Original Research Article

Validating the ID-GAMING e-Training Toolkit for People with Intellectual Disabilities in Greece

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ABSTRACT

Intellectual disability (ID) is a neurodevelopmental disorder characterized by limitations in adaptive and intellectual functioning. Serious games (SGs) incorporate learning and educational strategies that are commonly used in special education, and they have been proposed as assistive tools for people with developmental difficulties. ID-GAMING e-training toolkit encloses an SG named "Qool City" available as a board and a digital game, a game catalogue, and training materials on cognitive functions and quality of life. In this manuscript, we focused on describing the methodology and the preliminary outcomes of the validation actions of the toolkit. A four-step methodology was formed to specify the interaction of participants with the toolkit and a qualitative validation tool was developed by the consortium to assess the participants' performance during the session. The target groups were people with Intellectual Disabilities (PwID) (young adults and adults), professionals, and relatives. Twelve individuals participated of which seven were PwID, two educators, and three facilitators. However, two PwID withdrew from the activities performed in Steps 1 and 2, but one PwID joined the activities performed in Steps 3 and 4. The ID-GAMING e-training toolkit seems to lead to improvement in various cognitive functions of PwID including memory, attention, language, and spatial orientation. Components of quality of life such as wellbeing and independence were promoted. PwID remained engaged until the end of their interaction with the toolkit components while both PwID and educators were satisfied with the toolkit. Moreover, educators argued that the e-training toolkit helped them to be motivated and aware of the potential applications of SGs for improving cognitive functions as well as providing useful information about the quality of life, its improvement, and cognitive functions. In addition, collaborative and supportive skills were promoted along with digital skills. Indicators for participants' experience and improvement were fulfilled. Therefore, the ID-GAMING e-training toolkit seems to be a valuable assistive tool for PwID and the people involved in their care that should be further validated using a larger sample size and standardized assessment tools.

Keywords—*Intellectual disability, Serious games, Validation actions, Cognitive functions, Quality of life.*

INTRODUCTION

Intellectual disability (ID) constitutes a neurodevelopmental disorder[1] that is characterized by limitations in intellectual functioning and adaptive behavior.[2] The difficulties are present at birth and their manifestation is shown during the developmental period before adulthood.[1] The intellectual functioning refers to "the global ability to understand reality and interact with it" [2] and it is attributed to the concept of intelligence.[2] It integrates different cognitive functions such as problem-solving, logical reasoning, abstract thinking, planning, ability in learning, and experiential learning which are all affected in ID.[1,2] Adaptive behavior is conceptualized as a set of skills that provide competence in the social, practical, and conceptual domain.[2] ID is characterized by deficits in adaptive behavior that lead to the inability to meet sociocultural and developmental standards for social responsibility and personal independence. Without ongoing support, deficits limit functioning to at least one daily activity and in multiple settings.[1] ID can be accompanied by different co-morbidities such as other neurodevelopmental, neurological, or mental disorders as well as medical conditions.[2]

The treatment of ID should be multilevel, multidisciplinary, and tailored to patient needs and may include psychopharmacologic interventions, educational support, behavioral approaches, vocational training, and family education.[2] Another interventional approach that was introduced as a tool to support people with ID was serious games (SGs). SGs are defined as the games that are designed with a primary purpose rather than pure entertainment[3] and they have been applied in multiple fields such as education, healthcare, advertisement, and military among others.[4] Although there are some examples of SGs that have been developed for mentally challenged people to support emotion recognition and expression[5,6], dealing with real-life situations[7] or mathematics[8], the landscape of how to design, develop, and evaluate SGs is not adequately explored.[9] However, it is clear that people with ID have special educational needs[10] and therefore it is crucial to consider their abilities and needs while designing and evaluating an SG. Most of the SGs that have been evaluated were computer games, in the field of education and healthcare and questionnaires were used as an assessment method.[11]

ID-GAMING e-training toolkit was designed and developed in the context of the Erasmus+ ID-GAMING project and it is freely available on the project website (https://id-gaming.inesc-id.pt/). It encloses an SG named "Qool City" that is provided in two versions as a board game and a digital game (Figure 1), a game catalogue, and training materials. The "Qool City" is a collaborative SG that incorporates a narrative adapted to the ID sector and to life settings and expectations of young adults and young adults with ID. The main purpose of the game is to promote quality of life improvement through training in cognitive functions and quality of life dimensions. The game catalogue is a collection of serious games, non-serious games, and platforms already tested by people with ID (PwID). Every game can be selected based on the cognitive function the user wants to train, and it is accompanied by a brief explanation of the training purpose, tips for a satisfying gaming experience, and relation, if any, with the dimensions of quality of life. Training materials were designed to familiarize PwID, professionals and caregivers with concepts that are involved in the "Qool City" game and further expand their knowledge on SGs and quality of life dimensions. More precisely, training materials were developed in five different themes that are dimensions of quality of life and cognitive functions, the impact of cognitive training on quality of life, the definition of serious games and Information and Communications Technology (ICT) serious games, selection of ICT serious games to train cognitive functions for PwID, the role of supports in Easy-to-Read format. A methodological guide was also included to facilitate the interaction with the SG "Qool City".

In this manuscript, we describe the validation actions of the Intellectual Outputs (IOs) of the ID-GAMING project that are incorporated into the ID-GAMING e-training toolkit. The project had as Intellectual Outputs (IOs) the development of a Quality-of-Life Training Game so-called "QooL City", a Training Toolkit, and an e-training Tool. The validation actions were focused on the evaluation of the quality of IOs and therefore the quality of ID-GAMING e-training toolkit, the assessment of possible improvements in competencies of persons with ID, relatives, and

professionals, and the collection of feedback on "QooL City" for refinement purposes.
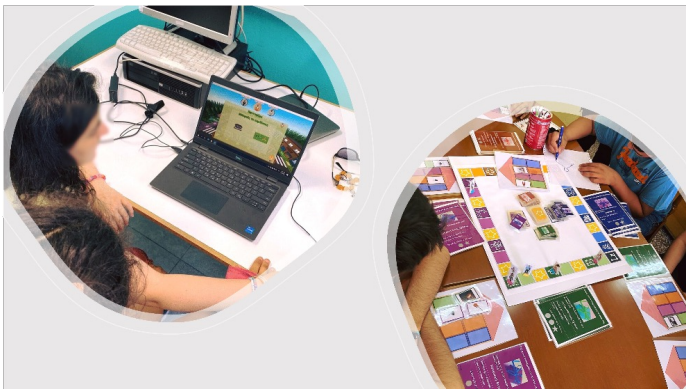

FIGURE 1. Screenshots of the "Qool City" game available as a digital game (left) and a board game (right).

METHODS

The validation actions were performed through face-to-face sessions from May to July 2022 with a goal to involve at least 100 participants across countries (30 in Portugal, Spain, and Italy, and 10 in Greece). Our target groups were young adults and adults with intellectual disabilities, professionals, and relatives.

A four-step methodology (Figure 2) was formed including interaction with training materials in five different themes in Easy-to-Read format as described earlier (Step 1); Two complete turns of playing the board game "Qool City" as single players (Step 2); Two complete turns of playing the online game as single players (Step 3); interaction with the game catalogue and five ICT-Serious Games on training environment or at home (Step 4). At least one facilitator/trainer and observer participated during each validation session. The facilitator/trainer was a professional who was trained on "QooL City" contents, training methodology, and design and guided participants through the activities, while the observer was a professional who was responsible for collecting information about the validation experiences and facilitator support.

At the end of each validation session, the players commented on their experience with support, if needed, from the facilitator and observer. Moreover, the facilitator
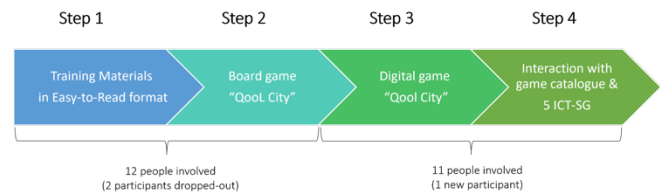
FIGURE 2. Flowchart of the 4-step methodology applied to validation actions.

and observer had to fill in the qualitative validation tool (Questionnaires A, B, C, D) developed by the consortium to assess participants' performance during the session (see Appendix). Two different versions of each questionnaire were designed, the one to be filled by facilitators/trainers after collecting PwID responses and the other addressed to relatives and professionals. Data collected through the questionnaires were anonymous. Additionally, all sessions were accompanied by an attendance list, a checklist page and notes, and a satisfaction questionnaire. A number of indicators were set to assess the participants' experience and improvement, listed below in Table 1.

TABLE 1. Indicators to assess the participants' experience and improvement.

No.	Validation Indicator	Target
1	Attendance to Validation Pilot Actions	100 participants (30 in Portugal, Spain, and Italy, and 10 in Greece)
2	Target group awareness and motivation to use ICT SGs to improve QoL	$\geq$ 70% target group is aware and motivated to use ICT SGs to improve QoL
3	Target group digital skills use improvement	$\geq$ 70% target group experienced opportunities to use digital skills.
4	Target group cognitive functions use improvement	70% of the target group experienced opportunities to use their cognitive functions
5	Target group quality-of-life dimensions improvement	70% of the target group experienced opportunities to improve quality-of-life dimensions

6	Improvement of collaborative/ cooperative/teamwork skills	70% of the target group experienced opportunities to improve collaborative/ cooperative/teamwork skills
7	Target group opinion on "QooL City"	≥ 70% target group evidence satisfaction

RESULTS

Twelve individuals took part in validation sessions of which seven were PwID, two educators, and three facilitators. However, two PwID withdrew from the activities performed in Steps 1 and 2, but one new participant with ID joined the activities performed in Steps 3 and 4.

All educators agreed that training materials, both versions of "Qool City" game (board and online) and the game catalogue helped them to be aware of the use of SGs for improving cognitive functions, to be motivated about using SGs, to know more about quality of life, cognitive functions, and quality of life improvement. Moreover, they responded positively to questions about the different components of ID-GAMING e-training toolkit and the use of supportive skills. More precisely, both versions of "Qool City" and the game catalogue facilitated the use of collaborative and supportive skills such as active listening, respect choices, teamwork, flexibility, as well as the balance between support and autonomy. Educators also agreed that the online version of "Qool City" and the game catalogue promoted the use of digital skills.

After interacting with training materials, six out of seven PwID showed improvement in their language, memory, and attention skills. PwID were able to practice their language skills to share their thoughts and opinions regarding the training material themes and discuss with each other and the facilitators. Through discussions, they had the opportunity to learn the meaning of some new words and phrases. They could also recall moments from their personal experiences related to the quality-of-life dimensions and they were able to remain focused throughout the whole session. Generally, it was observed that most of the players were motivated and actively participated in the discussion especially on topics related to material wellbeing. Six out of seven PwID completed all cognitive challenges of the board game "Qool City" with little or no help. Similar findings were revealed in five out of six PwID when playing the online game "Qool City". Evaluating the game catalogue experience, four out of six showed an improvement in their memory skills, while five out of six in attention to detail and spatial orientation skills, as they were able to focus on each game to find the matching pairs, or the right position and the new elements added to the scene. Moreover, it was observed that half participants strengthened their skills in calculation and emotional wellbeing, as they could do calculations with money (*i.e.,* addition and subtraction) and correctly recognize different emotional expressions.

Six out of seven PwID were aware and motivated about the use of ICT-SGs for improving cognitive functions and therefore their quality of life after their interaction with the board version of "Qool City". Similar findings were observed in all participants (6 out of 6) after interacting with the online game "Qool City" and the game catalogue. This was emphasized by the fact that they enjoyed playing the "Qool City" by trying to fall into challenge boxes and they remained motivated and engaged until the end of the game. All PwID (6 out of 6) were familiar with playing digital games and interested in playing the five ICT-SGs. They remained engaged until the end of the session and it was noticed that some of them continued playing even though they had successfully completed the games. Six out of seven PwID actively participated throughout the game, and they took part in every challenge they had to accomplish in their turn. Moreover, participants tended to prefer challenges related to physical activity and socialization. Similar findings were shown in all participants (6 out of 6) after interacting with the online game "Qool City".

Moreover, six out of five out of six improved their wellbeing competence after playing the board and the online game respectively. Evaluating the independence competence, five out of seven and five out of six PwID were autonomous in completing the challenges of the board and the online game respectively. Some of them (4 out of 7 for the board game and 3 out of 7 for the online game) needed help to understand the challenges' instructions because they did not have the ability to read. It was also observed that they could decide for themselves on those challenges that offered several options. Interacting with

the online game "Qool City", all players gradually improved their digital skills. More specifically, they got familiar with the use of the computer mouse, and they learned how to use the "zoom" function in the pictures. Some of them (3 out of 6) were able to use the keyboard to name their avatar. In this direction, most of the participants (5 out of 6) improved their ability to use the keyboard and the computer mouse to follow the game rules and advance to the next level after interacting with the five ICT-SGs.

During both versions of "Qool City" game, all PwID had the opportunity to enhance their teamwork skills. A friendly and cooperative environment was fostered during the game where participants encouraged each other to perform the challenges. It should also be noted that every player was willing to patiently wait for his/her turn to play. Assessing whether the "QooL City" game is playable, fun, educational, accessible, usable, and having an impact on their cognitive functions and quality of life, six out of seven PwID after playing the board game reported that they had fun and they liked using the physical elements of the game like rolling the dice and moving their pawns. They also thought that the game was useful for learning new things and practicing new skills. Likewise, all PwID had fun during the online game which was also considered useful. However, the board game was preferred compared to the online game as they enjoyed the interaction with the physical elements of the board game.
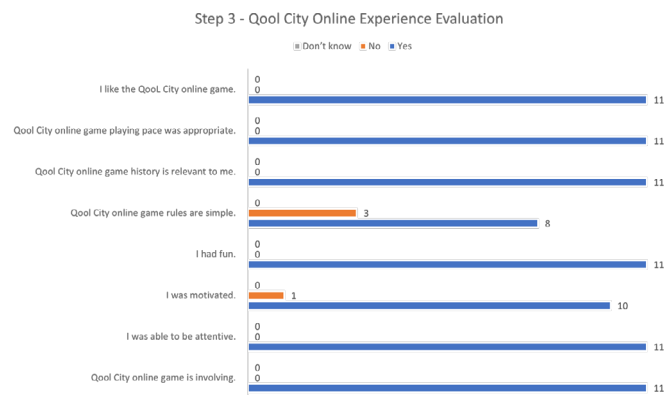
The overall satisfaction of participants in different steps and the global satisfaction are presented in Figures 3–6 as well as in Figure 7 respectively.
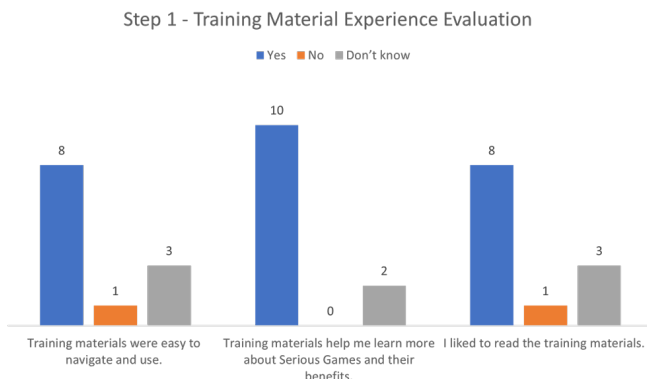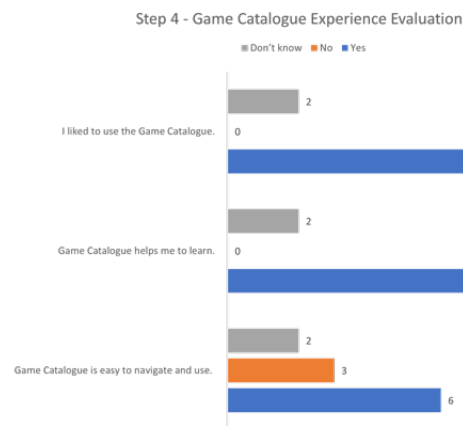

FIGURE 3. Evaluation of participants' experience after interacting with training materials (Step 1).
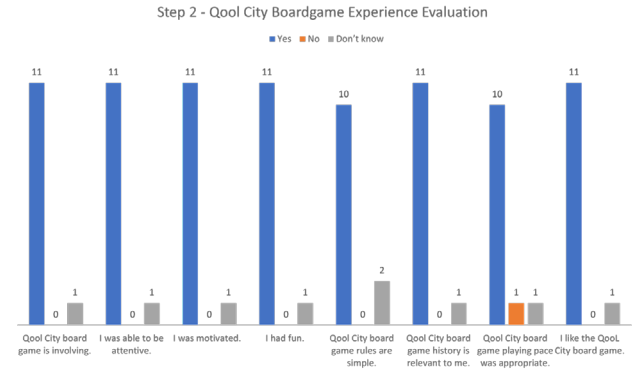
FIGURE 4. The overall participants' satisfaction after interacting with the board game "Qool City" (Step 2).

FIGURE 5. The overall satisfaction of participants after interacting with the online version of the "Qool City" game (Step 3).

FIGURE 6. Evaluation of the game catalogue experience (Step 4).

Global Satisfaction

FIGURE 7. Evaluation of the global participants' satisfaction after interacting with the ID-GAMING e-training toolkit.

All indicators defined to assess the participants' experience and improvement were fulfilled in PwID as displayed in Table 2.

TABLE 2. Results of participants' experience and improvement indicators in PwID.

No.	Validation Indicator	Results
1	Attendance to Validation Pilot Actions	12 participants
2	Target group awareness and motivation to use ICT SGs to improve QoL	95.2%
3	Target group digital skills use improvement	91.7%
4	Target group cognitive functions use improvement.	78.6%
5	Target group quality-of-life dimensions improvement	84.9%
6	Improvement of collaborative/cooperative/ teamwork skills	91.7%
7	Target group opinion on QooL City	92.9%

DISCUSSION

Serious games incorporate learning and educational strategies that are commonly used in special education such as repetition, narrative, simulation of real-world conditions, as well as coherent and immediate feedback.[12] Repetition is an important learning component of SGs as it highly enhances memory retention[13] which is affected in persons with developmental disabilities.[14] Memory retention is further enhanced by incorporating information into context[15] that can be achieved through a narrative. Embedding a narrative into an SG facilitates cognitive load reduction[16], motivation, problem-solving[17], and efficiency.[18] Simulation of real-world settings inherent to SGs seems to promote better transition to everyday life tasks.[19] The transition from learning environment to real-life setting is challenging for PwID as they face difficulties in generalizing the acquired knowledge to different conditions or applying it to daily activities.[4] The coherent and immediate feedback provided by SGs has been observed to enhance motivation[20], independent learning[21], and retention of acquired knowledge[22] while reducing errors.[21]

As SGs constitute an appropriate learning method for people with developmental difficulties such as PwID, they have been incorporated into the ID-GAMING e-training toolkit, leading to beneficial outcomes on different cognitive skills such as attention, spatial orientation, and memory skills. Similar benefits of SGs in attention, spatial orientation skills and memory were reported in children with Attention Deficit Hyperactivity Disorder (ADHD)[23, 24], while improvement in cognitive and adaptive functioning was found in children with intellectual disability and/or autism spectrum disorder in a recent meta-analysis.[25] Training materials, integrated into the ID-GAMING e-training toolkit, were found to promote language skills. A similar conclusion was reached by a recent study[9] which argued that SGs could have positive outcomes in vocabulary and language learning.

We also observed that emotional recognition skills were strengthened after interacting with the e-training toolkit. This finding was also supported by the study of Kokol et al.[26] PwID showed improvement in wellbeing competence,

independence, motivation, and engagement. Similar findings in motivation, participation, and engagement are reported in recent studies.[27–29] Additionally, ID-GAMING e-training toolkit appeared to facilitate teamwork and cooperative skills as most of the participants enhanced their collaboration and social skills, which is consistent with previous research.[9] Interacting with the online version of "Qool City" game, all PwID gradually improved their digital skills. This finding may be indicative that the toolkit fulfilled its educational purpose, as SGs have long been used for acquiring skills and/or training in various knowledge areas.[30–33]

Although there are several studies that have attempted to use SGs for supporting people involved in the care of vulnerable populations[34–37], to the best of our knowledge, this is the first study that explored an e-training toolkit that incorporates SG designed for PwID with the involvement of professionals (*i.e.,* educators). The educators who participated mentioned that the toolkit helped them to be aware of the use of SGs for the improvement of cognitive functioning, to be motivated about SGs as well as to know more about quality of life and its improvement and cognitive functions. Moreover, they reported that the game catalogue and both versions of "Qool City" game promoted teamwork, supportive, and digital skills.

However, there are several limitations in our study that should be noted. The small number of participants along with the inherent heterogeneity of PwID may limit the generalization of our study outcomes. Another limitation is associated with the methodology applied as a qualitative validation tool (Questionnaires A, B, C, D) developed by the consortium was used to assess the participants' progress. However, the results presented here could be considered useful motivators for knowledge building in a greater and clearly defined sample of PwID using standardized assessment tools. In this way, the power of the study will be enhanced and the comparison of outcomes from different research groups could be possible and straightforward. Furthermore, future research should be focused on the investigation of the long-term effects of SGs as it seems to be quite an unexplorable field.

CONCLUSION

This paper describes the summary of preliminary research on the effects of ID-GAMING e-training toolkit on cognitive functions and quality of life. The toolkit seems to lead to improvement in various cognitive functions of PwID including memory, attention, language, and spatial orientation. Components of quality of life were promoted such as wellbeing and independence. Teamwork and digital skills were enhanced, while the PwID remained engaged until the end of their interaction with the toolkit. Both PwID and educators were satisfied with the toolkit. Moreover, educators argued that ID-GAMING e-training toolkit helped them to be motivated and aware of the potential applications of SGs for improving cognitive functions as well as providing useful information about the quality of life, its improvement, and cognitive functions. In addition, collaborative and supportive skills were promoted along with digital skills. Indicators for participants' experience and improvement were fulfilled. Therefore, the ID-GAMING e-training toolkit seems to be a valuable assistive tool for PwID and the people involved in their care that should be further validated using a larger sample size and standardized assessment tools.

GRANT SUPPORT

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APPENDIX

A detailed description of the indicators defined to assess the participants' experience and improvement is presented in the following table (Table 3).

TABLE 3. Detailed description of the indicators defined to evaluate the experience and performance of participants.

No.	Indicator	Definition	Measurement Method	Target	Instrument Used to Collect Evidence
1	Attendance to Validation Pilot Actions	Number of persons belonging to the Target Group who participated in the Validation Pilot Actions.	List of attendants identifying the specific target group (PwID, relative, professional)	100 participants (30 in Portugal, Spain, and Italy and 10 in Greece)	Attendance list
2	Target group awareness and motivation to use ICT SGs to improve QoL	Number of trainees/players (PwID, Relatives and Professionals) who are aware and motivated about the use of ICT-Serious Games for improving the cognitive functions of PwID and therefore their Quality of Life.	PwID: guided interviews for collecting their opinions. Relatives and professionals: Self-Assessment questionnaire about their experience after each Step.	≥ 70% target group aware and motivated to use ICT SGs to improve QoL	Questionnaires A, B, C and D
3	Target group digital skills use improvement	Number of trainees/players (PwID, Relatives and Professionals) that showed an improvement of Digital Skills use.	PwID (qualitative): Trainers' assessment through direct observation and guided interviews about their experience on Steps 2 and 3. PwID (quantitative): Trainers and supports assessment on questionnaire B and C. Supports: Self-assessment questionnaires after the validation actions.	≥ 70% target group experienced opportunities to use digital skills.	Questionnaires B and C
4	Target group cognitive functions use improvement	Number of trainees/players (PwID) that showed an improvement of cognitive functions (Language, Calculus & Problem Solving; Memory & Attention to Detail; Spatial Orientation; Social & Emotional) use. Number of Supports that showed an improvement in supporting skills, while playing.	PwID (Qualitative): Trainers' assessment through direct observation and guided interviews (questionnaires A, B and C) with PwID about their experience on validation Step 1, 2 and Step 3. PwID (Quantitative): Trainers and supports assessment through a questionnaire assessing PwID's cognitive functions use during validation Step 1, 2 and Step 3. Supports: Self-assessment questionnaires after the validation actions assessing supporting skills (respect, collaboration, teamwork, trust, etc.).	70% of the target group experienced opportunities to use their cognitive functions	Questionnaires A, B and C

5	Target group quality-of-life dimensions improvement	Number of trainees (PwID) that showed an improvement of Quality-of-Life Dimensions (self-determination, social inclusion, rights, personal development, personal relationships, material wellbeing, emotional wellbeing and physical wellbeing). Number of Supports that showed an improvement in supporting skills, while playing.	PwID (Qualitative): Trainers' assessment through direct observation and guided interviews with PwID (to fill in questionnaire A and B) about their experience on validation Step 1 and Step 2. PwID (Quantitative): Trainers and supports assessment through a questionnaire assessing quality of life dimensions of PwID. Supports: Self-assessment questionnaires after the validation actions assessing supporting skills (respect, collaboration, teamwork, trust, etc.).	70% of the target group experienced opportunities to improve quality-of-life dimensions	Questionnaires A and B
6	Improvement of collaborative/ cooperative/ teamwork skills	Number of trainees (PwID and Supports) that showed an improvement on collaborative/Cooperative/ Teamwork skills.	PwID and supports. (Qualitative): Trainers' assessment through direct observation and guided interviews with PwID about their experience on validation Step 1 and Step 2. PwID and supports (Quantitative): Cross Assessment between PwID and Supports about their experience on validation Step 1 and Step 2.	70% of the target group experienced opportunities to improve collaborative/ Cooperative/ Teamwork skills	Questionnaires A and B
7	Target group opinion on "QooL City"	Number of trainees (PwID and Supports) who thought that the QoL Game is playable, fun, educational, accessible, and usable and with impact in their cognitive functions and quality of life.	PwID and supports. (Quantitative)	≥ 70% target group evidence satisfaction	Satisfaction questionnaire

Questionnaire A | Applied to PwID

After having read all Easy-to-Read training materials, please present below your opinion and conclusions about the most significant improvements.

Step 1—Training Materials Experience Evaluation	
[Indicator 4]	
How many players in this validation group have improved **cognitive functions** use?	
Qualitative opinion and conclusions:	
Other comments:	

Questionnaire B | Applied to PwID

After playing Qool City board game please present below your opinion and conclusions about most significant improvements.

Step 2—QooL City board game Experience Evaluation	
[Indicator 2]	
How many players in this validation group are aware and motivated about the use of ICT-Serious Games for improving **cognitive functions** and therefore their **Quality of Life**?	
Qualitative opinion and conclusions:	
[Indicator 5]	
How many players in this validation group have improved their **participation's** competence after playing QooL City game?	
Qualitative opinion and conclusions:	
How many players in this validation group have improved their **wellbeing's** competence after playing QooL City game?	
Qualitative opinion and conclusions:	
How many players in this validation group have improved their **self-determination's** competence after playing QooL City game?	
Qualitative opinion and conclusions:	

Questionnaire C | Applied to PwID

After playing Qool City online game please present below your opinion and conclusions about most significant improvements. Thanks.

Step 3—Qool City online game Experience Evaluation

[Indicator 2]	
How many players in this validation group are aware and motivated about the use of ICT-Serious Games for improving **cognitive functions** and therefore their **Quality of Life**?	
Qualitative opinion and conclusions:	
[Indicator 5]	
How many players in this validation group have improved their **participation's** competence after playing QooL City game?	
Qualitative opinion and conclusions:	
How many players in this validation group have improved their **wellbeing's** competence after playing QooL City game?	
Qualitative opinion and conclusions:	
How many players in this validation group have improved their **self-determination's** competence after playing QooL City game?	
Qualitative opinion and conclusions:	

Questionnaire D | Applied to PwID

After using game catalogue in the ID-GAMING e-training toolkit and have played five (5) different ICT - serious games (ICT-SGs) online game, please present below your opinion and conclusions about most significant improvements.

Step 4—Game catalogue Experience Evaluation	
[Indicator 2]	
How many players in this validation group are aware and motivated about the use of ICT-Serious Games for improving **cognitive functions** and therefore their **Quality of Life**?	
Qualitative opinion and conclusions:	
[Indicator 3]	
How many players in this validation group that show an improvement of **digital skills** use?	
Qualitative opinion and conclusions:	
[Indicator 4]	
How many players in this validation group have improved **cognitive functions** use?	
Qualitative opinion and conclusions:	
Other comments:	

Questionnaire A | Applied to Relatives and Professionals

After having read all Easy-to-Read training materials, mark with an X your chosen option using "Yes", "No", or "Don't Know".

	👍	👎	🤷
Step 1—Training Materials Experience Evaluation			
[Indicator 2]			
Training Materials helped you to be aware of the use of Serious Games for improving cognitive functions			
Training Materials helped you to know more about quality of life			
Training Materials helped you to be motivated about using Serious Games			
Training Materials helped you to know about cognitive functions improvement and quality of life improvement			
Other comments:			

Questionnaire B | Applied to Relatives and Professionals

After playing Qool City board game mark with an X your chosen option using "Yes", "No", or "Don't Know".

	👍	👎	🤷
Step 2—Qool City board game Experience Evaluation			
[Indicator 2]			
Qool City board game helped you to be aware of the use of Serious Games for improving cognitive functions			
Qool City board game helped you to know more about quality of life			
Qool City board game helped you to be motivated about using Serious Games			

Qool City board game helped you to know about cognitive functions improvement and quality of life improvement			
[Indicator 4, 5]			
Qool City board game made you to use supportive skills such as active listening and respect choices			
Qool City board game made you to use supportive skills such as teamwork and being flexible			
Qool City board game made you to use supportive skills such as balance between support and autonomy			
[Indicator 6]			
Qool City board game helped to use more collaborative skills			
Other comments:			

Questionnaire C | Applied to Relatives and Professionals

After playing Qool City online game mark with an X your chosen option using "Yes", "No", or "Don't Know".

	👍	👎	🤷
Step 3—Qool City online game Experience Evaluation			
[Indicator 2]			
Qool City online game helped you to be aware of the use of Serious Games for improving cognitive functions			
Qool City online game helped you to know more about quality of life			
Qool City online game helped you to be motivated about using Serious Games			
Qool City online game helped you to know about cognitive functions improvement and quality of life improvement			

[Indicator 3]			
Qool City online game promoted digital skills acquisition			
Qool City online game promoted digital skills improvement			
[Indicators 4, 5]			
Qool City board game made you to use supportive skills such as active listening and respect choices			
Qool City board game made you to use supportive skills such as teamwork and being flexible			
Qool City board game made you to use supportive skills such as balance between support and autonomy			
[Indicator 6]			
Qool City online game helped to use more collaborative skills			
Other comments:			

Questionnaire D | Applied to Relatives and Professionals

After using game catalogue in the ID-GAMING e-training toolkit and have played five (5) different ICT - serious games (ICT-SGs), mark with an X your chosen option using "Yes", "No", "Don't Know".

	👍	👎	🤷
Step 4—Game catalogue Experience Evaluation			
[Indicator 2]			
Game catalogue helped you to be aware of the use of Serious Games for improving cognitive functions			
Game catalogue helped you to know more about quality of life			

Game catalogue helped you to be motivated about using Serious Games			
Game catalogue helped you to know about cognitive functions improvement and quality of life improvement			
[Indicator 3]			
Game catalogue promoted digital skills acquisition			
Game catalogue promoted digital skills improvement			
[Indicator 4]			
Game catalogue made you to use supportive skills such as active listening and respect choices			
Game catalogue made you to use supportive skills such as teamwork and being flexible			
Game catalogue made you to use supportive skills such as balance between support and autonomy			
[Indicator 6]			
Game catalogue helped to use more collaborative skills			
Other comments:			

Satisfaction Questionnaire

Please answer the next questions using "Yes", "No", or "Don't Know". Please mark with an X your chosen option.

	👍	👎	🤷
Step 1—Training Material Experience Evaluation			
Training materials were easy to navigate and use.			

Training materials helped me learn more about Serious Games and their benefits.			
I liked to read the training materials.			
Step 2—Qool City board game Experience Evaluation			
Qool City board game is involving.t			
I was able to be attentive.			
I was motivated.			
I had fun.			
Qool City board game rules are simple.			
Qool City board game history is relevant to me.			
Qool City board game playing pace was appropriate.			
I like the QooL City board game.			
Step 3—Qool City Online Experience Evaluation			
Qool City online game is involving.			
I was able to be attentive.			
I was motivated.			
I had fun.			
Qool City online game rules are simple.			

Qool City online game history is relevant to me.			
Qool City online game playing pace was appropriate.			
I like the QooL City online game.			
Step 4—Game catalogue Evaluation			
Game catalogue is easy to navigate and use.			
Game catalogue's games helped me to learn.			
I liked to use the Game catalogue.			
Global satisfaction			
Trainers have been friendly and supportive.			
The training space has been comfortable.			
I liked to participate in the sessions.			
I want to continue to use the Qool City game.			
I'll recommend the ID-GAMING e-training toolkit to others			
Other comments:			