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Project Career guidance game in a city full of occupations No 2019-1-CZ01-KA201-061204

C-Game pilot verification from the statistical point of view

C-Game project

Praha, November 2022

Contents

1 Introduction

Most children are attracted to the world of computer games. If they are drawn into the game, it is hard to tear them away from it. This was, among other things, the reason why the educational game C-Game was developed as part of the ERASMUS+ program project C-Game: Career guidance game in a city full of occupations during the years 2020-22. The following institutions participated in the development of C-Game:

- Association of Educational Counsellors, Czech Republic
- National Training Fund, Czech Republic
- K.A.B.A. Slovakia, Slovakia
- TeCeMko, Slovakia
- Znam I Moga, Bulgaria
- ISON, Greece

In the project application entitled C-Game: Career guidance game in a city full of occupations (https://project.c-game.cz/), we planned to create a game intended for pupils in the last years of elementary school who are facing their first choice of profession and related educational paths. A game that goes beyond the boundaries of the classroom and provides pupils with a deeper insight into the world of work in a playful, interactive and engaging way and helps them to start thinking about their life and work plans.

We have been working on this goal for 29 months with above mentioned partners from Slovakia, Bulgaria and Greece. The result is an originally programmed, publicly and freely available C-Game, which is equipped with an extensive database in 5 languages with a user-friendly editorial system allowing each of the partners to change the published texts inside the game at any time.

C-Game can be played both individually and with groups of pupils under the guidance of a facilitator. It is playable on digital devices such as desktop and laptop computers and tablets with a fast and stable internet connection and the Google Chrome browser. Playing on mobile phones is not recommended due to game graphics high resolution and map size.
C-Game is free and freely available on the website https://play.c-game.eu. The game is equipped with a facilitator "back office". To enter it, please send an email to freibergova@asociacevp.cz.

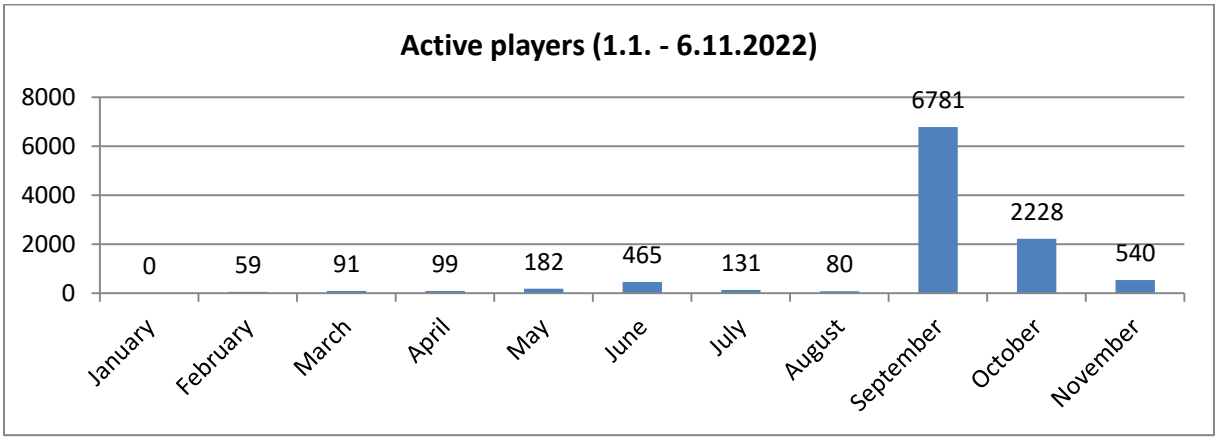
This document summarizes the progress of the game pilot verification from a statistical point of view. The data on which this report is based was drawn from the C-Game database and is from the period January 2022 to October 2022, when the pilot testing of the game took place. The development graphs also show the beginning of November 2022, when this document was being prepared.

2 Active players

Pilot verification began to take place gradually from February till beginning of November 2022 (Chart 1). Initially with the help of internal collaborators, and since April, C-Game has been tested with primary school pupils in Starý Kolín. In April, the C-Game newsletter was sent round and the number of newly registered game users slightly increased. E.g. members of the Association of Educational Counsellors began testing the game with small groups of pupils and family members. Another newsletter was sent out in June, which appears to have attracted interest in C-Game over the holidays, and, applications for participation in the C-Game pilot validation began through the project website. In September, pilot verification and dissemination events took place in all participating countries. Interest in using the game began to rise sharply.

From the beginning of the year to November 6, 2022, amount of 10 832 active players were recorded in the game. Chart No. 1 shows their gradual ramp-up since February, a slight increase in June, a sharp increase in September, and the continuation of the increase in players in October even after the end of the pilot testing. For further calculations, the 540 active players in November are not included.

Graph No 1: Active players



C-Game offers three options for registration: a) classic email and password, b) pupil code (see chapter 2.1), c) as a guest. Almost 60% of entries into the game (Tab. 1) come from direct entry into the game during internal testing. If we disregard these entries related to internal testing, then from January to October 74% of pupils entered the game with their unique pupil code (Tab. 1). Pupil codes were also used in dissemination events (2%), where participants entered the game in the role of pupils. There were approximately 12% of users entering the game by email, as well as guests.

Tab. No 1: All users' entrance to C-Game

Method of registration	Number of entrance
Undetermined (internal testing)	5 950
Pupil code	3 093
Pupil code used in dissemination events	56
E-mail	527
Host	490
In total	**10 116**

The Czech game version was used the most (78%), which was certainly due to the size of the Czech team, including the Association of Educational Counsellors as well as the project team, the coordinator, programmer and graphic/game designer, who also participated in the internal piloting, as well as other team members who entered the game very often, and continuously monitored functionality of individual elements of the game and reported weaknesses and defects in the functionality of the game (Tab. 2).

In the same way, the other teams entered the game often in proportion to size of their teams and their target groups. 17% of the users entered the Slovak language version, 2% in Greek as well as in English, and 1% in Bulgarian version, which also corresponds to the above-mentioned number of registered users.

Tab. No 2: Number of entrance to language versions

C-Game language version	Number of entrance
English	230
Czech	7 848
Slovak	1 661
Greek	243
Bulgarian	134
In total	**10 116**

2.1 Facilitators[1]

It was chosen to use pupil codes for pupil entry into the game for several reasons. They allow pupils to enter the game more easily as they don't have to enter email address and remember the password. If the pupil forgets the code, they can contact their facilitator who can easily retrieve it from the system. The facilitator can follow the game of the classes and

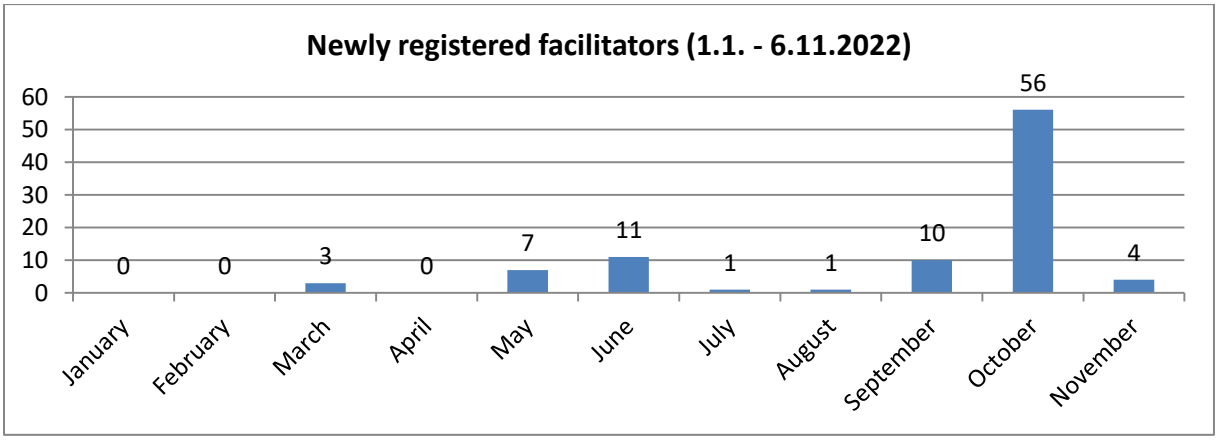
[1] The term "facilitator" is used to refer to anyone who works with pupils in the last years of elementary school in or out of school, and helps pupils in their first choice of profession and secondary school.

pupils he/she founded and obtain information about the interest profile of individual pupils from the game. Its main function is to provide feedback to pupils, which would be more difficult without the possibility of monitoring the game.

The facilitator must request the possibility of entering the facilitation environment (back office) by e-mail (freibergova@asociacevp.cz). Access is usually established within few days. For this step, the Association of Educational Counsellors decided to have an overview of who is interested in using C-Game. So far, there has been no reason to deny access to the back office to any interested parties.

Graph No. 2 shows the newly registering facilitators, of whom 89 joined the game during the given period and 4 in the first days of November, which do not count further. In September, the main round of pilot verification took place and at the same time dissemination events, which aroused great interest of facilitators in joining the game.

Graph No 2: C-Game facilitator's registration



Most facilitators (Tab. 3) come from Slovakia (50%), number of the Czech facilitators is slightly lower (41%). The relatively low number of facilitators in Bulgaria (4) can be explained by the size of their team and the way they work with youth. The Greek institution is an expert in the creation of diagnostic and psychodiagnostic tools and does not work directly with youth. Nevertheless, they also successfully participated in the pilot verification.

Tab. No 3: Facilitators origin

Country	Number of facilitators
Czech Republic	37
Slovakia	45
Greece	3
Bulgaria	4
In total	**89**

The vast majority of facilitators (Tab. 4) work in elementary schools (79%) and the remaining 21% are divided between gymnasiums (2%), self-employed (2%), universities (1%), the Labour Office (1%) and partners (14%). Out of the total number of 89 facilitators, only 5 are men.

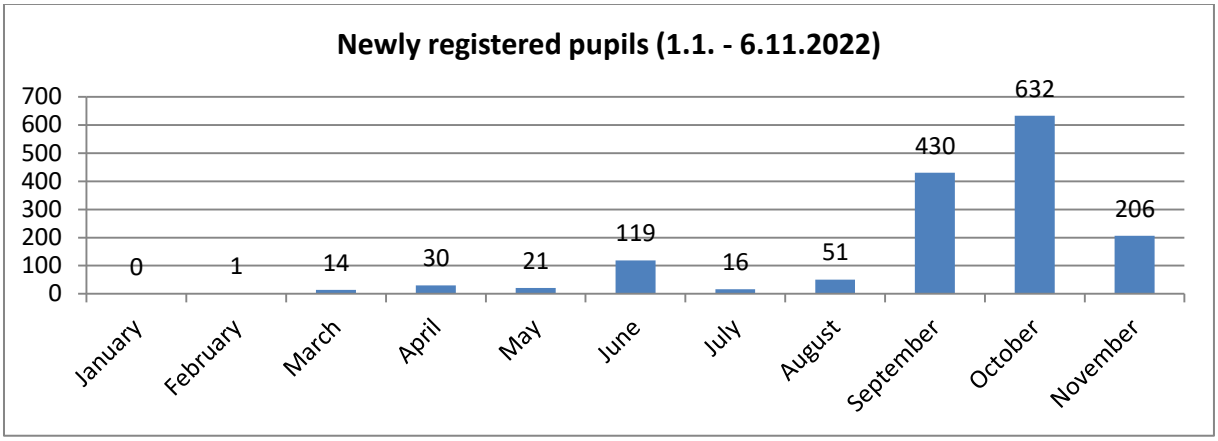
Tab. No 4: Facilitators and their institutions

Facilitators and their institutions	In total
Elementary School	70
Grammar school	2
Self-employed	2
University	1
Employment Department	1
Partners	---
Association of Educational Counsellors, Czech Republic	2
National Training Fund, Czech Republic	1
KABA, Slovakia	2
TeCeMko, Slovakia	2
Znam i Moga, Bulgaria	3
ISON, Greece	3
In total	**89**

2.2 Pupils

Chart No. 3 shows over time how 1 520 pupils were registered by facilitators in the back office from March 2022. In the first eight months, 16% of pupils were enrolled, half of them in June (8%). A few facilitators enrolled pupils and prepared pupil codes in August. In September, 28% pupils were registered and the most in October (42%). The data for this report was downloaded from the database as of 6/11/2022 and 14% of pupils were enrolled during the first week of November. Only 1 314 pupils are included in further calculations, 206 pupils are not included in further calculations.

Graph No 3: Newly registered pupils with pupils codes



A total of 96 classes were established (Tab. 5), of which Czech facilitators established 56 classes (59%) with an average number of 14 pupils in one class (not including 4 classes established for the purposes of dissemination events), Slovak facilitators established 29 classes (32%) with an average number of 12 pupils, Greeks established 3 classes (3%) with an average number of 24 pupils and Bulgarian facilitators established 4 classes (4%) with an average number of 6 pupils.

Tab. No 5: Facilitators and their established classes

C-Game language version	Number of facilitators	Number of established classes	Number of classes per 1 facilitator	Number of pupils	Average number of pupils per class
Czech	36	56	1,6	785	14
Czech (dissemination events)	1	4	4	170	43
Slovak	45	29	0,7	268	10
Greek	3	3	1	70	23
Bulgarian	4	4	1	21	5
In total	**89**	**96**	**1,1**	**1 314**	**14**

A maximum of 50 pupils can be placed in each established class. It is up to the facilitator whether he decides to enrol all their pupils in one or more classes (Tab. 6). If we do not include in the calculation the last column with classes established for the purposes of dissemination events, most classes (42%) have up to 10 pupils, 31% from 11 to 20 pupils, 26% are classes with 21-30 pupils and over 30 pupils it is 1%.

Tab. No 6: Numbers of established classes in language versions

Number of classes	CZ	SK	GR	BG	CZ dis.events	In total
1 - 10 pupils	19	16	1	3	0	**39**

11 - 20 pupils	20	7	0	1	1	**29**
21 - 30 pupils	17	5	2	0	0	**24**
31 - 50 pupils	0	1	0	0	3	**4**
In total	**56**	**29**	**3**	**4**	**4**	**96**

When setting up a class, facilitators should also indicate the age range of the pupils (Tab. 7). However, it is not entirely conclusive that all facilitators indicated the correct age group. These concerns are mainly 10 classes of pupils younger than 8 years of age as well as one class of the age group 9 to 10 years. The purpose of the game with pupils over 17 is also debatable. The target group of pupils in the last years of elementary schools is 65% among the holders of pupil codes. For the age group marked 19+, we assume that these are classes in which potential facilitators were trained.

Tab. No 7: Indicated age of established classes

County	> 8	9-10	11-12	13-14	17-18	19+	Total
Czech Republic	8	0	8	31	8	4	**56**
Slovakia	1	1	4	18	2	3	**29**
Bulgaria	1	0	2	1	0	0	**4**
Greece	0	0	1	1	1	0	**3**
In total	**10**	**1**	**15**	**51**	**11**	**7**	**92**

The system generated **1 520** pupil codes. From this number, we can subtract 170 codes that were intended for participants in dissemination events and we do not count on these codes. The use of these codes is evaluated separately so that pupils' approach to the game is not distorted.

Thus, **1 314** pupil codes were generated for pupils, of which **858** entered the game, i.e. 75% of pupils used their codes to enter C-Game. There were **3,146** entries into the game with these pupil codes, and each pupil code thus accounts for an average of **3.67** entries into the game. This relatively high number can also be affected by a slower and unstable internet connection that causes game interruptions. Pupils thus have to enter the game more often during their game.

The largest group of players are pupils who played the game only once (36%), then twice (21%), three times (11%), four times (8%), five times (6%), six times (4%) and seven times (3 %), which adds up to almost 90% (Tab. 10). The higher frequencies of playing C-Game add up to 10%, however it is surprising that these players returned to the game more than nine times. The pupil with 26 games is quite exceptional. In these cases, the use of one pupil code by several pupils cannot be ruled out.

Tab. No 8: C-Game play frequency with pupil's codes

No of entrance	Number of pupils codes	No of entrance	Number of pupils codes
1	313	**11**	5
2	182	**12**	10
3	98	**13**	7
4	67	**14**	3
5	52	**15**	5
6	35	**16**	3
7	23	**17**	2
8	19	**18**	4
9	13	**19**	2
10	14	**26**	1
---	---	**In total**	**858**

For dissemination purposes, 170 pupil codes were generated, of which 56 codes were used to enter the game (Tab. 11). 36 participants (64%) entered the game only once, 10 twice (18%), 2 three times (3%) and 4 three times (5%). One participant entered the game five times and another ten times. The other three pupil codes were apparently used by the dissemination events participant to work with some group, so it is possible that the pupils' games are behind these three codes. We consider it unlikely, although possible, for one adult to enter the game more than 50 times.

Tab. No 9: C-Game play of dissemination events participants' frequency with pupil's codes

No of entrance	Number of pupils codes
1	36
2	10
3	2
4	3
5	1
10	1
51	1
59	1
68	1
In total	**56**

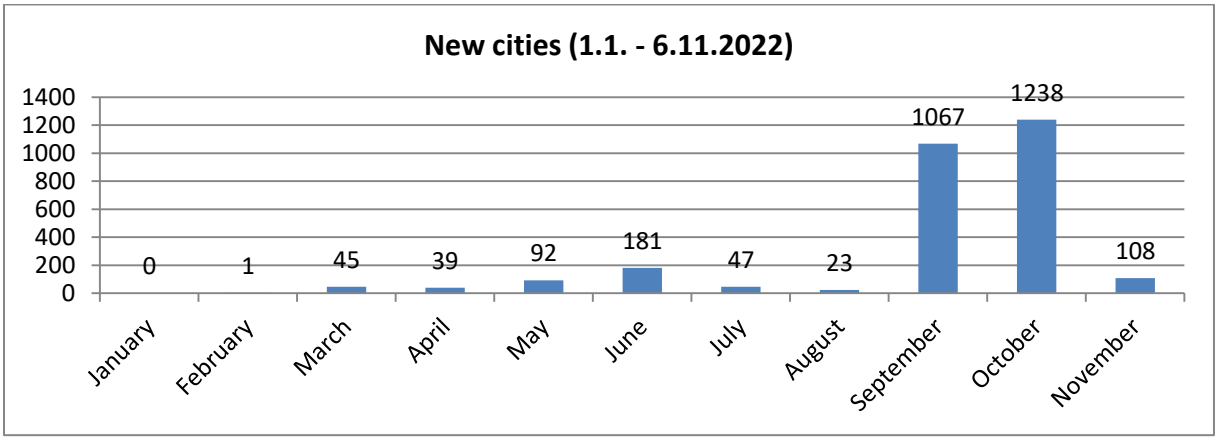
3 Course of the game

After a simple registration, the player gets to the city for which invents a name. Each of its cities is saved separately. Each player can establish any number of cities.

3.1 Cities

During the monitored period, 2 841 cities were created by all players (Graph 4). Their higher number was created in September and slightly less in October after the end of pilot testing. 108 cities created in during first week of November are not further not calculated.

Graph No 4: Development of cities



The game has 3 levels and the players, if they have multiple cities, can have each city in a different level of the game (Tab. 10). Most cities were in the first level of the game (86%). 12% of cities reached the second level and 2% reached the third level. Almost three quarters of all cities (71%) were built in the Czech game version, 13% in Slovak, 8% in English, 5% in Greek and 3% in Bulgarian.

Tab. No 10: Number of cities according the game level and language version

Number of cities in game levels	Language game version					In total
	EN	CZ	SK	GR	BG	
1st level	207	1682	349	134	76	**2448**
2nd level	9	305	18	23	2	**357**
3rd level	3	28	3	1	1	**36**
In total	**219**	**2015**	**370**	**158**	**79**	**2841**

Main indicator of players success is the number of residents, which are obtained by building a building (100 residents), occupying a vacant job (10 residents), completing a mission (10 residents), and obtaining an achievement (10 residents).

Tab. 11 provides an overview of the size of cities by population and the average number of city residents. In one third of the established cities (34%) no building has been built and the city has no inhabitants, yet the cities are included in the first level of the game, in which are 86% cities (the limit of the transition from the first to the second level of the game is 2 100 inhabitants). 13% of cities have between 2 101 and 10 000 inhabitants (10 000 residents is the threshold for entering the third level of the game). 1% of cities reached the third level of the game.

Tab. No 11: Built cities and acquired "inhabitants"

Number of cities by number of their residents	Number of cities	Number of residents	Average residents number in the city
0	975	-	-
1-500	705	148 755	211
501-2100	768	942 275	1 227
2101-10000	357	1 667 459	4 671
10001-20000	19	261 600	13 768
20001-30000	7	587 888	83 984
>30001	10	885 064	88 506
In total	**2841**	**4.496.296**	**-**

The following table (Tab. 12) contains an overview of the built buildings in given language versions. It shows players activity in individual language versions, but it cannot be ruled out that some Greek and Bulgarian players did not play the English version.

Tab. No 12: Built buildings in cities

Number of cities according number of built buildings	Number of built buildings in language versions					In total
	EN	CZ	SK	GR	BG	
0	109	734	101	59	46	**1049**
1-20	95	864	208	66	25	**1258**
21-40	7	255	53	20	8	**343**
41-60	5	49	1	5	0	**60**
61-80	3	111	7	8	0	**129**
>81	0	2	0	0	0	**2**
In total	**219**	**2015**	**370**	**158**	**79**	**2841**

3.2 Vacancis and their filling by employees

The game is based on vacancies being advertised in buildings that house institutions and companies, which the player fills by answering three to four randomly generated questions based on the information contained in the occupation card. For each occupied job, the player gains 10 residents. In total, there are 609 vacancies in the game, unevenly distributed in 135 buildings.

During the monitored period, players occupied a little more than 62 000 vacancies (Tab. 13). There are 1 317 cities in which was no occupied any vacancy. The rest are dominated by cities in which up to 50 vacancies were filled (77%). In 12% of cities, 51 to 100 vacancies were filled, 8% of cities are in the category of 101 to 200 vacancies, and 1% in the category of 201-300 and 2% have more than 300 vacancies filled.

Tab. No 13: Occupied vacancies in the cities

Number of occupied vacancies in the cities	Number of cities	Number of occupied vacancies
0	1317	-
1-50	1178	17300
51-100	174	12334
101-200	115	15618
201-300	21	5170
>300	36	11619
In total	**2841**	**62041**

The following table (Tab. 14) lists the number of occupied vacancies in individual language versions. Here, too, it is evident that the most active players were those using the Czech language version (81%). In second place was the Slovak language version (10%), third was Greek (5%), fourth was English (3%) and last was Bulgarian (1%).

Tab. No 14: Occupied vacancies

Number of occupied vacancies in cities	Number of occupied vacancies in cities					In total
	EN	CZ	SK	GR	BG	
1-50	505	12302	3085	1178	230	**17300**
51-100	307	10105	1055	725	142	**12334**
101-200	872	13026	1293	185	242	**15618**
201-300	-	4209	460	501	-	**5170**
>300	311	10653	327	328	-	**11619**
In total	**1995**	**50295**	**6220**	**2917**	**614**	**62041**

3.3 Missions

At the penultimate project meeting in Sofia (March 2022), it was decided to revive the game with missions, which were added to the game very soon. Every time after filling five vacancies, the player is offered to solve one thematic mission. Its solution lies in matching the name of the occupation to its description.

The following table (Tab. 15) provides an overview of the 15 missions topics, the number of occupations that are assigned in individual missions (usually these are almost all occupations having a certain relationship to the topic of the given mission), the number of attempts to complete the given mission, the number of successfully completed missions and mission play success percentage.

There were just over eight thousand attempts to play the missions, of which about one in five was successful. During the pilot testing, pupils reported that some of the missions were too difficult, but the pupils still liked them and played them.

Tab. No 15: Number of missions and their fulfilment

No	Mission topic	Number of occupation involved	Number of attempts to complete the mission	Successfully completed missions	% success of playing missions
1	Happy grandparent	25	1140	362	32
2	Wood works	19	431	81	19
3	Legal authorities	17	553	135	24
4	Game development	13	668	127	19
5	House construction	35	408	37	9
6	Car manufacturing	37	345	15	4
7	Hamburger chain	17	869	268	31
8	Wedding	25	718	225	31
9	Capital of culture	21	638	88	14
10	Resident satisfaction survey	12	432	55	13
11	Construction of the city bypass	26	345	26	8
12	Traditional fair	22	382	85	22
13	Electricity production	17	326	40	12
14	Clean and healthy city	17	437	83	19
15	Agro tourism	22	359	48	13
	In total	**325**	**8051**	**1675**	**21**

4 In conclusion

This document describes the pilot testing of the C-Game educational game. It follows from the given static data that the planned number of:

- **pupils involved in the pilot testing was achieved**. Instead of the planned 200 students, 858 participated.
- **facilitators involved in the pilot testing was achieved**. Instead of the planned 70, 89 participated.

C-Game pilot verification from the statistical point of view

Project	C-Game: Career guidance game in a city full of occupations Č. 2019-1-CZ01-KA201-061204
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