Using Digital Game-Based Adventure Education Counseling Course to Adjust Primary Students' Interpersonal Deviant Behaviors

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Abstract: This paper designed a digital game-based adventure education counseling course to adjust ten students' interpersonal deviant behaviors at a primary school far from cities in Taiwan. Researchers take quasi-experimental design to investigate the effectiveness after the course with questionnaires, short-term reflections and feedback forms. The results show that there were significant differences between pretest and posttest results which proved that the course can effectively adjust students' interpersonal deviant behavior and those games were felt satisfied.

Keywords: Digital Adventure Education Game, Human Relations, Deviant Behaviors, Group Counseling.

1. Introduction

In the information society, people have to make more decisions in their daily life. Thus, it is important to train people to have correct attitudes for decision making since their childhood. Proper decisions normally lead to appropriate behaviors which can help people to build great interpersonal relationships, increase self-confidence, reach self-fulfillment, as well as be responsible for their own behaviors. Conversely, inappropriate behaviors in class would be regarded as "deviant behaviors" in scholarly terms. It would cause relationship breakups and psychological diseases. Students' interpersonal deviant behaviors are considered outcomes of maladjustments to situations, which brings normally troubles to parents and teachers. It includes all kinds of situations including people's incapability of solving problems, changing fixed behavior patterns to adapt to the environment. When they encounter difficulties, they demonstrate deviant behaviors. In addition, deviant behaviors are normally long-term behaviors. One can usually find signs of deviant behaviors in juvenile delinquents from their childhood. Therefore, if deviant behaviors can be addressed and prevented since one's childhood, it might have reduced the probability of juvenile crimes.

The participants in this research are students who have mild deviant behaviors such as teasing classmates, playing pranks, noncooperation, and breaking rules. The primary stage of school intervention mainly focuses on the prevention, in which counselors teach students who have school adaption problems. The second stage mainly focuses on interventions, in which counselors help students who have signs of deviant behaviors to make adjustments. The third stage mainly focuses on postventions, in which counselors make treatments to students' deviant behaviors.

In this research, a digital game-based adventure education counseling course was developed to integrate digital adventure education games into group counseling process which guides to the intervention of the secondary stage. In the game-based counseling course, counselors might be able to see behaviors which were unable to be observed in the individual counseling process. The course was conducted with small student groups so that counselors can observe children's social behaviors in groups. Besides, the activities of digital adventure education games provide children different experiences such as practicing social skills, generating more positive interpersonal behaviors. Therefore, the purpose of this study is to investigate whether the primary school students' interpersonal

deviant behaviors and interpersonal relationship concepts could be adjusted, and to know students' satisfaction levels to the digital adventure education games.

2. Literature Review

2.1 Deviant Behaviors

Deviant behaviors are the behaviors that individuals contravene social norms, group rules, or people's expectations (Gottfredson & Hirschi, 1990; Brezina, 2000). They lead to problems of personality developments and interpersonal relationships. The categories of deviant behaviors are defined differently in different countries, cultures or organizations. When deviant behaviors cross the legal boundaries, they become crimes.

In past few years, many researchers explored the deviant behaviors from different perspectives. Deviant behaviors are divided into six categories from social perspectives. a). Extrovert behaviors, which refer to the rebellious and anti-social behaviors, such as truancy, theft, and fight. b). Introverted behaviors, which refer to the emotional disturbance, such as autosadism and suicide. c). Academic adaptation, which refer to poor academic performances due to bad behaviors, such as cheating or lazy. d). Bad habits, which refer to the borderline personalities, such as nail biting, stammer or drug user. e). Anxiety disorders, which refer to situations caused by overanxiety, such as nervous, vomit, or hysteria. f). Mental illness, which refer to those who are divorced from reality, such as schizophrenia and bipolar disorder (Wu, 1985). Similarly, Hoghughi and Hoghughi (1992) categorized children's deviant behaviors into eight kinds. a). Lack of socialization: scuffle or lie. b). Anti-social behaviors: truancy or theft. c). Attention-deficit: lack of concentration or patient. d). Type of anxiety/ retraction/ moodiness: nervous or shy. e). Lack of interaction: staring into space or apartness. f). Lack of social competence: bad peer relationship. g). Mental patients: speaking incoherently and intelligibly or auditory hallucination. h). Hyperkinetic syndrome: talkativeness or restless.

2.2 Digital Game-based Adventure Education Group Counseling

Peer group is a small society. Members in the group would gradually show their innate behaviors as the time passes (Yalom & Leszcz, 1992). Consequently, group is the best learning tool for practicing interpersonal interactions. Members in the groups would improve self-confidence, adjust deviant behaviors, and enhance peer relationship through group works. Group counseling has six characteristics, including attraction, leadership, norms, expectations, communication, and cohesiveness (Johns, MacNaughton, & Karabinus, 1989). With those advantages, groups can provide students with deviant behaviors a place to vent their negative emotions, an opportunity to observe others' behaviors, and a way to learn effective social abilities (Berg, Landreth, & Fall, 2013).

This research used group counseling due to its functions of multiple ways of interpersonal interactions and communication conditions. In the course, group members would rebuild the past conflicts and re-experience the interactive patterns. By observing the interactions, counselors can assist members to learn new patterns of interpersonal interactions. This knowledge transfer would help students to put thoughts into actions. The course helps students to correct their deviant interpersonal behaviors, both from learners' gaming experiences and reflection feedbacks after each game. Thus, children have opportunities to modify their deviant behaviors in group counseling. In every short-term reflection, the contents were connected to their living experiences. Children reflect on the events, adjust concepts, and put new thoughts into practices (Teyber, 2000).

3. Digital Game-based Adventure Education Counseling Course

3.1 Design of Digital Game-based Adventure Education Counseling Course

Digital adventure education games functioned as the medium in the group counseling course. Students played those games cooperatively and learned interpersonal interaction methods in the gaming process. The participants in this study were ten 5th grade and 6th grade students from a suburban city in Taiwan.

To investigate the thoughts and behaviors of the participants that changed throughout the counseling course, the activity feedbacks were designed in accordance to the goals of each game; and the form of each activity reflection contents were formulated by counselors depending on the group conditions (Table 1).

Table 1: Activity goals of the games.

	Group goals
Mind Collage	1. Getting familiar with group members. 2. Helping members to know their own characteristics and their influences to their interpersonal relationships.
Moon Ball	1. Experiencing the sense of achievement of mission completion. 2. Being aware of their roles in the groups.
Polar Bear	1. Understanding the messages delivered during the discussion. 2. Understanding that the communication is two-way and finding ways to reduce misunderstanding.
Group Balance	1. Experiencing the importance of listening during communication 2. Understanding the meaning of body language.
Calculator	1. Finding the skills to solve interpersonal conflicts and figuring out 2. Finding out their own interaction patterns.

3.2 Reflections of The Digital Game-based Adventure Education Course

The reflections after each game can enhance learners' self-awareness, helping them to rethink and internalize learned issues after every activity which can accelerate their adjustments to interpersonal deviant behaviors. The reflection questions and details of activity feedbacks are as follow:

Counselor's guided reflections of Mind Collage:
a) Did you find the differences between your original thoughts of yourself and the game feedbacks?
b) Which object did you spend the most time on? Why?
c) Was there any object that troubled you? Why?

Reflection feedback: Self-concept refers to individuals' ideas about themselves including responses and preferences of all kinds of situations. It is the first step of understanding and changing oneself. Keeping the opening attitude to suggestions is the beginning of revaluate oneself.

Counselor's guided reflections of Moon Ball:
a) What did you feel when the ball touches the ground?
b) What were the main factors that stop your group from reaching the game goals?
c) What role did you act in this game? How did you perceive other members' roles in the game?
d) What feedbacks would you give to your members?

Reflection feedback: Moon Ball is a game that participants can discuss and generate common goals. In the game, one learns the importance of strategies such as producing high-performance within confined rules, setting up goals positively, and having great team works. Problem-solving and cooperation are the abilities that come from actions rather than insights.

Counselor's guided reflections of Polar Bear:
a) What did you hear or see in this game?
b) Could you express your opinions or ideas easily?
c) Did any thoughts from others influence you? What was that?
d) What feedbacks would you give to your members?

Reflection feedback: Listening is one of the most important abilities in the interpersonal interactions. It leads to the understanding to the logics of stories. Putting oneself in the storyteller's position, trying to figure out the implications of story, learning to hear what is behind the words, are the important skills of communication.

Counselor's guided reflections of Group Balance:
a) Which stage made you most nervous? Which stage let you feel relieved?

b) What should each member do to get the groups complete the game? What things did you learn?
c) How did the members support each other? What were heard the most?
d) What feedbacks would you give to your members?

Reflection feedback: In the game, the breakable item on the balance board refers to "Trust" in the interpersonal relationships. Trust and support exist side by side. One small mistake can cause chain reactions that might destroy long-term relationships.

Counselor's guided reflections of Calculator:
a) Was the plan changed during the process?
b) How did the members discuss and come up with the effective plan?
c) How did group complete missions with cooperation?
d) What feedbacks would you give to your members?

Reflection feedback: Calculator is an exciting game. It is can train team works and strategies to become a high-performance team. Members have to learn to trust each other, use appropriate strategies, and cooperate effectively to reach the goals.

4. Research Design

4.1 The Digital Adventure Education Games

The five digital adventure education games were developed by Unity3D. The five games were were developed based on five traditional adventure education activities chosen from "Experiential education-learning from 150 games" (Hsieh, Wang, & Chuang, 2008). The purposes of the five traditional adventure education activities were to train students' self-conception, team-building, cooperation, and human interactions. The learners' gaming processes and interactive pattern were recorded by gaming system. Those data will be used to analyze the interactions between learners, game missions, and the environment contexts to see the possibility of learning transfer to adjust their interpersonal deviant behaviors. Except Mind Collage game, the other four digital adventure education games are all multiplayer games. The detail descriptions of the five games are as follow:

Mind Collage (Figure 1): According to psychological projection, players put the twelve objects into the frame in sequence: Rivers, Mountains, Farmlands, Roads, Houses, Trees, Humans, Flowers, Animals, Rocks, Bridges, and Suns. The finished picture will lead to the counseling feedbacks based on the analysis results.

Moon Ball (Figure 2): Group members need to keep the ball in the air as long as possible. Members have to use strategies to cooperate with each other game.

Polar Bear (Figure 3): In the beginning of the game, the facilitator tells a story about polar bears, which gives hints for completing the task. Then, the facilitator throws dices three times for giving more hints. After that, members observe, discuss, and induce for correct answers using the logistics of the story.

Group Balance (Figure 4): The game need to be played by three people. One keeps his balance on the board, and the other two keep pushing the board upward on the two sides until the board reaching the finishing line. The purpose of the activity is to increase members' cooperation strategies, reliance, and courage to face the challenges.

Calculator (Figure 5): Thirty ladybugs are marked with number 1 to 30 in the game. The goal of the game is to catch the bugs in sequence as fast as possible. If group members violate the rules, five seconds will be added as punishment. Four chances will be given to each group for completing the task. The best score will be recorded for competition between groups. The purpose of the activity is to train members to solve problems and communicate with each other. It strengthens group members' concepts and helps them to identify their roles.
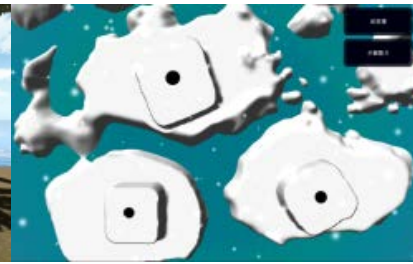
Figure 1. Mind Collage

Figure 2. Moon Ball

Figure 3. Polar Bear

Figure 4. Group Balance

Figure 5. Calculator

4.2 Research Method

This research used quasi-experimental design. The ten students of fifth-graders and sixth-graders who had mild interpersonal deviant behaviors were referred by their mentors. For exploring the effectiveness of adjusting interpersonal behaviors and gaming satisfactions, the students needed to fill up the digital adventure education games questionnaire a week before and after the experiment. The five digital games of the digital game-based adventure education counseling course were conducted and guided by a counselor with forty minutes each week for five weeks. When each game ended, the feedback forms were filled by students and the counselor collected the thoughts and oral feedbacks from the students. After the experiment, the effectiveness of adjusting students' interpersonal deviant behaviors and gaming satisfactions were shown through the results of questionnaires, reflections and feedback forms. The experiment procedure was as figure 6.
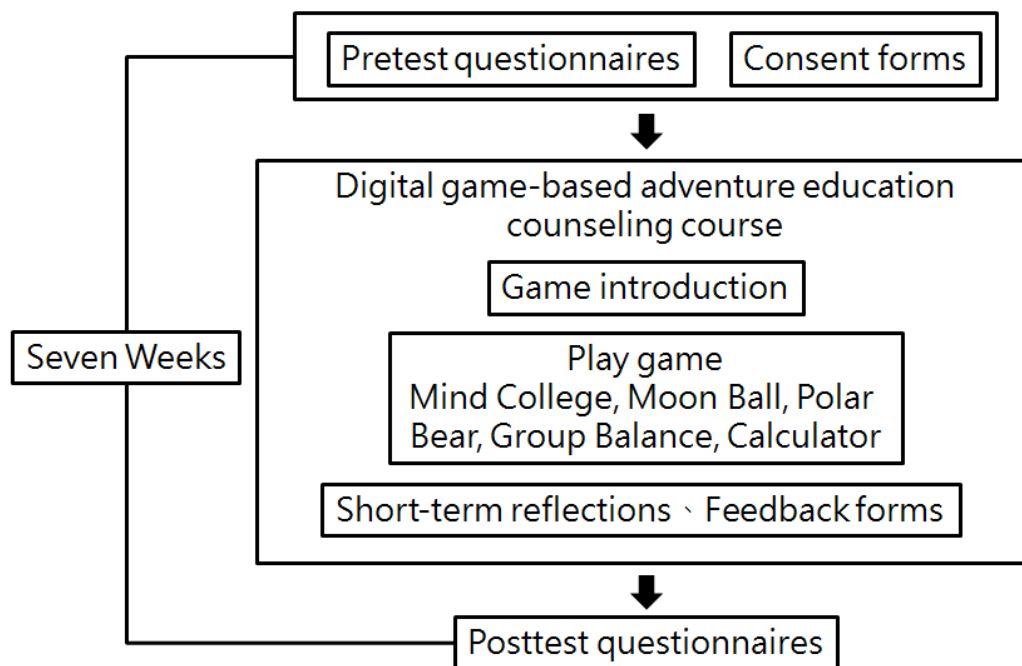

Figure 6. Experimemt procedure

The participants in this research were ten primary school students' with mild interpersonal deviant behaviors (Lack of socialization, Anti-social behaviors, Attention-deficit, Type of anxiety/ retraction/ moodiness, Lack of interaction, Lack of social competence, and Hyperkinetic syndrome) (Hoghughi & Hoghughi, 1992). Mild deviant behaviors identified in this study were emotional disturbance, disobedience, and violations. Emotional disturbance refers to inappropriate behaviors such as making pranks or fighting with peers due to unstable emotional status. Disobedience refers to the behaviors of disregarding teachers' regulations such as making noises in class or uncooperative with others. Violations refer to behaviors such as breaking rules that contribute to great influence to the class.

The digital adventure education games questionnaire was in 6-point Likert scale. Cronbach α is .70, Coefficient of Internal Consistency is .90. The questionnaire includes total of 37 questions. In the pretest, there are 15 questions about group interpersonal behaviors, including participants' perceptions to the group efficiency, group cooperation, and interpersonal interactions after participating the game-based counseling sections. Among which, there are 7 questions regarding to emotional disturbance, 5 regarding to disobedience, 3 regarding to violations behaviors. In the posttest, there are also 8 questions regarding to gaming satisfactions, which include gaming interactivities, guidance content, fun, challenges, and simulations.

5. Results

The course in this research included five digital games. The course content was designed for 5 to 9 graders. Therefore, this research targeted 10 fifth- and sixth-graders to participate the course. The ages of the students are between 12 and 14. There were 4 sixth-graders, and 6 fifth-graders; among which, there were 9 males and 1 female. Total questionnaire received were 10 with recovery rate of 100%.

Since the sample size of this research is below 30, Wilcoxon signed-rank test was used, and the results were shown in Table 2. The results show that group interpersonal behaviors aspects has reached significant differences (z=-2.091*, p=.037), which signified that the 10 students with mild interpersonal deviant behaviors were improved after taking the digital adventure education counseling course.

Table 2: Statistic results of group interpersonal behaviors.

Topic		N	Mean	SD	z	p
Interpersonal Behavior	pretest	10	5.127	.5564	-2.09*	.037
	posttest	10	5.507	.5166		

*p<0.05

The mild interpersonal deviant behaviors of the 10 students included teasing classmates, making pranks, uncooperative, breaking rules. The questionnaire of this research investigated three aspects about students' perceptions to their own deviant behaviors both before and after taking the game-based counseling course. In the emotional disturbance aspect, all 10 students showed willingness to respect different opinions from group members (Q8) with pretest (m=4.8) and posttest (m=5.8); think in other members' perspectives (Q2) pretest (m=5.3) and posttest (m=5.6); respect people in different ethnicity, beliefs, and physical conditions (Q3) with pretest (m=4.4) and posttest (m=5.0); worry about whether other members like the things they have done and do not make arbitrary decisions (Q14) with pretest (m=4.9) and posttest (m=5.6).

In disobedience aspect, after the course, all ten students who had the situations of arguing with classmates and refusing to obey teachers' orders showed they would like to discuss with their classmates peacefully even when they have divarication (Q7) with pretest (m=5.2) and posttest (m=5.3); handle appropriately about the unfair rules or fouls results (Q9) with pretest (m=4.6) and posttest (m=5.7); play their roles no matter they are leaders or followers (Q12) with pretest (m=5.3) and posttest (m=5.7).

In the violation aspect, the violation followed once students have emotional labiality or unmoral interaction between classmates and teachers. After the course, 10 students showed they have to focus on listening to member discussion rather than against that.

The main course content of this research is the digital adventure education games. Therefore, the design of the gaming system would directly influence students' learning effectiveness. The gaming satisfaction results showed that the overall satisfaction level of all aspects were above 5.8, which includes gaming interface, situation setup, gaming interactions, fun, adaptively, problem-solving, competitions, and challenges. It was evident that the games designed in this research were both satisfactory in both manipulations and learning content.

The feedback forms were used after each digital adventure education games with the reflection sessions. Students filled up the feedback forms with open-ended questions.

In stage one, from the feedback forms and reflections of Mind Collage game, students thought the game was fun, and could uncover their hidden personality. In the beginning, most students have negative thoughts about themselves, such as having bad behaviors, unable to make friends, timid, and impulsive. After taking the counseling course, they found some hidden characteristics such as active, thoughtful, adventurous. The students said, "I think the games were fun, and I find a new self in myself" (G1-07-HBH), and "I get to know more about myself in the activities" (G1-07-THS).

In stage two, from the feedback forms and reflections of Moon Ball game, students experience the process of completing tasks cooperatively. Students can clearly find their own roles in the group, can positively and actively participate group discussions, and generate strategies for completing tasks. The students said, "We discussed gaming strategies together" (G2-02-HBH)), "I learned how to interact with others" (G2-03-HBH), "Group members would support me by my side" (G2-02-WTY), and "We help each other, face challenge, interact, cooperate, and discuss in the process" (G2-03-CTH).

In stage three, from the feedback forms and reflections of Polar Bear game, students learned about the importance of listening and expressing their thoughts and feelings. The students said, "I tried to listen to other group members and felt interesting" (G3-05-CYJ)", and "I found it important to let others understand before exchange ideas" (G3-05-THS).

In stage four, from the feedback forms and reflections of Group Balance game, students can observe members thoughts, feelings and messages of their boy language insightfully due to the time limit. Also, they can learn and understand meaning of cooperating with each other, sharing enjoyments, and getting together peacefully. The students said, "We needed to help each other, get together peacefully. Do not bully!" (G4-03-CYJ), "Make a suggestion or give an idea" (G4-04-CYJ), and "Share my ideas and suggestions to discuss" (G4-03-HYC). At the point of the seventh week, students found others advantages gradually. For example, "Actually, everyone had their goodness and a good nature" (G4-05-HYC) and "It was a great thing to help people and I also felt relaxed" (G4-06-HYC).

In stage five, from the learning sheets and reflections of Calculator game, five students said they would resolve their bad emotions in the activities such as playing basketball, jogging, and riding bicycle; the others said they prefer quiet ways, such as, chat with friends and teachers, or sleep. Those feedbacks showed that participants could use positive ways to face and solve their negative emotions, willing to accept different suggestions and thoughts, and solve interpersonal conflicts after the course. After the 7-week counseling course, researchers followed up the 10 students' interpersonal deviant behaviors in their own classes investigating whether the deviant behaviors were adjusted, and whether the 10 students could get along with their classes better. The mentors expressed that two of the students' interpersonal deviant behaviors were adjusted after the course. The other eight students, although not fully adjusted, were in better conditions. The eight students would show interpersonal deviant behaviors once their classmates kicked up a fuss. There might be two reasons: 1. This experiment was conducted once a week with forty minutes each, five times in total. In the course, the 10 participants had obvious improvement. However, it was difficult to make far learning transfer from two hundred minute course. 2. In the course, the 10 participants were familiar with the pattern of solving problems and completing missions, but they had to rebuild the new patterns when they went back to their own classes. It was hard to adjust the interpersonal deviant behaviors in their classes if mentors did not follow up with the course to build the pattern of positive interpersonal interactions in their own class scenes. These issues will be regarded and considered in the future studies.

6. Conclusion

The purpose of designing the digital game-based adventure education counseling course in this study is to investigate the effectiveness of adjusting the interpersonal deviant behaviors of the ten primary students, and their gaming satisfaction. Furthermore, their thought and feedbacks in short-term reflections and feedback forms about the course were recorded after the course, for example, increasing interpersonal interactions and positive thinking, controlling negative emotions, adjusting deviant behaviors and having positive evaluations for self-adjustment.

As a result, the 10 primary students' emotion intelligence and interpersonal deviant behaviors regarding to emotional disturbance, disobedience, and violations (Lack of socialization, Anti-social behaviors, Attention-deficit, Type of anxiety/ retraction/ moodiness, Lack of interaction, Lack of social competence, and Hyperkinetic syndrome) in group were improved through the digital game-based adventure education counseling course (Hoghughi & Hoghughi, 1992). What's more, participants feel the digital adventure education games were satisfying. Though those students' interpersonal deviant behaviors were adjusted within the counseling course, some mentors found those students still had the situations of interpersonal deviant behaviors when they went back to their original classes. The cause of the situation is their classmates who they meet in class lacks the experiences of counseling course. If the digital adventure education games can be integrated into the formal courses in their classes, the problems might be solved. Consequently, all students not only learn the knowledge of formal course but practice positive interpersonal interactions.

In the future, researchers will help the counselors at schools use the interdisciplinary media in counseling. It was rare to see digital tools integrated in counseling in the past. This research hopes to find evidence that of the use of digital adventure education games can have similar effectiveness to traditional counseling activities.

Acknowledgements

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