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RESEARCH ARTICLE

Helping Students Comprehend the Needs of Living Things in Their Natural Habitats Through Creative Drama Technique: A Musical Chair Game

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Abstract

This study aimed to develop secondary school seventh-grade students' awareness of natural habitats and the interactions among living things, as well as reveal their views on the problems encountered. The study was designed as a case study, a qualitative perspective and conducted with 64 students from a private school during the 2017-2018 academic year. Three open-ended questions were posed in semi-structured interviews and the students' responses were analyzed using the content analysis technique. The results revealed that the students developed an awareness of natural habitats and the interaction among living things. The students proposed the protection of living things, protection and reproduction of habitats, transportation of living things to more suitable habitats, and protection of the natural balance, as solutions to the problems that might arise in natural habitats.

Keywords: Creative drama, natural habitats, hunted-hunter relationship, safe area, habitat loss

Introduction

Environment, in the general sense, is defined as "a setting in which living things exist and connect with vital ties, and which living things affect and are affected in various ways" (Yıldız & et al., 2009: 14). The environment in which an organism lives contains biotic (living) and abiotic (nonliving) factors, which surrounds the environment. Abiotic factors include chemical and physical factors, while biotic factors consist of producers, consumers and decomposers. Each species has an ecologic niche which is defined as the collective use of biotic and abiotic sources in the environment of that species. The ecologic niche can be defined as the collection of physical and biological conditions that a species needs to survive, grow and reproduce (Simon et al., 2017: 429; Sadava et al., 2014: 1123; Withgott & Brennan, 2008). Several different conditions influence an organism's interaction with its environment. A system is said to stand in balance if it functions without any problems within the natural process (Karakaya & Yılmaz, 2017). In recent years, factors such as the rapid increase in population, industrialization, misuse of natural resources and urbanization have disturbed the balance among the factors

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constituting the environment. In order for human beings to continue their life, they create the artificial environment, which is different fromnatural one, by using the resources in natural environment, improving technology and realising financial activities (Karakaya, Avgın, Gömlek & Balık, 2017). Ecosystems fulfill a function yielding direct and indirect benefits to humans; consequently, the disappearance of these ecosystems will result in the loss of these benefits. Ruined and fragmented habitats due to agriculture, urban development, forestry, and mining collectively become the most important threat to the biodiversity (Simon et al., 2017: 427).

Environmental education plays an important role in eliminating environmental problems (Erten, 2004), finding permanent solutions, and improving individuals' perceptions, attitudes, and values towards the environment (Karakaya, Avgin & Yılmaz, 2017). Environmental education contributes to individuals being sensitive towards the environment and seriously finding solutions to environmental problems. This education provides an understanding of events taking place in the environment and increases sensitivity and positive attitudes towards the environment (Yardımcı & Bağcı-Kılıç, 2010). The world is rapidly changing and developing. An important objective of environmental education is raising children, who are our future, to be individuals who are sensitive to the environment with high-level awareness, and who are capable of finding solutions to the problems. An effectively planned educational strategy should be developed in order for students to achieve sensitivity towards the environment. Learning by experience cannot be overlooked. Interactive learning techniques such as drama are effective in learning biology (Braund & Ahmed, 2018).

Studies in related literature focused on topics such as nature education, summer camping, views on environmental problems and attitudes towards the environment. Additional topics included behavior towards the environment, knowledge level about the environment, and using drama techniques in biology classes. For example, Braund and Ahmet (2018) investigated the effect of courses performed with drama and traditional techniques on seventh-grade students' achievement in South Africa. Their results reported that students who were taught with drama techniques were more successful. In a different study, Carlsson (2002) developed a drama game titled "I want to be coal-a photosynthetic drama game" and found that students learned the topic of photosynthesis with this technique. Doğan et al. (2017) in their study determined secondary school students' ideas and understanding about environmental problems, and their ideas about solutions. Erdoğan (2011), in a different study, determined the effect of an ecology-based summer nature program on primary students' knowledge of the environment, their affective tendencies towards the environment, and their responsible behaviors towards the environment. The effect of environmental education based on nature experiences and primary school students' perceptions and behaviors towards the environment was investigated in a study by Özdemir (2010). Yardımcı and Bağcı-Kılıç (2010) revealed eight-graders' knowledge about the environment and the problems and meanings they attributed to their ideas about the environment.

One special aim of the science curriculum published by the Ministry of National Education (MoNE) states that "In exploring nature and understanding the human-environment relationship process, we should find solutions to problems encountered in these areas by adopting scientific process skills and scientific research approaches." (MoNE, 2018). For this reason, it is pertinent for students to be aware of the problems experienced in their environment and to find solutions to these problems. Students' participation in out of school activities strengthen relationships with nature and increases the foundation of the desired behaviors. The musical chair game developed within the scope of this study and the results are thought to contribute to the literature.

Aim of the Study

This study aimed to develop secondary school seventh-grade students' awareness of natural habitats and the interactions among living things as well as reveal their views on the problems experienced. In line with this purpose, the following questions were identified:

a) What do the chairs used in the musical chair game represent in natural habitats?
b) What would you expect to happen if the last chair were excluded from the game?
c) What do you suggest to help keep the rabbit population at a certain balance without leading to their extinction?

Methodology

Model of the Study

This study used a case study, as a qualitative research approach. Case study refers to the in-depth explanation of cases or events taking place within a system (Creswell, 2007). The biggest advantage of case studies is that they focus on a multifaceted and in-depth analysis of the case being investigated.

Participants of the Study

A total of 64 students, of whom 39% were female (n=25) and 61% were males (n=39), from a private school during the 2017-2018 academic year constituted the participants of the study. These students were not previously informed about the game and the theme in the game.

Data Collection and Analysis

Data were collected using a semi-structured interview form consisting of open-ended questions developed by researchers. Data were analyzed using the inductive content analysis. For this reason, each datum was read first and then a holistic understanding of the entire data was developed. Two different researchers carried out the content analysis. The formula Reliability= Agreement / Agreement + Disagreement suggested by Miles and Huberman (2015) was considered to determine the consistency between these researchers. The calculations revealed a reliability of .86 between the researchers.

Performing Musical Chair Game

In line with the purpose of the study, the musical chair game was performed following this procedure:

a) A game group consists of 16 students.
b) Twelve students wear rabbit masks (hunted), and 4 students wear wolf masks (hunter).
c) 16 chairs are placed in a circle in an open space.
d) The students wearing rabbit masks are asked to form a circle one meter away from the chairs and the students wearing wolf masks are asked to form another circle one meter away from the students wearing rabbit masks.

e) The students wearing rabbit masks move clockwise around the circle, dancing when the music starts, while the other students move around the inner circle in the same direction however at a faster pace.

f) The students are informed that they will move in their circle continuously until the music stops. Then each student with a rabbit mask needs to find a chair to sit down on. The students wearing wolf masks can tag the student who is unable to find a chair. The student who is tagged leaves the game.

g) The game is carried out in five stages. At the first stage, 12 rabbit students and 4 wolf students compete for 16 chairs. At the second, third and fourth stage, the game administrators remove four chairs for each game at these levels. After completing the fourth stage, three of the four remaining chairs are also removed, the students compete for one chair at the final stage.

h) These instructions are followed for each game group (there are four in total).

i) The research questions were posed to the students who were able to complete the game and their answers were investigated. Examples of students in a musical chair game shown in Figure 1 and Figure 2.

Figure 1. Students in a musical chair game

Figure 2. Students in a musical chair game

Findings

Table 1 gives the data from the answers to the following question "What do the chairs used in the musical chair game represent in natural habitats?"

Table 1.

Views on what the chairs represent in natural habitats

Themes	*f*	*%*	*Examples of the Students' expressions "They represent …"*
Forest	4	6.3	S-1:Forests S-55:Trees
Habitat	15	23.4	S-8: Habitats of rabbits. S-14:Habitats and ecosystems. S-16:Habitats of rabbits.
Rabbit Nest	19	29.7	S-5: Rabbits nests. Ö-30:Rabbits houses.
Natural Habitat	12	18.8	S-9: Natural habitat of rabbits. S-15:Natural habitats in which rabbits' shelter. S-46:Factors such as animals' houses and life sources, which are vanishing one by one. S-47:Habitats of living things in nature and food that nature provided for them to survive.
Shelter	14	21.9	S-6:Shelters in which rabbits protect themselves from wolves. S-7:Shelter in which animals hide in to protect themselves from hunters. S-17:Hiding-places for rabbits. S-18:Brush that rabbits use for protection. S-51:Safe area.

As the data in Table 1 indicate, the chair used in the musical chair game represented the rabbits' nests (19%, n=29.7), habitat (23.4%, n=15), and shelters for protection (21.9%, n=14) according to the students.

Table 2 shows the data from the answers to the following question "What would you expect to happen if the last chair were removed from the game?"

Table 2.

Views on the removal of the last chair in the musical chair game

Themes	*f*	*%*	*Examples of the Students' expressions "I would expect…"*
Rabbits to be caught	13	20.3	S-1:Wolves to catch the rabbits immediately. S-7:All rabbits to be caught. S-27:Wolves to catch rabbits. S-29:All rabbits to be hunted. S-34:None of the rabbits to be able to run away.
No shelter left	3	4.7	S-2:Rabbits to lack shelter for protection. S-52:Disappearance of rabbits' houses
Extinction of rabbits	35	54.7	S-6:The extinction of the rabbit population. S-8: All animals are beaten, rabbits become extinct. S-10:The extinction of that species. S-14:The extinction of rabbits S-19:The extinction of animals (rabbits) living in that area. S-46:All rabbits will not be able to find a place to run away and will be slaughtered.
Interruption of the natural balance	13	20.3	S-17: The interruption of the natural balance S-32: First the end of rabbits and then the end of wolves. S-47: The disappearance of living things in nature from the food chain.

As the data in Table 2 shows, 54.7% (n=35) of the students expected the extinction of rabbits, 20.3% (n=13) expected the interruption of the natural balance when the last chair in the musical game is removed.

Table 3 shows the data from the answers to the following question "What do you suggest to keep the rabbit population at a certain balance without leading to their extinction"

Table 3.

Students' suggestions to keep the rabbit population at a level in nature

Themes	*f*	*%*	*Examples of the Students' Expressions "I suggest that.."*
Protection of rabbits	14	21.9	S-2:Hunters should not hunt rabbits. S-27:We need to put rabbits under protection.
Habitat change (Change of place)	2	3.1	S-3:We can transport rabbits to prevent wolves from eating them. S-52:Rabbits' houses can be transported to somewhere else.
Protection of the natural balance	15	23.4	S-5:We can increase the food rabbits eat and decrease the number of wolves. S-7:We should not destroy nature and ruin animals' shelters and protection areas. S-18:We should prevent environmental pollution and unrestrained hunting. S-19:We should hunt consciously. S-47:We should not disturb the law of nature.
Protection of habitats	23	35.9	S-13:We need to protect habitats. S-16:Habitats should not be decreased. S-34:We should not ruin their habitat.
Reproduction of habitats	10	15.6	S-6:We can increase the number of chairs. S-14:We can increase the number of chairs instead of decreasing it. S-15:We should not destroy habitats and therefore can provide a place for living things S-30:We can create more place for them to hide. S-38:We should make more nests.

As the data in Table 3 indicates, 35.9 (n=23) of the students suggested the protection of habitats and 23.4% (n=15) suggested the protection of the natural balance to keep the rabbit population at a balance in nature.

Results and Discusiion

Conditions such as water, access to food sources, finding a partner, competition, finding a safe shelter and nesting site can limit the size of a population (Simon et al., 2017: 410; Reece et al., 2013: 1182; Smith & Smith, 2009: 220-221; Krebs, 2009: 260-261). Students' knowledge of these conditions is of the critical importance for the solution to environmental problems and the future of populations. This study aimed to determine seventh-grade students' awareness of and views on natural habitats and the interactions among living things using a musical chair game. In the study, the question "What do the chairs used in the musical chair game represent in natural habitats?" was posed to the students and their awareness of natural habitats was investigated. In the musical chair game, rabbits represented the hunted, wolves represented the hunters, and chairs represented safe shelters. The students' responses (Table 1) revealed a high-level awareness of natural habitats. Braund and Ahmed (2018) in their study reported that creative drama activities are effective for seventh-grade students to learn science topics. In a different study, Özdemir (2010) identified that environmental education based on

nature experiences is effective in fostering students' awareness of the environment. On the other hand, nature education carried out within the scope of summer camp increased students' knowledge of the environment and their affective tendencies towards the environment, as a study by Erdoğan (2011) pointed out. Furthermore, studies in literature highlighted that teaching with drama techniques is effective in the topics of photosynthesis (Carlsson 2002), cell division (Ødegaard 2001), and ecology (Bailey 1994). The results of this study were corroborated by these aforementioned results of the related literature.

In the study, the question "What would you expect to happen if the last chair were excluded from the game?" was posed to the students and their views on the problems that might arise in natural habitats were investigated. The students' responses revealed views such as the rabbits will become extinct, natural balance will be disturbed, and the rabbits will be caught by wolves (Table 2). When the literature was reviewed, Erdoğan and Erentay (2007) revealed that primary school students who participated in natural field activities have a higher understanding of biodiversity, endangered species, and reason and solution suggestions for water pollution. Martin (2003) conducted a study containing activities carried out in the school garden and found that such activities increase primary school students' level of knowledge about the environment, which infers that learning by doing and experience enables students' to effectively and permanently learn. According to Heather (1999), enabling students to gain real life experiences will enhance their in-class and extracurricular cognitive learning. Alternatively, Bogner (1998) reported that students are able to learn about the environment and related topics more easily in extracurricular field activities compared to their ability to learn during school time. These results indicated in the literature were in parallel with the results of this study.

The patterns of hunted-hunter relationships demonstrate similar fluctuations in populations located in natural habitats without human intervention. In these habitats, a small number of hunters keep the population size of a larger number of hunters within particular boundaries (Simon et al., 2017: 411; Reece et al., 2013: 1185). Humans can also have a negative influence on the population size of living things in their natural habitats. Habitat loss and splintered habitats, overhunting or overharvesting, introducing foreign species into the area, and global changes can be listed among these influences. Change of habitats at the hand of man stands alone as the utmost threat to the biodiversity in the biosphere. Habitat loss is the result of agriculture, urban development, forestry, mining, and environmental pollution. Global climate changes habitats and will have an even greater impact after this century. In cases where an alternative habitat is not present or a species lacks the ability to relocate, habitat loss may result in the extinction of that species (Reece et al., 2013: 1241-1244). The compound effect of climate change, overharvesting, pollution, introducing foreign species and particularly human actions such as habitat change has caused many species to become extinct. Today, the biodiversity on the earth is decreasing dramatically (Withgott & Brennan, 2008: 18).

The question, "What do you suggest to keep the rabbit population at a certain balance without leading to their extinction?" was posed to the students and their views on solutions to the problems that might arise in natural habitats were revealed. The students underlined the protection of rabbits, protection and reproduction of habitats, making habitat changes for living things, and protection of the natural balance (Table 3). The related literature identified that students recommend education as the primary solution to environmental problems (Doğan, Saraç & Çiçek, 2017). Yılmaz, Samsunlu, and Peker (2017) in their study found that nature should be protected in solving environmental problems. In a different study conducted by Yardımcı and Bağcı-Kılıç (2010), students suggested education and protection of living things in order to solve environmental

problems. The results of this study were corroborated by these results in the related literature.

In conclusion, it was observed that secondary school seventh-grade students whose ages range between 13–14 recognized the interaction among living things within the flow of the game and thoroughly enjoyed themselves during the musical chair game. The students were also found to be capable of detecting negative impacts that might arise due to human intervention in natural habitats and propose solutions to those problems.

Suggestions

Based on the results of this study, these suggestions can be put forward:

a) Students can have the opportunity to learn with fun by adapting familiar international and national popular games to similar ecological stories.

b) The same game used in this study can be applied to students in all age groups.

c) Teacher training can be carried out to circulate these kinds of game activities, which yields positive outcomes, to more students.

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References

Bailey, S. 1994. *The Ecogame.* Risley, Warrington and Cheshire: BNFL Education Unit.

Braund, M., & Ahmed, Z. (2018). Drama as physical role-play: actions and outcomes for life science lessons in South Africa. *Journal of Biological Education*, 1-10.

Bogner, F. X. (1998) The influence of shortterm outdoor ecology education on long-term variables of environmental perspectives, *Journal of Environmental Education, 29*(4), 17-29.

Carlsson, B. 2002. “Jag Vill Vara Kol!-Ett Fotosyntetiskt Dramaspel.” Miljödidaktiska Txter, Lärarutbildningen, Malmö, Högskola 4: 10–27.

Creswell, J.W., & Clark, P. (2011). *Designing and conducting mixed methods research*. Thousve Oaks: Sage.

Doğan, Y., Saraç, E. ve Çiçek, Ö. (2017). Ortaokul öğrencilerinin çevre sorunları, nedenleri ve çözümlerine yönelik algıları. *International Journal Of Eurasia Social Sciences*, *8*(29), 787-804).

Erdoğan, M. (2011). Ekoloji temelli yaz doğa eğitimi programının ilköğretim öğrencilerinin çevreye yönelik bilgi, duyuşsal eğilimler ve sorumlu davranışlarına etkisi. *Kuram ve Uygulamada Eğitim Bilimleri*, *11*(4), 2223-2237.

Erdoğan, M., & Özsoy, A. M. (2007). Graduate students’ perspectives on the human and environment relationship. *Türk Fen Eğitimi Dergisi, 4*(2), 21-30.

Erten, S. (2004). Çevre Eğitimi ve Çevre Bilinci Nedir, Çevre Eğitimi Nasıl Olmalıdır? *Çevre ve İnsan Dergisi,* Ankara: Çevre ve Orman Bakanlığı Yayın Organı.

Heather, P. (1999). Enperiential environmental education for primary aged-children (ERIC Document Reproduction Service No. ED 471 723).

Karakaya, F., & Yılmaz, M. (2017). Environmental ethics awareness of teachers. *International Electronic Journal of Environmental Education, 7*(2), 105-115.

Karakaya, F., Avgin, S. S., & Yilmaz, M. (2017). Environmental literacy dimensions of pre-service teachers. *Üniversitepark Bülten, 6*(1), 95-108.

Karakaya, F., Avgın, S. S., Gömlek, E., & Balık, M. Nature relatedness of pre-service teachers. *Turkish Journal of Education, 6*(2),79-87.

Martin, S. C. (2003). The influence of outdoor schoolyard experiences on students’ environmental knowledge, attitudes, behavior and confort level. *Journal of Elementary Science Education, 15*(2), 51-63.

MEB. (2018). İlköğretim Fen Bilimleri Dersi (3,4,5,6,7 ve 8. Sınıflar) Öğretim Programı. Ankara: MEB Yayınevi. http://mufredat.meb.gov.tr/Dosyalar/201812312311937-FEN%20B%C4%B0L%C4%B0MLER%C4%B0%20%C3%96%C4%9ERET%C4%B0M%20PROGRAMI2018.pdf

Miles, M.B., & Huberman, A.M. (2015). *Nitel veri analizi.* (1.baskı) (Ed. S. Altun Akbaba ve A. Ersoy). Ankara: Pegem Akademi.

Ødegaard, M. 2001. *The Drama of Science Education. How Public Understanding of Biotechnology and Drama as a Learning Activity May Enhance a Critical and Inclusive Science Education*. Unpublished Dr. Scient. diss., University of Oslo, Norway.

Özdemir, O. (2010). Doğa deneyimine dayalı çevre eğitiminin ilköğretim öğrencilerinin çevrelerine yönelik algı ve davranışlarına etkisi. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, *27*(27), 125-138.

Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., & Jackson, R.B. (2013). *Campbell Biyoloji,* (E. Gündüz, İ. Türkan, Çev.). Ankara, Palme Yayıncılık.

Sadava, D., Hillis, M.D., Heller, H.C., & Berenbaum, M.R. (2014). *Yaşam bilimi biyoloji*. (E. Gündüz, İ. Türkan, Çev.). Ankara, Palme Yayıncılık.

Simon, E.J., Dickey, J.L., Hogan, K.A., & Reece, J.B. (2017). *Campbell temel biyoloji*. (E. Gündüz, İ. Türkan, Çev.). Ankara, Palme Yayıncılık.

Smith, M.T. and Smith, L.R. (2009). *Elements of ecology, international edition*, Pearson Benjamin Cummings, 649p, USA.

Withgott, J., Brennan, S. (2008). *Environment The Science Behind The Stories,* Pearson Benjamin Cummings, USA, 681 pp.

Yardımcı, E., & Bağcı-Kılıç, G. (2010). Çocukların gözünden çevre ve çevre sorunları. *İlköğretim Online, 9*(3), 1122-1136.

Yıldız, K., Sipahioğlu, Ş., & Yılmaz, M. (2009). *Çevre Bilimi ve Eğitimi.* Ankara: Gündüz Eğitim ve Yayıncılık.

Yılmaz, O., Samsunlu, Ö., & Peker, R. (2017). Üniversite öğrencilerinin çevre sorunlarına ilişkin görüşleri: Isparta İli Örneği. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, (43), 283-301.

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RESEARCH ARTICLE

Öğrencilere Yaratıcı Drama Tekniği İle Canlıların Doğal Yaşam Alanlarındaki Gereksinimlerinin Kavratılması: Müzik Eşliğinde Sandalye Kapmaca Oyunu

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Özet (Turkish Abstract of Paper)

Bu araştırmada, yaratıcı drama tekniği kullanılarak ortaokul 7.sınıf öğrencilerinin doğal yaşam alanları ve canlılar arasındaki etkileşimler ile ilgili farkındalık oluşturmak ve yaşanılan sorunlara yönelik görüşlerinin belirlenmesi amaçlanmıştır. Nitel araştırma desenlerinden durum çalışmasının kullanıldığı araştırma, 2017-2018 eğitim- öğretim döneminde bir özel okulda öğrenim gören 64 öğrenci ile gerçekleştirilmiştir. Öğrencilerle 3 adet açık uçlu soru yöneltilerek yapılan yarı-yapılandırılmış görüşmeler sonucunda elde edilen veriler içerik analizi tekniği ile analiz edilmiştir. Araştırma bulgularına göre, öğrencilerde doğal yaşam alanları ve canlılar arasındaki etkileşimlerle ilgili farkındalıkların oluştuğu belirlenmiştir. Ayrıca araştırmada, öğrencilerin doğal yaşam alanlarında oluşabilecek sorunların çözümlerine yönelik canlıların korunması, habitatların korunması ve çoğaltılması, canlıların daha uygun habitatlara taşınması ve doğal dengenin korunmasına dair görüşlere sahip oldukları belirlenmiştir.

Anahtar Kelimeler: Yaratıcı drama, doğal yaşam alanları, av-avcı ilişkisi, güvenli sığınma alanları, habitat kaybı.

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