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# C-Game Czech pilot report

## C-Game project, O3-11

**Prague, October 2022**

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# 1 Involved elementary schools, pupils, and facilitators

In the Czech Republic piloting of C-Game was held from June till September 2022. 6 elementary schools, located in cities of different sizes, participated in the verification (Table 1). In total in the piloting were involved 293 pupils aged 14-15, from which was nearly half of girls and half boys. Involved were 13 class groups. There were 2 elementary schools with 3 class groups (ZŠ Vinoř, ZŠ Všetaty), 3 elementary schools with 2 class groups (ZŠ Jana Wericha, ZŠ Křemže, ZŠ Starý Kolín),and one elementary school with one class group (ZŠ Jungmannovy sady).

In piloting have been involved 7 facilitators. All of facilitators are teachers and most of them are also part time educational / career guidance counsellors at their school. With all of them was held one hour online session during which were explained all parts of the C-Game as well as the facilitators back office.

**Table 1: List of participating elementary schools, involved facilitators and pupils**

| No | Elementary school | Involved facilitators | Involved pupils / girls | Pupils´ age | Number of paired questionnaires #3[1] |
|---|---|---|---|---|---|
| **1** | ZŠ Jana Wericha, Praha | 1 | 25 / 13 | 14-15 | 32 |
| | ZŠ Jana Wericha, Praha | | 26 / 15 | 14-15 | |
| **2** | ZŠ Jungmannovy sady, Mělník | 1 | 28 / 17 | 14-15 | 16 |
| **3** | ZŠ Křemže | 1 | 20 / 7 | 14-15 | 28 |
| | ZŠ Křemže | | 20 / 6 | 14-15 | |
| **4** | ZŠ Starý Kolín | 2 | 21 / 10 | 14-15 | 29 |
| | ZŠ Starý Kolín | | 11 / 3 | 14-15 | |
| **5** | ZŠ Vinoř | 1 | 23 / 13 | 14-15 | 51 |
| | ZŠ Vinoř | | 25 / 11 | 14-15 | |
| | ZŠ Vinoř | | 23 / 10 | 14-15 | |
| **6** | ZŠ Všetaty | 1 | 25 / 11 | 14-15 | 17 |
| | ZŠ Všetaty | | 23 / 14 | 14-15 | |
| | ZŠ Všetaty | | 23 / 10 | 14-15 | |
| | **Total** | **7** | **293 / 148** | **--** | **173** |

## 1.1 Pupils´ preparation before the game

Pupils´ preparation was held with all class groups and lasted 5-20 minutes (10 minutes in average). Half of the group the game was introduced using data projector. All groups were introduced to the game, including the functions and logic of the game.

[1] Questionnaire No 3 C-Game Questionnaire for measuring changes in perception of career orientation was filled in by pupils twice: before and after the game. Its aim was to find out whether and to what extent the game has potential to influence pupils' interest in their future vocational choice and selection of secondary school. See results of the questionnaire No 3 in chapter 4.

The vocational choice was discussed with pupils only in connection with the C-Game. Holland's typology was introduced only briefly as part of the introduction, as only a few pupils during the game reached the 2nd game level, in which "Your Interest Profile" opens.

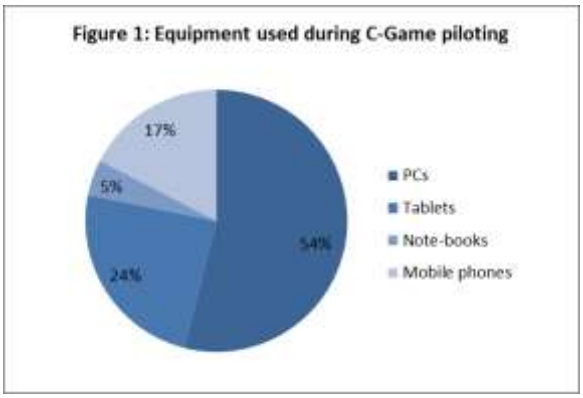
## 1.2 The course of the game (in minutes)

Facilitators mentioned that pupils game in school lasted 15-90 minutes (in average 51 minutes), and some of the pupils continued to play at home.

Facilitators have been instructed beforehand that the game itself is not as important as the feedback that we expect from them to be given to pupils. Facilitators claimed that they have been speaking with class groups for 5 – 40 minutes (in average 16 minutes) to give pupils feedback and to speak with them about their future study and career paths.

## 1.3 Equipment used during C-Game piloting

For testing all pupils (100%) had their own digital equipment and played the C-Game independently on one digital device (Table 2, Figure 1).




54% of pupils played on a PC, 24% of pupils used tablets and 5% laptops. In one school, pupils (17%) played C-Game on mobile phones. However, they had the biggest difficulties with loading the map and opening certain windows.

Table 2: Equipment used during C-Game piloting

| No | Elementary school | PCs | Tablets | Note-books | Mobile phones | Total |
|---|---|---|---|---|---|---|
| **1** | ZŠ Jana Wericha, Praha | | | | 25 | 25 |
| | ZŠ Jana Wericha, Praha | | | | 26 | 26 |
| **2** | ZŠ Jungmannovy sady, Mělník | 15 | | 13 | | 28 |
| **3** | ZŠ Křemže | 20 | | | | 20 |
| | ZŠ Křemže | 20 | | | | 20 |
| **4** | ZŠ Starý Kolín | 21 | | | | 21 |
| | ZŠ Starý Kolín | 11 | | | | 11 |
| **5** | ZŠ Vinoř | | 23 | | | 23 |
| | ZŠ Vinoř | | 25 | | | 25 |
| | ZŠ Vinoř | | 23 | | | 23 |
| **6** | ZŠ Všetaty | 25 | | | | 25 |
| | ZŠ Všetaty | 23 | | | | 23 |
| | ZŠ Všetaty | 23 | | | | 23 |
| | **Total** | **158** | **71** | **13** | **51** | **293** |

# 2 Pupils´ feedback captured by the facilitators during and after the C-Game

Pupils' opinions on the game were mostly positive. They were particularly unhappy with the fact that the game often crashed and had to wait for the map to reload. Differences between individual schools were also evident. Pupils were more satisfied if the internet connection was fast and stable. The run of the game was rated as good, with the exception of those who played the game on mobile phones. The pupils were familiar with principles of the game very quickly, within a few minutes, and only about 10% of the pupils did not skip the tutorial and went through it.

> *"I liked the game, maybe it would be better to split it into smaller parts - less buildings in each level."*
>
> *"It would be better to use the arrow keys on the computer instead of just using the mouse."*
>
> *"It was immediately clear where to click, what to open, how to answer."*

## 2.1 Evaluation of the "fun" of the game

Pupils generally evaluate the game as fun. When asked if they would show the game to someone outside their class, most of the pupils were reticent. Only one answered in the affirmative. Some pupils were interested in what awaits them in the 3rd level of the game and how the game ends. Among the pupils, there were also those who spoke positively to the question of whether they would return to the game even from home.

> *"The pupils generally liked the game, but some did not enjoy it."*
>
> *"Yes, I showed C-Game to a friend while playing from home."*
>
> *“What's in the 3rd level of the game? Is it the same as the first and second? So it's boring."*
>
> *"Some said they would continue to play at home."*
>
> *"6 pupils claimed that they also played at home."*

## 2.2 Reading is part of the game

It was confirmed that the pupils like to play and do not like to read. They generally understood the tasks and descriptions.

> *"Yes, it's good, but too long. It would shorten the captions and texts.”*
>
> *"Communication was too lengthy when filling jobs."*
>
> *“The first question 'Can we start?' is annoying.*

### 2.3 The city

Pupils generally like the graphics of the city, but some found the layout of the buildings in the city to be illogical, with little greenery, a lifeless city and little interactivity.

> *"The layout of the buildings seemed chaotic to the pupils, but they couldn't explain why."*
>
> *"There should be more greenery in the city and the city should be in motion - cars, buses, trains could drive there..."*
>
> *"A profession that the player takes to see what they are doing - more interactivity."*

### 2.4 Occupation card

For the occupation card, two groups of pupils suggested to add average monthly earnings.

> *"On the occupation card, the labels and information are understandable, perhaps the average salary would be useful."*

### 2.5 Number of inhabitants of the city

Pupils began to notice the growing number of inhabitants of the city immediately and after a while they were already communicating with each other who gained inhabitants. Some also followed the information hidden in the upper right corner.

> *"As soon as they built the building, they looked to see if they had more residents."*

### 2.6 Mission

Most pupils have played the missions and find them too difficult (this occurred in time when the missions weren't tied to filling 5 vacancies). Pupils realised that mission don't work on mobile phones.

> *"Most of the pupils played the missions, some said they didn't work for them."*
>
> *"They were understandable, there were too many professions."*

### 2.7 Achievements

Achievements were not clear for some pupils and they did not understand reason they are inside the game.

> *"The pupils quickly understood that these achievements will not get them to the next level, that they are actually useless."*
>
> *"Achievements should be more tied to the game."*

### 2.8 What could be improved in the game

Among the elements that should be improved in the game are both technical and textual elements:

- *acceleration of map loading,*

- *some buildings were not found on the map, after clicking on them in the economic sector of the city, the program directed pupils outside the city and they were nowhere to be found,*
- *control also with arrows, not only with the mouse on the computer,*
- *unclear conditions for entering the 2nd level of the game,*
- *graphics – e.g. unfinished sea,*
- *shorten – optimize texts,*
- *some job descriptions are unclear, difficult formulated,*
- *hiring positions can be just click away without reading,*
- *explain the missions better, some are really hard to understand,*
- *use a more entertaining approach, lacks a well-thought-out story,*
- *it would be better not only online, but also as an application,*
- *the option to chat is missing,*
- *missing people, little reality, life, cars...*

# 3 Facilitators´ feedback

## 3.1 Pupils´ beahaviour during playing C-Game

Most of the facilitators stated that the pupils concentrated on the game and after a while they started to communicate with each other, ask questions and compare their results.

> *"They were concentrating on the game and were quiet, the communication took place more in questions about number of reached residents, and whether they have already occupied a specific position in the game. Some did not know how to control the game, so they asked about specific procedures."*
>
> *"They took it seriously, everyone played for themselves. Only if they came across an occupation they didn't know, they discussed among themselves for a while."*
>
> *"They were engaged and they enjoyed it."*
>
> *"Rather, they were focused, the communication directed to the further progress of the game."*
>
> *"They were focused, they were communicating with others."*

## 3.2 Pupils' questions during the game

Most of the questions were about the required minimum education for a specific occupation. There were also questions about technical problems, especially with loading the map and using mobile phones. One question was also about missions.

> *"They asked if the presented education was required for a specific job, which was explained to them, including the difference between each type of education. "*
>
> *"They went to each other for help - technical problems with mobile phones."*

*"What's the point of missions, what are they supposed to do if they take a long time to load. Otherwise, they managed everything themselves."*

### 3.3 Pupils' questions after the game

After the game, the pupils filled in questionnaire no. 3 for the second time (see chapter 4) and their questions were directed to the meaning of this questionnaire. During the post-play discussion, the pupils asked about some of the occupations they came across in the game. Those who progressed to the 2nd level of the game were interested in what professions the game recommended for them to consider and how their choices were arrived at. Most of them agreed with the choice. They were interested in how their interest profile was put together and if and when it would be explained to them in more detail. Several pupils asked if they could continue playing at home.

*"Why do they have to fill out questionnaire no. 3 once more? "*

*"We solved professions they didn't know and told each other about."*

*"Some asked about the recommended professions and how they were arrived at in the game."*

*"Some agreed with the choice of profession that it was for them, others were ashamed to share what worked for them."*

*"They also dealt a lot with the percentage share in the individual personality sections, and they were interested in the profession."*

*"Whether they get feedback."*

*"Whether they can play at home."*

### 3.4 Facilitators' opinion of the game

All the facilitators liked the game and consider it a suitable addition to the teaching, with the potential to become a helper not only for the pupils in choosing a profession, but also for the school in teaching the educational area Man and the world of work.

*"C-Game is an interesting addition to the Man and the World of Work class. Most of the pupils were enthusiastic about the game and put themselves fully into the game. Some complained about the long captions, why they had to read everything and answer everything. Others didn't mind.'*

*"I like it, it would be necessary to tighten it, but even in this way our pupils enjoy it."*

*"I only played for a while, I liked it."*

*"It's a good move and an interesting addition to decision making on career choice."*

*"The game is good, I spent quite a bit of time with it myself. I quite enjoyed it.'*

*"I think it can help some undecided pupils to see the possibilities in the labour market."*

*"C-Game is very beneficial. I believe in its potential to become a helper for pupils when choosing a profession."*

*"Definitely yes. We continued to work with C-Game, and then we talked a lot about occupation that the pupils did not know. It is certainly possible to work with it within the hours when choosing a profession and to develop further through discussion."*

*"It is sufficient for elementary school pupils in this state."*

**What do you like most about the game?**

*"Graphics (although some pupils complained about the textures regarding their loading speed)"*

*"Interactivity - interactivity, individualization."*

*"Simplicity, clarity."*

*"The idea."*

### 3.5 Recommendations for game enrichment

Only 4 facilitators answered this point. Nevertheless, from recommendations, the development of the game concerned the addition of the number of employees in the given profession, the expected trend of employed persons in the given occupation and the average monthly earnings. (This is information that could be available BUT it would be necessary to update them every year.) Other topics include enriching the game with illustrative examples of occupations, e.g. in the form of video demonstrations, and defining the advantages and disadvantages of individual occupations.

*"Indicate the number of persons employed in a given occupation and the trend into the future in the future."*

*"Average monthly earnings."*

*"Professional examples - what they do in real life - video examples."*

*"Advantages and disadvantages of individual jobs."*

### 3.6 What can be done better

Suggestions for improvement relate to the number of levels of the game, its control, increasing the attractiveness of the game, supplementing the average earnings, adjusting the way of filling vacancies, job descriptions, difficulty of missions, etc.

**More C-Game levels**

*"Split the game into more levels with fewer buildings - maybe include more than 2 questions from RIASEC - that could push pupils to read more. Those who did it honestly and were interested really spent a lot of time on it - even several hours."*

**Game control**

*"Pupils' opinion is that it's mostly just clicking."*

*"Controls on the map, for example zooming in and out the map (using the mouse wheel, or two fingers like on a mobile phone)."*

*"At the beginning of each lesson, it happened that for some pupils the game was loaded only after some time (approx. 2-4 minutes). I cannot guess whether the problem occurred due the school's Internet connection or the game server."*

*"Texture optimization."*

**Level of gaming fun**

*"To draw the pupil more into the reality of employment. "*

*"The map is too static, the kids were missing people, movement and life."*

*"Today's generation is looking for action, reading is necessary, the 1st game caught their attention, the 2nd game was already routine for them."*

*"So that children can see the need for individual professions and fields."*

**Filling vacancies**

*"Adjust the way vacancies are filled to make the pupil think about the text (now it's enough to click away without reading)."*

*"Some pupils were too lazy to read everything and figured out that when hiring positions, everything can be clicked off without reading the information on the labels."*

**Texts of job descriptions**

*"Somewhere the examples didn't make sense - for example that a carpenter doesn't need skill."*

*"Better to formulate work activities and simplify them."*

**Mission**

*"The missions are too difficult and long."*

**Other**

*"Pupils said that it did not help them in their decision-making, if the average salary evaluation was given, it could motivate them, make them more interested."*

*"To add the choice of country according to the pupil (we also have pupils from other countries than the Czech Republic)."*

### 3.7 C-Game overall facilitators´ evaluation

Facilitators generally evaluate C-Game positively, and their answers indicate that they will recommend the game to other educators as well.

> *"Overall, I rate the game positively, and I agree with the pupils' comments on how to improve the game."*
>
> *"In all three groups, the pupils were so excited by the game that when the pupils started playing the game, there was complete silence in the classroom. Then some pupils inquired about the game controls and their curiosity was directed towards the recorded population and the satisfaction of others.*
>
> *"I really liked the game and as a teacher I would recommend it to my colleagues, which I did at our school. In a playful way, it communicates information to pupils that is absolutely necessary for them to be able to navigate their choice of profession and the educational system. I will be happy if the creators manage to complete the third level of the game as well."*
>
> *"Thank you very much to everyone that I could participate with the pupils of our school in this pilot project and I wish you all a lot of strength and success in completing the game."*

# 4 C-Game Questionnaire for measuring changes in perception of career orientation

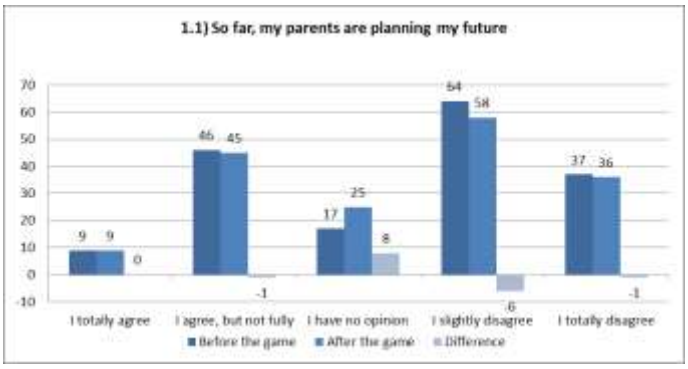
This questionnaire was designed to determine the influence of the C-Game and activities related to this game on the decision-making process of pupils about their future professional direction. The questionnaire was filled out by the pupils twice. The pupils filled it in the first time before the game and the second time after the game. Both questionnaires were to be marked by pupils either with a pupil code or a nickname so that they could be matched. From the total number of completed online questionnaires, it was possible to clearly identify only 173 pairs of questionnaires, from which 166 were completed in Czech and 14 in English.

Questionnaires were filled out by pupils using their pupil code or nickname to preserve anonymity, and it is not possible to find out which questionnaire was filled in by a girl and which by a boy.

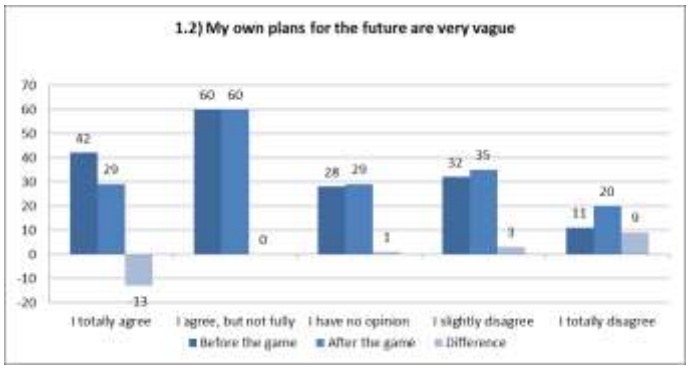
The questionnaire had 4 section and 38 items. The individual items of the questionnaire are further commented on.

## 4.1 1st section: My future and with whom I speak about it

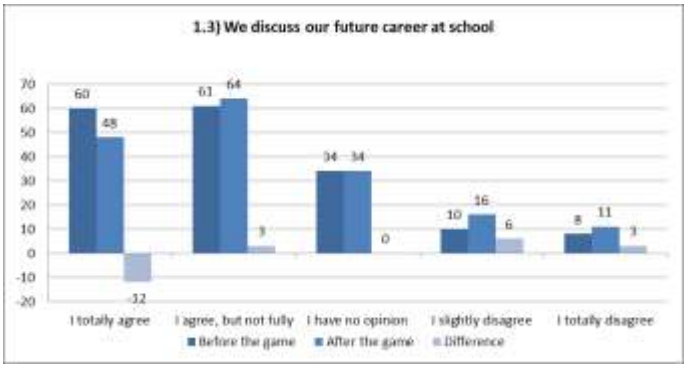
In this section we asked pupils to select one response on their future and with whom they speak about it.



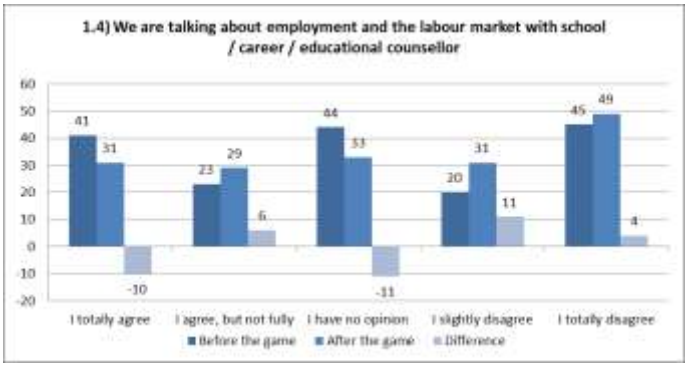

If we add up the results of the answers before and after the game (hereinafter we will call this sum "on average"), then slightly more than half of the pupils (56%) do not agree that their parents determine their future. Less than one third (32%) agree with this and 12% of pupils took a neutral position. The number of pupils who are not sure if their parents plan the future slightly increased after the game.




On average, slightly more than half of pupils (55%) agree that their plans for the future are somewhat vague. 28% of pupils disagree with this statement, and 16% of pupils take a neutral position. Before the game, pupils considered their plans vaguer than after the game.

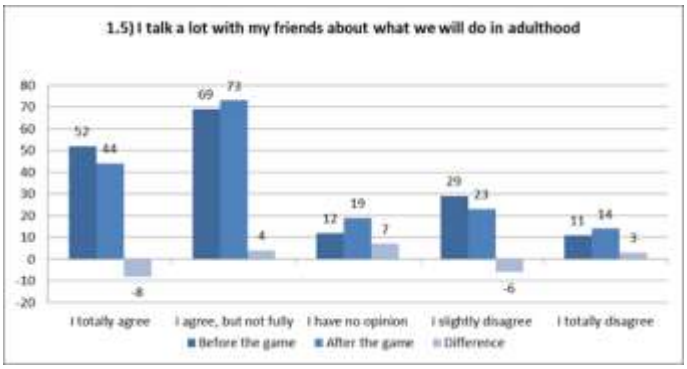



On average, 65% of pupils agree that they talk about plans for the future at school, 20% of pupils disagree with this statement and 13% of pupils took a neutral position. From responses it seems that the pupils realized after the game that they don't talk about the future that much at school.

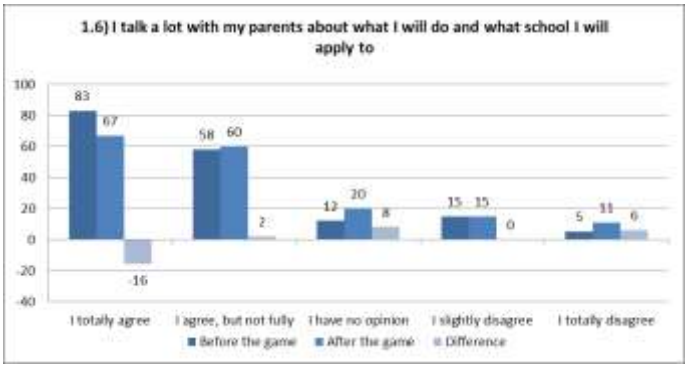



On average, there is little difference between positive (36%) and negative opinions (42%) before and after the game on talking about employment and the labour market with school / career / educational counsellor. What is different here is the relatively high percentage of neutral responses (22%).

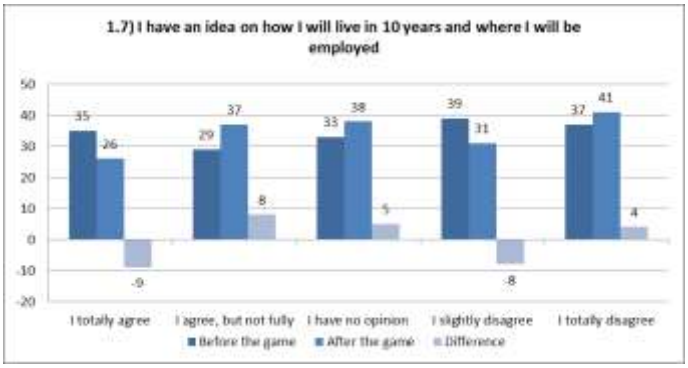
On average, 69% of pupils agree that they talk a lot with their friends about what we will do in adulthood, 22% disagree and 9% take a neutral position. Pupils changed their opinion about the extent to which they talk about their adult life with friends only slightly.




On average, 77% of pupils said that they talk a lot with my parents about what I will do and what school I will apply to, 13% of pupils do not talk to their parents about this topic and 9% took a neutral position. The answers show that pupils realized that they could talk to their parents about their life after school more than before.

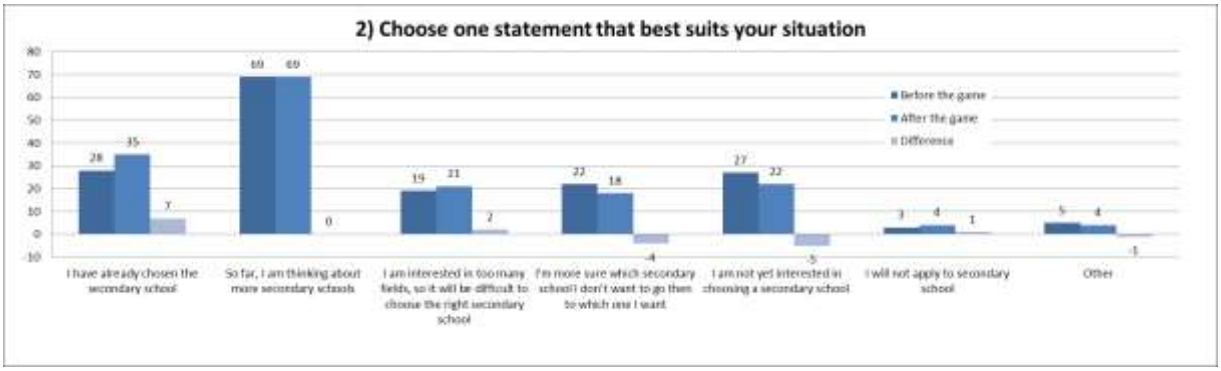



When asked if they have an idea on how they will live in 10 years and where I will be employed, slightly more pupils said that they do not (43%) than that they do (37%) and 21% were neutral. It seems that after the play, the pupils became more aware of their uncertainty about their future careers.



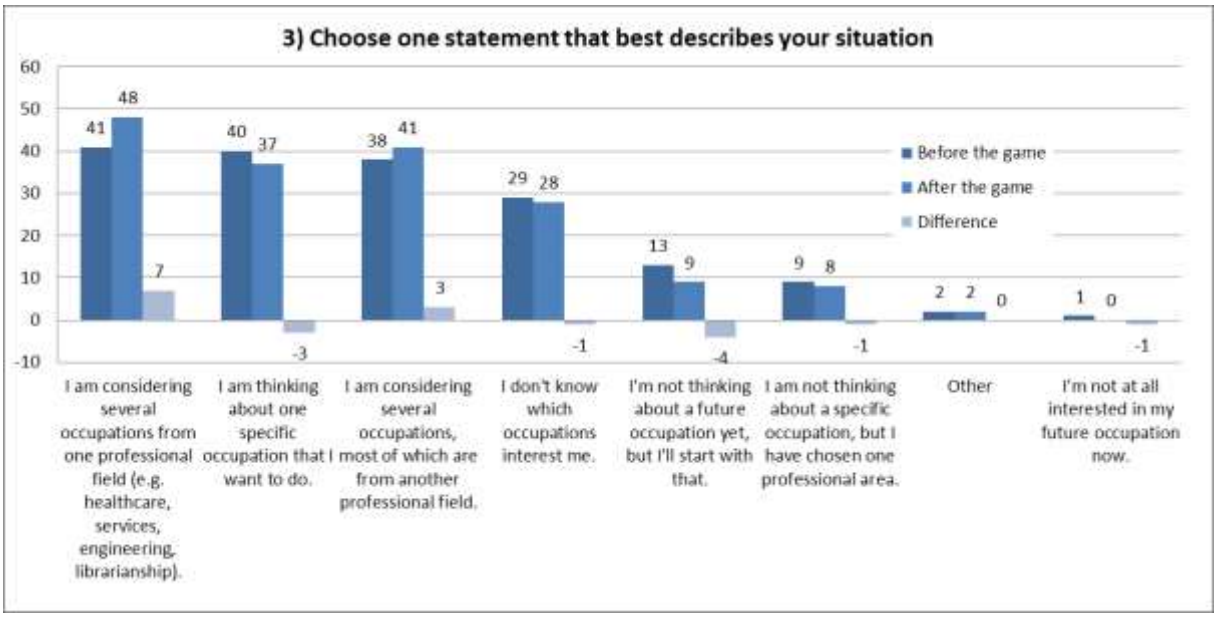

## 4.2 2nd section: Secondary school choice

There is a significant difference only in the answers to the already chosen secondary school. After the game, number of pupils claiming that they have already decided on their choice of secondary school increased by 7.



## 4.3 3rd section: Thinking about future occupation

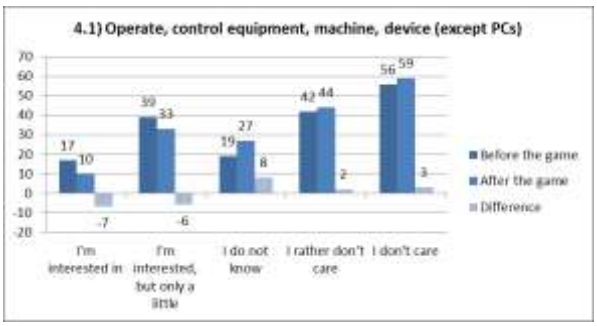
There is a change in the statements about the pupils' thinking about their future occupation in consideration of multiple occupations from one professional field, where there was an increase of 7 responses. We notice a slight change in favour of thinking about a future occupation.

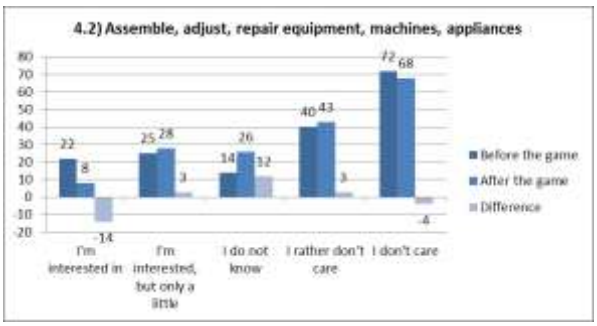



## 4.4 4th section: Activities and interest preferences

In this questionnaire section there were 29 descriptors that clearly determine an interest in working with things (4.1 – 4.7), with people (4.8-4.19), nature (4.20-4-22), data and information (4.23-4.27), and arts (4.28-4.29). Descriptors were originally created to describe occupations in the C-Game, but were ultimately not used for that purpose. Instead of descriptors, occupations in C-Game were assigned RIASEC codes.

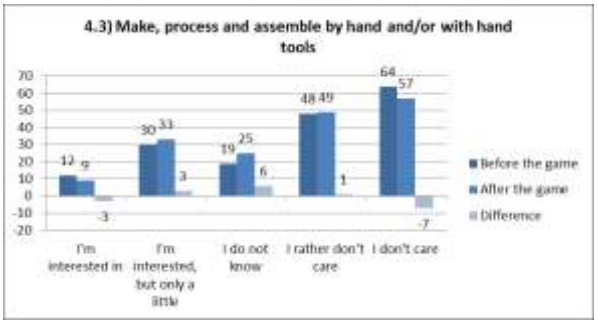
Pupils´ task was to mark their interest in individual descriptors before and after the game. The changes in pupils' answers before and after the game are smaller than expected. Nevertheless, even these lower differences can be influenced by the lack of concentration and inattention of the pupils, their desire to have the questionnaire filled out quickly, not reading the assignment and choosing answers randomly.

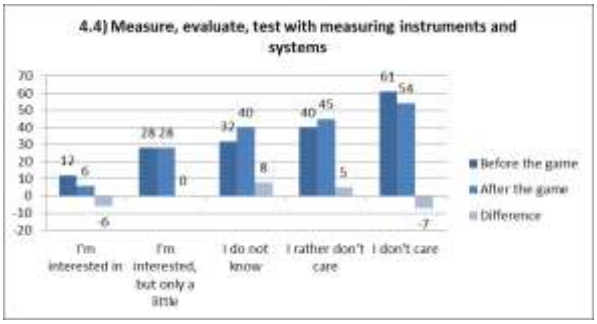


In average:
- 29% of pupils are interested,
- 13 % are neutral, and
- 60 % are not interested in operation and control of equipment, machines, and devices.
The changes that occurred after the game correspond to the above division.

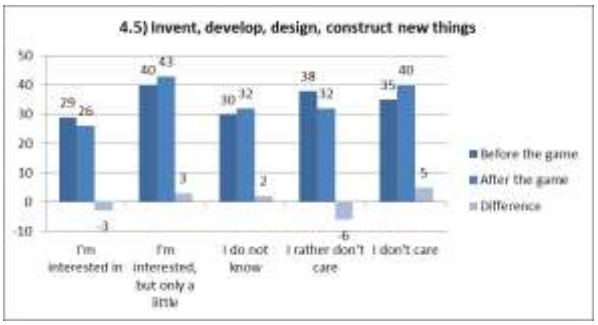
In average:
- 24% of pupils are interested,
- 12% are neutral, and
- 64 % are not interested in assembling, adjusting, and repair equipment, machines, and devices.
The changes that occurred after the game correspond to the above division.

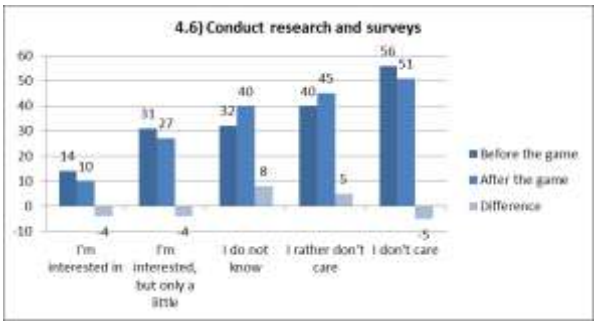



In average:
- 24% of pupils are interested,
- 13% are neutral, and
- 63% are not interested in making, processing and assembling by hand and / or hand tools.
The changes that occurred after the game went in favour of the neutral position.

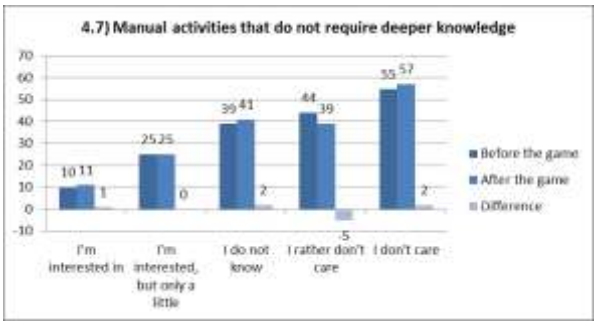
In average:
- 21% of pupils are interested,
- 21% are neutral, and
- 58 % are not interested in working with measuring instruments and systems.
The changes that occurred after the game went in favour of the neutral position.



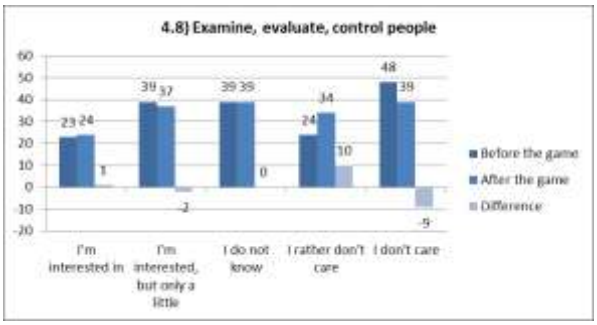




Pupils are divided into two balanced groups based on their interest in inventing, developing, design, and construct new things. In average 40% are interested, 42% are not interested, and 18% do not know.
The changes that occurred after the game correspond to the above division.

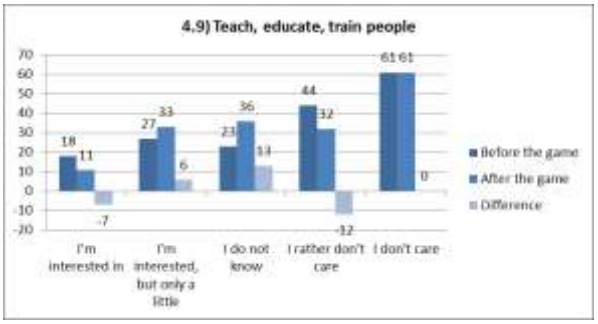
In average:
- 24% of pupils are interested,
- 21% are neutral, and
- 55 % are not interested in conduction research and surveys.
The changes that occurred after the game went in favour of the neutral position.



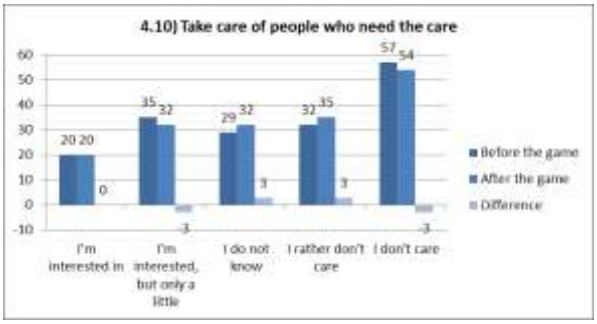

In average:
- 21% of pupils are interested,
- 23% are neutral, and
- 56 % are not interested in manual activities that do not require deeper knowledge.
Interesting is number of neutral answers (39, 41) that is bigger than the sum of the positive ones (26, 26).
The changes that occurred after the game correspond to the above division.



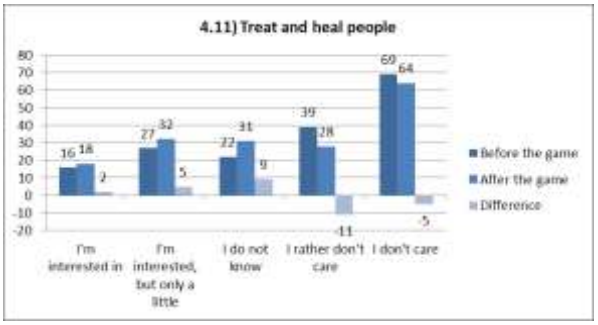

In average:
- 36% of pupils are interested,
- 23% are neutral, and
- 42% are interested in examining, evaluating, and control people. Pupils´ interest can be considered as balanced, negative attitudes are only slightly higher. There is a surprisingly high number of neutral responses.
The changes that occurred after the game correspond to the above division.

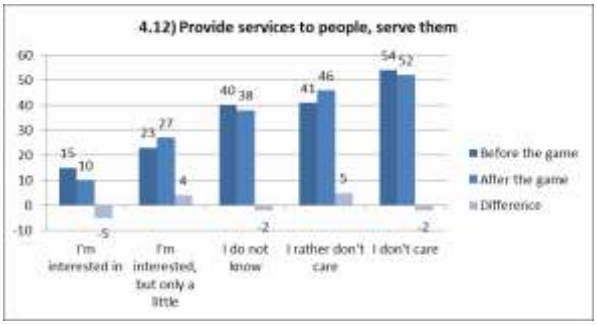



In average:
- 26% of pupils are interested,
- 17% are neutral, and
- 57% have negative attitude towards teaching, educating, and train people.
The changes that occurred after the game went in favour of the neutral position.



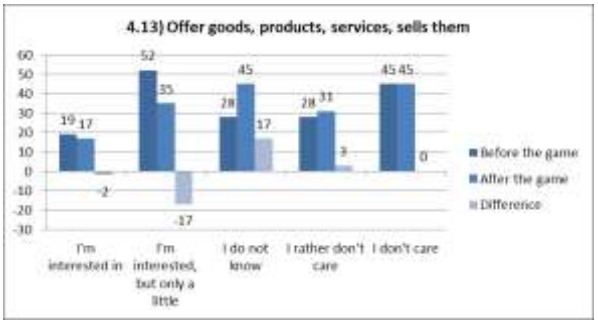

In average:
- 31% of pupils are interested,
- 18% are neutral, and
- 51% have negative attitude towards taking care of people who need the care.
The changes that occurred after the game correspond to the above division.

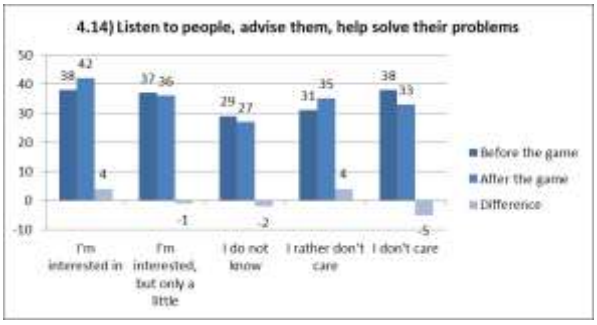


In average:
- 27% of pupils are interested,
- 15% are neutral, and
- 57% have negative attitude towards treating and healing people.
The changes that occurred after the game went in favour of the neutral position.

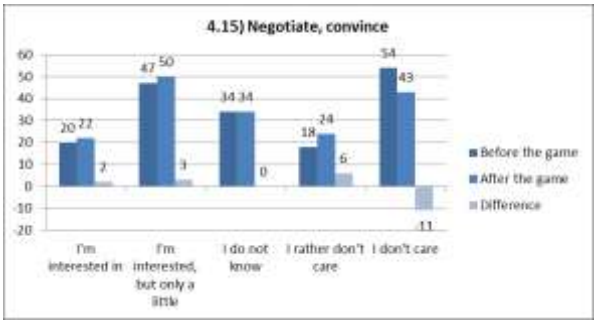
In average:
- 22% of pupils are interested,
- 23% are neutral, and
- 56% have negative attitude towards providing services to people and serve them.
The changes that occurred after the game correspond to the above division.

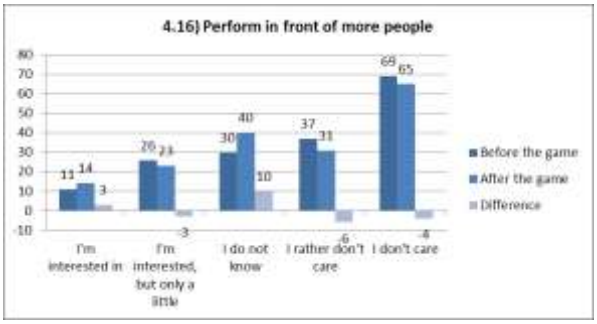



In average:
- 36% of pupils are interested,
- 21% are neutral, and
- 43% have negative attitude towards offering goods, products, services, and selling them.
The changes that occurred after the game went in favour of the neutral position.

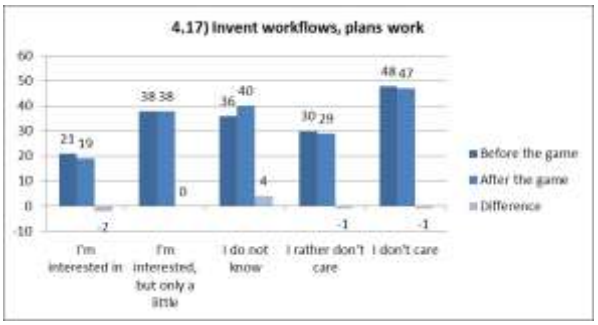
In average:
- 44% of pupils are interested,
- 16% are neutral, and
- 40% have negative attitude towards listening to people, advising them, and help to solve their problems.
The changes that occurred after the game correspond to the above division.



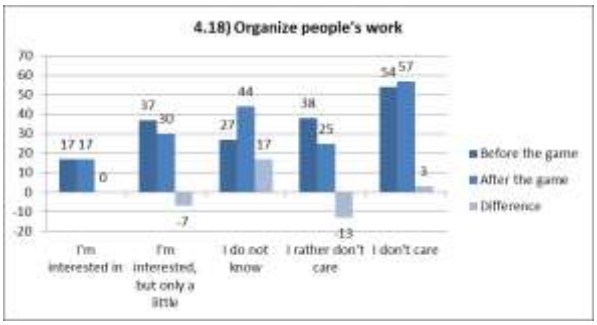




In average:
- 40% of pupils are interested,
- 20% are neutral, and
- 40% have negative attitude towards negotiating and convincing people.
The changes that occurred after the game correspond to the above division.

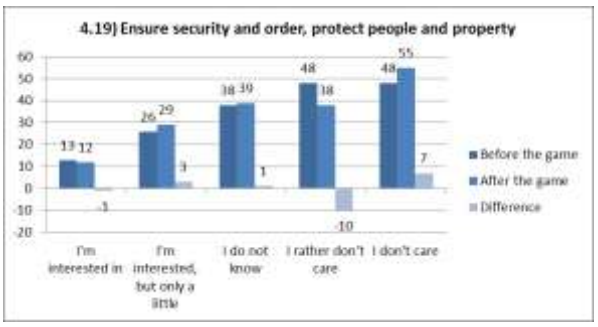
In average:
- 22% of pupils are interested,
- 20% are neutral, and
- 58% have negative attitude towards performing in front of more people.
The changes that occurred after the game went in favour of the neutral position.



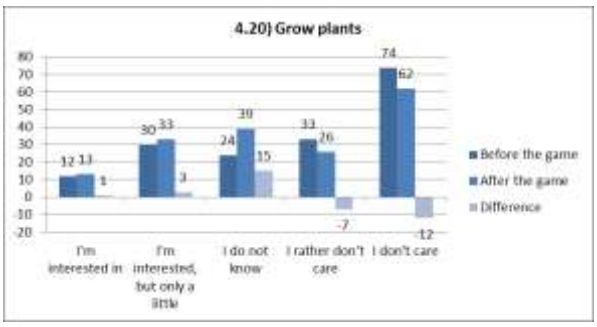

In average:
- 34% of pupils are interested,
- 22% are neutral, and
- 45% have negative attitude towards inventing workflows and planning work of others.
The changes that occurred after the game went in favour of the neutral position.



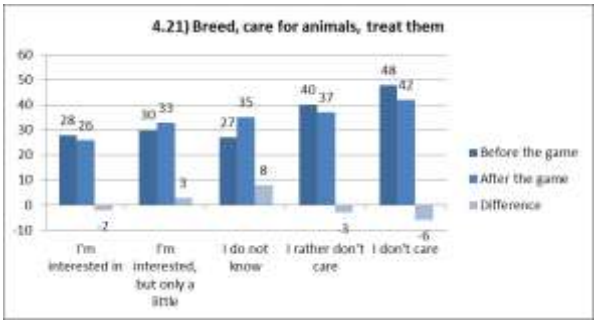

In average:
- 29% of pupils are interested,
- 21% are neutral, and
- 50% have negative attitude towards organizing people´s work.
The changes that occurred after the game went in favour of the neutral position.

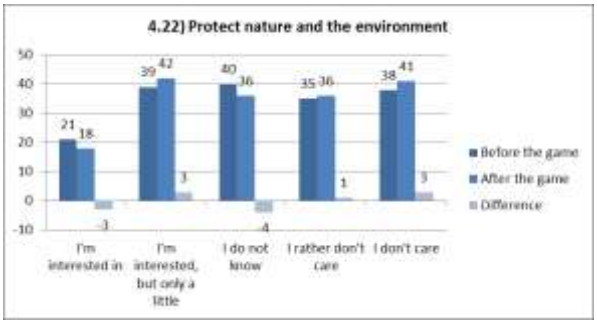



In average:
- 23% of pupils are interested,
- 22% are neutral, and
- 55% have negative attitude towards ensuring security and order, protect people and property.
The changes that occurred after the game correspond to the above division.



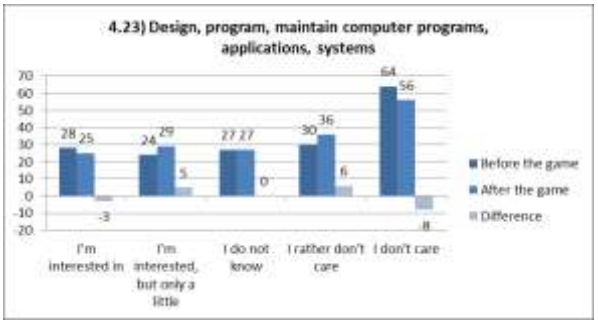

In average:
- 26% of pupils are interested,
- 18% are neutral, and
- 56% have negative attitude towards growing plants.
The changes that occurred after the game went in favour of the neutral position.

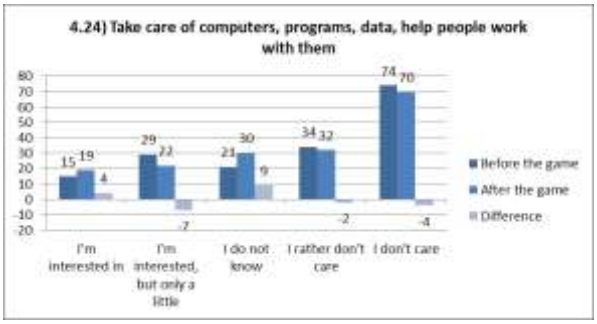


In average:
- 34% of pupils are interested,
- 18% are neutral, and
- 48% have negative attitude towards breeding, caring for animals, and treating them.
The changes that occurred after the game went in favour of the neutral position.

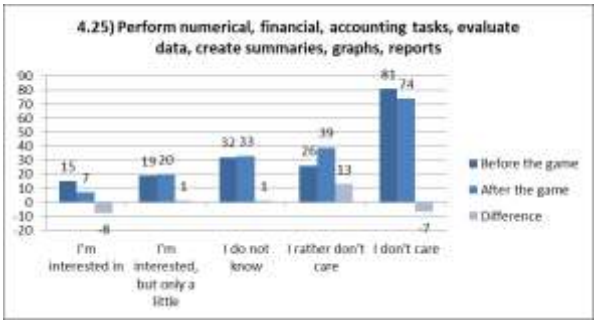
In average:
- 35% of pupils are interested,
- 22% are neutral, and
- 43% have negative attitude towards protecting nature and environment.
The changes that occurred after the game correspond to the above division.

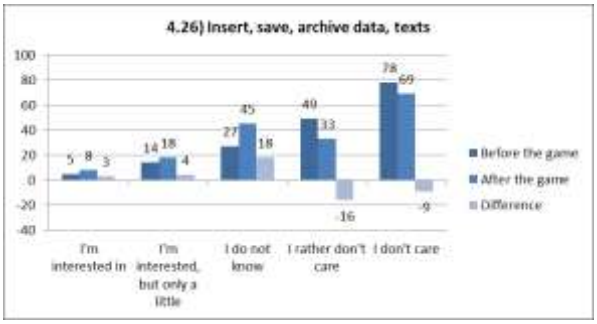



In average:
- 31% of pupils are interested,
- 16% are neutral, and
- 54% have negative attitude towards designing, programing, maintaining computer programs, applications, and systems.
The changes that occurred after the game correspond to the above division.

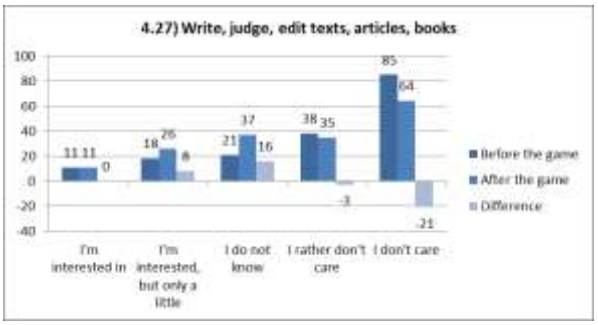
In average:
- 25% of pupils are interested,
- 15% are neutral, and
- 61% have negative attitude towards taking care of computers, programs, data, help people work with digital technologies.
The changes that occurred after the game went in favour of the neutral position.



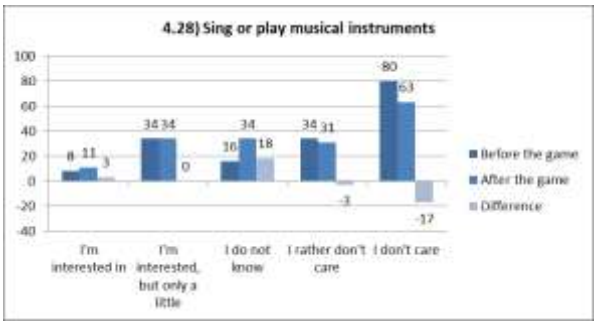




In average:
- 18% of pupils are interested,
- 19% are neutral, and
- 64% have negative attitude towards performing numerical, financial, accounting tasks, evaluating data, creating summaries, graphs, and reports.
The changes that occurred after the game correspond to the above division.

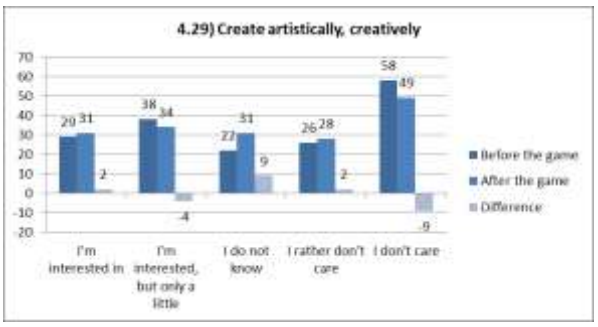
In average:
- 13% of pupils are interested,
- 21% are neutral, and
- 66% have negative attitude towards inserting, saving, archiving data and texts.
The changes that occurred after the game went in favour of the neutral position.




In average:
- 19% of pupils are interested,
- 17% are neutral, and
- 64% have negative attitude towards writing, judging, editing texts, articles, and books.
The changes that occurred after the game went in favour of the neutral position.




In average:
- 25% of pupils are interested,
- 14% are neutral, and
- 60% have negative attitude towards singing or playing musical instruments.
The changes that occurred after the game went in favour of the neutral position.

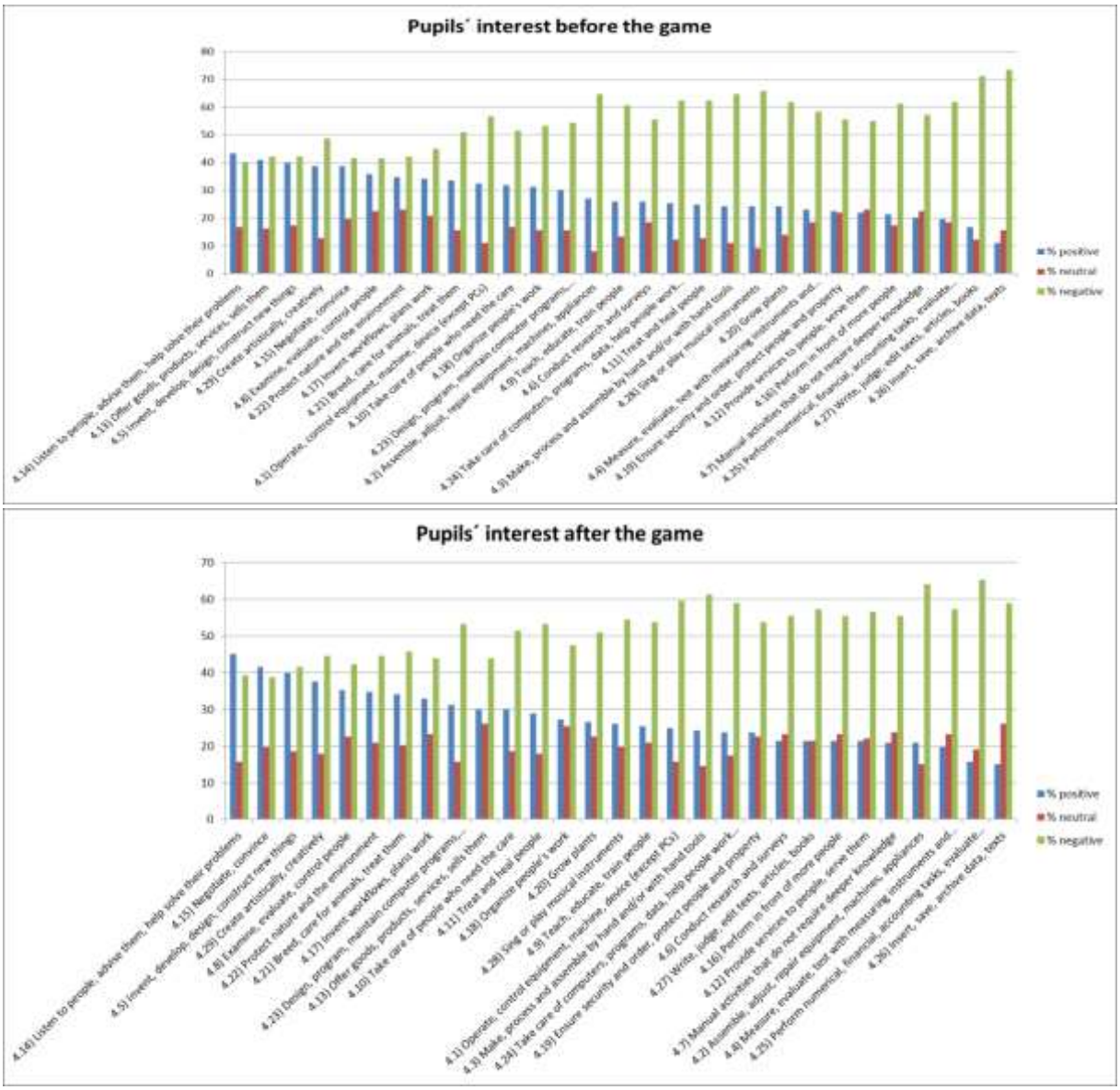



In average:
- 38% of pupils are interested,
- 15% are neutral, and
- 47% have negative attitude towards creating artistically, creatively.
The changes that occurred after the game went in favour of the neutral position.

### Summary of the above data

For illustration, we present two graphs summarizing the above data. The first captures the pupils' answers before the game and the second after the game. The information in both graphs was sorted according to positive responses in individual descriptors. Both graphs show a large ratio of negative responses and relatively large amount of neutral responses.

Descriptors – the “winners” - are listed below.

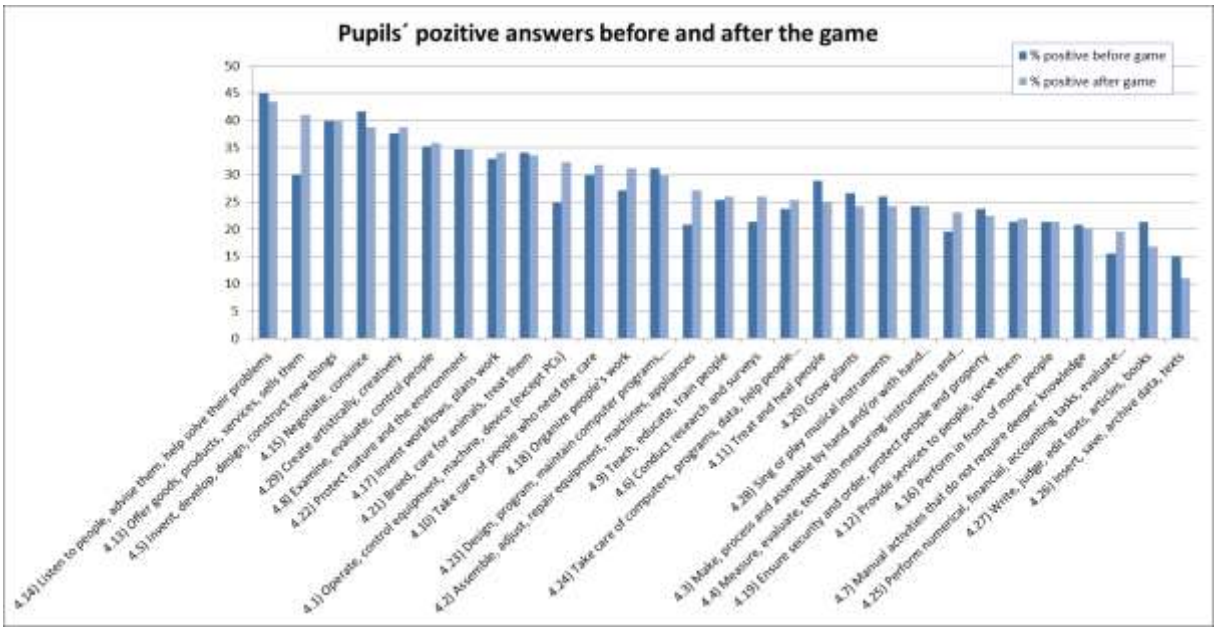



There was almost the same number of positive responses to the descriptors in the questionnaires before the game (1,426) and after the game (1,385) with a difference of 41 responses. There was a relatively large increase in the number of neutral answers "I don't know, I have no opinion" after the game (by 204 more answers) than before the game. 41 previously positive responses and 163 previously negative responses moved to neutral responses. Overall, there were probably more pupils who are less sure of their choice after the game than they were before the game.

| Answers possibilities | Before the game | Before the game | After the game | After the game | Difference |
|---|---|---|---|---|---|
| I'm interested in | 519 | 1.426 | 475 | 1.385 | -41 |
| I'm interested, but only a little | 907 | | 910 | | |
| I do not know | 819 | 819 | 1.023 | 1.023 | 204 |
| I rather don't care | 1.048 | 2.772 | 1.018 | 2.609 | -163 |
| I don't care | 1.724 | | 1.591 | | |
| **Total answers** | **5.017** | **5.017** | **5.017** | **5.017** | **0** |

The reduction in the negative rating of descriptors could be considered as positive contribution of the game, but especially in the case when the negative rating would move to the positive rating, not to a neutral one, as can be seen from the above-mentioned table. The reason why the neutral rating increased is difficult to estimate. Perhaps the pupils realized during the game that they were undecided about their future direction, but it is also possible that this was due to another reason.

The following graph shows the positive evaluation of the descriptors before and after the game.




The following table provides an overview of positive responses (the sum of the responses *"I'm interested in"* and *"I'm interested, but only a little" in %*) from the total responses to the given descriptor.

| No | Descriptor | % positive before the game | % positive after the game | average |
|---|---|---|---|---|
| 4.14) | Listen to people, advise them, help solve their problems | 45 | 43 | 44 |
| 4.15) | Negotiate, convince | 42 | 39 | 40 |
| 4.5) | Invent, develop, design, construct new things | 40 | 40 | 40 |
| 4.29) | Create artistically, creatively | 38 | 39 | 38 |
| 4.13) | Offer goods, products, services, sells them | 30 | 41 | 36 |
| 4.8) | Examine, evaluate, control people | 35 | 36 | 36 |
| 4.22) | Protect nature and the environment | 35 | 35 | 35 |
| 4.21) | Breed, care for animals, treat them | 34 | 34 | 34 |
| 4.17) | Invent workflows, plans work | 33 | 34 | 34 |
| 4.10) | Take care of people who need the care | 30 | 32 | 31 |
| 4.23) | Design, program, maintain computer programs, applications, systems | 31 | 30 | 31 |
| 4.18) | Organize people's work | 27 | 31 | 29 |
| 4.1) | Operate, control equipment, machine, device (except PCs) | 25 | 32 | 29 |

| No | Descriptor | % positive before the game | % positive after the game | average |
|---|---|---|---|---|
| 4.11) | Treat and heal people | 29 | 25 | 27 |
| 4.9) | Teach, educate, train people | 25 | 26 | 26 |
| 4.20) | Grow plants | 27 | 24 | 25 |
| 4.28) | Sing or play musical instruments | 26 | 24 | 25 |
| 4.24) | Take care of computers, programs, data, help people work with them | 24 | 25 | 25 |
| 4.3) | Make, process and assemble by hand and/or with hand tools | 24 | 24 | 24 |
| 4.2) | Assemble, adjust, repair equipment, machines, appliances | 21 | 27 | 24 |
| 4.6) | Conduct research and surveys | 21 | 26 | 24 |
| 4.19) | Ensure security and order, protect people and property | 24 | 23 | 23 |
| 4.12) | Provide services to people, serve them | 21 | 22 | 22 |
| 4.4) | Measure, evaluate, test with measuring instruments and systems | 20 | 23 | 21 |
| 4.16) | Perform in front of more people | 21 | 21 | 21 |
| 4.7) | Manual activities that do not require deeper knowledge | 21 | 20 | 21 |
| 4.27) | Write, judge, edit texts, articles, books | 21 | 17 | 19 |
| 4.25) | Perform numerical, financial, accounting tasks, evaluate data, create summaries, graphs, reports | 16 | 20 | 18 |
| 4.26) | Insert, save, archive data, texts | 15 | 11 | 13 |

Let's consider the descriptors that received more than 25% positive responses as “winners” and divide these 15 “winners” into the above 5 groups (thinks, people, nature, data, arts). These results cannot be generalized to the entire population of Czech pupils because the sample was not representative both in terms of its size and the essentially random selection of schools and pupils involved.

**According to this first group of pupils´ interests are activities during which occurs contact with “people”:**

4.14) Listen to people, advise them, help solve their problems (in average 44%)
4.15) Negotiate, convince (in average 40%)
4.13) Offer goods, products, services, sells them (in average 36%)
4.8) Examine, evaluate, control people (in average 36%)
4.17) Invent workflows, plans work (in average 34%)
4.10) Take care of people who need the care (in average 31%)
4.18) Organize people's work (in average 29%)
4.11) Treat and heal people (in average 27%)
4.9) Teach, educate, train people (in average 26%)

**2nd group of pupils´ interest is in connection with “things”:**

4.5) Invent, develop, design, construct new things (in average 40%)
4.1) Operate, control equipment, machine, device (except PCs) (in average 29%)

**3rd group of pupils´ interest are activities falling under "arts":**

4.29) Create artistically, creatively (in average 38%)

**4th group of pupils´ interest concerns "nature":**

4.22) Protect nature and the environment (in average 35%)

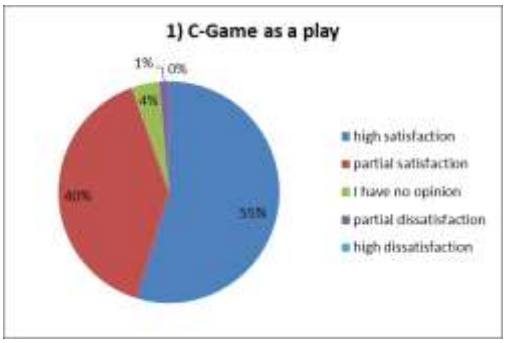
4.21) Breed, care for animals, treat them (in average 34%)

**5th group of pupils´ interest is in connection with "data":**

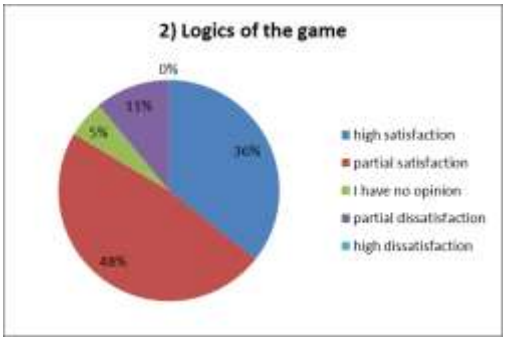
4.23) Design, program, maintain computer programs, applications, systems (in average 31%)

# 5 Pupils' feedback questionnaire

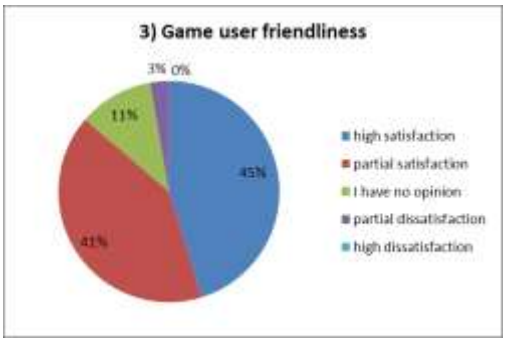
This questionnaire was in the Czech Republic not mandatory for the pilot test and was therefore answered by only 73 pupils. They answered the questionnaire several days apart after the game.




The majority of pupils evaluate the game as a whole positively (95%), 4% took a neutral position and 1% commented on the game as partial dissatisfaction.

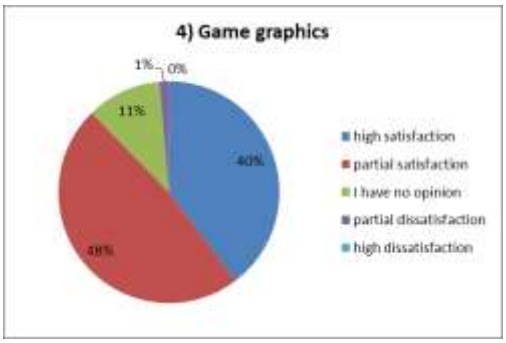



The logic of the game was evaluated positively by the majority of pupils (84%), 5% of pupils took a neutral position and 11% of pupils are partially dissatisfied with the logic of the game.

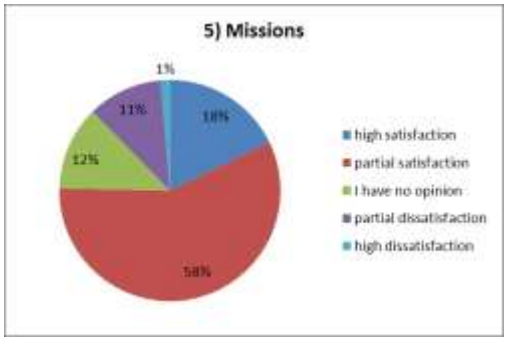



86% of pupils rated the user friendliness positively, 11% of pupils did not comment and 3% found the game unfriendly. From the verbal expression, these are mainly pupils with whom the game was played on mobile phones.

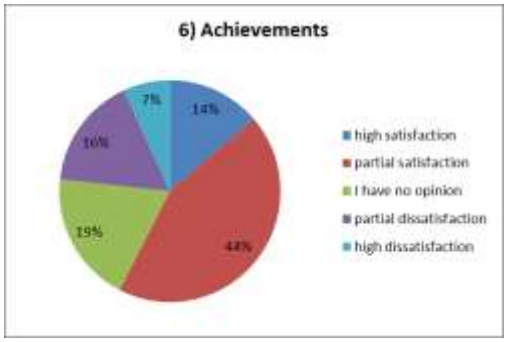
While 88% of pupils like the graphics of the game, 11% did not comment on this topic and 1% are partially dissatisfied with the graphics. It follows from the verbal expression that the pupils do not like a "dead" city without inhabitants and movement.



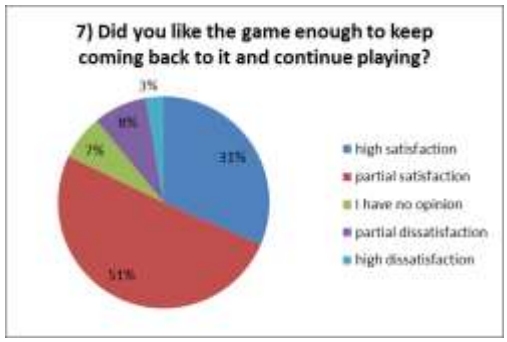

One mission opens up for players after every 5 vacant jobs are occupied. Some missions require careful reading of job activities and choosing the correct job title. 76% of pupils evaluate the mission positively, 12% of pupils take a neutral position, 11% of pupils are partially dissatisfied with the missions and 1% is highly dissatisfied.



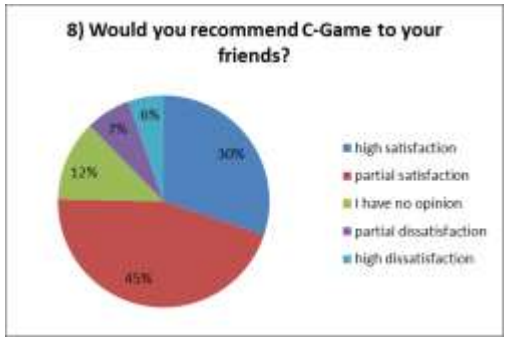

Achievements received the most critical comments from pupils. Only 58% responded positively to the missions, 19% apparently did not study the missions and 23% of the pupils evaluated the missions negatively.



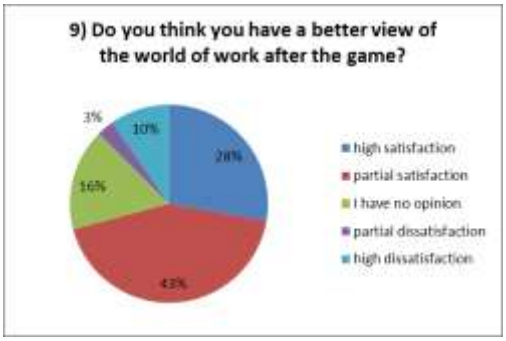

Majority of pupils (82%) said positively that they liked the game and that they could continue playing. 7% took a neutral stance and 11% commented negatively on their further C-Game playing.



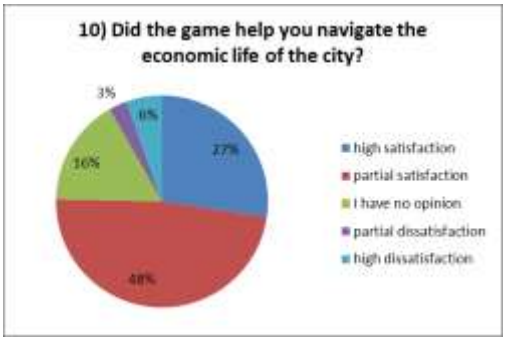

Almost three quarters of pupils (75%) would recommend the game to their friends, and approximately the same percentage would not recommend it (13%) and were neutral (12%).



**We consider as very positive that 71% of the pupils said that they have a better view of the world of work after C-Game.** 16% were neutral and only 13% were negative.




**Another very positive result of the game is that 75% of the pupils said that C-Game helped them to orientate themselves better in the economic life of the city,** 16% were neutral and only 8% were negative.




**Comments and remarks from the open field**

In the field in which the pupils had the opportunity to comment on the game and its individual elements, they wrote comments of various lengths, which can be summarized as follows.

**1) The game as a whole**

69 comments, of which 47 positive and 28 critical. The positives were generally formulated briefly as "good", "I like it", "nice game", "OK", etc.

- *Good gameplay and logic*

Criticisms included:

- *Game lengths and after a certain period of boredom (8 notes)*
- *Not much action (5 notes)*
- *Too much reading (4 notes)*
- *A city without inhabitants and movement (6 comments) "The city is empty of people, people could actually increase"*
- *Unplayable on mobile (4 notes)*
- *Different target group (1 note) "Seventh-graders would enjoy it more than us ninth-graders"*

**2) Graphic Design**

7 comments, of which 3 positive (good, nice) and 4 critical, of which 3 related to the unfinished sea:

- *What about the blue rectangles instead of the sea, it's like what.*

**3) Internet speed**

8 pupils complained about problems with internet speed.

- *It sucks, the school has crappy internet*

**4) Achievements**

5 notes regarding the importance of achievements in the game in particular:

- *They are useless, it's a pity that they don't lead to a faster move to a higher level.*

**5) Mission**

The missions were given 3 critical notes pointing out their excessive complexity.

- *Mission too complex, too much reading.*

**6) Chat**

Chat only appeared once in the notes

- *What about adding some chat or something so I can see how my city is doing against my friends*

**7) Search**

Only one pupil complained about the missing search.

- *I'm missing a search function.*

Pupils' comments and notes in feedback questionnaires are generally the same as those listed in the facilitators' records from the individual pilot verifications. We learned from them that pupils generally liked the game and contributed to their greater outlook on occupations, the labour market and economic life in the city. We also obtained valuable information and suggestions for further development from the pupils' notes and comments and how they perceive the game. E.g. their opinion on the fact that it could also be played by seventh-grade elementary school pupils.

# 6 Conclusions from C-Game piloting in the Czech Republic

In the Czech Republic, already during the second year of project implementation, a campaign focused on informing elementary schools about the development of the C-Game. Individuals interested in pilot verification had the opportunity to let us know their interest via the online contact form provided on the website http://project.c-game.cz/cz/ (the form was already deactivated). Out of the total number of 18 expressed their interest, 7 elementary schools participated in the pilot verification, of which only 6 met the pre-determined requirements and submitted all the documents that were required. The seventh school could not meet these conditions due to poor quality of their internet.

The participating schools appreciated the opportunity to participate in the pilot verification and also the time when the pilot verification was carried out. According to their reactions, the month of September was ideal, because classes had not yet fully started and, especially for ninth graders, the beginning of the school year becomes a topic of choosing a secondary school.

In chapter 3.5 Recommendations for game enrichment, the facilitators' recommendations are summarized, which are not in within this project implementable in the game, especially because of the need of continuous updating and processing complexity. From the other comments, we select the following, which from our point of view are justified and feasible and can be implemented:

- Lacks a well-thought-out story and its integration into the game
- Dividing the game into several smaller parts / levels and better defining what needs to be accomplished to move to a higher level of the game
- Each level of the game should be playable differently
- The game should be more action-packed and contain some fun
- The city should not be "dead", but alive, and after each time the player earns an increase in population, at least 1/10 of them should be added to the city, i.e. for each building 10 pictures of people and for each profession 1 picture of a person and the means of transport should also increase as well - for example, if I build an airport, there will be 10 people around the airport and 1 plane / helicopter. There should be more greenery in the city and photovoltaic panels on the roofs of buildings.
- Vacancies should have a maximum number of wrong answers, just like missions.
- For completing missions and achievements, residents should increase - not only in the form of numbers, but also in the form of images of people on the streets.
- Sea and coast graphics

- The option to chat is missing
- Missing job search function

The Association of Educational Consultants has invested countless hours of labour into the game on job descriptions, work activities, work subjects, etc., translating them into English, negotiating, communicating with partners, with schools, etc. The hours and hours of work done may not be completely at first glance obvious, but they are rendered in the game itself and hidden in the game's database. There are now 609 occupation cards (vacancies) in the database, which are divided into 136 buildings according to their nature. Each building is classified into one of the 8 economic areas of the city. The database contains more than 330 standard text pages in five language versions. The Czech partners of the project (Avp and NVF) were responsible not only for the Czech version of everything in the database, but also for the English version of the same, for the graphic design of the game and its programming.

Despite its efforts devoted to the preparation of the game, C-Game will definitely take care of it closely, ensure its operation and cover any small costs for the operation and maintenance of the application and website at least for the period: a) when its software is capable of online operation, b) when in its power to update the information about occupations accordingly.

## *C-Game Czech pilot report*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|---|---|
| **Project** | C-Game: Career guidance game in the city full of occupations<br>No 2019-1-CZ01-KA201-061204 |
| **Output** | O3-11 |
| **Financed from** | ERASMUS+ program, 2019-2022 |
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