SUPPORTING THE CAREER CHOICES OF NEET YOUNG ADULTS WITH AUGMENTED REALITY SERIOUS GAME: A PILOT STUDY

SUPPORTARE LE SCELTE DI CARRIERA DEI GIOVANI ADULTI NEET ATTRAVERSO UN SERIOUS GAME IN REALTÀ AUMENTATA: UNO STUDIO PILOTA

Clarissa Lella
Università Telematica Pegaso, Smarted srl
clarissa.lella@unipegaso.it

Rosanna Napolano
Università degli Studi di Napoli Federico II, Smarted srl
rosanna.napolano@smarted.it

Raffaele Di Fuccio
Università Telematica Pegaso
raffaele.difuccio@unipegaso.it

Lia Danila Sasanelli
Università Telematica Pegaso
liadaniela.sasanelli@gmail.com

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ABSTRACT
The article presents findings from a pilot study with a sample of 10 young adults. The aim is to analyse the gameplay experience of players using the NEFELE tool. NEFELE is an innovative career exploration gameplay tool designed to address the pressing issue of NEETs and is supported by game-based learning theory. The study showed promising results for the use of the tool on different dimensions of the Game Experience Questionnaire, such as flow, challenge and positive affect.

L'articolo presenta uno studio pilota condotto su un campione di 10 giovani adulti. L'obiettivo è analizzare l'esperienza di gioco utilizzando la NEFELE BOX. NEFELE è uno strumento di gioco innovativo progettato per affrontare il problema pressante dei NEET supportato dalla teoria dell'apprendimento basato sul gioco. Lo studio ha mostrato risultati promettenti per l'uso dello strumento su diverse dimensioni del Game Experience Questionnaire come il flusso, la sfida e l'affetto positivo.

KEYWORDS
NEET; Game-Based Learning Theory; Career decision making; Serious game; Augmented reality
NEET; Teoria dell'apprendimento basato sul gioco; Decisione di carriera; Gioco serio; Realtà aumentata

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Introduction

The umbrella term 'serious game' refers to any game that is specifically designed for educational or training purposes. The first known definition comes from Clark (1987), who describes serious games as "games with an explicit and well-structured educational purpose, not primarily designed for entertainment, but not to the exclusion of it". Serious games, defined in this way, by their very nature support the basic principles of gamification theory, which considers the use of elements typically used in ludic contexts and game creation techniques in non-ludic contexts. Non-ludic contexts in which the effects of using gamification can be considered include educational contexts, be they formal, informal, school/academic or professional. On the basis of these initial considerations, we set ourselves the objective of analysing the possibility of using the basic principles of gamification to design a serious game with the underlying educational purpose of acquiring more knowledge about career opportunities, assuming that the privileged users of such a game would be those belonging to the NEET category (Sica, 2020). The acronym NEET (Not in Education, Employement or Trainingis) is used to identify individuals who are not in education, training or employment. The NEET phenomenon, which affects 17 million young people in the EU-28, poses challenges such as social exclusion and economic dependency. In the EU-27 (after 01/02/2020, in which Brexit happened) NEETs were reported to be 13.1% of European youth (Eurostat, 2021). In 2022, 11.7 % of 15-29 year-olds in the EU were NEETs and in 2023 data reported the percentage to be 11.2% making the decreasing trend noticeable but the current data are still not to be underestimated (Eurostat, 2024). The 21st century, characterised by a fast-moving global economy, economic crisis, and many challenges of post-industrial society is considered a risk factor for the new generations to construct their future career paths, to school-to-work transition and social exclusion and marginalisation (O'Higgins & Brockie, 2024). As the Eurostat data shows, the NEET problem was and still is urgent because its implications are two-fold: on a personal level, young are more likely and to suffer social exclusion; on a social level, they represent a considerable loss in terms of unused productive capacity and a high welfare payments cost (Mussida & Sciulli, 2023; O'Higgins & Brockie, 2024; Petrescu et al., 2024).

The psychological literature highlights that in this environment adolescents have difficulty thinking about their future: fear, insecurity, anxiety seems to replace the experiences of trust, security, and hope, low levels of aspiration and little

motivation (Papadakis, 2015). In this scenario, it is important to support adolescents by promoting a positive vision of the future and to be proactive, stimulating the propensity to manage changes adaptively, with versatility, flexibility and enhancing hope and optimism for a meaningful future.

NEFELE, acronym for “Neet prevention in Educational systems through positive Future vision Enhancing Learning and teacher Education'', Erasmus+ project (Project Number: ID KA220-HED-1E30D78F) aims to impact at an upper level: positive youth development through producing four different project results: EU Framework of Career Development in Teacher Education (Marcionetti & Parola, 2022, Parola et al., 2023); NEFELE MOOC; NEFELE Box; NEFELE OER’s shared platform. The present article will focus solely on the function of the NEFELE box, a serious game designed with the aim to elicit interest in previously known and unknown professions, digital competences, entrepreneurial competences, green competences for sustainability, life competences and important strength and values identified as useful and desirable in the world of work; the serious game is targeted for different age groups including young adults (20-30 years old). A serious game, browsing deeper in exploring definitions among scientific literature, could be defined as “any form of interactive computer-based game software for one or multiple players to be used on any platform and that has been developed with the intention to be more than entertainment” (Ritterfeld et al., 2009), still leaving a broad space to different variations of it. This could be also noted in systematic reviews regarding the theme, involving often different aims, strategies, designs (2d or 3d), different areas and competences (i.e. maths, geography, language learning, conflict resolution, physical rehabilitation, medical triage training), with or without the use of extensive hardwares such as a webcams or Tangible User Interface (TUIs) (Connoly et al., 2012).

“Serious Games represent an acknowledged potential for instruction, because they are able to strongly motivate learners. They can also provide immersive environments where advanced users can practise knowledge and skills, also exploiting multimodal interaction. They can combine the effectiveness of computer processing and data storage, with high levels of attractiveness” (Bellotti et al., 2010). At the same time the adoption of gamification in learning and instruction is perceived to have strong appeal among the learners in stimulating motivation, learner engagement and social influence (Zainuddin et al., 2020). Gamification and game-based learning are very popular mobile and technological trends that use

game elements to promote desired behaviours and drive corporate learning outcomes (Vasilevski & Birt, 2020). Gamification is the concept of learning serious topics through the use of several elements of the game that are integrated into the learning process in order to gain experience by playing. Some elements of the game used are points, levels, rewards, badges and ranking (Limantara et al., 2019; Zainuddin et al., 2020).

Oksanen (2013) studied the subjective experience of a serious game called "GAMEBRIDGE" on a sample of 86 persons among students and teachers. Constructs measured in this study were: flow, which is considered a central concept of the user experience in many studies related to the engagement and enjoyment of digital games; immersion; competence; positive and negative affect; tension; challenge (Whalen & Csikszentmihalyi, 1991). Csikszentmihalyi (2014), described flow as a self-rewarding state of complete absorption or engagement in an activity. Referring to the feelings of enjoyment that result from the balance between skill and challenge in the process of performing an intrinsically rewarding activity, including: concentration, time distortion, autotelic experience, loss of self-consciousness, and a sense of control. Immersion, defined as a gradual, time-based, progressive experience that includes the suppression of all surroundings, along with attention and involvement within the sense of being in a virtual world (Jennett et al., 2008).

Immersion also refers to the degree of involvement within a game. Brown and Cairns (2004) suggested three stages of immersion indicating increasing levels of involvement: engagement, engrossment, and total immersion; this distinction is particularly useful to grasp the concept of graduality intrinsically related to immersion's dimension. Involvement increases with time and is controlled by barriers of human activity (e.g. willingness) and game features (e.g. graphics, and plots).

Competence and challenge, can be considered close to each other during a serious game experience and intertwined with the game design at its core. A competence is defined as the ability to successfully meet complex demands in a particular context through the mobilisation of psychosocial prerequisites (including both cognitive and non-cognitive aspects). This represents a demand-oriented or functional approach to defining competencies. The primary focus is on the results the individual achieves through an action, choice, or way of behaving, with respect to the demands, for instance, related to a particular professional position, social

role, or personal project (Rychen & Salganik, 2001). The APA dictionary, on the other hand, defines the challenge as “an obstacle appraised as an opportunity rather than a threat.” A threat is perceived as a challenge when the individual judges that their coping resources are adequate not only to overcome the stress associated with the obstacle but also to improve the situation in a measurable way, that has to be intended in the context of a game (APA, Dictionary of Psychology, n.d).

By positive affect, it is intended in psychology “the internal feeling state (affect) that occurs when a goal has been attained, a source of threat has been avoided, or the individual is satisfied with the present state of affairs”. The tendency to experience such states is called positive affectivity (APA Dictionary of Psychology, n.d.).

Negative affect is defined as “the internal feeling state (affect) that occurs when one has failed to achieve a goal or to avoid a threat or when one is not satisfied with the current state of affairs; the tendency to experience such states is known as negative affectivity”, it an often ignored in the understanding of a game experience, and it involves feelings of boredom and lack of concentration (APA Dictionary of Psychology, n.d. ; IJsselsteijn et al, 2008).

The last dimension of the core game experience, according to IJsselsteijn et al. (2008), is tension, which is closely linked to negative affect and refers to feelings such as irritation, frustration, and pressure.

Jennett et al. (2008) examined the negative emotions related to immersion in games. The research found that states of anxiety and negative affect were higher for faster-paced games, but were not significant. Even though these findings were inconclusive, the results suggest that negative emotions should be studied to understand the immersive appeal of games.

In the study conducted by Oksanen (2018) results had shown that while playing a serious game that “is a collaboratively scripted multiplayer game with a focus on task solving in the area of human sustainability” players felt successful and felt that they were good at it, making that interesting for competence findings in that game design, the results for the measure of positive affect was found to be significantly higher than the scale midpoint essentially meaning that the sample enjoyed playing the serious game and they found it fun. Negative affect, such as fatigue, tension and frustration toward the game, were much less severe and less frequently experienced, that could be related to the feeling of competence; furthermore

players did not feel that the game was particularly challenging. Meanwhile, the educational landscape is undergoing a rapid transformation fueled by advancements in augmented reality technologies. Augmented reality (AR) is “a live direct or indirect view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data” (Yang & Li, 2016).

Useful tools in augmented reality can be seen in Tangible user interface (TUI) “is a user interface in which a person interacts with digital information through the physical environment” (Roebuck, 2011). TUI “aims to interlink the digital world and physical world seamlessly so as to allow humans to acquire knowledge of the world around them through holistic interactions with their external environment” (Zhou & Wang, 2015). To the field of TUIs, also belongs NFC technology, defined as short range, high frequency, wireless communication technology between two NFC enabled devices (Coskun et al., 2011). Therefore, as better explained in the part of the article dedicated to the tool, the NEFELE box is a serious game comprehensive of augmented reality, gamification, roleplaying and educational digital storytelling elements given the important role they have in the learning process as the scientific literature has a record of. Another component of the NEFELE box is the learning process of different non cognitive and cognitive skills, as prevention factors of NEETs and protective factors for a successful school-to-work transition (Ripamonti, 2023). Kusuma (2021) proposed a game-based historical learning using the role-playing game on a mobile platform, decreeing that using the game can increase student learning motivation and learning achievement (Kusuma et al., 2021). Role playing is derived from psychodrama that may be used to help students understand the more subtle aspects of literature, social studies, and even some aspects of science or mathematics. Further, it can help them become more interested and involved, not only learning about the material, but also learning to integrate the knowledge in action, by addressing problems, exploring alternatives, and seeking novel and creative solutions (Crăciun, 2010). In relation to the above, the primary objective of this study is to evaluate the NEFELE BOX tool in terms of the user's gaming experience. A secondary and related objective to the first is to make an assessment of the NEFELE box's ability to comply with the design logic of game-based learning theory.

1. NEFELE tools: components and operation

The NEFELE tool, was developed as part of the European project NEFELE - "Neet prevention in Educational systems through positive Enhancing Learning and teacher Education"- [https://www.nefele-project.eu] and is one of the outcomes of the project. The NEFELE tool was developed within the project with the intention of creating a useful tool for career exploration. It is ideally designed to be used by young adults in the NEET category as a means and resource to access information about different career options. Looking more closely at the merits of the tool, it requires two components in order to be used: a hardware component and a software component.

The software component of the tool is the NEFELE app, which is a free access app, also a result of the NEFELE project. This application can be downloaded from the Play Store on any smartphone running the Android operating system and equipped with an NFC reader. The smartphone as a whole fulfils three functions: software framework, processor and hardware component. As a software support component, it acts as a framework for initialising the application. The second function, as a processor, makes it a media provider, producing sounds and projecting images on its screen during the game. Finally, it is also a hardware device in that, through the presence of the NFC reader, it enables dialogue with the game level, making it interactive.

In addition to the smartphone, the hardware component consists of two other elements: the NEFELE interactive tabletop and the NEFELE interactive cards. The NEFELE Interactive Tabletop is an advanced game board equipped with NFC tags, while the NEFELE Cards are thematic cards also equipped with NFC tags that can be communicated with through the smartphone. NFC (Near Field Communication) is a transceiver technology that enables two-way wireless communication over short distances.

In this case, this technology allows the user equipped with a smartphone with an NFC reader to communicate with the interactive floor and the NEFELE cards. This allows a series of activations that follow an input-output logic. The input is given by the proximity between the smartphone and the NFC tags on the interactive floor or on the cards, while the output is given by the activation of responses in the form of audio-photo content presented on the smartphone.

The elements just described together make up the NEFELE box, i.e. the equipment needed to access the NEFELE game (Figure1).

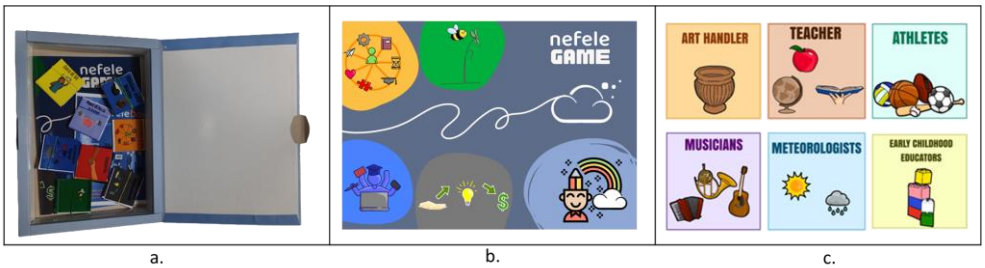

Figure 1. (a. NEFELE Box; b. NEFELE tabletop; c. NEFELE interactive cards)

The interactive cards (Figure 1.) are 30 thematic cards, each representing a specific profession. On each of these cards, the profession is described in text and in graphic form. In addition to these thematic cards, in the NEFELE kit used, there are 4 player cards that are used to indicate how many players are taking part in the game session and to signal to the system each time which player/team is answering the question posed by the system. The NEFELE interactive tabletop (Figure1.) is equipped with 5 NFC tags placed in each of the 5 areas into which the floor is divided. The division of the floor into 5 areas is indicated by the presence of 5 different graphic representations, each of which corresponds to a specific area of competence. The 5 areas of competence are: 1. Life competences, 2. Green competences, 3. Digital competences, 4. Entrepreneurial competences, 5 If I were.

The aim of the game is to use the clues provided by the system to identify the profession of each of the characters/avatars presented by the game. For each of the avatars, the players have a maximum of 5 clues relating to the 5 themes on the game board; it is up to the player in charge to decide which clues to use. The latter will be asked to: a) let the system read their player card to identify themselves by holding it near their smartphone; b) select the area in which they would like to receive a hint about the avatar's profession, by holding their smartphone close to the area of the game board in which they would like to receive a hint. In the case of a positive answer, the system will give a positive sound feedback and the player will receive points in the overall ranking visible on the smartphone. In the case of a negative answer, the game passes to another player, who, after signalling with his player card, can answer using the clue chosen by the previous player, or give up his turn to answer in order to receive a new clue, which he can only receive after everyone has tried or skipped their turn to answer. The game ends when all avatars have been correctly matched to their professions based on the clues given. The text of the clue is given for each of the different subject areas for which a clue can be obtained from the system. These clues are played during the game in the form of speech synthesiser audio from the smartphone and displayed on the screen in the

form of text. Once all the avatars have been correctly matched, the overall ranking can be consulted on the smartphone, while the partial ranking is displayed during the game at the end of each round in which the avatar has been correctly matched. The presence of the leaderboard and the logic of scoring is a central element of the game, as it creates a challenging situation between the players, who must try to guess the correct avatar-occupation combination as quickly as possible, with as few clues as possible, in order to climb the leaderboard and overtake the other players. This element and its relevance is in line with the gamification theory.

2. Materials and methods

In total, there were 8 participants who took part in the study, aged between 21 and 28 years, equally divided between the different data collection sessions. The data collection took place in two different game sessions, each supervised by a researcher who acted as coordinator of the game activity. Each of the two sessions took place in a specific setting organised as follows. The group of participants for each session was arranged around a game table so that everyone had a full view of the 'NEFELE Box' tool positioned in the centre of the table. In both sessions, after an introductory moment by the experimenter, during which the rules of the game were explained, the actual game session began. The order of the game rounds was determined by the system itself according to a random logic. In the case of the present study, in each of the two game sessions the players were asked to correctly identify the occupation of four different avatars. The avatars to be correctly associated were randomly selected by the system from an internal list by the experimenters. Figure 2. shows the teacher's occupational scenario as an example.

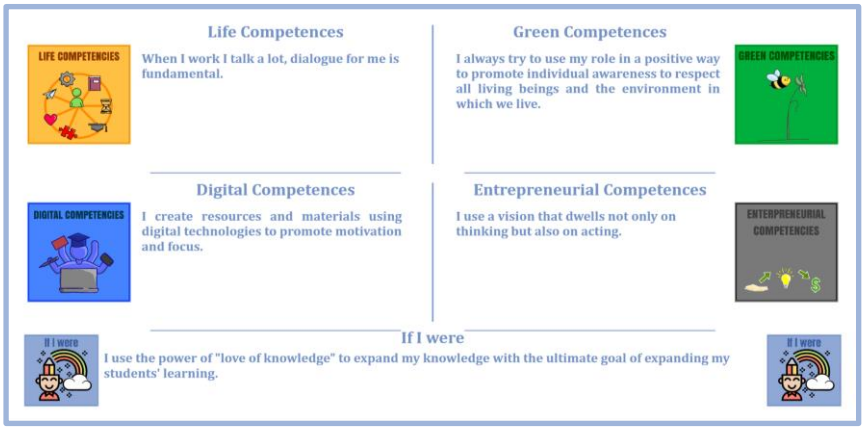

Figure 2. (Teacher's occupational scenario)

The game session was considered complete when all four characters presented by the system had been correctly matched to their occupation. Each of the two sessions lasted an average of 20 minutes. At the end of each game session, participants were asked to provide personal information such as age, gender, education level and employment status. They were also asked to answer questions from the core module of the Game Experience Questionnaire (GEQ). Data was collected anonymously and participants were asked to give informed consent before taking part in the research. The core module of the GEQ is the first part of the GEQ and is designed to collect data on players' feelings and thoughts as they play. The core module of the GEQ is a questionnaire consisting of 33 items, each of which is answered by choosing from 5 options arranged on a Likert scale ranging from 'not at all' to 'extremely'. Each of the 5 options of the ordinal scale is associated with a relative numerical value in the following way: not at all=0; slightly=1; moderately=2; fairly=3; extremely=4.It provides data on the game experience, taking into account seven different components: Immersion, Flow, Competence, Positive and Negative Affection, Tension and Challenge. The 33 items that make up the GEQ Core Module are shown in Figure 3.

1. I felt content	12. It was aesthetically pleasing	23. I felt pressured
2. I felt skilful	13. I forgot everything around me	24. I felt irritable
3. I was interested in the game's story	14. I felt good	25. I lost track of time
4. I thought it was fun	15. I was good at it	26. I felt challenged
5. I was fully occupied with the game	16. I felt bored	27. I found it impressive
6. I felt happy	17. I felt successful	28. I was deeply concentrated in the game
7. It gave me a bad mood	18. I felt imaginative	29. I felt frustrated
8. I thought about other things	19. I felt that I could explore things	30. It felt like a rich experience
9. I found it tiresome	20. I enjoyed it	31. I lost connection with the outside world
10. I felt competent	21. I was fast at reaching the game's targets	32. I felt time pressure
11. I thought it was hard	22. I felt annoyed	33. I had to put a lot of effort into it

Figure 3. (GEQ Core Module items)

3. Results and discussion

Once all the data had been collected, it was possible to proceed with the analysis of the data. The personal data of the sample consisted of 8 subjects: 5 men and 3 women, with an average age of 25 years. Regarding the level of education: 3 has a secondary school diploma, 3 a bachelor's degree and 2 a master's degree. Regarding employment all the components of the sample are still studying or working. With regard to the gaming experience data, the score obtained on the GEQ Core Module for each of the 7 components was calculated for each of the participants. As this was a pilot study with a small number of participants, we

limited ourselves to a descriptive analysis of the data and then calculated the mean and standard deviation for each of the 7 components of the questionnaire. The scoring was performed taking into account the scoring rules provided by the scale, which stipulate that each component is the result of the average of the scores obtained from specific items in the questionnaire (IJsselsteijn, De Kort & Poels; 2013).

In Table 1. is presented the averages and standard deviations calculated for the entire sample are presented ,for each of the components analysed by the core module of the GEQ, which are derived from the scoring activity carried out as described in the previous section on methodology. The results of the core module of the GEQ reported in Table 1 show that the subjects who participated in the study achieved, on average, a score corresponding to the label 'fairly', for the dimensions 'competence' (*M* = 3.25, *SD* = 0.57) , 'sensory and imaginative immersion' (*M* = 3.06, *SD* = 0.62) 'flow' (*M* = 2.5, *SD* = 0.52) and 'positive affect' (*M* = 1.00, *SD* = 1,22); a score of approximately 'moderate' for the dimension 'challenge' (*M* = 2.06, *SD* = 0.97); and an approximate score of 'low' for the dimension 'negative affect' (*M* = 0.97, *SD* = 1.04) and 'tension' (*M* = 3.13, *SD* = 0.75).

	CORE MODULE GEQ DIMENSION						
PARTECIPANT	COMPETENCE	SENSORY AND IMMAGINATIVE IMMERSION	FLOW	TENSION	CHALLENGE	NEG.AFFECT	POS. AFFECT
P1	2,8	2,67	2,8	3,33	3,75	2,5	2,6
P2	2,8	3,33	1,8	2	3	2	3,2
P3	2,6	2,83	2,6	0,67	2,25	2	2,8
P4	4	4	3,2	0	1,25	0	4
P5	4	3,67	3	0	1,5	0	4
P6	3,6	2,17	2,2	1,67	0,75	0,75	1,8
P7	3,4	3,33	2,6	0,33	1,75	0,5	3,6
P8	2,8	2,5	1,8	0	2,25	0	3
AVERAGE	3,25	3,06	2,5	1	2,06	0,97	3,13
DEV STANDARD	0,57	0,62	0,52	1,22	0,97	1,04	0,75

Table 1(Scoring Core Module of the GEQ)

Conclusions

As previously reported, the results of this study indicate that the NEFELE instrument yields encouraging data with respect to specific dimensions related to gaming experience, such as flow, challenge and positive affect. The data collected with the

Game Experience Questionnaire (GEQ) demonstrate that a serious game dedicated to a relevant topic, such as career prospects, can produce effects in terms of flow. This indicates that the game can induce a sense of transport in the player, which subsequently influences their motivation to continue with the activity.

The psychologist Mihály Csíkszentmihályi (1990) introduced the concept of flow, which is defined as a mental state where an individual is fully immersed in an activity, experiencing total concentration, deep engagement, and intrinsic enjoyment. During the state of flow, time appears to pass rapidly, and the individual becomes unaware of their own existence, focusing solely on the task at hand. The experience of flow creates a highly engaging gaming experience, which in turn motivates players to continue playing. This intrinsic motivation is of particular importance in maintaining interest and commitment, particularly in educational and training contexts.

Research has demonstrated that flow is associated with elevated levels of participation and persistence in a range of activities, including digital games. For instance, a study conducted by Sweetser and Wyeth (2005) developed the GameFlow model, which identified the conditions necessary to achieve flow in games and how this influenced player satisfaction. During the state of flow, players are in a state of focused attention, which facilitates more effective learning and better retention of information. This is particularly pertinent to the design of serious games which are intended to educate or train players in specific areas. In their 2015 study, Plass, Homer, and Kinzer demonstrated how educational games that facilitate flow can enhance learning and skill acquisition. Students in a state of flow tend to experience more profound and meaningful learning. In the context of serious games, maintaining player engagement is of paramount importance to achieve the desired educational or training outcomes.

Flow can be employed to ensure that players remain focused and motivated, thereby increasing the likelihood that they will complete the game and achieve learning goals. Wouters et al. (2013) conducted a meta-analysis demonstrating that serious games can enhance learning and motivation when designed to induce flow.

The immersion of players in the game, which is characteristic of flow, serves to reduce the impact of distractions. This is of particular importance in educational settings, where distractions can impede learning. A report by Bowman et al. (2018) demonstrated that players experiencing flow are less susceptible to external distractions, thereby enhancing the quality of the gaming and learning experience.

Flow is associated with feelings of happiness and satisfaction. The provision of a gaming experience that produces flow can contribute to players' emotional well-being, thereby reducing stress and anxiety. A study by Csíkszentmihályi (1990) demonstrated that individuals who frequently experience flow report higher levels of life satisfaction and well-being. In gaming contexts, this translates to a more rewarding and positive gaming experience. In conclusion, the literature indicates that flow is a crucial factor in the success and effectiveness of serious games.

Regarding the challenge dimension, in the context of gamification theory, it is a pivotal element, given its profound influence on the acquisition of knowledge and the engagement of players. The efficacy of challenges in games is contingent upon their alignment with the player's abilities and resources. An appropriately balanced challenge can result in several positive outcomes. These include enhanced knowledge acquisition, increased motivation and engagement, development of skills and competence, and sustained interest and long-term engagement.

When challenges are suitably aligned with a player's skill level, they can facilitate learning and knowledge retention. It can be reasonably assumed that players are more likely to engage deeply with the content and apply problem-solving skills, which in turn will lead to a better understanding and mastery of the subject matter (Gee, 2003). Challenges that are neither excessively easy nor excessively difficult can be maintained as a source of motivation and engagement for players. This optimal level of difficulty, which is often referred to as the "zone of proximal development," ensures that players remain interested and continue to invest effort in overcoming obstacles (Vygotsky, 1978). Balanced challenges facilitate the development of new skills and competencies. As players successfully overcome challenges, they gain confidence in their abilities and are more likely to take on more complex tasks in the future. This element is linked with the concept of flow, as defined by Csíkszentmihályi (1990). Furthermore, games that offer well-calibrated challenges can maintain players' interest over an extended period. This sustained engagement is of paramount importance in educational games, where continued interaction with the game content is necessary for achieving learning outcomes (Malone & Lepper, 2021). The challenge dimension is a crucial component for the promotion of effective learning, the maintenance of motivation, and the development of player skills.

The NEFELE Box also demonstrated the potential to create a strong sensory and imaginative immersion in players. This type of immersion enables players to feel as though they are fully immersed in the game world, which can have significant benefits for maintaining attention and reducing distractions. Immersive

experiences can assist players in maintaining high levels of attention by enhancing the captivating and absorbing nature of the game environment. This reduces the likelihood of players becoming distracted by external factors. In their 2008 study, Jennett and colleagues investigated the concept of immersion in games and demonstrated that immersive environments can enhance focus and decrease the impact of distractions, thereby improving the overall gaming experience. The NEFELE Box's capacity to engender sensory and imaginative immersion serves to sustain high levels of attention and to mitigate the impact of distractions.

Finally, the positive affective dimension, namely the experience of positive affect or feelings of enjoyment, can serve as a useful motivator to continue engagement. The positive affective dimension plays a pivotal role in motivating continued engagement. It can be posited that when players feel good about what they are doing, they are more likely to remain interested and committed to the activity. This intrinsic enjoyment is a significant factor in maintaining engagement, particularly in the context of educational or serious games. The experience of positive emotions during gameplay has been demonstrated to enhance engagement and increase the likelihood of players returning to the game. Enjoyable experiences create a desire to re-engage, thus promoting long-term involvement. In their study on the motivational pull of video games, Ryan, Rigby, and Przybylski (2006) found that games which generate positive affect can lead to higher levels of player retention and engagement. Their work highlighted the significance of enjoyment in sustaining player interest.

On the other hand, the results indicated that those who participated in the study reported low levels of negative affect and tension/anxiety. This led to the hypothesis that a game with characteristics like the NEFELE Box is able to create a positive play experience free of anxiety and boredom.

It is evident that low levels of negative emotions, such as anxiety and boredom, are crucial for the creation of a positive play experience. It can be posited that when players are not experiencing stress or boredom, they are more likely to find the game enjoyable and engaging. As previously stated, Csíkszentmihályi (1990) emphasised in his work on flow that the absence of negative emotions is crucial for achieving a state of flow, whereby players are fully immersed and enjoy the activity they are engaged in. The low levels of negative affect and tension/anxiety reported by participants indicate that such games can provide a positive, stress-free play experience. These elements are of critical importance for the fostering of sustained interest and engagement, thereby rendering serious games an effective tool for education and training.

At this point, it is also important to consider the limitations of the present study and its future directions. Firstly, it should be considered that this is a pilot study conducted with a small number of participants, so the results are purely indicative and should be collected on a larger sample. In terms of sample limitations, the sample considered in the study is not very representative of the population of young people considered to be in the NEET category, to which the use of the NEFELE tool is ideally dedicated. In fact, the data were collected from individuals who are representative in terms of the age variable describing the NEET category, but not in terms of employment. In part, this is not a real limitation of the study, since the only intention was to evaluate the gaming experience and not to assess the impact on the acquisition of knowledge useful for tackling the NEET problem, but it would be interesting to repeat the study at a later stage with a group of subjects that fully corresponds to the characteristics of NEET subjects and to assess, in addition to the gaming experience, the impact of the tool on the acquisition of knowledge about possible career paths. Beyond these limitations, which serve as a starting point for future studies, it is important to emphasise that the results of the present study demonstrate the potential of using serious games to promote knowledge about career prospects among individuals of an age where the NEET phenomenon is widespread. A potential that is realised in the ability of such games to maintain low levels of negative states during the game activity and to produce a state of flow that makes the user feel immersed in the activity they are playing and inclined to continue.

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