Flipped Classroom in the European Vocational Education

Result of the survey in Hungary

Context

Recent literature reveals that the full potential of ICT is often not realised in formal education, and that "only a few innovative projects manage to survive beyond the early adopter stage and become fully embedded in educational practice." (S. Bocconi, P. G. Kampylis, Y. Punie, 2012). The FlipIT Erasmus+ research project aims to integrate "flipped classroom" method into the pedagogical practice of the VET schools and training centers in order to engage a movement towards work-based, collaborative and problem-oriented learning/teaching by utilising the pedagogical potential of ICT tools.

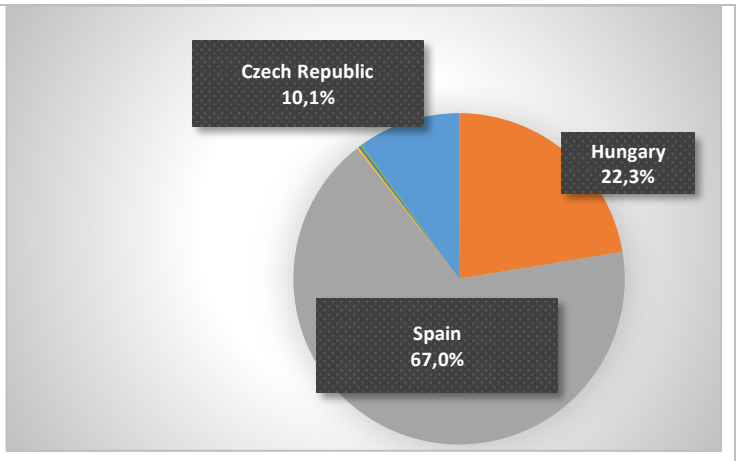
The FlipIT consortium developed a questionnaire with 25 questions, they published it on the multilingual **EUSurvey** portal (https://ec.europa.eu/eusurvey/home/welcome) in Spanish, in Hungarian and in Czech and carried out the survey in March of 2016 by involving VET teachers from the three countries.

The aim of the survey was to reveal whether the VET teachers are open and ready to use FC methods in the classroom, do they have necessary IT-skills, does the school have sufficient equipment and IT infrastructure for teachers and students. The FlipIT consortium set hypothesises to check by the survey as follows

- H1 - Infrastructure: Schools have the requisite IT infrastructure to apply an FC model, and students have access to this equivalent infrastructure to do their homework, while studying at home.
- H2 - IT skills of teachers: The teachers have basic IT skills, but are not trained in using specific IT tools (e.g. applications for creating & editing video, or Web 2.0 tools) needed for FC methods.
- H3 - Methodology: modern pedagogical methods are known to some teachers, but that the Flipped Classroom methodology is not known, and not widely used among VET teachers in the target countries (Hungary, Spain).
- H4 – Motivation: teachers are motivated to introduce new innovative pedagogical methodologies that include the use of technologies.
- H5 – Training needs: there is a need for training covering both the pedagogical and technological aspects of using the Flipped Classroom methodology in the teachers' daily work.

The sample size and distribution among the countries is presented on the chart as follows:

Czech Republic	54
Hungary	120
Spain	360
Total	534



573 teachers responded for the questionnaire. Most of them are from Spain (67%), 22.3% from Hungary-120 people, and 10.1% from the Czech Republic.

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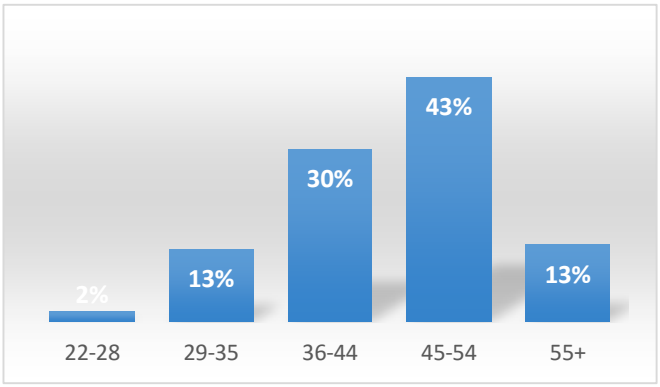
Analysis and results

In Hungary the invitation letter was sent via e-mail to more than 300 vocational schools, and we asked the leadership involve more than one teacher per school. The final number of the samples was 120.

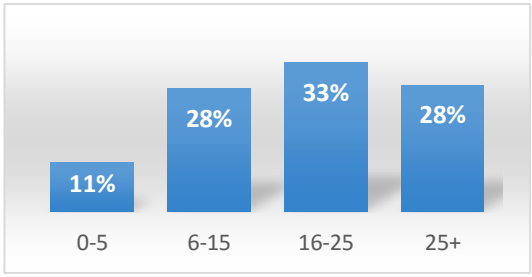
Personal details (2., 3., 4., 5 questions)

Age	Frequency
22-28	2
29-35	15
36-44	36
45-54	51
55+	16
Total	120



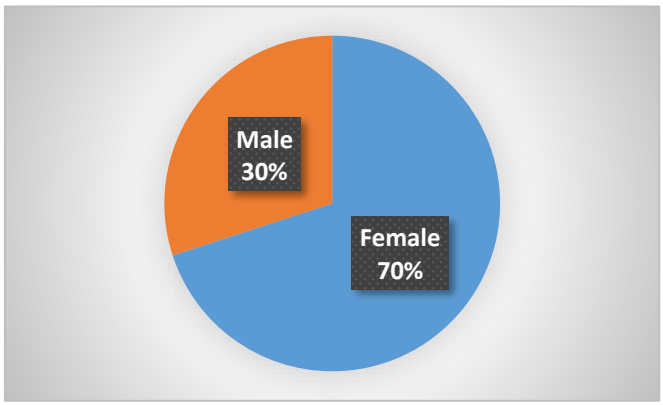
This result shows that the sample is "younger" than the average teachers in Hungary, as in the rate of the teachers 55+ is much higher than 13%.

Teaching experience	
Year	**Frequency**
0-5	13
6-15	33
16-25	40
25+	34
Total	**120**



61% of the respondents have more than 15 years of teaching experience. It is related to the previous result- 56% (67) people is older than 45.

Gender	
Male	36
Female	84
Total	120



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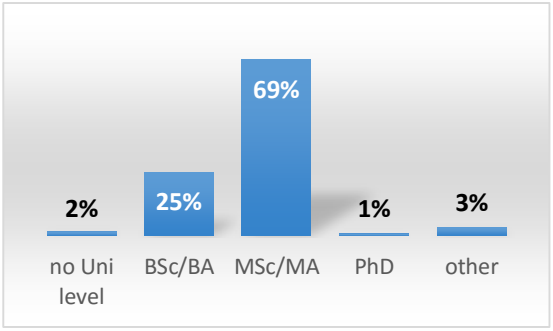
The rate of the females more than double of the rate of male teachers. It reflects on the trend that of the feminization of this profession.

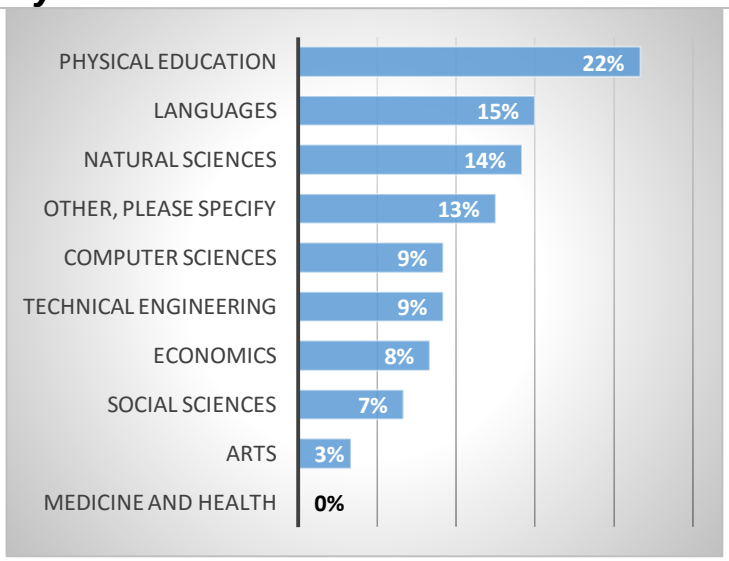
Level of study	
no Uni level	2
BSc/BA	30
MSc/MA	83
PhD	1
other	4



98% of the Hungarian respondents has higher educational degree. Most of the respondents obtained master degree, as this is the requirement in Hungary to become a teacher of theoretical subjects at secondary school level. For practical teachers the BSc/BA level appropriate, and for practical teacher of apprenticeship is not obligatory to have university diploma.

Question 6: Subject category

Subject of teaching	
Physical Education	26
Languages	18
Natural sciences	17
Other, please specify	15
Computer Sciences	11
Technical Engineering	11
Economics	10
Social Sciences	8
Arts	4
Medicine and Health	0



There was a misunderstanding in the question regarding the category of "Physical education". In Hungary the subject is called "gymnastic", and the translation in the Hungarian questionnaire was "Education" without the attribute of "Physical". This might be the explanation for the high value (22%) in the first category. In the list given in "Other" we find hospitality, horticulture, agriculture (2), tourism, food industry (5), commerce, pedagogy.

Question 7: Type of school

Type of the school of the respondents	
Vocational and Secondary vocational school	47
Grammar school and secondary vocational school	26
Secondary vocational school	18
Vocational Educational Centre	13
Vocational school	9

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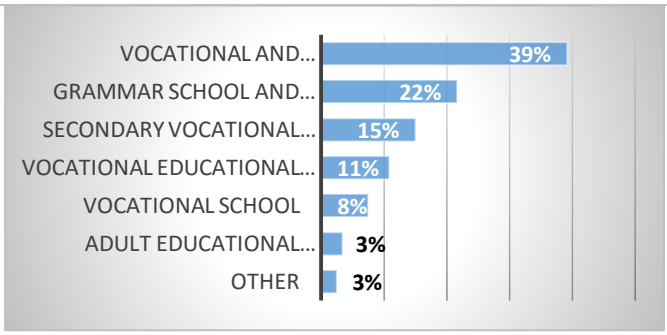
Adult educational vocational school	4
Other	3

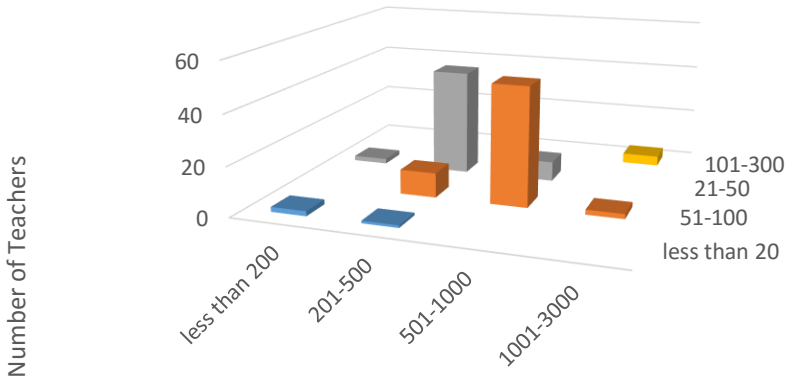


In Hungary there are so called integrated lower and upper secondary school. The most dominant in the sample is the type of **secondary vocational school, what** offers studies covering upper and post-secondary levels. Upon completion of these upper secondary years, students take the vocational secondary school leaving examination (professional maturation: ISCED 344).

Should they wish to continue their studies, they can pursue an ISCED 454 level OKJ vocational qualification in the post-secondary VET year(s) of SZKI, or apply for higher education studies.

Except from 6% of the respondents, all of the teachers are teaching in the in vocational schools, or in secondary vocational school.

Question 8-9: Number of students, number of teachers / educators in the school



	less than 200	201-500	501-1000	1001-3000
less than 20	2	1		
51-100		10	48	2
21-50	2	43	8	
101-300				4

Number of Students

Almost half of the respondents reported a size of the schools 501-1000 (56) students and the other half of 201-500 (54) students and the number of teachers in these schools are between 51 and 100.

Question 10: Conditions for Innovation in Teaching

	Does your curriculum allow you, as a teacher, to innovate with teaching methods?	Does your school encourage you to be similarly innovative?	Do you feel any demand from students to change current teaching practices?
Fully	44	38	49

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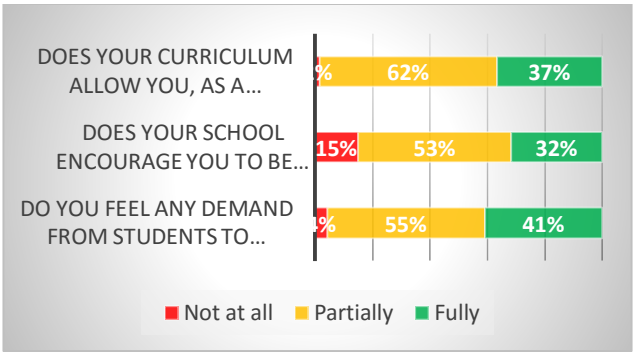
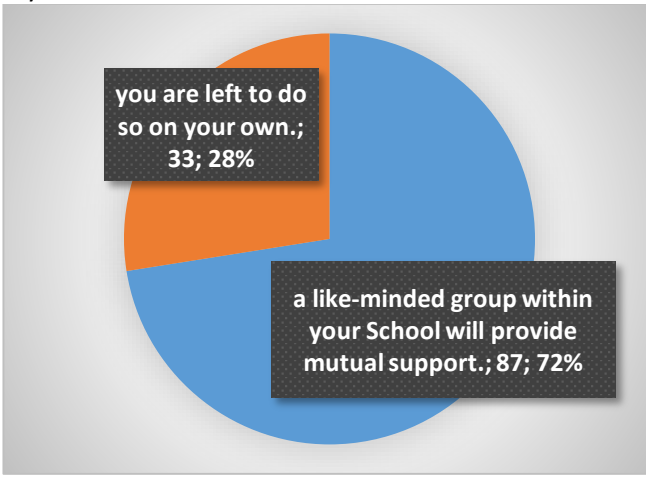
Partially	74	64	66
Not at all	2	18	5



Most of the respondents answered this very important question with "partially", what means that the teachers do not get full support for using innovative teaching methods, however according to them, only 4% of the students was not interested at all in renewing the traditional methods.

Question 10/B: Support for using innovative methods

If you innovate...



A good result that 72.5% of the respondents say that they are supported by the staff in case they try out new methods.

Question 11:. Innovative techniques in the practice of the teachers

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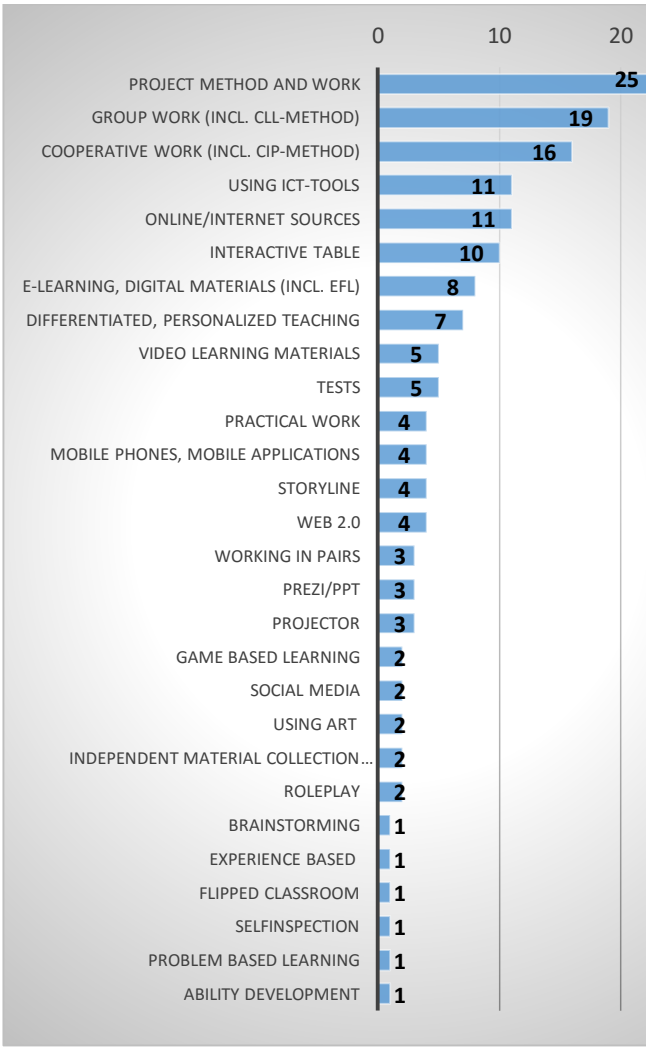


The respondents were asked to list the innovative pedagogical methods they use.

The methods with higher frequency are: as project based work, group work and cooperative work (mentioned in 68 answers), what means a clear significance. Other techniques, e.g. using ICT-tools, internet-resources, video materials, etc. are used regularly, but not really widespread, however usually less traditional methods (storyline, social media, roleplay, etc.) are not significant for our responders, too.

The frequency of collaborative and cooperative work is very similar. It might be that for the teachers the difference is not quite clear between them

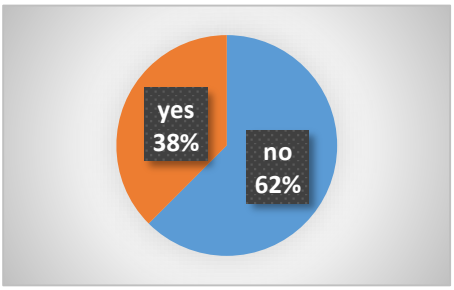
An answer for **H3 hypotheses**: "… the Flipped Classroom methodology is not known, and not widely used among VET teachers"

Cooperative vs collaborative learning:

http://www.teacherswithapps.com/the-differences-in-cooperative-learning-collaborative-learning/
http://cei.ust.hk/files/public/ccl_related_stories.pdf (Accessed: July 2016.)

Question 12: E-learning platform in the school

Does your school offer online e-learning platform?		
yes	45	62%
no	75	38%



In 2016 we can say that not a positive result that the almost 40% of the respondents' schools do not have its own e-learning platform in Hungary.

Question 13: Pedagogical methods used by the teachers

	Never	Rarely	Sometimes	Often	Always

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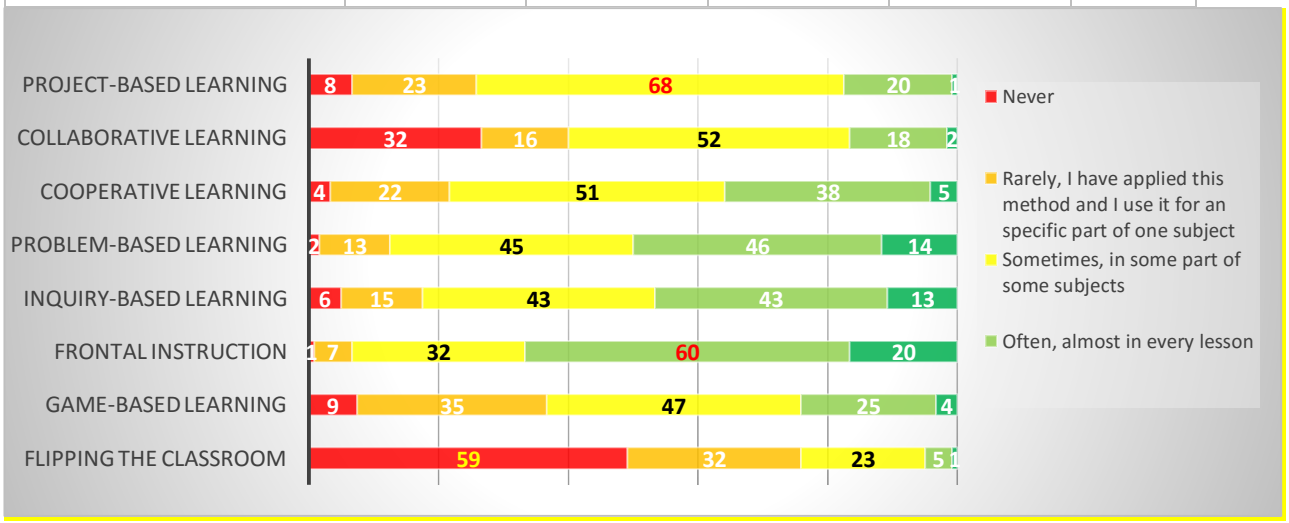
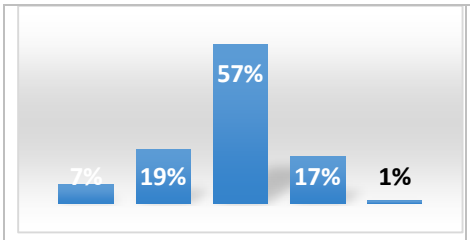
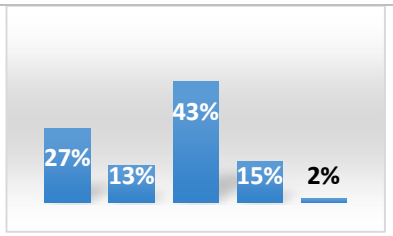
Project-based learning	8	23	68	20	1
Collaborative learning	32	16	52	18	2
Cooperative learning	4	22	51	38	5
Problem-based learning	2	13	45	46	14
Inquiry-based learning	6	15	43	43	13
Frontal instruction	1	7	32	60	20
Game-based learning	9	35	47	25	4
Flipping the classroom	59	32	23	5	1



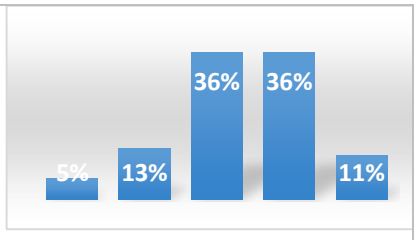
What we can see from this chart: the traditional teaching methods have been widely used, in accordance with the answers to question 11. The project-based learning and the frontal instruction are most significant, and flipped classroom method is not really used. See the details below on separate charts:



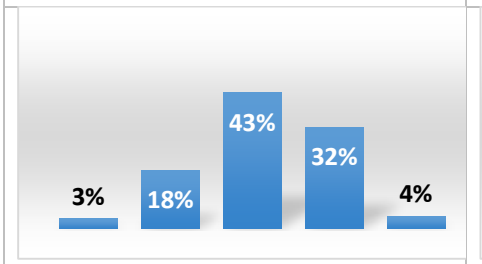
Project-based learning



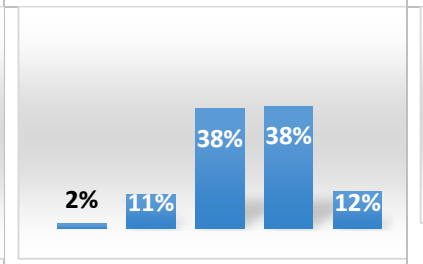
Collaborative learning



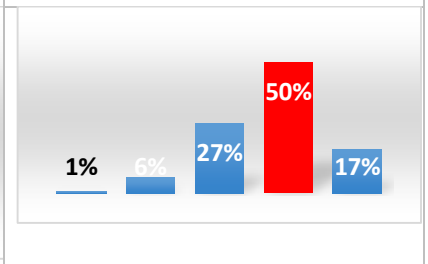
Inquiry-based learning



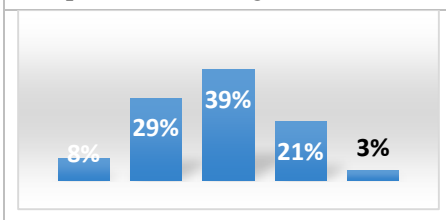
Cooperative learning

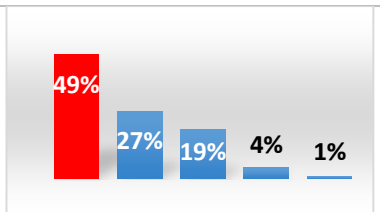


Problem-based learning



Frontal instruction





The columns represent the number of answers for: **Never, Rarely, Sometimes, Often, Always** from left to the right.

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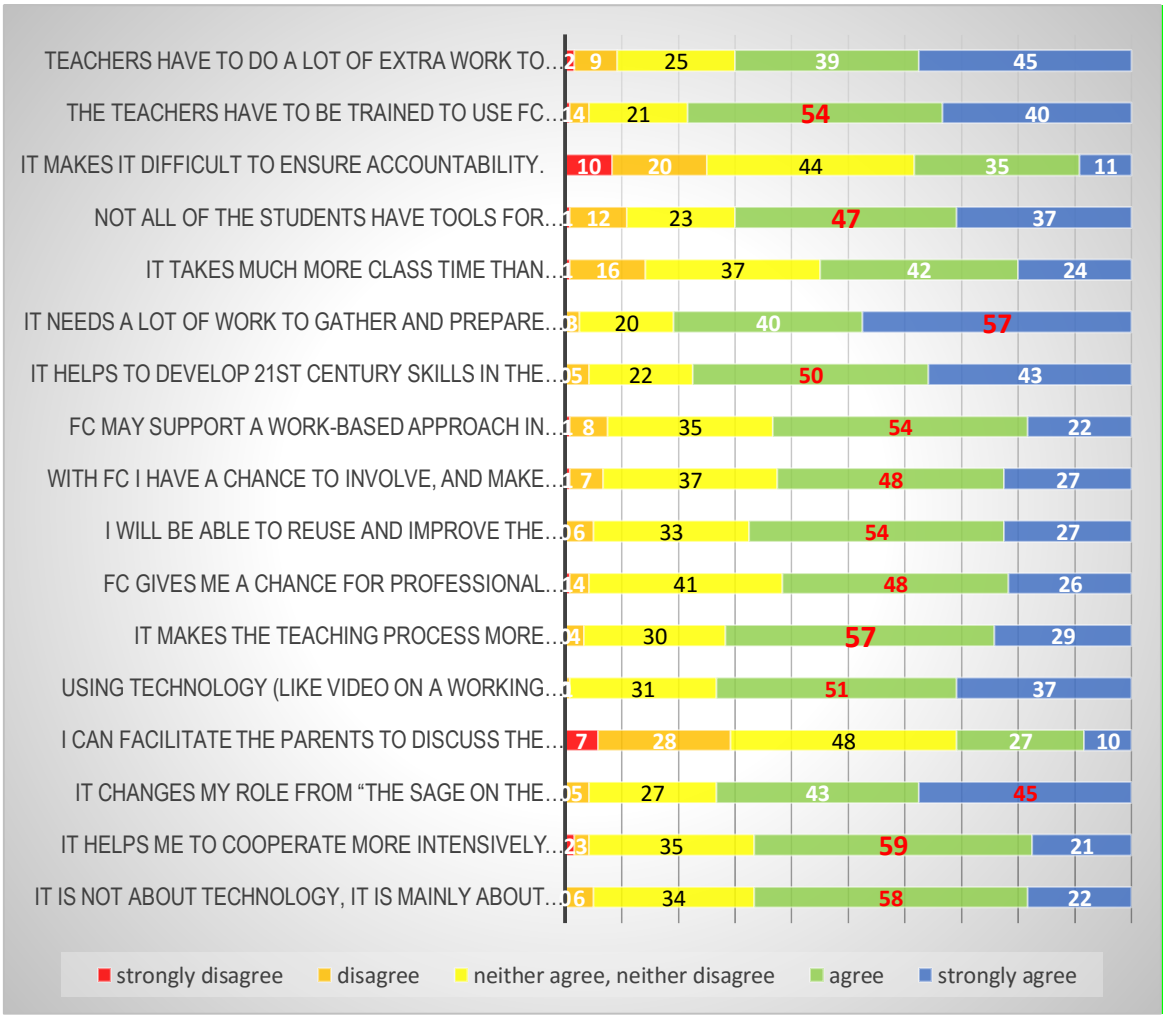
Game-based learning	Flipping the Classroom	

Question14:

The question included a definition: "Flipping (or inverting) the classroom can be described as moving from a teacher-centered learning environment to a student-centered learning environment. In the classical model the teacher in the classroom delivers the material to the students; in a flipped classroom the material is processed at home, before the lesson takes place in the school. In a flipped scenario, the students read the material (or watch the video) at home (offered or prepared by the teacher), and in the classroom they are involved in collaborative and interactive work. While videos and other technological tools can be effective in a flipped classroom, they are not required in every case to use this method. The true essence of the flip is really to focus on the student."

How far the respondents agree with the statements as follows:



The most dominant color the green is on the chart: AGREE with two exceptions. The respondents "strongly agreed" that FC

- needs a lot of work to gather and prepare the necessary learning content. (57)
- changes the teachers' role from "the sage on the stage" to "guide on the side". (45)

From the chart with details by categories, it is important to put the focus on the figures where the answers "**agree**" plus "**strongly agree**" together are high relative to the other categories.

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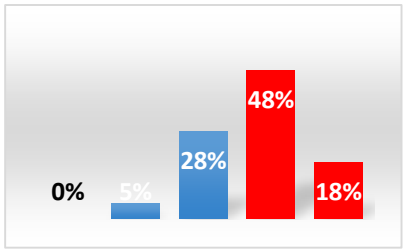
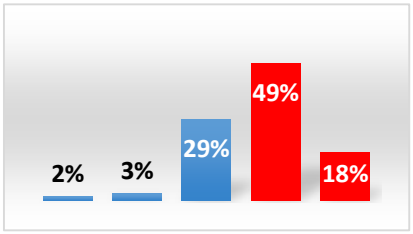
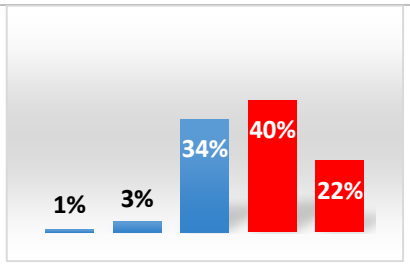
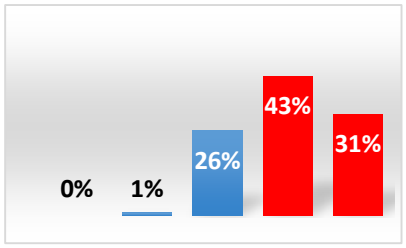
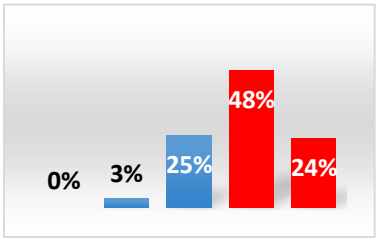
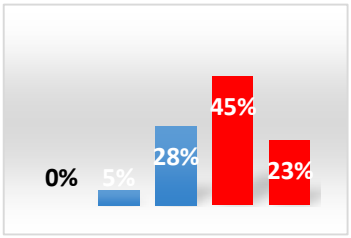
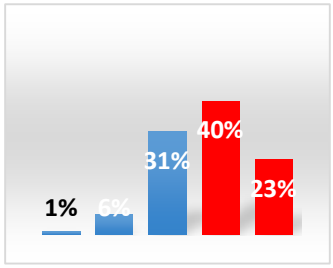
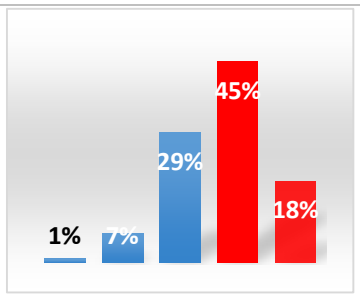
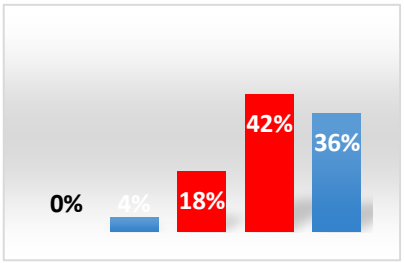
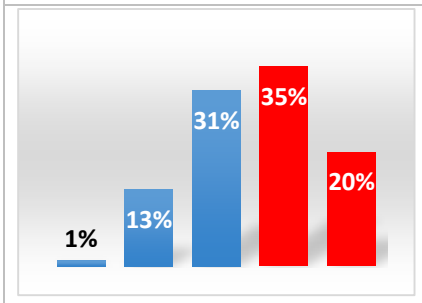
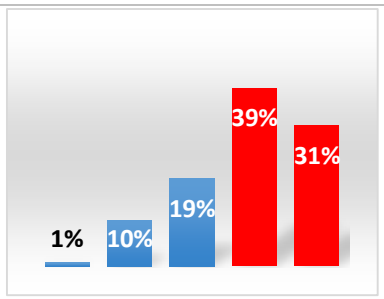
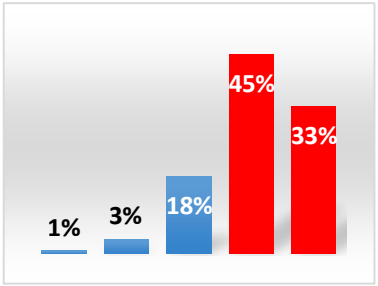
		
It is mainly about **pedagogy**	More intensive cooperation with students	A chance for professional development of teachers
		
FC is motivating for students in practice-oriented vocational subjects	teaching process more enjoyable …	FC is a chance to reuse and the learning materials
		
FC a chance to involve the students	FC may support a work-based approach	It helps to develop 21st century skills
		
It takes much more class time than traditional teaching methods.	Not all of the students have tools for watching videos or reading online text.	**The teachers have to be trained** to use FC both from a pedagogy and technology viewpoint.

The high value of the *agreed* and *strongly agreed* answers confirms several hypothesis of the survey, especially "H4: teachers are motivated !!!" and H5: There is a strong need for training both regarding pedagogy and technology.

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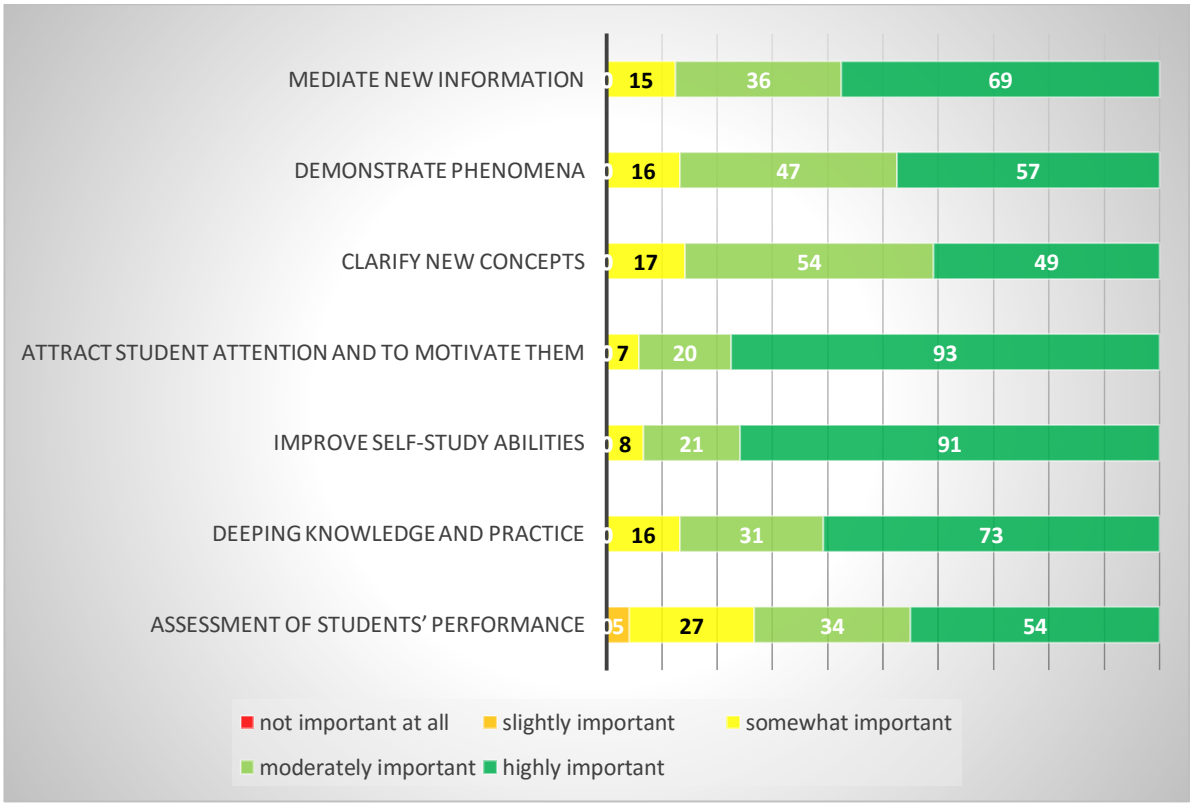
Question15: Pedagogical activities in which innovative methods, technology is important

The basic aspects of class work haven't changed. In which of the following is it important to apply innovative methods, including the use of technology?	not important at all	slightly important	somewhat important	moderately important	highly important
Mediate new information	0	0	15	36	69
Demonstrate phenomena	0	0	16	47	57
Clarify new concepts	0	0	17	54	49
Attract student attention and to motivate them	0	0	7	20	93
Improve self-study abilities	0	0	8	21	91
Deeping knowledge and practice	0	0	16	31	73
Assessment of students' performance	0	5	27	34	54



The answers show that the teachers think innovative methods and technology highly important for almost all stages and activities in the teaching process, however two of them was significantly underlined: **motivating the students** and **improve self-study abilities**. Both of them could by strengthen by using FC methodology. The third pedagogical goal which for which innovative methods were selected as highly important: **deepening**

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knowledge and practice.

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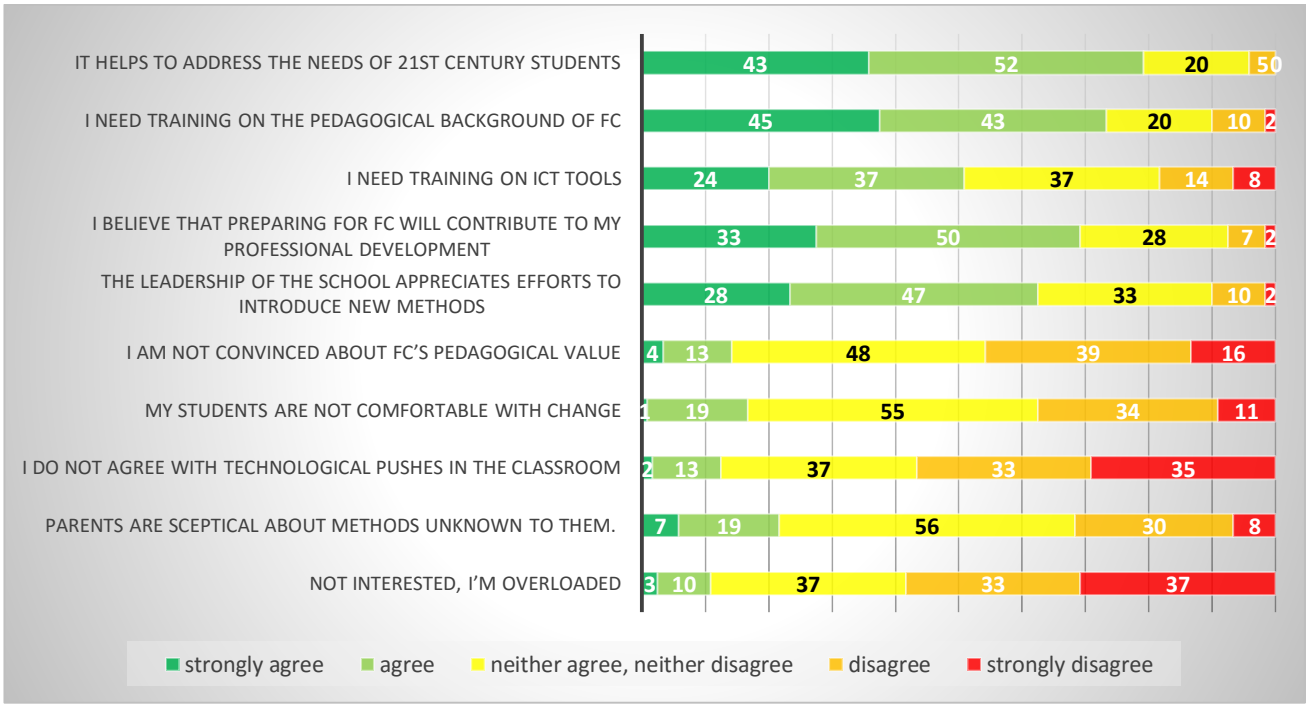
Question16: Advantages and disadvantages of an FC methodology

With your impressions of the advantages and disadvantages of an FC methodology, rate the following:	strongly agree	agree	neither agree, neither disagree	disagree	strongly disagree
It helps to address the needs of 21st century students	43	52	20	5	0
I need training on the pedagogical background of FC	45	43	20	10	2
I need training on ICT tools	24	37	37	14	8
I believe that preparing for FC will contribute to my professional development	33	50	28	7	2
The leadership of the school appreciates efforts to introduce new methods	28	47	33	10	2
I am not convinced about FC's pedagogical value	4	13	48	39	16
My students are not comfortable with change	1	19	55	34	11
I do not agree with technological pushes in the classroom	2	13	37	33	35
Parents are sceptical about methods unknown to them.	7	19	56	30	8
Not interested, I'm overloaded	3	10	37	33	37



The most important consequence is the very positive attitude of the respondents: most of them agree with the positive statements and disagree with the negatives one. **They agree**, that

- FC helps to address the needs of 21st century students
- FC will contribute to my professional development
- They need training on pedagogical and technological aspects of FC as well
- The leadership of the school appreciates efforts to introduce new methods.

Most of them **do not agree** with some of the negative statements as "Teachers are not interested, as they are

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overloaded", what means, that they are open to learn and use FC. However, there are some statements where the figures show uncertainty (see the yellow bars!). The respondents are not sure, about the students and parents attitudes when the traditional teaching methods are changed.

Question 17: Training needs

If you were to take part in an FC training course, what are the most important competences to be developed?	not	slightly	somewhat	moderately	highly
	Important				
Preparing FC lesson plans	0	9	27	36	47
Designing class activities	0	3	19	37	61
To learn strategies to integrate in home phase with the activities in the classroom	0	4	15	24	77
Assessment of students' work in FC lessons	0	4	30	39	46
Assessment of students' processing new information at home	0	3	30	41	46
Managing the collaboration of students in class time	0	2	21	39	58
To understand a range of methods to support problem-solving team-work	0	3	21	36	60
Creating, editing storing attractive learning content, and publishing them on the web	0	4	26	33	57
To find quality, free educational applications (offline & online) for learning, practice, creating, etc.	0	4	18	29	67
Designing interesting and attractive digital presentations	0	9	25	32	54

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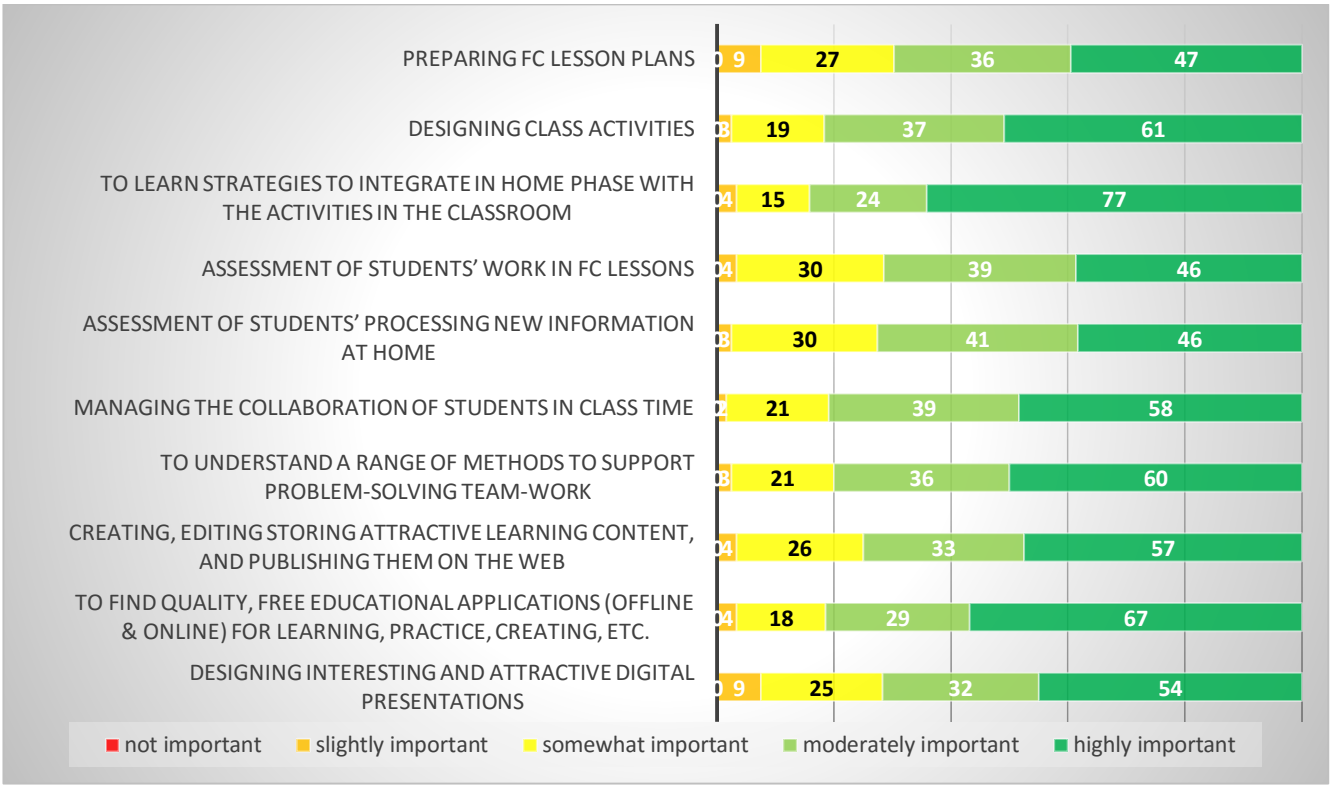

On this chart the significance of the green bars for "highly important" is well marked. It shows that almost all areas listed in the table are selected by the respondents as important. However the key pedagogical competencies that are necessary include to FC training are:

- To learn strategies to integrate in home phase with the activities in the classroom (85 %: 64 % highy important + 20 % moderately important),
- Designing class activities (82 %: 51 % highly important + 31 % moderately important),
- To find quality, free educational applications (offline & online) for learning, practice, creating, etc. (82 %: 57 % highly important + 25 % moderately important).

Question 18: IT skills of the respondents

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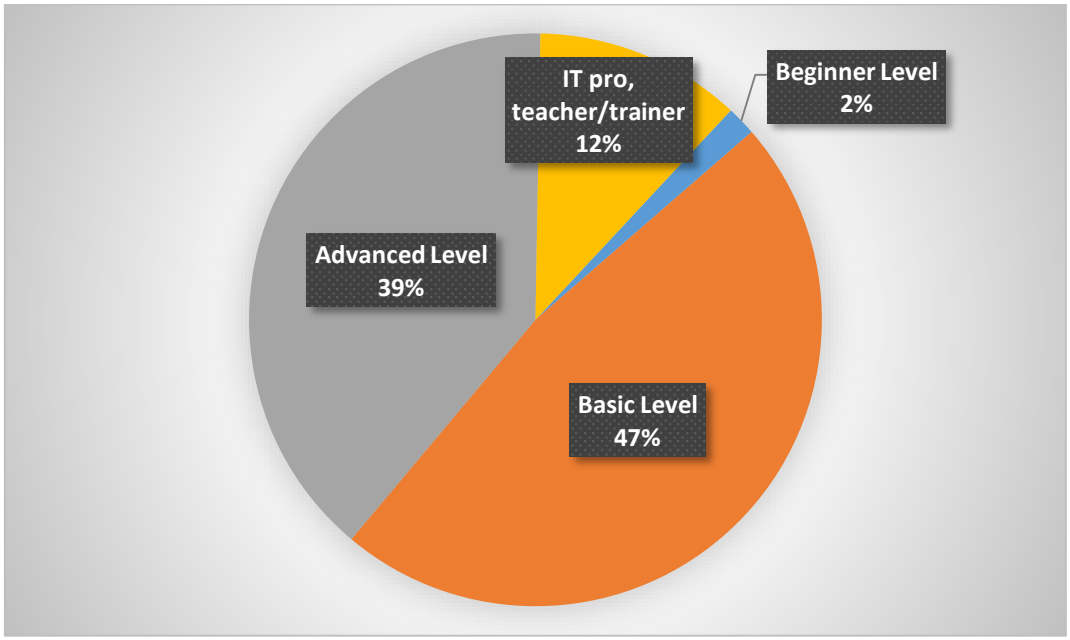

For planning the modules for FC training is a very important information, that 86% of the respondents has advanced or at least basic level IT skills.

Question19. Competences to create, edit and publish the following digital media

Are you trained on how to create, edit and publish the following digital media?	Not at all	Basic level	Advanced level	Professional level
Social networks	9	52	47	12
Presentations	41	51	20	8
Hypertext, embedding different media elements	55	45	15	5
Digital timelines	48	43	16	13
Concept maps	47	39	20	14
Blogs	59	35	15	11
Animations	46	43	17	14
Videos	4	39	43	34
Digital pictures	15	51	35	19

Not at all: No training, no experience

At basic level: I am self-taugh or have some experience at non-professional level knowing how to use basic functionalities

At advanced level: I have received training about it or have some experience at professional level knowing how to use some advanced functionalities.

At professional level: I have professional training or I am a trainer knowing how to use well advanced functionalities.

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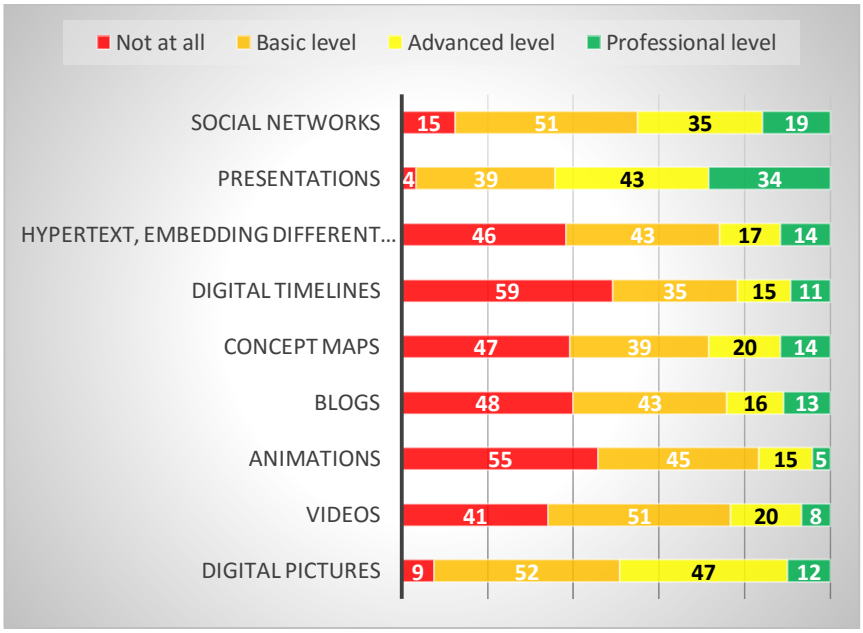
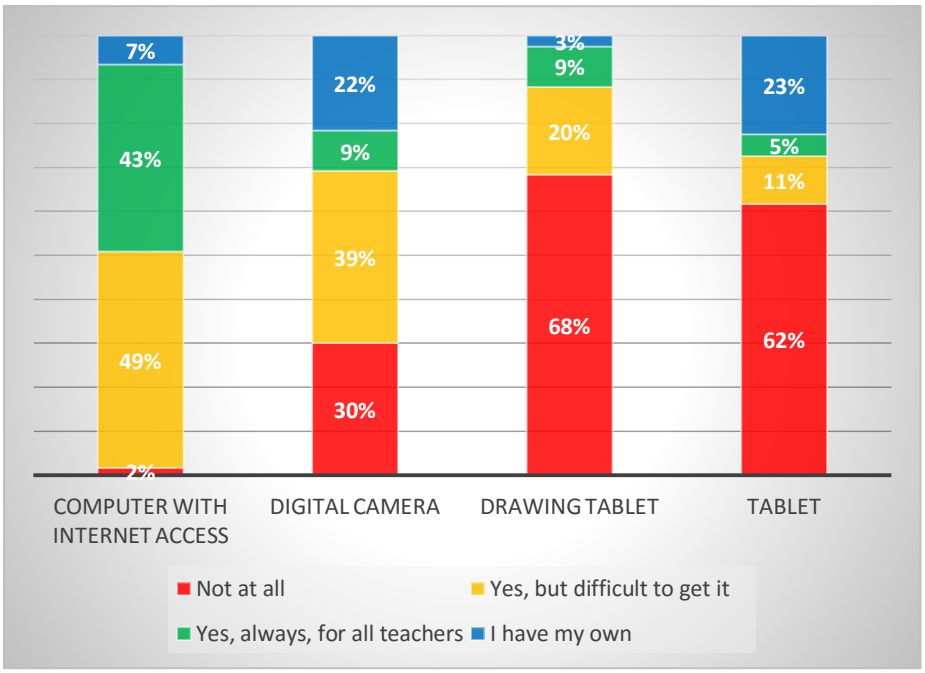


The red bars are significantly longer in most of the categories, except social networks (Facebook!), presentations (PowerPoint!) and digital pictures. In all other areas almost 50% of the respondents are not trained. Most of the tools needed for developing flipped classroom materials (like concept maps, animations, videos) are signed as "basic level". <u>As a consequence they need training in using IT tools.</u>

Question 20: IT tools available in the schools

Does your school provide the following tools?	PC with internet	digital camera	drawing tablet	tablet
Yes, always, for all teachers	51	11	11	6
Yes, but difficult to get it	59	47	24	13
Not at all	2	36	82	74
I have my own	8	26	3	27



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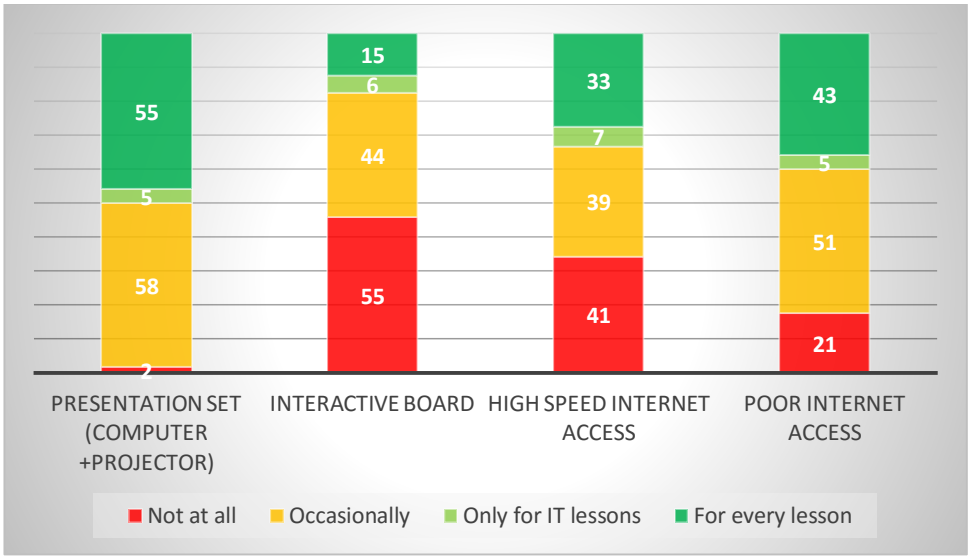
PC with internet access are available in 92% of the teachers' school. However, most of the schools does not provide tools for creating videos what would be important for integrating FC into their pedagogical practice. The teachers in the schools is not generally provided a tablet (62 %) and a drawing tablet (68 %). Only a few schools have a digital camera. The survey also shows that more teachers are using their own tablet (23 %) or own digital camera (22 %).

We can say, that the appropriate IT infrastructure is not generally vailable in the Hungarian VET schools.

Another very important consequence is, that the teachers have to be trained in searching for and finding free tools and open source content, what can be a solution in these circumstances, as not all of them have the IT tools for preparing their own digital content.

Question 21: IT tools available in the classroom

Do you have access to the following IT tools/features for your classroom work?	Presentation set (computer + projector)	Interactive board	High speed internet access	Poor internet access
Not at all	2	55	41	21
Occasionally	58	44	39	51
Only for IT lessons	5	6	7	5
For every lesson	55	15	33	43



The chart shows that the tools most frequently used by the teachers is the presentation set. Most of the respondents reported, that even the poor internet access is available only sometimes in their classroom.

Question 22: Students per computers

If using computers in the classroom, how many students works on every single computer?	1	2-3	4-7	8 or more
without internet	12	8	5	16
with internet	38	15	3	23

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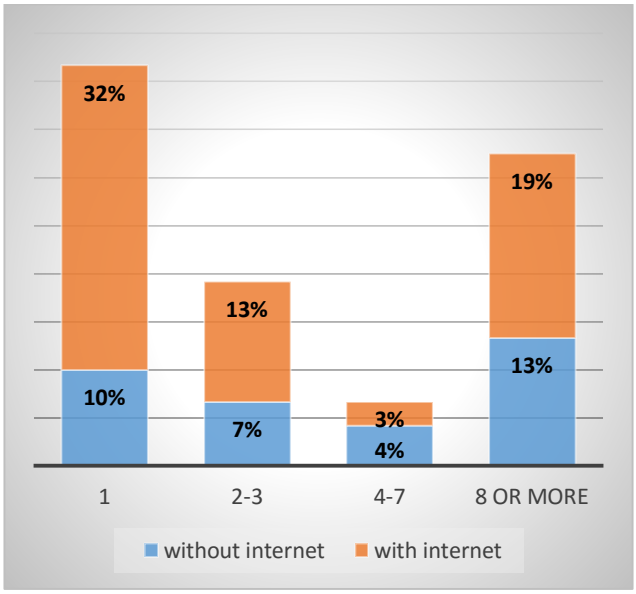
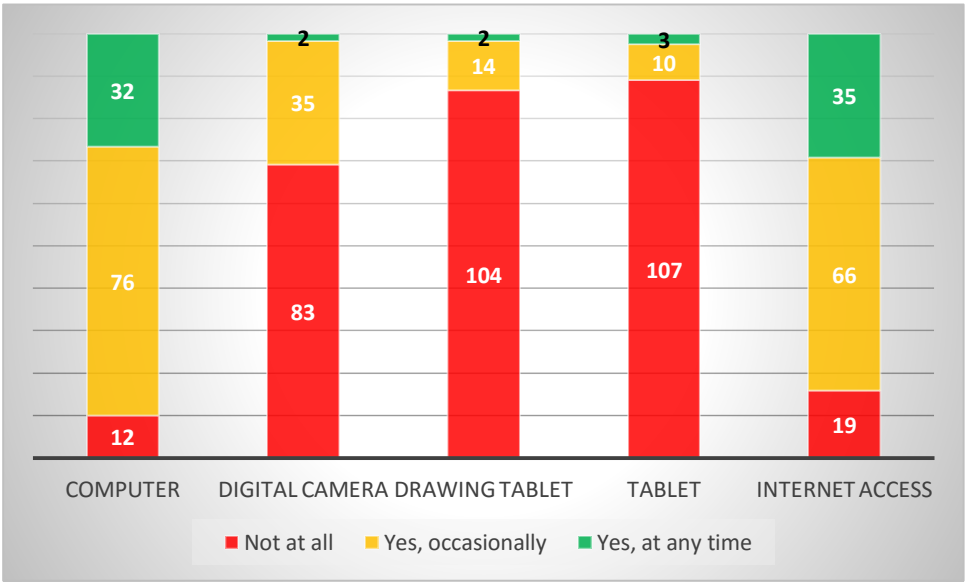


Only 32% of the teachers' schools provides 1 computer/student with internet access, what is a very bad situation. In 41% of them say that more than 8 students have to use a single computer.

Question 23: IT tools in the schools for students after the lessons

Are the following tools available for students in the school after official lessons?	PC	camera	drawing tablet	tablet	internet
Not at all	12	83	104	107	19
Yes, occasionally	76	35	14	10	66
Yes, at any time	32	2	2	3	35



The situation is even worse regarding the IT tools for using after the lesson in the schools. According to the sample the schools are not able to provide IT tools except computers (sometimes) and internet access (sometimes).

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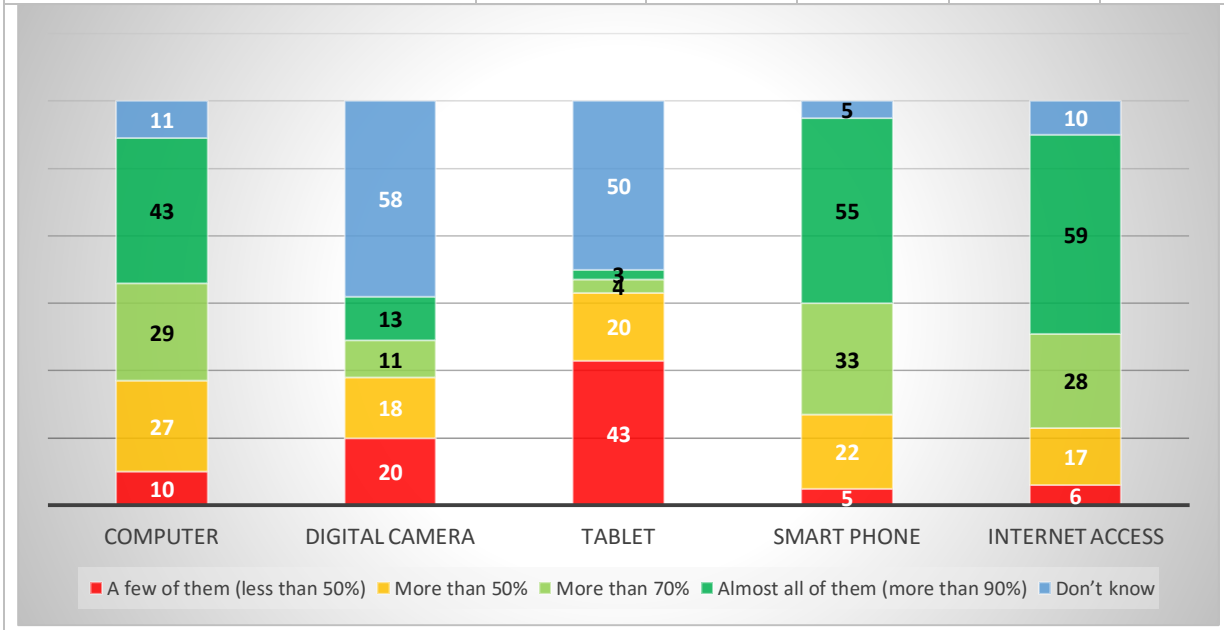
Question 24. Own devices of the students at home

Do your students have the following tools at home?	Computer	Digital camera	Tablet	Smart phone	Internet access
A few of them (less than 50%)	10	20	43	5	6
More than 50%	27	18	20	22	17
More than 70%	29	11	4	33	28
Almost all of them (more than 90%)	43	13	3	55	59
Don't know	11	58	50	5	10

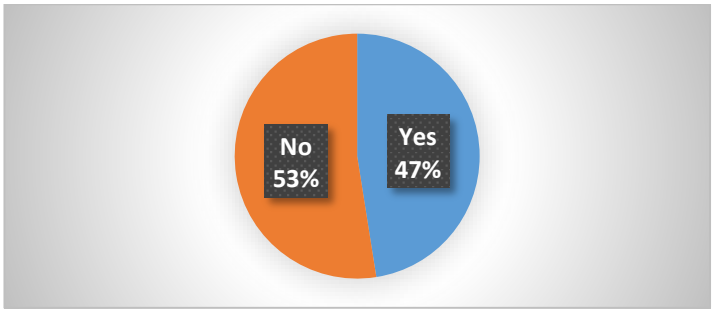


The picture is a little bit more positive relative to the IT tools available in the schools after the lessons. About the digital camera and the tablet most of the teachers has now information, but in case of computer, smart phone and internet access. More than 50% of the teachers estimated this tools higher than 90%.

It is a good result for FC method: this means that the students have the tools at home to help the teachers to create digital materials, they can record a working process during their practical lessons for example.

Question 25.

In the Flip-IT project, we will develop an online FC course for teachers in early 2017. If you are interested in taking part, please provide your e-mail address.



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Almost half of the respondents would take part in a training on Flipped Classroom Training, what is not a bad rate if we take into account the low level of the IT infrastructure in the Hungarian VET school.

Conclusions

H1 – **Infrastructure - failed**

In the Hungarian VET schools the IT infrastructure is very poor according to the result of the survey. It does not mean, that the teachers are not able to apply FC methodology at all, however the IT tools for content creation are not fully available for them nor for the student. In the majority of the schools of the respondents only the basic presentation set is provided for the classroom work, and the rate of the schools, *where internet access is not available at all is extremely high (Q21, 34%). It was a negative surprise as well, that only 60% (Q24) of the teacher suppose, that more than 90% of the students has a computer at home, and however they can access always (Q23, 27%), or occasionally (Q23, 62%) to computers after the lessons in the school.*

The tablets, drawing tablets are very rare in the schools, however the vast majority of the students have their own smart phone what can be used for video recording.

H2 - **IT skills of teachers – underlined by the survey**

The survey results have underlined, that the teachers have basic IT skills (Q18), but are not trained in using specific IT tools (e.g. applications for creating & editing video, or Web 2.0 tools) needed for FC methods.

H3 - **Methodology - underlined by the survey**

Modern pedagogical methods are known to some teachers, but that the Flipped Classroom methodology is not known, and not widely used among VET teachers in Hungary, and what is most important, the most of the respondents (72,5%) stated that they are supported by the staff and the leadership in their efforts. ***(Q10b, Q11, Q13)***

H4 – **Motivation - underlined by the survey**

Teachers are motivated to introduce new innovative pedagogical methodologies that include the use of technologies. ***(Q14, Q15, Q16)***

H5 – Training needs: **underlined by the survey**

There is a strong need for training covering ***both the pedagogical and technological aspects (Q17, Q19)*** *of using the Flipped Classroom methodology in the teachers' daily work.*

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