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Development of a Scale for Fantasy State in Digital Games

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Abstract

Digital games appear to motivate players intrinsically. Of various game features, fantasy in particularly plays a crucial role in enhancing motivation and is a key factor in immersion in gameplay. As with its inherent value, fantasy also plays a vital role in distinguishing digital games itself from other media. Despite its significance, fantasy has received little attention, and this concept is still ambiguous to define with any certainty. This study thus aims to create a framework to explore a dimension of fantasy and to develop a scale to measure a state of fantasy in digital games. As a result, four factors were extracted, which were 'identification', 'imagination', 'analogy', and 'satisfaction', to account for fantasy state in digital gameplay. Based on these factors, a fantasy scale in digital games (FSDG) included 16 items was developed.

Keywords: Digital game; Fantasy; Intrinsic motivation; Measurement; Exploratory factor analysis; Confirmatory factor analysis

1. Introduction

Numerous studies on technology in education have sought to find appropriate pedagogies and learning activities in order to create meaningful learning environments with various multimedia. It is hard to explicitly define meaningful learning environments with technology, though many scholars have widely agreed that meaningful learning environments arouse interaction, feedback, motivation, and collaboration (Norman, 1993; Dede, 1996; Jonassen et al., 1999).

Digital games have been recently considered as meaningful learning environments (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005; Kiili, 2005; van Eck, 2006). Games are the optimized environments for fun. In addition to fun, games provide interaction, feedback and collaboration. Of these attributes, motivation is the most remarkable feature digital games have. Integrating digital games in education, therefore, becomes more significant because it can provide engaging and motivating learning environments. It is thus not surprising that many educators have begun to examine whether games can contribute to students' interest and learning (Gee, 2003; Prensky, 2001; Squire, 2006; Van Eck, 2006). For last decade, many empirical studies have shown that games enhance students' motivation (Cordova & Lepper, 1996; Lopez-Morteo & Lopez, 2007; Tüzün, YIlmaz-Soylu, Karakus, Inal, & KIzIlkaya, 2009).

Meanwhile, motivation is an important catalyst for success in learning. Strong correlations exist between academic intrinsic motivation and academic achievement (Adelman & Taylor, 1983; Burton et al., 2006; Corpus et al., 2009; Gottfried, 1985; Jurievi et al., 2008). Learning embedded in motivational situations yields desirable learning outcomes and increases intrinsic motivation (Cordova et al., 1992; Cordova & Lepper, 1996). As such, games appear to intrinsically motivate users through environmental features (Thomas & Macredie, 1994). According to Garris, Ahlers and Driskell (2002), there are six characteristics of digital games, such as fantasy, rules/goals, sensory stimuli, challenge, mystery, and control. They stressed that such game characteristics should be activated within an instructional context in order to enhance learning. Malone and Lepper (1987) also stated that game features, such as challenge, curiosity, fantasy, control, cooperation, competition and recognition, make learning fun. Of these game features, fantasy in particular plays a crucial role in enhancing motivation (Crawford, 1982; Malone & Lepper, 1987) and is a key factor in immersion in gameplay. Chris Crawford (1982) indicates that fantasy is the main reason for

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playing digital games; that is to say, people want to fulfill their needs from fantasies in games. Consequently, fantasy can serve as a 'hook' to engage the player, which activates game affordances such as interaction, competition, control, curiosity, challenge, and feedback (Asgari & Kaufman, 2004).

Despite such significance of fantasy in digital games, fantasy has received little attention in digital game research. It is safe to say that there was barely any research on fantasy in digital games with a view of intrinsic motivation since this concept has been first addressed as a vital contributor to intrinsic motivation in digital games in the early 1980s. In a nutshell, even though fantasy appears to be a predominant factor in intrinsic motivation, this concept is still too ambiguous to define with any certainty. Most people may, by and large, perceive fantasy only as a fictitious emotion such as imagination, illusion, and the like. In game environments, Malone (1981) refers to this attribute as an emotional aspect of fantasy. However, he further defines a cognitive aspect of fantasy such as metaphor and imaginary. This clarification he made provides us with an insight into how to approach the concept of fantasy in digital games; that is, fantasy can be considered as an inclusive concept of diverse set of subcomponents.

With that in mind, this study attempts to identify fantasy components as an innate feature for intrinsic motivation in digital games. Toward that end, this study aims to create a framework to explore a dimension of fantasy and to develop a scale to measure a state of fantasy in digital games.

2. Role of fantasy for enhancing intrinsic motivation

2.1. Fantasy and intrinsic motivation in digital games

Many researchers, who have studied digital games, have agreed that fantasy is a key contributor to making games fun. Digital games represent imaginary worlds where people's desire and needs are represented. Of various game features, fantasy may be the first catalyst that catches the attention. All the tangible entities existing in digital games evoke fantasy as well as diverse mental images, which enable players to become engrossed in gameplay. Fantasy thus plays a vital role in maintaining players' interest and engagement in gameplay. In this regard, Asgari and Kaufman (2004) addressed the importance of fantasy in gameplay, stating "Games with no fantasies involve only abstract symbols (p. 4)."

Many empirical studies have examined the relationship between fantasy and intrinsic motivation in gameplay (Cordova & Lepper, 1996; Parker & Lepper, 1992; Vos, Meijden, & Denessen, 2011). These studies concluded that fantasy is a critical factor in increasing intrinsic motivation in gameplay. Driskell and Dwyer (1984) said that fantasies facilitate focalization of attention and the self-absorption, enabling users to immerse in game activity. Although fantasy initially comes from environmental features of games, it is by no means visible and tangible embellishments. Embellished environmental entities, of course, evoke fantasy and contribute to players' motivation in gameplay; however, far beyond such tangible entities, other game features, such as game story and users' role in games, also play a pivotal role in players' motivation. Take role-play games and action games for example. In these games players become heroes of the game world, who create the game story through their action in the game world. The key factors to play such games are players' gaming identities (e.g., characters), which are assigned in the game world, and missions or quests given to them so that continue to make the games story. These intangible attributes also play a critical role in making players engrossed in gameplay.

2.2. Fantasy as a construct

Psychologists define fantasy as a "defense mechanism for the fulfillment of wishes and the resolution of conflict (Caughey, 1984; Hume, 1984). According to Hume (1984), fantasy is any departure from consensus reality, an impulse native to literature and manifested in innumerable variations, from monster to metaphor. In terms of fantasy in game environments, Garris et al. (2005) stated fantasy as an activity in which has no impact on the real world. Malone and Lepper (1987) define fantasy as one that evokes mental images of physical or social situations not actually present, and classified the concept of fantasy as intrinsic and extrinsic fantasy. This classification can be explained by the relationship between fantasy and skills in game environments. An intrinsic fantasy is defined as

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"one in which the skill being learned and fantasy depend on each other" and "there is an integral and continuing relationship between the fantasy context and the instructional content being presented", whereas extrinsic fantasy is defined as "one in which the fantasy depends on the skill being learned but not vice versa" and the relationship is arbitrary and periodic. A number of empirical studies indicate that intrinsic fantasy is more motivational and educational than extrinsic fantasy (Cordova & Lepper, 1996; Habgood et al., 2005; Malone & Lepper, 1987; Parker & Leper, 1992). In the same vein, Vos, Meijden, and Denessen (2011) examined how designing games enhances motivation and deep learning, as opposed to playing existing games. In short constructing a game can boost learners' intrinsic fantasy, which is an integral and continuing relationship between fantasy environments and instructional context, and enhances students' motivation and learning.

Malone and Lepper (1987) also addressed that fantasy has two important aspects such as emotional aspect and cognitive aspect. Emotional aspect of fantasy derives much of its appeal from the emotional needs they help to satisfy. In fact, it is very difficult to determine which fantasies might appeal to particular individuals; however, one general mechanism that may explain these differences is identification. Namely fantasies are most likely to fulfill emotional needs when they provide imaginary characters with whom the individual can identify, such as perceived similarity between the self and the character, admiration for the character, and so forth. In addition to the emotional needs that fantasy may serve, there is also a cognitive component to fantasy. In the cognitive aspect of fantasy, fantasy offer analogies or metaphors that may provide learners with leverage to better understand new information through relating to the past knowledge.

Reiber (1996) has further noted that fantasy contexts can be exogenous or endogenous to the game content. An exogenous fantasy is simply overlaid on some learning content. For example, children may learn fractions by doing slay a dragon in an enchanted forest. This type of game is likely to be more engaging than a long page of fractions. However, fantasy in this case is external to and separate from learning example. In contrast an endogenous fantasy is related to the learning content. For example, students may learn about physics by piloting a spaceship on reentry earth's orbit. He noted that since endogenous fantasies are more closely tied to the learning content, if the fantasy is interesting, the content becomes interesting.

Although definitions and attributes of fantasy vary from scholar to scholar, fantasy in gameplay can be described as mental images, which evoke imagination, identification and satisfaction, with interaction with environment attributes of digital games, such as graphics, sound, story, events, and control. That is to say, fantasy in digital games should be understood as a mental image, which evokes from interaction with players and its distinctive media features, including not only tangible entities (e.g., embellishments) but also intangible ones (e.g., game story and role).

3. Method

3.1. Initial Item development

Items were developed from the definitions of fantasy cited by various scholars (Crawford, 1982; Caughey, 1984; Hume, 1984; Malone & Lepper, 1987; Garris et al., 2002) and experimental research on fantasy (Parker & Leper, 1992; Cordova & Lepper, 1996; Habgood et al., 2005). Five researchers, who are familiar with the fantasy concept and had used this concept as game based learning research, then evaluated an initial pool of 36 items independently. In this process, several negatively or ambiguously worded items were found to be less effective in item analyses. These weak items were replaced with more clearly stated and positively worded items. These items were also evaluated by a group of experts. The expert group consisted of five faculty members and four research associates all studying games for learning at either the department of education or the department of educational technology from two universities in the United States and South Korea. These evaluators rated each item in terms of perceived relevancy to its proposed dimension and provided feedback in terms of item wording. Items rated as less relevant were removed, and the wording of items was improved based on the feedback from these evaluators. This review resulted in the removal of six items with similar meaning. As a result, 30 items were generated to administer for this study.

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3.2. Participants and procedures

Participants in the present investigation were 357 respondents (57% male, 43% female) from South Korea. Participants varied in age from 11 to 13. In the preliminary study, 153 respondents were participated in this study so as to examine a construct of fantasy scale. 53 % of the students were male, and 47 % of the students were female. 19 % of the participants were 11 years old, 22 % of them were 12 years old, and 59% of them were 13 years old.
In this study, 35 commercial off-the-shelf games were used to analyze: twelve online action games; seven massively multiplayer online role-playing games (MMORPG); five first-person shooter (FPS) games; five social network games (SNGs); three adventure games; two real time strategy (RTS) games; and two online sports games. Participants first indicated one of their favorite games, and then replied to the questions based on their preference game.

The main study group consisted of 204 respondents aged from 11 to 12. 63% of the students were male. 74% of the subjects were 13 years old, and 26% were 12 years old. When answering the fantasy scale questionnaire, participants were asked to indicate their favorite game. They then responded to the fantasy items using five-point Likert scales anchored by 1=strongly disagree to 5=strongly agree.

3.3. Measures

Prior to preliminary test, simple descriptive statistical analysis was conducted. After examining simple statistical analysis, exploratory factor analysis (EFS) was conducted as a preliminary test so that explores constructs of a fantasy scale. Principal component analysis was used to determine the number of extracted factors, and varimax structure was used as a suitable method of orthogonal rotation. The criterion for valid variables was decided at 1.00 of eigen value and factor loading above .50. In the exploratory analysis, factor loadings are generally considered meaningful when they exceeded .30.

In order to confirm validity of the fantasy scale, confirmatory factor analysis (CFA) was conducted. For structural equation modeling (SEM), maximum likelihood method was adopted.

4. Result

4.1. Exploratory factor analysis of the fantasy scale

For factorability of the data for the fantasy scale, an exploratory factor analysis (EPA) was adopted. To validate the communality, the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and the Bartlett's test of sphericity were utilized. As a result, the KMO measure of sampling adequacy was .91, and the Bartlett's test of sphericity was 2445.195 (p =.00) at significance level .01. Thus, it could be interpreted as fit for factor analysis, and that there were common factors.

The number of factors to be retained was guided by three decision rules: Kaiser criterion (eigen value above 1), inspection of the Scree plot and comprehensibility. Principle component analysis (PCA) with varimax rotation was performed to extract factors. Table 1 shows factor loadings after varimax rotation. To eliminate insignificant item from the fantasy scale, first the items with statistically insignificant factor loadings at the 0.05 level were deleted. Second, the items with communality less than 0.50 were dropped because they did not meet acceptable levels of explanation and were poorly represented in the factor solution. Lastly, the items with a difference of factor loadings less than 0.10 were deleted.

Although PCA of the 30 items revealed five factors with an eigenvalue above 1, according to inspection of the Scree plot four factors were chosen as it exhibited simple structure and clearly defined factors. To shorten the scale, items were removed from these processes, a rotated factor matrix generated after each removal. At the end of this process 26 items were retained (see Table 1).

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Table 1. Factor loadings for EFA with varimax rotation of Fantasy scale

Items	Factors			
	1	2	3	4
Item 23	.778			
Item 8	.685			
Item 28	.677			
Item 27	.632			
Item 18	.624			
Item 20	.602			
Item 19	.585			
Item 22	.582			
Item 26	.552			
Item 12		.712		
Item 7		.676		
Item 3		.668		
Item 10		.642		
Item 1		.634		
Item 2		.627		
Item 30		.571		
Item 17		.531		
Item 6			.803	
Item 15			.652	
Item 24			.638	
Item 11			.636	
Item 29			.580	
Item 4			.557	
Item 16				.745
Item 14				.713
Item 25				.657

Extraction Method: Principle Component Analysis

Rotation Method: Varimax with Kaiser Normalization

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The four factors were extracted resulting in EFA, factor 1 was organized in nine items, factor 2 was eight items, factor3 was six items, and factor 4 was organized in three items. The four factors were labeled as identification, imagination, analogy, and satisfaction.

Each factor can be described as follows:

Identification refers to as "the psychological state in which identifies oneself with the game world." Imagination is defined as "the psychological state in which is able to constantly experience and imagine diverse events that is unlikely to happen in real world." Analogy, in contrast to Imagination, refers to as "the extent to which evokes diverse experience related to real world." And lastly, satisfaction refers to as "the level of satisfaction being given to environmental factors."

Among the extracted factor to be able to examine fantasy state, identification accounted for 21.53% of the total variance explained, imagination was 17.068%, analogy was 13.933%, and satisfaction accounted for 10.073% of the total variance explained. The result from the extracted factors and items were shown in table 2.

Table 2. Extracted factors and items determined by EFA.

Dimensions	No.	Items	
Identification	ID1	Item 23	I can control myself and use my will as I do in my real life.
	ID2	Item 8	I am satisfied to be able to control of this game.
	ID3	Item 28	I feel satisfied that this game continues as I control.
	ID4	Item 27	The story of this game makes me feel like hero.
	ID5	Item 18	I can go around here and there according to my will.
	ID6	Item 20	I feel it's real me in this game, while playing.
	ID7	Item 19	The sound of this game makes me immersed.
	ID8	Item 22	I am the main character during the course of this game.
	ID9	Item 26	The graphic of this game are realistic.
Imagination	IM1	Item 12	The story of this game is mysterious.
	IM2	Item 7	The story of this game includes an ideal entity which does not exist in real life.
	IM3	Item 3	I can control the events in the game in which I can only imagine in my real life.
	IM4	Item 10	Environment exhibited in this game reflects well my desired image.
	IM5	Item 1	The graphics help me imagine a new world.
	IM6	Item 2	The story of this game gives me clues at what happens later in this game.
	IM7	Item 30	Various game activities, which I cannot do in my real life, make me enjoy this game.
	IM8	Item 17	This game leads me to a new experience that I've never had before.
Analogy	AN1	Item 6	The game scenes make me imagine something.
	AN2	Item 15	The tasks within the game help me imagine something in real life.

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	AN3	Item 24	The sound in the game makes me feel that I am in the real world.
	AN4	Item 11	The tasks in this game recall me certain ways to solve problem.
	AN5	Item 29	The sound in this game makes me imagine something.
	AN6	Item 4	The game sound constantly makes me imagine something in real life.
Satisfaction	SF1	Item 16	The environment of this game makes me satisfied.
	SF2	Item 14	The sound of this game adds enjoyment to the game.
	SF3	Item 25	A variety of game activities add to my satisfaction with this game.

4.2. **Validity analysis of the fantasy scale**

To evaluate the construct validity of the fantasy scale in digital games (FSDG), confirmatory factor analysis (CFA) was conducted. For structural equation modeling (SEM), maximum likelihood method was adopted.

Prior to CFA, the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and the Bartlett's test of sphericity were replicated among the extracted four factors and 26 items. As a result, the KMO measure of sampling adequacy was .911, and the Bartlett's test of sphericity was 3292.683 ($p = .00$) at significance level .01. Thus, it could be interpreted as fit for factor analysis.

The fit measures test how well the competing models fit the data. In general, three aspects can evaluate the model fit: estimate, overall model fit, and detailed model fit. First of all, estimate should have correlation coefficient and statistical significance (i.e., $p<0.5$). Secondly, the overall model fit should be considered. $\chi 2$ is a classic goodness-of-fit measure to determine overall model fit. However, the $\chi 2$ test is widely recognized to be problematic (Jöreskog, 1969). It is sensitive to sample size. Due to these drawbacks of $\chi 2$ test, many alternative fit statistics have been developed. Instead of $\chi 2$, the ratio $\chi 2/DF$, which appears as CMIN/DF, was considered as the overall model fit. When ratio $\chi 2/DF$ is close 1 or less than 3, the model is considered reasonable fit. Among the various model fit indices, the Root Mean Square Error of Approximation (RMSEA), Comparative fit index (CFI) and Tucker-Lewis index (TLI) were adopted to determine overall model fit. These are relatively insensitive to sample size. RMSEA incorporates a penalty function for poor model parsimony and thus becomes sensitive to the number of parameters estimated and relatively insensitive to sample size (Brown, 2006, pp. 83-84). In general, a value of the RMSEA of about 0.05 or less would indicate a close fit of the model in relation to the degrees of freedom. Comparative fit index (CFI) evaluates the fit of a user-specified solution in relation to a more restricted, nested baseline model, in which the covariances among all input indicators are fixed to zero or no relationship among variables is posited. CFI ranges from 0 for a poor fit to 1 for a good fit. Tucker-Lewis index (TLI) is another index for comparative fit that includes a penalty function for adding freely estimated parameters. TLI can be interpreted in a similar fashion as CFI. When CFI and TLI are close to .90 or greater the model may have a reasonably good fit. Thirdly, modification index (MI), T-value, squared multiple correlation (SMC) are considered to evaluate the detailed model fit.

Although four factors and twenty-six items were extracted, resulting in exploratory factor analysis, the results of confirmatory factor analysis were reported four factors involving sixteen items from improving and modifying of model fit in accordance with modification indices.
Particularly the values of goodness of fit were reasonable. CDIN/DF was 1.993 (<0.3), and RMSEA was not close to its cutoff value, <0.50, but it was evaluated reasonable fit from the value of less than 0.80. Both of TLI and CFI were over 0.90, so that it was evaluated reasonably good fit. As above, from the result of CFA, the constructed fantasy scale involving four factors such as identification, imagination, analogy and satisfaction, was evaluated to be a reasonable model to measure for the degree of fantasy state. (see Table 3.)

After examining of model fit, by analyzing convergent validity and discriminant validity along with construct validity, the constructed fantasy scale was evaluated whether this scale credibly measured for each factors.

First of all, standardized regression weights were over 0.5, so that it was verified for construct validity. To evaluate convergent validity, construct reliability and variances extracted were considered from the criteria by Fornell and Lacker (1981). Consequently, construct reliability was above 0.7 variance extracted were above 0.5. The fantasy scale thus was verified its convergent validity (see Table 3.)

The discriminant validity was also examined by the manner of Fornell and Lacker (1981). If variances extracted are bigger than squared correlation coefficient (i.e., R^2) , discriminant validity was secured between factors. As seen in Table 4, variances of extracted of each factor was bigger than the squared correlation coefficient. Accordingly, the discriminant validity was verified.

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Table 3.Model fit indices for validity of Fantasy scale

Factor	Item number	Standardized Regression weight	Standard Error	t-value	Construct reliability	Average variances extracted
Identification	ID 1	0.64	0.103	10.329	.97	.86
	ID 4	0.78	0.083	10.772		
	ID 6	0.74	0.077	10.241		
	ID 7	0.71	0.081	9.800		
	ID 9	0.72	0.074	-		
Imagination	IM1	0.66	0.097	8.518	.95	.79
	IM2	0.54	0.125	6.882		
	IM3	0.68	0.119	8.833		
	IM6	0.58	0.107	7.511		
	IM8	0.75	0.095	-		
Analogy	AN2	0.70	0.096	9.264	.94	.84
	AN4	0.68	0.094	9.070		
	AN5	0.77	0.097	-		
Satisfaction	SF1	0.72	0.088	9.880	.94	.85
	SF2	0.63	0.088	9.563		
	SF3	0.73	0.083	-		

Goodness of Fit

	χ^2	CMIN/DF	RMSEA	TLI	CFI
Model Fit Indices		1.993	.70	.919	.937
Rec.Value	P > .05	<5.00 (Wheaton et al., 1977)	<0.50 (Steiger & Lind, 1980)	>0.90 Bentler & Bonett, 1980)	>0.90 (Bentler, 1990)

Rec. Value: Recommended Value (see sources cited for recommendation)

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Table 4. Correlation matrix and variances extracted

	Identification	Imagination	Analogy	Satisfaction
Identification	.86*			
Imagination	.62**	.79*		
Analogy	.66**	.53**	.84*	
Satisfaction	.76**	.55**	.63**	.85*

* Variance extracted

**P<.01

The CFA structural model of Fantasy scale, in particular, is shown in Figure 1. This shows that all items had factor loadings above 0.60. Accordingly, the verified fantasy scale which resulted in the CFA shown in Table 5.

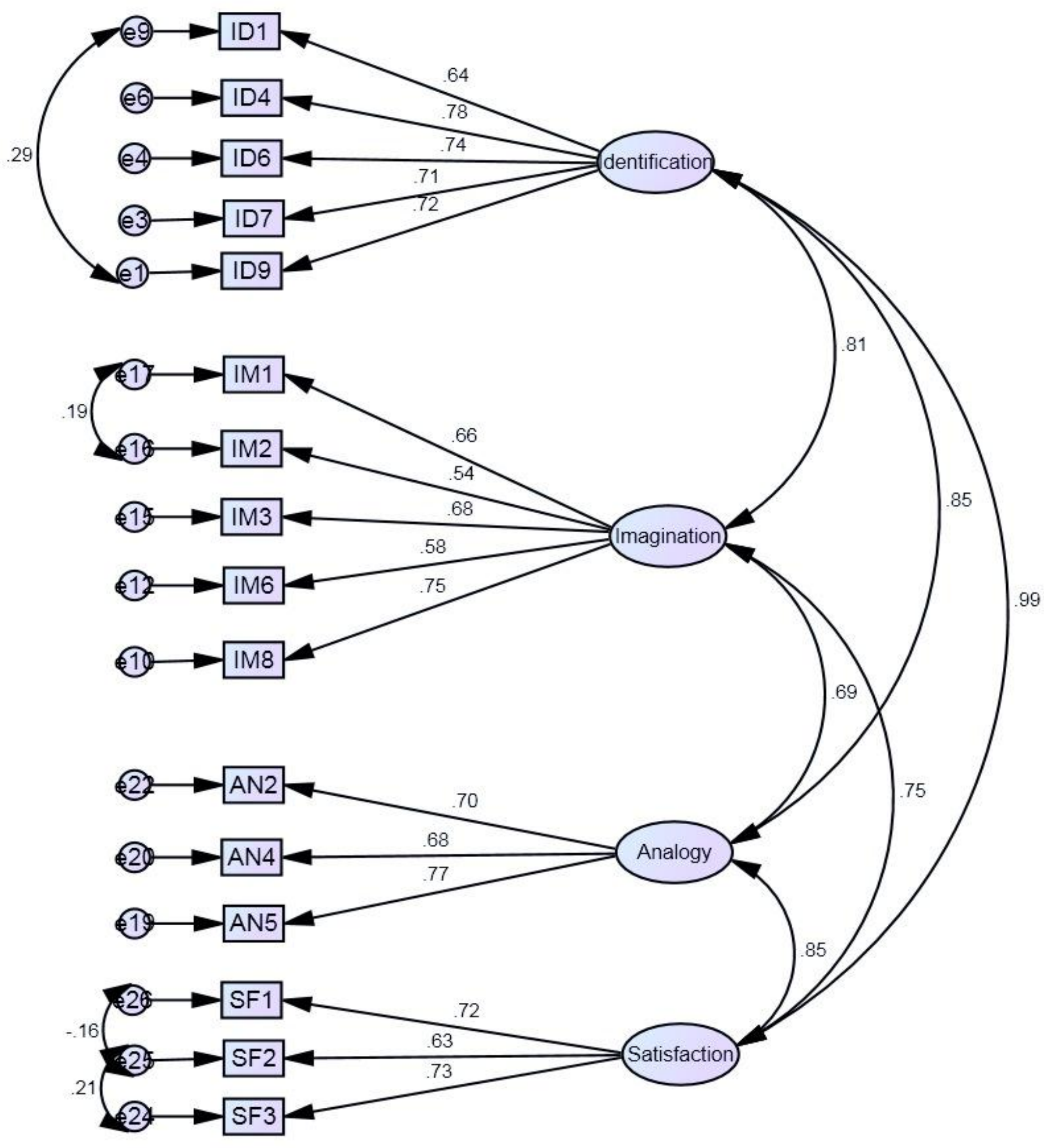

Figure 1. Final 16-item model of factorial structure for the fantasy scale

Table 5. The Fantasy Scale in Digital Games (FSDG) resulting from CFA

Dimensions	Items	
Identification	ID1	I can control myself and use my will as I do in my real life.
	ID4	The story of this game makes me feel like hero.
	ID6	I feel it's real me in this game, while playing.
	ID7	The sound of this game makes me immersed.
	ID9	The graphic of this game are realistic.
Imagination	IM1	The story of this game is mysterious.
	IM2	The story of this game includes an ideal entity which does not exist in real life.
	IM3	I can control the events in the game in which I can only imagine in my real life.
	IM6	The story of this game gives me clues at what happens later in this game.
	IM8	This game leads me to a new experience that I've never had before.
Analogy	AN2	The tasks within the game help me imagine something in real life.
	AN4	The tasks in this game recall me certain ways to solve problem.
	AN5	The sound in this game makes me imagine something in real life.
Satisfaction	SF1	The environment of this game makes me satisfied.
	SF2	The sound of this game adds enjoyment to the game.
	SF3	A variety of game activities add to my satisfaction with this game.

5. Discussions and conclusion

The primary aims of this study were to develop a scale that measures the state of fantasy in digital games and to establish the validity and reliability of the scale. At the outset of this study, the researchers developed initial items from definitions of fantasy cited by various scholars and experimental research on fantasy. These items passed through three phases such as item review, preliminary study, and final study in order to significantly verify their validity and reliability. As a result, this study developed a 16-item scale for fantasy state in digital games along with conceptual framework of fantasy in digital games, including four factors such as identification, imagination, analogy, and satisfaction.

In light of the result of this study, conclusions are as following:

First, this study empirically examined a fantasy concept, providing not only a theoretical framework of fantasy in digital games but also new research directions in the field of digital game research. This study may help expand diverse research on fantasy in digital games with various research purposes.

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Secondly, since a variety of previous research on fantasy in game environments have stated that fantasy plays a critical role in enhancing intrinsic motivation, the proposed components of fantasy, such as identification, imagination, analogy, and satisfaction, should be carefully considered as design elements of educational games for motivational learning environments.

Despite the findings of this study, limitations should be considered. First, this study asked participants to respond to items by which relied on previous experience in gameplay. Such a retrospective approach to data collection might prove problematic in the collection of accurate responses. This study thus needs to establish the validation of this scale through direct responses during or soon after playing games. Second, the participants of this study were selected from a particular population sample which ranged in age from 11 to 13. The proposed scale may not be appropriate for other generations because it represents the perceptions or awareness of fantasy in a specific age group.

Based on these limitations, we suggest some directions for future study. First, surveying diverse samples may result on the development of a more generalizable scale. In particular, cross-cultural study and survey across a variety of generations will answer important questions such as the scale equivalent across the all nations and generations. Second, a variety of future research with using this scale may provide in depth and substantive concepts and role of fantasy toward intrinsic motivation in digital games in ways that examines how fantasy and each constructed factors relate to motivation. In addition, researchers will be able to analyze significant impacts on diverse dependent variables (e.g., academic achievement, learning satisfaction, and others) in order to find a meaningful ways to use games for learning.

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