkey Focus Group – KOCATÜRK

Introduction

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The survey has been produced and distributed among 6 Turkish teachers from Ford Otosan Secondary School in Kocaeli city and aims to investigate the importance of information technologies in new training dynamics.

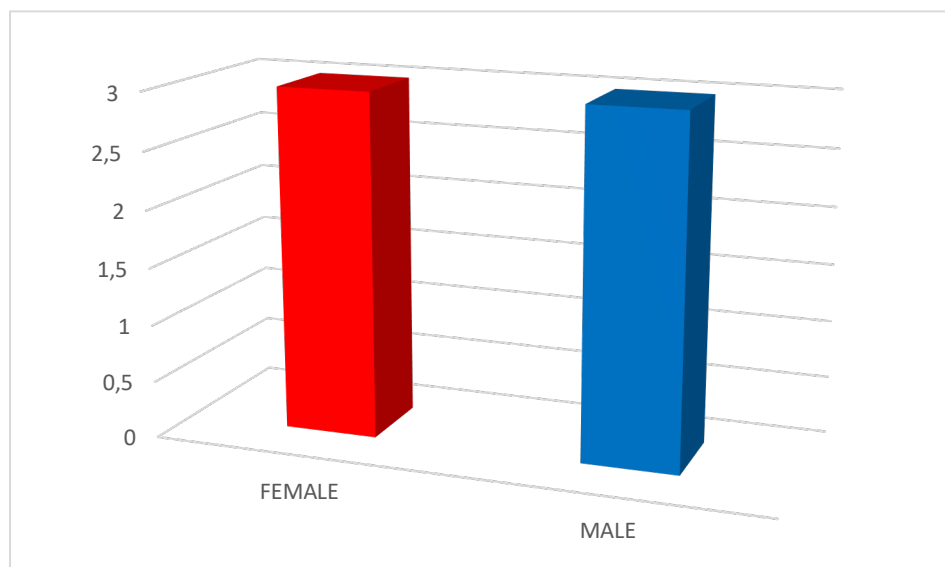
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The report of the survey is presenting numbers of answers and in relevant questions there are also explanations. The duration of the discussion was 1 hour 45 minutes. Two of the participants refused to be recorded during the discussion so the assistant took some notes.

Gender

Female: 3

Male: 3



Age of respondents

Between 25 and 55 years old

37	1
40	2
36	1
41	1
42	1

The career position in the institution

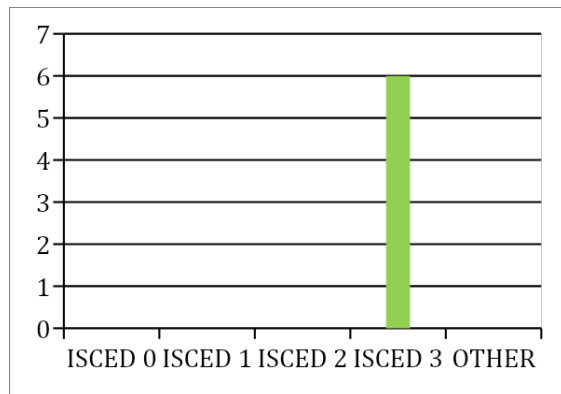
All of the responders are teachers from Ford Otosan Secondary School.

The teachers are:

- 1 Fatih AKÇAY Technology Design Teacher
- 2 Ali AYGÜN Maths Teacher
- 3 Deniz MEŞİN DEVRİK Maths Teacher
- 4 Ünzile Başak ELGİNÖZ Science Teacher
- 5 Erkan ALTINTOP ICT Teacher
- 6 Duygu YELDAN GÜRBÜZ English Teacher

School levels they teach

Lower Secondary (ISCED 3)-6



The subjects they teach

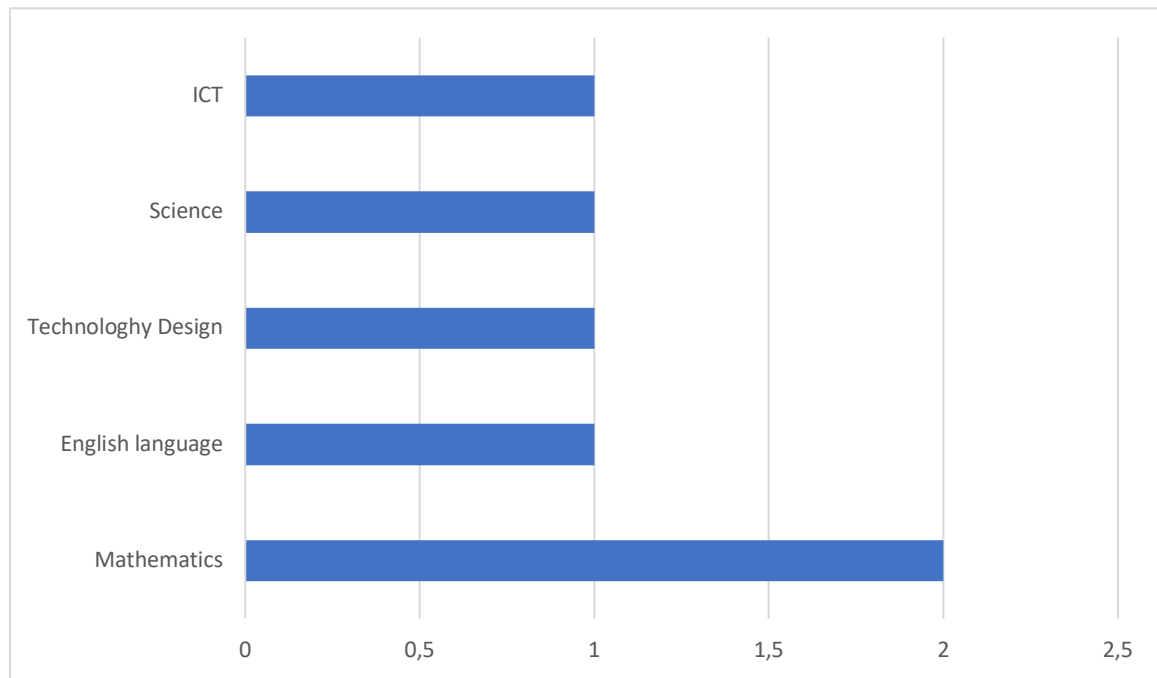
Mathematics: 2

English language: 1

Technology Design: 1

Science: 1

ICT: 1



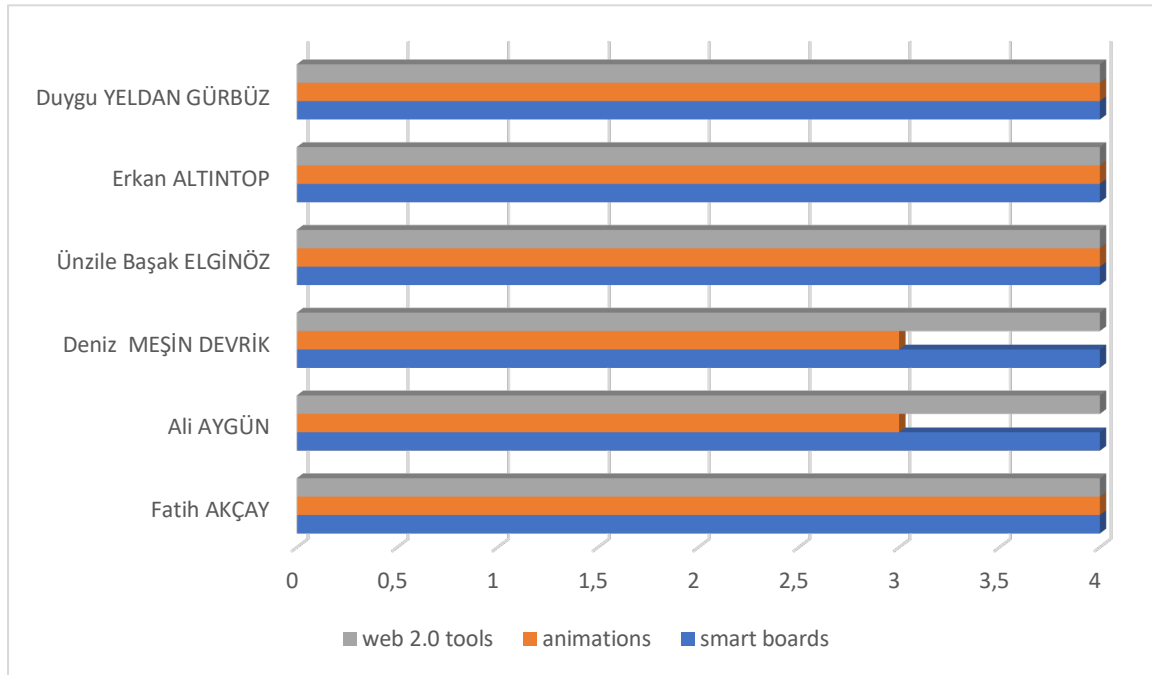
Questions for teachers

1. Do you know any kind of technology to use in classrooms to support active learning (PBL, game based learning, etc.)?

For example:

- **Virtual Reality, animation and 3D, mobile applications, gamification, etc.**

Since all the teachers work in the same school, the answer to this question was almost the same. There are smart boards in all classrooms and these boards are actively used by teachers. Teachers stated that they frequently use animations, web 2.0 tools (kahoot, tinkercad, etc.) especially during lessons.



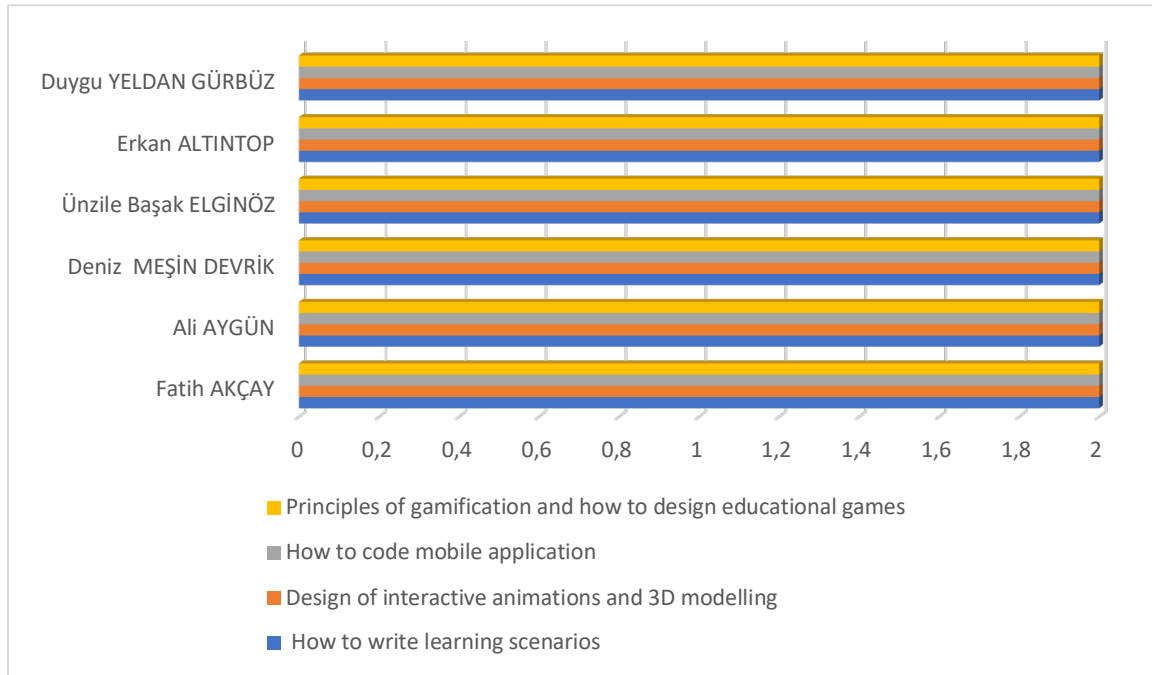
2. Have you ever used any of them before?

- **If yes:**
 - **How do you use it and what for?**

According to the answers given, we learned that they use materials prepared with scratch, kahoot and animation programs on smart boards. They stated that they use these tools especially to visualize the topics and to enable students to interact more in the lesson.

- **If not, would you like to learn how to develop this technology? for example**
 - **Virtual Reality**
 - **How to write learning scenarios;**
 - **Design of interactive animations and 3D modelling;**
 - **How to code mobile application;**
 - **Principles of gamification and how to design educational games**

In this section, they stated that they wanted to learn how to write learning scenarios, how to code mobile application, and principles of gamification and how to design educational games while they wanted to develop the technologies they used.



3.What aspects influence teachers for the use/or not use of this kind of technology among students?

All of the teachers stated that as teachers, they care about whether the learning takes place effectively at the end of the lesson. They also stated that students' interest, attention and relevance during the lesson affect the learning speed and permanence.

They emphasized that the technology used correctly contributes positively to this process.

4.How might these strategies/technologies be applied to students' learning and what kind of obstacles should be considered?

At this point, the teachers stated that some conditions should be created for the effective use of new technological learning tools in the lessons. Teachers Duygu Yeldan Gürbüz, Deniz Meşin Devrik and Ünzile Başak Elginöz stated that appropriate educational technology should be chosen for each lesson/subject. Ali Aygün stated that it should be suitable for student/teacher use (simple interface, functionality). Fatih Akçay and Erkan Altıntop underlined the importance of the teacher knowing how to apply the technology to be used in the lesson.

5.What kind of pedagogies should be used when using these strategies for teaching?

In this part of the survey, Fatih Akçay, one of the teachers, stated that pedagogy in its plain meaning is the science of children. Deniz Meshin Devrik and Duygu Yeldan Gürbüz said that the technologies to be used in this context should be chosen in accordance with the age and readiness level of children. Ali Aygün and Ünzile Başak Elginöz said that they believe that these

technologies should be child-friendly applications. Erkan Altıntop emphasized that teachers should pay particular attention to classroom management while practicing in their classrooms.

6.What kind of assessment do you use to evaluate these strategies?

The answer to this question was the same from almost all teachers. They emphasized that they did not directly measure whether the strategy and technology they used were beneficial, but as teachers, they observed what kind of changes the strategy and technology used in students mediated and how much learning changed compared to classical methods.

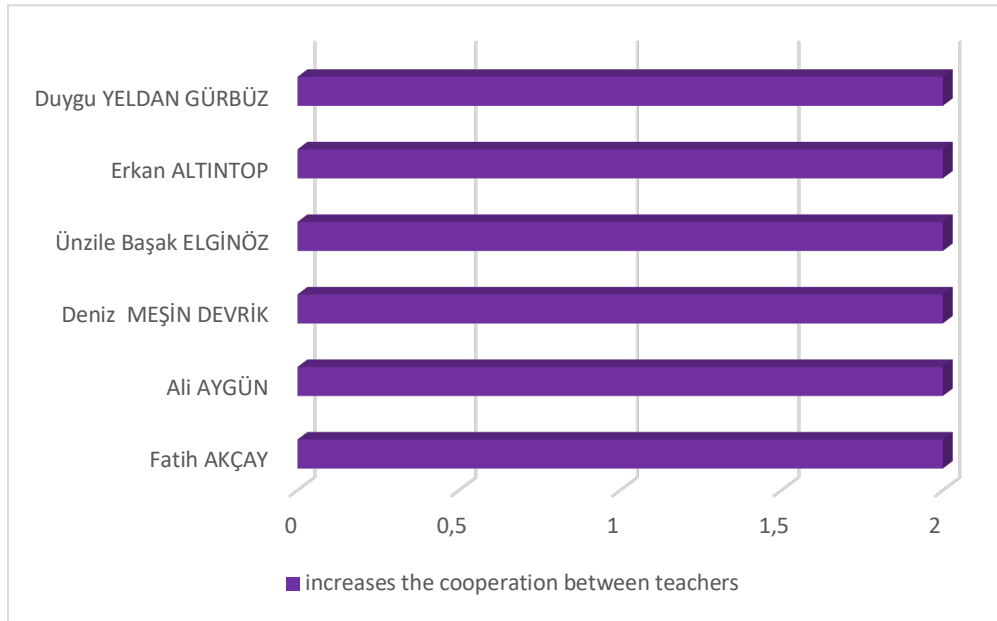
7.Is the use of these strategies empowered by your department (chiefs and pairs)?

All teachers answered yes to this question. In particular, they stated that the use of these technologies and strategies is encouraged in the guidebooks distributed by the Ministry of Education, to which they are affiliated.



8.Is the use of these strategies a way to motivate other teachers working collaboratively?

All teachers who answered this question believe that using these strategies increases the cooperation between teachers. Teachers stated that they exchanged information, documents and materials. They stated that they learned the strategies and technologies that other colleagues used and observed to be successful and used them in their lessons.



9. What kind of equipment for teaching these strategies do you use to motivate more students?

Teachers said that they have smart boards in every classroom in their schools and they have high-speed internet on these boards. Fatih Akçay and Erkan Altıntop said that in addition to these, there are robotic coding classes in their schools and tools to prepare 360-degree video content. (camera, VR glasses)

10. Considering the following list, which are the 5 transversal skills that you think are more relevant for today's students?

- Analytical Thinking and Innovation
- Active learning and learning strategies
- Complex problem-solving
- Critical thinking and analysis
- Creativity, originality and initiative
- Leadership and social influence
- Technology use, monitoring and control
- Technology design and programming
- Resilience, stress tolerance and flexibility
- Reasoning, problem-solving and ideation
- Emotional Intelligence

- **Troubleshooting and User experience**
- **Service orientation**
- **Systems Analysis and Evaluation**
- **Persuasion and negotiation**

1. Analytical Thinking and Innovation
2. Critical thinking and analysis
3. Creativity, originality and initiative
4. Reasoning, problem-solving and ideation
5. Emotional Intelligence

11. Which strategies do you use to increase those soft skills?

Duygu Yeldan Gürbüz, Deniz Meşin Devrik and Erkan Altıntop stated that they tried to go beyond the classical learning-teaching strategies and tried to relate the subjects they studied in the lessons with real life as much as possible.

Ünzile Başak Elginöz , Fatih Akçay and Ali Aygün stated that they use project-based learning and STEAM approaches in their science classes. They stated that scientific method and problem-based learning strategy are used in social sciences lessons.

Greece Focus Group

Introduction

This report is a part of the Project Result 1 "Curriculum & Training scheme" in the project *"The hybrid future of scholar education. The digital skills we need to cope with complexity. (DigiComplex)"*, a European project funded in the frame of "Erasmus + Key Action 2- Strategic Partnership in the field of school education".

The survey has been produced and distributed among 8 Greece teachers from 4 different Greek schools and aims to investigate the importance of information technologies in new training dynamics.

We expect that this report helps the DigiComplex consortium to have overall portrait on the current situation of ICT supporting tools used in Greece, resulting from the analysis of the teachers' survey results.

The report of the online survey is presenting numbers of answers and in relevant questions there are also explanations. The duration of the discussion was 1 hour 30 minutes.

The career position in the institution

School levels they teach: Secondary schools

Subject of teaching: Mathematics, ICT, Literature

Age of respondents: Between 30 and 55 years' old

Questions for teachers

1. Do you know any kind of technology to use in classrooms to support active learning (PBL, game based learning, etc.)?

For example:

- **Virtual Reality, animation and 3D, mobile applications, gamification, etc.**

All participants agree that the use of these technologies improves students' learning and engagement, as well as their ability to learn difficult subjects. Despite the Greek educational system's shortcomings in the use of technology in the classroom, teachers are making concerted efforts in this direction, such as through the use of the Nearpod platform, the Kahoot and Quizziz apps, and AR technology.

2. Have you ever used any of them before?

If yes:

- **How do you use it and what for?**

Some of the participants mentioned that they have used the aforementioned technologies during their lessons in order to motivate their students and make them become more interested in learning the subject being taught. More specifically, they have used:

Nearpod platform: to deliver multimedia and interactive content in lessons;

Kahoot and Quizziz apps: to assess students' performance in a more engaging manner;

AR technology: to help students learn and understand difficult concepts.

If not, would you like to learn how to develop this technology? for example

- **Virtual Reality - how to write learning scenarios;**

Virtual reality is not used in any of the classes because there are not enough devices available at the schools. However, all teachers have expressed a desire to increase their proficiency in VR technologies.

- **Design of interactive animations and 3D modelling;**

Participants expressed their interest in learning how to create interactive animations as they consider that learning provided by using graphics, sound and animations will have positive effects on learning. Moreover, they stated that interactive animations for educational materials that teachers can change and renew depending on the age of their students provide an educational and entertaining learning experience.

They also mentioned that 3D modelling can definitely support the learning process through the visualization of abstract concepts.

- **How to code mobile application;**

Because of the specialized knowledge required, ICT teachers are hesitant to include the topic of coding mobile applications.

- **Principles of gamification and how to design educational games**

At that point, all participants strongly advocated for the development or improvement of teachers' knowledge of gamification, as well as the creation of educational games.

3. What aspects influence teachers for the use/or not use of this kind of technology among students?

Following the discussion, aspects that influence teachers for the use/or not use of this kind of technology among students have been documented as being:

- Time availability to design and develop lessons where technology can be applied.
- Availability of efficient educational material and digital educational resources for the different subjects taught by teachers.
- Skills/qualifications of teachers to incorporate technology in the educational process.
- Inadequate opportunities for professional training relevant to the utilization of technology in teaching.
- Lack of interest from teachers to utilize technology.
- Negative attitude towards technology in general by teachers and other professionals who are involved in school education, who express their concern on the positive outcomes of the use of such technologies.
- Possible lack of interest of teachers concerning the use of technology-based teaching methods.
- Possible different aspects of the benefits of the application of technology in education.

4. How might these strategies/technologies be applied to students' learning and what kind of obstacles should be considered?

Regardless, the use of technology in education is a great way to keep students engaged. If teachers can set up an environment where students are learning through technology, they will enjoy learning more and will be eager to do so. If technology is used properly, it can help students learn at a level that will exceed that of traditional education by far. To that end, it is important to invest in this technology so that teachers in Greece can use technology to teach their students, despite any obstacles they encounter.

In closing, we can see that technology can be a boon to the education system in Greece because it would help students learn at a level that exceeds what they have been able to learn using traditional educational methods. It is a technology that will help students in many different ways and is a great way to retain students' attention.

5. What kind of pedagogies should be used when using these strategies for teaching?

Participants learned that cooperative learning is a widely accepted solution that should be applied when using these strategies for teaching. Furthermore, it has been demonstrated to deepen students' understanding and reach more students than just one who is good at a subject. Cooperative learning groups are not only an effective tool for stimulating academic growth through participation, but they may also be an effective vehicle for reducing isolation.

Educators can attempt to break down the superficial barriers that students may encounter as individuals by forming a team. Individual attitudes, ideas, experiences, and beliefs are exposed in group work as they are used to achieve a common goal through a collaborative effort. Group work fosters a better understanding of the task at hand as well as the dynamics of teamwork, which will be useful throughout life, and it facilitates communication among group members. Cooperative learning allows students to hone their critical thinking, cooperation, and communication skills. Of course, the content of the learning materials is crucial.

6. What kind of assessment do you use to evaluate these strategies?

Participants suggested using formative assessment, which has some characteristics that distinguish it from "traditional" methods, such as the fact that it occurs throughout the educational process and allows for feedback.

7. Is the use of these strategies empowered by your department (chiefs and pairs)?

Participants stated that the use of these strategies empowered by your department, however, given the established challenges in Greece, the adoption of new technology is significantly more difficult than one would think. There are other areas where people would argue the need to be emphasized first, with regard to the budget. This general lack of infrastructure in Greece makes it difficult for teachers to get the equipment required for the application of these technologies.

It is therefore very important to recognize the challenge that the adoption of new technology presents, and the obstacles that the lack of infrastructure in Greece presents. However, if we look at the potential benefits that technology does offer, we can see that it would, in fact, be a boon to the education system.

That being said, sustainability is also an issue that needs to be taken into consideration. It is not enough for schools to be equipped with modern technology, they also need to be able to keep it up-to-date. If new advancements in applications appear, schools in Greece will have to be able to keep up, otherwise, they would face the same problems all over again.

8. Is the use of these strategies a way to motivate other teachers working collaboratively?

Respondents believe that dissemination of good practices and innovative applications of such technologies in school education, will affect positively the beliefs of teachers, and will contribute to create an atmosphere that encourages and promotes a culture of acceptance of technology in education.

To ensure that introduction and use of such technologies in school education is easy, respondents believe that teachers need a) proper information and training on how to use it,

b) technical training to use technology and incorporate it into teaching and c) communication tools to enable communication among teachers so as to exchange good practices.

They also consider that, in order to make it easier for teachers to apply modern technology to different subjects' teaching, it is appropriate to have an online platform, specially developed to contain information and sources about the application of such technology in school education.

9. What kind of equipment for teaching these strategies do you use to motivate more students?

Participants said that in order to be able to include these technologies in their lessons it would be important for all classes to be equipped with the necessary equipment including computers.

10. Considering the following list, which are the 5 transversal skills that you think are more relevant for today's students?

The five most important for students' transversal skills, according to the participants, are:

- Critical thinking and analysis
- Technology use, monitoring, and control
- Resilience, stress tolerance, and flexibility
- Reasoning, problem-solving, and ideation
- Emotional Intelligence

11. Which strategies do you use to increase those soft skills?

Participants stated that cooperative learning is one of the best ways to cultivate many soft skills in students. Cooperative learning usually involves interpersonal communication, discussions, problem-solving, goal-setting, and more.

Everyone in the group will have a different understanding of the same problem/issue which may help students improve their skills in understanding and analyzing a situation for better results.

Germany Focus Group

Introduction

The present sub-report is a part of the Project Result 1 "Curriculum & Training scheme" in the project "*The hybrid future of scholar education. The digital skills we need to cope with complexity.*" (*DigiComplex*), a European project funded in the frame of "Erasmus + Key Action 2- Strategic Partnership in the field of school education".

Linden elementary school is located in Spandau, Berlin and has about 620 students and is divided into 24 classes. The school was chosen for the focus group because the school has been "chalk-free" since 2015, which means that the classrooms and specialist rooms are equipped with interactive smartboards. The school inspection was carried out and its report was published in 2019 clarifying the development needs, the implementation of concrete measures for media education¹. Accordingly, the media concept at that time does not offer a superordinate structure that could specify and systematize the subject-related and interdisciplinary increase in competence in the internal school curriculum.

The teaching process showed that the teachers use digital media pedagogy or rarely include work on the computer in a targeted manner. The interactive whiteboard is mainly used as a replacement for a blackboard, online research or the use of digital teaching materials are the exception rather than the rule.

The URE team talked to six teachers from this school to discuss the current situation of pedagogy and the related methods in the school. These six teachers are all female, between 25 and 65 years old, with varying years of experience, teaching in grades 3 to 6.

Age of respondents

Between 25 and 65 years

School levels they teach

3 to 6

The subjects they teach

All of the teachers teach German and mathematics.

¹ The complete report can be found here: <https://www.linden-grundschule.de/wp-content/uploads/2020/01/Inspektionsbericht-2019.pdf>

Some also teach social sciences (history, political sciences, geography, societal issues, etc.) as well as science (preparatory information about physics, chemistry, and biology).

Questions for teachers

Responses Resume of questions 1 and 2

All classes have a smart board. There are also 3 different computer rooms, several tablets and laptops, which are used by teachers. All teachers report that the children are allowed to watch Logo, a children's news program, every day during the breakfast break. In addition, the teachers use the Smartboard to watch films or listen to music with the children, e.g. on YouTube. A teacher reports that in her class, various websites are used to deepen a topic, such as "Schlaukopf", by which every child can work independently on a PC (Schlaukopf can be accessed here: <https://www.schlaukopf.de/>).

A teacher who previously worked in another school shares her experiences about Corona times with the group. At her old school, Anton App was used a lot during lockdown (Anton App can be accessed here: <https://anton.app/de/>). The school first had to obtain a license for this. After that, every teacher could register their class in the app, and the children all got free access to this app. The teacher could activate certain areas or questions for the students in the app, check which child has already worked on which areas and how much time they had spent on it. On the other hand, the children could collect coins while working on the tasks, with which they could later create their own avatar, for example. The difference between Anton App and Schlaukopf is that Anton APP is not a freeware. After purchasing it, the teacher can control the progress of each pupil or which homework or task has been done by the pupil, so the evaluation and monitoring of the activity of the children by the teacher is easy.

Another website, Sofatutor (the website can be accessed here: <https://us.sofatutor.com/>), was also mentioned in the conversation with the focus group. There are films and animations for different subjects and also questions and tasks. Tasks can be defined by the teacher for the pupils. The links related to games can be opened by the teacher for the pupils, but the school should pay for these properties. During the Corona times, this website was developed more, for example, the teachers could send links to pupils, who could access the contents for fourteen days for free.

Responses Resume of questions 3, 4 and 5

All teachers of the focus group see a major obstacle in teacher science. Many have mentioned that, as teachers, they sometimes have little experience with the new technology or are not able to master it well. They see the other problem with the sufficient equipment available, namely how many PCs, tablets or laptops there are in the school. Also, you did not know many apps or websites that are suitable for elementary school kids or easy to be used at this age. In addition, with some existing apps, a license must be purchased separately, which is not affordable for everyone, regardless of school or parents. Sometimes time is of the problem. In order for all children to be able to work on the PC (see an example of the PCs used in the school in Fig. 1), the children have to change rooms and booting up or logging into the system for 25 children takes a lot of time.



FIG. 1: THE COMPUTERS AT THE LINDEN ELEMENTARY SCHOOL IN SPANDAU, BERLIN

On the other hand, working with digital media provides an interesting platform for the children and increases their motivation. The various learning channels are involved, visually, acoustically and in a haptic way. The children can each work at their own learning pace or work on different tasks. The teachers in the focus group agreed that the same rule as with print media should also be observed when using new technologies. For one of the teachers, it was important that the children should be made aware of the time limit for digital media. According to the focus group, it is important for children to write by hand, not only use media and learn by games. If they write by hand, their handwriting will be better.

Responses Resume of questions 6, 7 and 8

Sometimes the app itself returns feedback in the form of a star, grade, or chart. With some apps, there is even the option for the children to receive a confirmation of doing the task or even a certificate for their work after a longer period of time.

However, the teachers in the focus group were able to ensure that these apps, compared to the ILeA test (see below for the definition), do not return the not much technical information as feedback. ILeA (Individual Learning Status Analysis in Primary School) is a standardized test that is always carried out annually at the beginning of the school year in some federal states such as Berlin and Brandenburg in the subjects German and mathematics. The children work on the tasks on the PC and the teachers and later also the parents receive a detailed report on the learning status of their child as feedback. This report will be used as a basis for further funding measures².

The younger colleagues in the focus group were, in particular, more interested in working together in teams. They also mentioned that cooperation in such areas requires a lot of time and sometimes knowledge that not everyone has. There is also further training in this area, a colleague reports that she took such a further training course a few years ago and with her newly gained knowledge she was able to develop simple programs with her 6th graders.

Responses Resume of questions 9, 10 and 11

There were different experiences regarding the use of the devices. Cell phones are used the least. Smartboard is used when the whole class is working on a topic, e.g. preparing a quiz or competition for the whole class (Fig. 2 shows one of the smartboards of the school). For example, some colleagues use tablets in group work. The children work in groups of four or five, are allowed to work on an open task, research the Internet, or present their results as a short film, photo or PowerPoint. Others use the devices, PC or tablet, to support the individual children in specific areas. Digital media are of great help, especially for children who do not speak German well, for example. Or with children who have special needs or who learn more slowly than others. these children can work on several tasks independently with the help of such programs.



² For more information refer to <https://bildungsserver.berlin-brandenburg.de/ilea>

Everyone in the focus group voted for the competence: Critical thinking and analysis. After that, the competence: reasoning, problem-solving and ideation was selected the most.

FIG. 2: A SMARTBOARD IN LINDEN ELEMENTARY SCHOOL IN SPANDAU, GERMANY

In the discussion, it was mentioned that in group work or projects, the new technology gives the children the chance to communicate with each other (teamwork), to seek help for difficult tasks on their own or to develop their own strategy, to find and offer different solutions to a task (flexibility). In addition, the children can take on more responsibility for their own learning development through independent work.

Conclusion

The majority persons who answered these questions were teachers from primary and secondary schools between 25 and 55 years old and teaching Maths, ICT and English disciplines mostly.

In general, teachers use technology in their classrooms, they use many applications, specially Open Source Apps and Mobile Apps. Most of the teachers are using PBL in their classrooms, but they are not very familiar using gamification. They felt very interested in explore more themes like Virtual reality, design of interactive animations and 3D modeling.

When discussing about what aspects influence teachers for the use/or not use of this kind of technology, they reported they have no time to explore other experiences/pedagogies in their classrooms, although they are incentivated by their directors. Some teachers showed lack of interest to use technology and/or a negative attitude towards technology in general.

Concerning the kind of assessment teachers use to evaluate these innovative strategies, most of them answered they use direct observation and formative assessment.

Teachers believe that the use of these strategies is a way to motivate other teachers working collaboratively and that good practices and innovative applications of such technologies in school education should be disseminated. Some of teachers stated that they learned the strategies and technologies that other colleagues have been using to be successful and used them in their lessons too.

Some teachers said they have enough equipment inside their schools, some others said they need more computers, iPads, internet high speed connection and VR specific equipment. It seems it depends on the countries.

The most voted 5 transversal skills that teachers think are more relevant for today's students are: Critical thinking and analysis; Resilience, stress tolerance, and flexibility; Analytical Thinking and Innovation; Active learning and learning strategies; Creativity, originality and initiative.

Participants stated that cooperative learning is one of the best ways to cultivate and increase these soft skills among students. They make many group presentations, team group works and brainstorming in class.

Capacitation of teachers seems to be an important point, particularly, in active strategies related to the use of virtual reality and gamification, and about the tools they could use, and most important how can the tools integrated in the classroom to improve students learning and engagement.