

The Effect of Little Alchemy 2 Game Duration on Figural Creativity in Adolescence

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Abstrak. There are multiple methods to cultivate creativity, including play. In current times, teenagers frequently engage in smartphone-based play, leading to the emergence of online gaming as a solution. Little Alchemy 2 is a popular game among teenagers. This study aims to determine the effectiveness of the duration of little alchemy 2 game play on adolescent figural creativity in Makassar city. This study used a one group pre-test post-test experimental design by comparing experimental group 1 with a time limit of 1 minute and experimental group 2 with a time limit of 30 minutes. The study involved 30 male students aged 18-19. The statistical tests employed in this study were the Mann Whitney Test and the Wilcoxon Test. The results of this study indicate that there is an effect of intensity in playing the game little alchemy 2 with $p = 0.042$ ($p < 0.05$), and there is a difference between the intensity of experimental group 1 and experimental group 2 in playing games at $p = 0.000$ small than (< 0.005). Engaging in Little Alchemy 2 gameplay for a duration of 15 to 30 minutes has the potential to augment the creativity of adolescents.

Keywords: Playing intensity, Creativity, Online game, Little Alchemy 2, Adolescence

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INTRODUCTION

The pervasive impact of the internet on societal demands necessitates its incorporation into all activities. According to a survey conducted by APJII, the number of internet users has increased by 52,531 people in the past two years, with teenagers primarily using the internet for online gaming. The increasing number of online games has the potential for contributing to online addiction among teenagers. Adolescents are more susceptible to game addiction than adults due to their inclination towards experimentation and instability during this developmental stage (Jordan & Andersen, 2017). Internet addiction can be experienced by anyone as it serves as a coping mechanism for stress (Kasim, Murdiana & Fakhri, 2018). Internet addiction is prevalent among university students (Suryaningsih, Fakhri & Ridfah, 2021). However, playing games does not only bring bad affects, but it also has the potential to bring positive impacts to people's lives. Numerous studies have been conducted to demonstrate this assertion.

Gee (2007) posited that games incorporate learning principles that facilitate the development of individual abilities. Games with entertaining elements can serve as an enjoyable educational tool. Digital games utilize instructional technologies like simulation and multimedia presentations to provide interactive and experiential learning opportunities. According to Hromek and Roffey (2009), games are enjoyable and motivating, especially for children and young individuals. Playing strategy games has been linked to improved problem-solving skills, academic success (Adachi & Willoughby, 2013) and altered problem-solving approaches (Levine, 2006). Additionally, gaming requires multitasking abilities and enhances attention (Anguera et al., 2013), as well as improves information processing (Powers et al., 2013). Hanany et al. (2023) found that video games have the potential to transform negative emotions into positive emotions in players, even under specific circumstances.

Games serve as a medium for both entertainment and learning, offering unique educational opportunities not available in other environments. The game features an activity that allows players to solve diverse problems, including one that prioritizes performance over competence. This affords all players the chance to participate in the game, regardless of their level of proficiency. The game features customization options that enable players to solve problems at different levels, promoting diverse problem-solving approaches (Gee, 2005). Prensky (2001) stated that the experience of playing video games allows for the development of creativity and critical thinking. Game-based learning has been shown to effectively stimulate creative thinking (All, Nunez Castellar & Van Looy, 2016; Lin et al., 2018). According to Gao (2015), games can enhance individuals' motivation for learning and foster their self-directedness, autonomy, and ingenuity. Game-based practices in digital games can guide learners to become "experiencers" and solve multilevel problems. According to Zhan (2011), learners' creativity and problem-solving skills may enable them to become knowledge creators who offer solutions to real-world issues.

Little Alchemy 2 is an online game that fosters creativity. Koziol (2017) identified Little Alchemy 2 as a puzzle game. Puzzles are a form of game that fosters logical and creative thinking (Weng, 2022). Little Alchemy 2 is a game that involves the combination of various elements to produce new ones. This feature enables the

game to foster the creativity of adolescents. As noted by Koziol (2017), extended play enhances one's comprehension and ability to transform an element into a novel one.

In the words of Kaufman and Sternberg (2006), creativity is the capacity to convert something that lacks significance or is disregarded into something that holds meaning. According to Solso, Maclin, and Maclin (2013), creativity involves generating novel ideas and perspectives that are not constrained by practical outcomes. Early development of creativity has been linked to various benefits such as enhanced problem-solving abilities, adaptability, self-expression, improved health, and increased learning advantages (Ali, Park & Breazeal, 2021). According to Xiao (2011), creativity encompasses adventure, curiosity, imagination, and challenge. These three elements are present in games, where game genres often promote creative responses in players.

The capacity to create theories, original works, procedures, and concepts, according to VandenBos (2007), is what defines creativity. Individuals with a creative disposition tend to exhibit qualities such as originality, expressiveness, and imagination. Figural creativity is a type of creative thinking that involves generating novel concepts or ideas through the use of mental imagery. The capacity to employ imaginative faculties in modes of expression that are not verbal or literal, often with an emphasis on sketching or producing visual depictions. The aptitude in question can be exhibited through either the manipulation of pre-existing visual content or the production of original imagery. The notion of figural creativity is a scholarly construct that formed the basis of the Torrance Tests for Creative Thinking, which is regarded as a substitute or complement to conventional intelligence quotient assessments. The Torrance Test for Creative Thinking assesses the levels of verbal and figural originality. According to Alabassi et al. (2022), the figural originality test requires participants to produce drawings by incorporating incomplete lines or shapes that are already present on a sheet of paper, thereby integrating the original shapes into the final artwork. The concept of figural creativity centres on the utilisation of drawing exercises as a means of generating novel ideas, without necessitating any particular proficiency or aptitude in drawing. According to Munandar (1999), figural creativity places greater emphasis on the capacity to stimulate facets of imaginative thinking and assesses dimensions of fluency, flexibility, originality, and elaboration.

Blanco-Herrera et al. (2019) conducted a study which found a positive correlation between extended periods of playing video games and increased creativity. The concept of time period, also known as duration, pertains to a quantitative attribute that denotes the span of time in which a particular entity endures or persists (Merriam-Webster, 2023). According to Horrigan's (2002) proposal, the duration component of gaming pertains to the amount of time spent playing, specifically the duration of access within a given day. The present study focuses on the duration of online gaming, which is defined as the amount of time an individual spends engaged in gameplay, measured in either seconds or minutes.

Consequently, the present study was designed to investigate: (1) whether the length of time spent playing the game "Little Alchemy 2" has a significant impact on the figural creativity of adolescents residing in Makassar City? (2) What is the extent

to which engaging in gameplay of Little Alchemy 2 can enhance the figural creativity of adolescents?

RESEARCH METHOD

Thirty male Makassar State University students, aged 18 to 19 years, participated in this study. The sample population has been limited to male respondents due to the commonly held belief that male individuals exhibit a higher degree of creativity when compared to their female counterparts. According to He and Wong's (2011) research, there exist gender-based disparities in creativity levels, with men exhibiting higher levels of creativity than women.

The present study employs a quasi-experimental research design, utilising the one-group pretest-posttest design. Specifically, the design incorporates two experimental groups. The study involves administering a pre-test to participants assigned to the experimental groups. Following this, the participants are divided into two groups. Group 1 receives a 15-minute treatment, while Group 2 receives a 30-minute treatment. The treatment involves playing a game called "Little Alchemy 2" on a smartphone. In addition, the administration of the post-test occurs subsequent to a 72-hour interval following the pre-test and the intervention provided.

The study employed a Figural Creativity Test (TKF) tool, which draws on Guilford's conceptualization of creativity, to administer pre-test and post-test assessments of participants' creativity levels (Weisberg, 2006). The present investigation employs the subsequent design scheme:

Description:

O1 : Pre-test of all participants before treatment

O2 : Post-test of all participants after treatment

X1 : 15 Minutes Game Play Duration

X2 : 30 Minutes Game Play Duration

Table 1. Skema Desain Eksperimen

Participant	Pre	Treatment	Post
Eksperimen	O ₁	X ₁	O ₂
	O ₁	X ₂	O ₂

This research hypothesis test was carried out with non-parametric techniques using the Mann Whitney test then using the Wilcoxon test.

RESULT AND DISCUSSION

The results of the study are outlined in the following table.

Table 2. Pretest and posttest data of experimental group 1

No	Inisial	Pretest	Kategori	Posttest	Kategori
1	GJ	85	Below average	100	Average
2	MAJ	86	Below average	91	Average
3	AI	92	Average	107	Average
4	MFA	76	Border	80	Below average

5	AA	76	Border	80	Below average
6	MSB	72	Border	75	Border
7	MFA	80	Below average	85	Below average
8	AAH	83	Below average	92	Average
9	AI	90	Below average	95	Average
10	AGT	92	Average	92	Average
11	ZR	72	Border	82	Below average
12	MYP	90	Below average	97	Average
13	MAJ	85	Below average	94	Average
14	ZG	109	Average	109	Average
15	VA	105	Average	107	Average
Mean		86.2		92.4	

Table 3. Pretest and posttest data of experimental group 2

No	Inisial	Pretest	Kategori	Posttest	Kategori
16	ARL	88	Below average	94	Average
17	MR	91	Average	99	Average
18	AAK	96	Average	110	Average
19	MZ	97	Average	105	Average
20	MAW	89	Below average	98	Average
21	AF	93	Average	112	Above average
22	MAM	91	Average	114	Above average
23	MSA	85	Below average	99	Average
24	AAH	84	Below average	95	Average
25	MG	91	Average	97	Average
26	QMS	90	Below average	103	Average
27	MYA	106	Average	108	Average
28	A	94	Average	95	Average
29	MBM	89	Below average	114	Above average
30	MRM	110	Average	119	Above average
Mean		92,93		104.13	

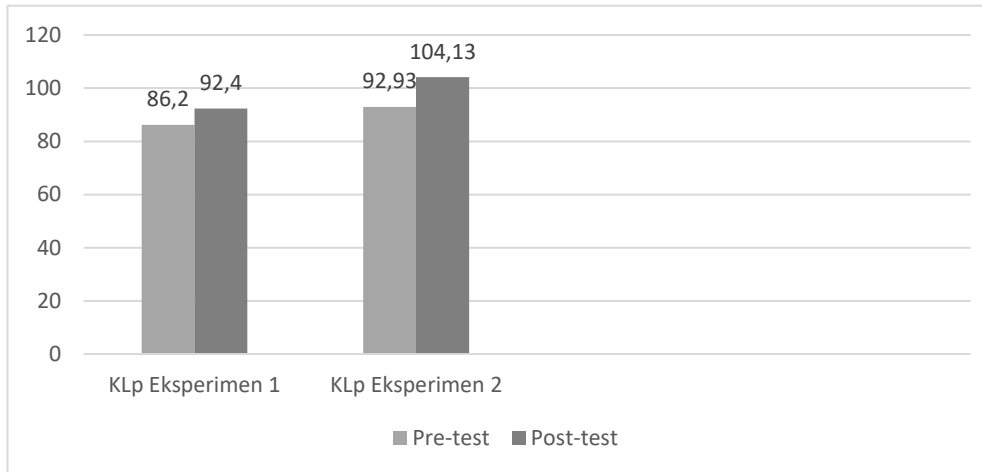


Figure 1. Graph of differences before and after treatment in experimental group 1 (Ex1) and experimental group 2 (Ex2)

The non-parametric hypothesis testing methodology employs the Mann Whitney Test and the Wilcoxon Test, both of which are executed using SPSS 25.0 for the Windows operating system. The Mann-Whitney U test was employed to ascertain the disparity between the experimental groups, wherein both groups were subjected to identical treatment. The Wilcoxon test was employed to assess the statistical significance of the differences between the pretest and post-test scores of experimental group 1 and experimental group 2.

Table 4. Mann-Whitney Hypothesis analysis

Kelompok	Sig. Gain Score
Ekperiment 1 dan Ekperiment 2	0,042

Table 5. Wilcoxon Hypothesis analysis for all the group

Pre-test dan Post-test	Asymp. Sig (2-tailed)
Ekperiment 1 dan Ekperiment 2	0,000

Table 6. Group hypothesis test differences using the Wilcoxon Test

Pre-test dan Post-test	Asymp. Sig (2-tailed)
Eksperiment 1	0,001
Eksperiment 2	0,001

Based on the results of the conducted data analysis, a significance value of $p=0.001$ was calculated because the p value was less than 0.005 , indicating that the hypothesis is accepted. In other words, the length of time spent playing Little Alchemy 2 has an impact on the figurative creativity of adolescents in Makassar City. Based on the findings of this study, it is recommended that a game duration of 15-30 minutes is optimal for enhancing figural creativity among adolescents.

The findings of the study are consistent with those of Blanco-Herrera et al. (2019), indicating a positive association between game duration and creativity levels. According to Bainbridge (2010), players of a game are provided with an opportunity to develop their problem-solving skills by engaging in the game and adapting to its challenges. Operational elements of creative ideas are those that alter pertinent knowledge and skill in the context of a specific task or problem (Scott, Longergan, & Mumford, 2005). Dailey and Mumford (2006) assert that the efficacy of idea generation is contingent upon a multitude of cognitive processes, including but not limited to problem construction, information gathering, conceptual combination, and critical processing activities. The act of engaging in video games necessitates a particular cognitive disposition. Adversity constitutes a fundamental and essential element of video games. Little Alchemy 2 is a game that necessitates the amalgamation of various elemental components in order to generate novel elements. This is the factor that enables games to serve as a means for fostering the creative abilities of adolescents. As one's playtime increases, their comprehension and capacity to reconfigure an element into a novel form also increases. According to Nickerson (1999), active participation in problem-solving activities is crucial for fostering creativity. And playing games can provide individuals with such opportunities.

According to a study conducted by Jackson et al. (2012), it was found that 12-year-old adolescents who possess prior experience in online gaming exhibit greater levels of creativity as measured by the Torrance tests in comparison to their counterparts who lack such experience. The study conducted by Gackenbach and Dopko (2012) revealed that the verbal creativity of adults remains unaffected by their gaming experience. However, their performance on the Torrance non-verbal creativity test is positively correlated with their gaming experience. The analysis of cognitive and creative aptitudes of gamers and game developers, encompassing producers, coders, musicians, animation and computer graphics specialists, and educators, can be facilitated through the utilisation of computer games (Lee & Peng, 2006). Games that are specifically designed require players to cultivate and arrange cognitive strategies in order to carry out tasks within highly intricate digital settings. The primary focus of this contribution pertains to elucidating the correlation between video games and creativity. Jackson and Games (2015) proposed that engagement in video games may enhance creativity by offering four distinct types of advantages: cognitive, social, emotional, and motivational. This correlation offers a potential explanation for the association between gaming behaviour and creativity.

CONCLUSION

The findings of the hypothesis testing indicate a significant correlation between the length of time spent playing Little Alchemy 2 and figural creativity among adolescents residing in Makassar city. The results indicate a statistically significant increase in mean scores for both experimental groups, as determined by pre-test and post-test measurements using the norm-referenced Figural Creativity Test (TKF). Recommendations for future researchers include expanding the sample size, incorporating diverse demographic cohorts, exploring alternative game genres, and accounting for players' prior gaming experience.

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