



Learning by Playing

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ABSTRACT

Play plays a key role in the development of all human beings; it is a fundamental tool for stimulating the development of thinking, language and the ability to interact with others and with the environment. Many authors in the field of psychology have emphasized the positive values of play, particularly linking it to learning processes and the experience of well-being. For these reasons, play is one of the themes considered fundamental in the Educational Psychology curriculum and is a topic that needs to be experienced to be fully understood.

To address these aims, a research project composed of three studies was conducted, adopting an interactive approach to academic class. The first study aimed to experience the positive effects of play on individuals' well-being in the academic classroom (emotional and social goals). In the second study, the experience shifted online, offering a screen-to-screen play practice to verify its effect on gaming well-being. The third study sought to promote understanding of the positive value of game formats in teaching-learning process (cognitive goal) and also to encourage reflection on the game experience in order to design play activities for children (metacognitive and learning transfer goals).

The experience of play had a positive effect on the students' perceived well-being in all cases. Students involved in the board game design activity showed an elevated understanding of the contribution of games to learning processes and psychological development.

Keywords: *Play, learning transfer, cognition, metacognition, wellbeing, game design*

1. INTRODUCTION

Since the 1976-77 academic year, the University of Macerata introduced a new model to interpret teaching-learning processes, giving students an active role as young adults and protagonists of their own growth. A hands-on approach along with small group interactions are essential, aiming to break down the anonymity of the "large class group" [1, 2]. This hands-on approach marked the beginning of a culture of active and interactive teaching in psychological subjects taught at the University of Macerata (and beyond) since the 1970s. It also introduced opportunities for reality-based tasks and guided reflection on lived experience, foreshadowing the vision of the so-called "reflective practitioner," proposed by Schön [3] in later years. Initially implemented in face-to-face classrooms, this model was later transposed into online experiences [4, 5, 6, 7].

According to the same framework, as play is a core topic in the curriculum of the university courses in Educational Psychology in Primary Education, it was proposed to experience games directly in the classroom. Although play is considered a childish activity, several authors treat play as a central element that plays a key role in the development of all human beings [8, 9, 10, 11]. It is a fundamental tool for stimulating the development of thinking, language and the ability to interact with others and the environment. Many authors in the field of psychology have emphasized the positive values of play [12], linking it particularly to learning processes and the experience of well-being [13]. Indeed, play occurs in a context that is "outside of reality", where the risk of failure is not perceived as an error, but rather as one of the possibilities that play offers [8]. This quality of play leads to a reformulation, a loss of interest, or a shift of attention to another activity. Play provides the perfect format for learning without the stress of failure, providing a space to make mistakes in a psychologically sustainable way.

2. METHODOLOGY

Three studies were conducted to demonstrate both the state of well-being achieved through play and the power of play as a catalyst for deep learning. The first study aimed to explore the positive effects of play on personal well-being in the academic classroom (emotional and social goals). It has been hypothesized that well-being perceived during the play experience would be higher than the general well-being perceived before playing. In the second study, the experience shifted online, offering a screen-to-screen play practice. It was expected that also the well-being level experienced during

online interactive gaming was higher than general well-being. In addition, it was hypothesized that students who played face-to-face presented a higher level of gaming well-being than students in screen-to-screen game condition. The third study sought to promote understanding of the positive value of game formats in the teaching-learning process (cognitive goal) and to encourage reflection on the game experience in order to design play activities for children (metacognitive and learning transfer goals).

2.1 Study 1

Participants and procedure. Participants in the first study were 44 university students ($F = 33$; $M = 11$; $M_{\text{age}} = 26.9$, $SD = 10.75$). During their Developmental and Educational Psychology lecture, they were invited to play board games in small groups of 4–5 students. Before and after the gaming experience, participants completed a questionnaire regarding their usual state of well-being (T0) and their well-being while playing (T1).

Measures. To assess general well-being (T0), the WHO-5 questionnaire was used (Bech et al., 1996). This is a 6-point Likert scale with five items measuring well-being over the previous two weeks. The Cronbach's alpha for this scale was equal to .671. For well-being while playing (T1), an adapted version of the WHO-5 questionnaire was used ($\alpha = .793$), with the five items referring to participants' feelings during the gaming experience. In addition, participants completed a satisfaction questionnaire composed by eight items ranging from 1 ("not at all") to 5 ("very much"). The Cronbach's alpha value was of .708.

Statistical analysis. Descriptive and correlational analyses as well as repeated measures analysis of variance were performed.

2.3 Study 2

Participants and procedure. Participants in Study 3 were 49 students enrolled in a post-specialization teaching training course. During an online lesson in Developmental and Educational psychology, they were first invited to complete a questionnaire about their level of well-being. They were then divided into small online groups to interact in playing a game of charades, where one student had to act out a profession and the others would try to take a guess at what the person was doing. At the end, they completed a questionnaire about their level of well-being during the game activity.

Measures. Study 3 used the same instruments as Study 1. In this sample, WHO-5 questionnaire (T0) and the gaming well-being questionnaire (T1) had Cronbach's alpha values of .756 and .890, respectively. Satisfaction questionnaire has a good reliability ($\alpha = .782$).

Statistical analysis. Descriptive, correlation analyses and repeated measures ANOVA were performed. In addition, a multivariate analyses of variance was conducted to explore well-being difference between online and offline gaming condition.

2.2 Study 3

Participants and procedure. The participants in Study 2 were 86 Primary Education Training students ($M = 4$; $F = 82$). In this study, they initially played board games during their Educational Psychology class. Following this, they attended a theoretical lesson covering key theories on play activities (Staccioli, 2012), strategies for teaching-learning processes in primary school (Di Pietro, 2022) and methods for teaching through play (cognitive goal). As a final task, students were asked to work in small groups and design a game aimed at teaching children the basics of road safety. They worked on their project work both during lessons as well as at home.

Measures. The games developed by each group, along with their descriptions, were assessed on a scale from 0 (insufficient) to 2 (excellent) for each of the six following indicators: (a) overall quality of the presentation; (b) bibliographical references; (c) in-depth treatment of the theme; (d) originality; (e) playability; (f) inclusion and accessibility. As for the (a) *overall quality of the presentation*, criteria included the quality of the game and box packaging (colours, designs, aesthetics) and the elements inside the game box (cards, dice, board, etc.). With regards to (b) *bibliographical references*, the quantity, accuracy and relevance of references to authors and their respective theories in the introductory sheet and in the descriptive materials accompanying the game box were assessed. In evaluating (c) *in-depth treatment of the theme*, i.e. road safety, the presence of varied scenarios (traffic around a school, on a motorway, near a hospital, etc.), examples (vehicles at crossroads, on roundabouts, pedestrians on pavements, etc.), types of road users (motorists, cyclists, skaters, pedestrians, wheelchair users, etc.), and traffic signs and road markings (compulsory,

danger, tourist signs, pedestrian crossings, centre lines, etc.) were considered. The assessment of (d) *originality* took into account whether or not the design of the game was distinct or reminiscent of existing games already on the market.

Playability (e) refers to the effectiveness and enjoyability of the player's experience, with key elements being the ease of understanding the rules, clarity of game elements (e.g. graphics, artwork, iconography), fluidity of the gameplay, the presence or absence of complications. Finally, *inclusion and accessibility* (f) were evaluated as follows: for *inclusion*, the presence or absence on the board or among the game materials of characters with disabilities or having diverse geographical origins (e.g. support devices, skin colour, clothing, etc.) was assessed to ensure that all players can feel represented within the game, and not excluded. For *accessibility* the evaluation focused on the game's ability to be enjoyed by anyone, regardless of their physical or cognitive abilities, by considering the different needs of users in the design to ensure active participation for all.

Based on the evaluation of each game using the six indicators, an average score was computed to assign an overall rating classified as insufficient (< 0.5), good ($0.6 \leq x < 1.4$) or excellent ($1.5 \leq x \leq 2$). Final scores evaluated as "good" were considered indicators of an adequate students' knowledge of the studied theories, attention to detail and inclusion, awareness of game dynamics, competence in knowledge transfer and commitment to the task.

Statistical analysis. Descriptive analyses (mean values and frequencies) were used for this study.

3. RESULTS

3.1 Playing to feel good

3.1.1. Offline game experiences

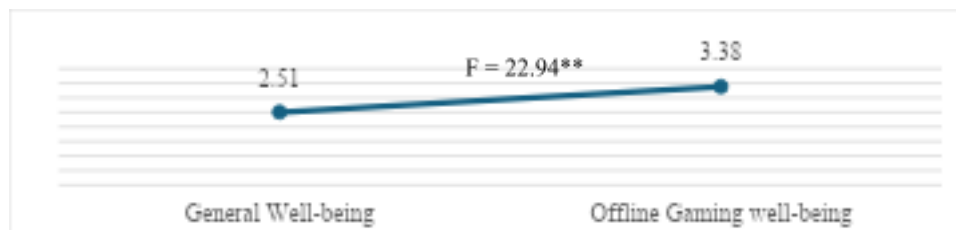
Descriptive and correlational analyses conducted in Study 1 are reported on Table 1 and showed that well-being during the offline gaming positively relates with usual state of well-being ($r = .304^*$) and with satisfaction to join the experience ($r = .780^*$).

Table 1
Descriptive data and correlational analyses

	<i>M (SD)</i>	Bivariate correlations		
		2.	3.	4.
1. Age	26.93 (10.75)	.143	.043	-.052
2. General well-being	2.51 (0.75)	-	.304*	.223
3. Offline gaming well-being	3.38 (1.18)	-	-	.780**
4. Satisfaction	3.90 (0.47)	-	-	-

Note. *Significant at the level of 0.05 (2-tails) **Significant at the level of 0.01 (2-tails)

In addition, repeated measures ANOVA conducted showed that the students' level of well-being was significantly lower than their perceived well-being during the offline game session, $F(1, 43) = 22.945, p = .000, \eta^2 = .348$.



Graphic 1. Differences between general well-being and offline gaming well-being – Study 1

3.1.2. Online game experiences

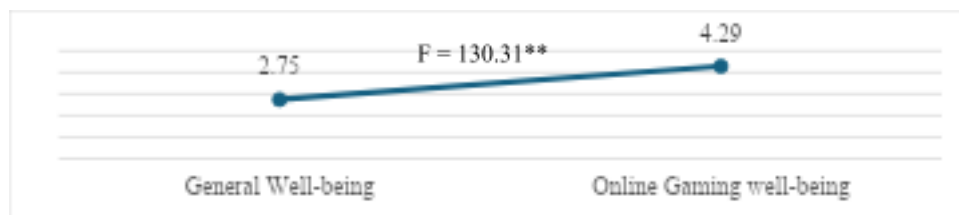
Table 2 reported descriptive and correlation analyses conducted in the second study. No significant correlation was found between general well-being and gaming well-being, except for the relation between gaming well-being and satisfaction for the experiences ($r = .505^{**}$).

Table 2
Descriptive data and correlational analyses

	<i>M (SD)</i>	Bivariate correlations		
		2.	3.	4.
1. Age	40.51 (10.74)	-.168	.235	.162
2. General well-being	2.75 (0.70)	-	.170	.126
3. Online gaming well-being	4.29 (0.75)	-	-	.505**
4. Satisfaction	4.52 (0.43)	-	-	-

Note. *Significant at the level of 0.05 (2-tails) **Significant at the level of 0.01 (2-tails)

Furthermore, repeated measure analyses conducted in Study 2 showed that the general level of well-being is significantly different than gaming well-being, $F(1, 48) = 130.31$; $p = .000$, $\eta^2 = .731$. Indeed, as Graph 2 shows, the general well-being at the beginning was 2.51, while the perceived well-being at the end of the game session was 3.38. The participants' responses showed that play had a positive effect on their mental state. Further explanation about these results are reported on Guardabassi et al. (2024).

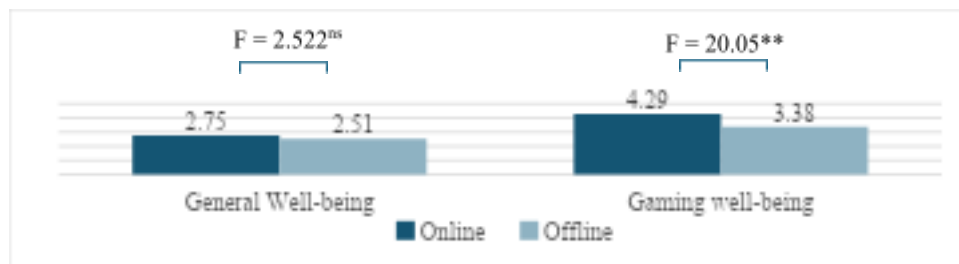


Graphic 2. Differences between general well-being and online gaming well-being – Study 2

3.1.2. A comparison between offline and online interactive game experiences

A supplemental multivariate analysis of ANOVA was performed to explore differences in general and gaming well-being between students who played offline and those who played online.

Results showed no differences on general well-being between students who played offline and online, $F(1, 91) = 2.522$, $p = .116$, $\eta^2 = .027$. Differently, perceived well-being during game experience differs between the two conditions: offline gaming well-being was lower than online gaming well-being, $F(1, 91) = 20.053$, $p = .000$, $\eta^2 = .181$.



Graphic 3. Differences between general well-being and gaming well-being in offline and online condition – Study 3

3.3 Designing games to learn about games

The students designed 13 different games about road safety, with 10 out of 13 being board games. Six indicators were adopted to evaluate the products, and the assessment process was conducted by three independent evaluators, including the academic teachers from the Psychology of education course and a game designer.

Based on the six indicators, the mean score was 1.25. No games were rated as insufficient; the majority were evaluated as being at a good level. Additionally, results showed that 3 out of 13 were considered excellent. Table 1 presents the results.

Table 1. Games and evaluation

Game name	Game type	Indicators						Average Score	Final Evaluation
		(a) quality	(b) bibliographical references	(c) in-depth theme	(d) originality	(e) playability	(f) inclusion and accessibility		
Ready, steady, go	Board game	1	0	1	0,5	1	2	0,92	good
Learning while going	Board game	0,5	0	2	1	1,5	0,5	0,92	good
RoadMind	Other	0,5	2	1,5	2	1,5	0,5	1,33	good
Safe Road	Board game	1,5	2	2	1,5	2	0,5	1,58	excellent
The good path to safety	Other	1	1	2	1,5	1,5	2	1,50	excellent
Ready, steady, go: on the road together	Board game	1,5	0	1	1	1,5	2	1,17	good
Everyone on the road	Board game	1	1,5	0,5	0	1	2	1,00	good
Having fun on the road	Board game	1,5	0	1	1	1	1,5	1,00	good
Full speed	Board game	2	0	1	1,5	2	0,5	1,17	good
Where do you think you're going?	Other	1,5	0	1	1	1,5	1	1,00	good
Getting around town - how-to	Board game	0,5	1	1,5	1,5	0,5	1,5	1,08	good
Road safety School	Board game	1	1	2	1	1	1	1,17	good
Find the street	Board game	2	1	2	2	2	2	1,83	excellent

The scores achieved in the task contributed to each participant's final assessment score, which was based on a weighted measure.

4. DISCUSSIONS

This research project was conducted to test the use of an interactive learning-teaching approach in teaching the role of play in human development. The first study suggests that presenting learning content in a playful form may promote the well-being of university students. In the gaming experience, students interact with each other in small groups. This finding is consistent with research on the positive effects of game activities in fostering psychological well-being (Csikszentmihalyi, 2000) which can be important since positive emotions can enhance cognitive engagement related to learning processes.

Study 1 showed that game-activities are not only tools for promoting engagement among university students (e.g., gamification in S. González-Yubero et al. 2023), or for fostering participation, involvement and fun (Llorens-Largo F. et al., 2016), but they also represent opportunities for socialization, reward, and experiencing the mental state of flow along with its positive effects (Bruner J.S. et al., 1976). Game activities appear to be a successful instrument to temporarily improving university students' well-being, even and especially when the experience is online and mediated by a screen, as emphasized by study 2. Indeed, contrary to one of the study's hypotheses, online gaming well-being was higher than offline gaming well-being, suggesting its strong impact. However, differences in the sample composition in terms of age and personal condition (study 2 was conducted during the covid-19 pandemic) and in terms of the type of game experienced suggest that this relationship should be explored in depth in the future.

Furthermore, Study 3 shows that participation in play sessions provided opportunities for deeper understanding and the chance to apply creative processes. These results parallel the study by Boghian et al. (2019) about the positive effect of board games in adult education. In fact, students can experience the benefits of learning through play and transfer the acquired awareness to the teaching process addressed to children. Having the opportunity to lively engage in play activities and then design games for children may also foreshadow the vision of the so-called "reflective practitioner" as illustrated by Schön.

5. CONCLUSIONS

Based on the previous experience of interactive didactics at the university, it was easy to propose to the university students a play activity during the lessons, even though play is seen as an activity directly related to children and infants. In fact, generally in schools playing is still considered a mere diversion, like a break between the real learning activities, even when the pupils are very young. On the contrary, consistent studies in the psycho-pedagogical field [8, 9, 10, 11] show that play and games are excellent formats to support cognitive processes and deep learning, while positively practising social interactions and experiencing emotional well-being.

There is still a small amount of research on the effects of play with adults [20], and it is mostly dedicated to the effects of play on social and emotional well-being. Our studies show not only that adults can experience positive effects on their wellbeing when playing (studies 1 and 2), but also that playful activities allow cognitive and metacognitive effects that contribute to learning processes and the achievement of very good academic results (study 3). The studies are particularly useful because they involved students in primary education university course, giving them a concrete experience of the positive value of play and its positive effects not only on the socio-emotional state, but also on cognitive skills and knowledge construction.

In conclusion, these studies suggest that play during academic lessons, both in face-to-face and screen-to-screen online classes, can be a useful tool in the didactic process to promote students' well-being (socio-emotional objective) and to foster new learning (cognitive objective). Furthermore, the active interaction with board games provided an opportunity to understand what a playful activity can activate in children during play (metacognitive objective). On the basis of this understanding, it seems straightforward to design and implement games aimed at children (learning transfer). These positive effects could encourage teachers to include games in the design of didactic and pedagogical units, rather than seeing them as mere diversions with little impact on the learning process and mental health. In fact, reflecting on the results made the students aware of the many positive effects of play on themselves, and perhaps persuaded them to adopt playful activities when they start teaching in school.

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