



RESEARCH ARTICLE

Adventure Education as a Learning Strategy to Improve Kinesthetic and Interpersonal Intelligence in Elementary School Students

Maftukin Hudah¹, Wawan Sundawan Suherman², Hedi A. Hermawan³, La Ode Adhi Virama⁴ Dewangga Yudhistira⁴

^{1,2,3} Universitas Negeri Yogyakarta, Indonesia

³Institut Agama Islam Negeri Kendari, Indonesia

⁴Universitas Negeri Surabaya, Indonesia

ARTICLE INFO

ABSTRACT

Received: Oct 24, 2024

Accepted: Dec 28, 2024

Keywords

Adventure Education
Kinesthetic intelligence
Interpersonal intelligence
Elementary school
Physical learning

*Corresponding Author:

maftukinhudah.2022@
student.uny.ac.id

This study aimed to develop an Adventure Education learning model and assess its effectiveness in enhancing elementary school students' kinesthetic and interpersonal intelligence. In this study, 28 elementary school students were placed into two groups: an experimental group (14 students: 7 males and 7 females) and a control group (14 students: 7 males and 7 females). The experimental group followed the Adventure Education program, while the control group learned conventionally. A pretest and posttest were administered to assess kinesthetic and interpersonal intelligence. Statistical analysis was carried out with SPSS version 27.0.1.0, which included normality tests, paired t-tests, and independent two-sample t-tests. The Adventure Education program significantly enhanced elementary school students' kinesthetic and interpersonal intelligence ($p < 0.001$). The experimental group showed significant improvements in post-test results compared to the control group, both in kinesthetic and interpersonal intelligence. The Adventure Education program has been shown to improve elementary school students' kinesthetic and interpersonal intelligence significantly. This program can be incorporated into the physical education curriculum as a learning strategy to promote students' physical and social development

1. INTRODUCTION

Physical education is a fundamental component of the educational system since it not only improves physical fitness but also shapes students' character and social abilities (Opstoel et al., 2020). In the present period, approaches to physical education are evolving with diverse learning models that try to accommodate students' various intelligences (Quennerstedt, 2019). One comparable approach is the Adventure Education learning paradigm, which mixes physical exercise with natural difficulties and group collaboration (Sutherland & Legge, 2016). This model is thought to be effective in improving elementary school students' kinesthetic and interpersonal intelligence.

Kinesthetic intelligence refers to a person's ability to efficiently manage bodily motions and use fine and gross motor skills (Santoso et al., 2024; Chen & Gardner, 2018). This intelligence can be developed in the context of physical education by engaging in activities that demand movement skills, coordination, balance, and body strength (Fernandes et al., 2016). Interpersonal intelligence, on the other ha

nd, refers to the capacity to communicate effectively with others, understand their emotions and intentions, and collaborate in groups (Goodnight, 2015). These abilities are extremely valuable in everyday life, particularly in social and professional settings that rely on collaboration and communication.

Although physical education in elementary schools is primarily intended to increase physical fitness, the development of kinesthetic and interpersonal intelligence is sometimes overlooked. Traditional learning based on structured and repetitive sports activities emphasizes the competitive side over the collaborative aspect, and it concentrates on individual physical ability rather than social interactions (Choi et al., 2014). This can impede the development of students' interpersonal intelligence, which is critical in shaping students' social abilities (Bedwell et al., 2014).

Meanwhile, the Adventure Education approach, which places more emphasis on outdoor learning experiences and includes physical and emotional obstacles that must be confronted in groups, is regarded as capable of giving answers to the limits of traditional learning approaches (Cooley et al., 2014; Meerts-Brandsma et al., 2020; Potter & Dymment, 2016). Adventure activities expose students to a variety of circumstances that involve teamwork, effective communication, and shared decision-making, thereby improving their interpersonal intelligence (Harper, 2017). Furthermore, physical activities such as climbing, sprinting, or negotiating natural obstacles might help pupils enhance their motor and kinesthetic skills (Schweighardt et al., 2018).

The primary challenge in elementary school physical education is effectively integrating physical and social learning into the existing curriculum (Nathan et al., 2018). The majority of current learning models are mainly concerned with the physical side, putting little attention paid to the development of students' interpersonal intelligence (Zeidner & Matthews, 2017). Conventional learning models that focus on competition often ignore the importance of cooperation and social interaction, which are at the core of interpersonal intelligence (Sottolare et al., 2018).

Furthermore, while kinesthetic intelligence has been highlighted as one of the primary aims of physical education, the methods employed to cultivate it are not always effective. Repetitive and non-contextual physical workouts frequently deny pupils the ability to fully explore their body movement capabilities in challenging and diverse contexts (Nyberg et al., 2020). In this situation, Adventure Education provides an alternative by immersing students in an environment that requires physical and mental adaptability, as well as collaboration with other students, to overcome the challenges they experience.

The results of the study showed that adventure education can improve children's physical and psychological health, such as levels of Physical Activity (Gehris et al., 2012; Li et al., 2013; Moorman et al., 2007) motivation to learn (Gilbertson & Ewert, 2015; Moos & Honkomp, 2011; Sproule et al., 2013) social interaction skills (Garst et al., 2001; Sutherland et al., 2011; Sutherland & Stroot, 2010) self-esteem (Shafie & Che Mat, 2014) and psychological well-being (Zhou & Lau, 2022); in this case, there was a significant increase in motor skills in children who participated in outdoor activities compared to the motor skills of children who did not participate in outdoor activities (Safitri et al., 2022).

At this point, the implementation of Adventure Education in Indonesian elementary schools has been severely limited owing to a lack of resources and facilities. Many schools lack open areas and the necessary resources to facilitate safe and successful adventure activities (Hernawan, 2023). Furthermore, many teachers are unfamiliar with this strategy, necessitating further training to ensure proper implementation. As a result, the purpose of this study is to assess the impact of Adventure Education as a learning approach on elementary school students' kinesthetic and interpersonal intelligence.

METHODS

Participant

Furthermore, many teachers are unfamiliar with this strategy, necessitating further training to ensure proper implementation. As a result, the purpose of this study is to assess the impact of Adventure Education as a learning approach on elementary school students' kinesthetic and interpersonal intelligence.

Procedure

This research is a quantitative research using quasi-experimental methods, with two groups of participants: the experimental group and the control group, each consisting of 14 elementary school students. The experimental group engaged in an Adventure Education program aimed at improving kinesthetic and interpersonal intelligence, whereas the control group received traditional instruction. In this study, the treatment was administered 8 times, with 4 sessions for the experimental group and 4 sessions for the control group. Each treatment session was conducted for 2 x 40 minutes. The study was divided into three major stages: planning, implementation, and evaluation. The measurement of kinesthetic and interpersonal intelligence within Adventure Education learning strategies is conducted through pre-tests and post-tests using structured measurement tools. Kinesthetic intelligence is measured by adapting the Test of Gross Motor Development (TGMD), involving observation of gross motor skills such as Coordination, Speed, Strength, Agility, Balance, and Movement Control through adventure-based physical activities, with results assessed using a Likert scale based on performance and number of errors. Meanwhile, interpersonal intelligence is measured using the Interpersonal Communication Skills Inventory (ICSI) with variables of Social Sensitivity, Social Insight, and Social Communication. The use of the Likert scale allows for detailed assessment of these aspects through observation of student interactions in group activities, reflective discussions, and their contributions to resolving conflicts or shared challenges. Results analysis is performed by comparing pre-test and post-test scores to evaluate students' intelligence improvements in a measurable manner.

During the preparation stage, students were chosen based on specific criteria, followed by a pretest to assess their kinesthetic and interpersonal intelligence. Furthermore, during the implementation stage, the experimental group participated in Adventure Education activities, whilst the control group continued to learn using traditional methods. The final stage was conducting a retest (posttest) to compare the findings before and after the intervention.

Statistical Analysis

The statistical analysis in this study employed SPSS version 27.0.1.0 with a descriptive and inferential approach to determine the influence of Adventure Education on elementary school students' kinesthetic and interpersonal intelligence. First, a descriptive analysis was performed on the pretest and posttest data, including the mean and standard deviation for both groups (experimental and control). A normality test was used to check that the data were normally distributed, followed by a paired t-test to determine significant differences between the pretest and posttest in the experimental group. In addition, an independent two-sample t-test was utilized to compare the post-test outcomes of the experimental and control groups. Gender and grade level were identified using one-way ANOVA.

RESULT

Descriptive Analysis

The following table shows the mean and standard deviation (SD) of kinesthetic and interpersonal intelligence:

Table 1. Descriptive Analysis

Group	Gender	Variable	Pre-test (M ± SD)	Post-test (M ± SD)
Experiment	Male	Kinesthetic Intelligence	69.0 ± 5.1	81.2 ± 4.9
		Interpersonal Intelligence	70.5 ± 5.8	83.5 ± 5.1
	Female	Kinesthetic Intelligence	68.0 ± 5.3	79.3 ± 4.7
		Interpersonal Intelligence	69.8 ± 6.0	82.0 ± 5.6
Control	Male	Kinesthetic Intelligence	67.8 ± 5.5	69.8 ± 5.1
		Interpersonal Intelligence	71.0 ± 6.2	73.0 ± 5.8
	Female	Kinesthetic Intelligence	68.2 ± 5.4	70.0 ± 5.0
		Interpersonal Intelligence	70.5 ± 6.4	72.1 ± 6.2

In the experimental group, the average posttest score of kinesthetic intelligence increased in both males (M = 81.2) and females (M = 79.3) when compared to the pretest. In the control group, there was no significant increase in kinesthetic intelligence in either males (M = 69.8) or females (M = 70.0). Meanwhile, posttest interpersonal intelligence improved in the experimental group, with males (M = 83.5) and females (M = 82.0) showing a significant rise. The control group showed no significant increase in either males (M = 73.0) or females (M = 72.1).

Normality Test

The Kolmogorov-Smirnov test was used to see if the data was regularly distributed. The following table shows the normalcy test results for the pretest and posttest of kinesthetic and interpersonal intelligence in both groups.

Table 2. Normality Test

Group	Gender	Variable	Pre-test (p)	Post-test (p)
Experiment	Male	Kinesthetic Intelligence	0.200	0.188
		Interpersonal Intelligence	0.145	0.130
	Female	Kinesthetic Intelligence	0.210	0.198
		Interpersonal Intelligence	0.152	0.122

Control	Male	Kinesthetic Intelligence	0.192	0.185
		Interpersonal Intelligence	0.200	0.170
	Female	Kinesthetic Intelligence	0.205	0.195
		Interpersonal Intelligence	0.190	0.160

The p-value for kinesthetic and interpersonal intelligence is greater than 0.05, both before and after the test. This indicates that the data in the experimental group are normally distributed for the kinesthetic and interpersonal intelligence variables in both male and female students. In the control group, the pretest and posttest data for kinesthetic and interpersonal intelligence both had p-values > 0.05, indicating that the data were normally distributed in both variables.

Paired t-Test

A paired t-test was used to compare the pretest and posttest scores of kinesthetic and interpersonal intelligence in the experimental group, which included both male and female students. The outcomes are presented in the following table:

Table 3. Paired t-Test

Gender	Variable	t	df	p-value	Conclusion
Male	Kinesthetic Intelligence	7.24	6	< 0.001	Significant
	Interpersonal Intelligence	6.89	6	< 0.001	Significant
Female	Kinesthetic Intelligence	6.58	6	< 0.001	Significant
	Interpersonal Intelligence	6.77	6	< 0.001	Significant

For males, the t-test findings for kinesthetic intelligence demonstrate a significant difference between the pretest and posttest (t-value = 7.24, p-value < 0.001). This indicates that the treatment resulted in a significant gain in kinesthetic intelligence. The t-value for interpersonal intelligence is 6.89, with a p-value < 0.001, indicating a significant difference between the pretest and posttest.

The t-test results for kinesthetic intelligence in female students revealed a significant difference between the pretest and posttest (t-value = 6.58, p-value < 0.001). For interpersonal intelligence, the t-value was 6.77 with a p-value < 0.001, indicating a significant increase in interpersonal intelligence after the program.

Independent sample t-Test

Table 4 displays the results of the independent sample t-test:

Table 4. Results of the Independent Sample T-test

Variable	t	df	p-value	Conclusion
Kinesthetic Intelligence	7.12	26	< 0.001	Significant
Interpersonal Intelligence	6.89	26	< 0.001	Significant

The t-value = 7.12 and p-value < 0.001 show a significant difference between the two groups. This suggests that the Adventure Education program has a greater effect on boosting kinesthetic intelligence

than the group that did not participate. For interpersonal intelligence, the t -value = 6.89 and p -value < 0.001 indicate a significant difference between the two groups, indicating that the Adventure Education program also has a significant effect on increasing students' interpersonal intelligence.

DISCUSSION

The primary hypothesis of this study is that Adventure Education will have a major positive impact on elementary school students' kinesthetic and interpersonal intelligence. Specifically, students who complete the program (experimental group) are predicted to exhibit significant improvements in both types of intelligence when compared to the control group that was not given the intervention. This hypothesis is predicated on the premise that Adventure Education learning activities can enhance physical, cognitive, and social skills through active learning and direct experience.

The study's findings are consistent with earlier research on the impact of experiential and adventure-based learning on student development. Outdoor Education Programs can benefit pupils in terms of social, academic, physical, and psychological development (Becker et al., 2017). In line with (Houge Mackenzie & Hodge, 2020) research, the major findings of this study indicate that adventure recreation promotes the eudaimonic aspect of subjective well-being (SWB) by addressing four key psychological needs: autonomy, competence, connectivity, and generosity. In addition, contact with nature is regarded as a significant aspect of promoting well-being.

Other studies have found that the nature-activities education program has a significant positive effect on the development of multiple intelligences in children aged 8 to 12 years. A comparison of pretest and posttest results revealed a significant increase in all areas of intelligence, including linguistic, visual, mathematical, kinesthetic, social, intrapersonal, naturalistic, and musical intelligence (Merve, 2018). The adventure education learning model demonstrates that kinesthetic intelligence has a major impact on Physical Education learning (Yuliana, 2024).

Koszałka-Silska et al. (2021) found that the Adventure Education program significantly improved male adolescents' social competency. Findings include prioritizing traits that are considered more dominant in men, such as physical strength and toughness, the presence of linguistic sexism, the assumption that outdoor identities and careers are better suited to men, and less gender-sensitive teaching and facilitation methods (Warren et al., 2019). Another study discovered that the Team Building Through Physical Challenges (TBPC) program continued to benefit female students in gender-segregated physical education classes, even though the overall results indicated that the program benefited both male and female students (Gibbons & Ebbeck, 2011).

The results of this study are significant because they provide factual support for Adventure Education programs as learning opportunities for kids' overall growth. Increasing kinesthetic intelligence can increase physical coordination, motor abilities, and body awareness, all of which are essential for childhood development (Hernawan, 2023). Interpersonal intelligence is crucial for effective social interaction, teamwork, and conflict resolution in physical education settings (Núñez et al., 2018). By demonstrating that Adventure Education may foster multiple types of intelligence, this study underlines the possibility of incorporating such programs into formal education to address both the physical and social elements of student development. The conclusions of this study have practical consequences for educators and policymakers. Significant increases in kinesthetic and interpersonal intelligence indicate that Adventure Education programs can be successfully adopted in elementary schools to boost student engagement, social skills, and physical development. Schools can incorporate adventure-based activities into their physical education or extracurricular programs to improve these components of intelligence. Furthermore, the findings of this study underline the need to use a variety of educational approaches that accommodate different learning modalities, acknowledging that typical classroom

m instruction may not adequately cover all aspects of intelligence. Further research might look into potential moderating factors, such as the impact of individual characteristics (e.g., personality traits, past experience with physical activity) on adventure-based learning outcomes. Further research might look into the usefulness of Adventure Education in different age groups, cultural contexts, and educational systems.

CONCLUSION

The purpose of this study is to examine how Adventure Education affects the kinesthetic and interpersonal intelligence of elementary school students. The study found that the program significantly boosted kinesthetic intelligence, as seen by an increase in physical abilities and body awareness in the experimental group compared to the control group. Furthermore, interpersonal intelligence has greatly risen, assisting in the development of social and communication skills. The program was shown to be beneficial in both male and female pupils, with paired t-test findings indicating a rise in both intelligences. Independent two-sample t-test results revealed that the experimental group scored higher on kinesthetic and interpersonal intelligence posttests than the control group. These findings strongly support the incorporation of Adventure Education into the elementary education curriculum as a tool for students' physical and social development.

REFERENCES

- Becker, C., Lauterbach, G., Spengler, S., Dettweiler, U., & Mess, F. (2017). Effects of regular classes in outdoor education settings: A systematic review on students' learning, social and health dimensions. *International Journal of Environmental Research and Public Health*, 14(5), 1–20. <https://doi.org/10.3390/ijerph14050485>
- Bedwell, W. L., Fiore, S. M., & Salas, E. (2014). Developing the future workforce: An approach for integrating interpersonal skills into the MBA classroom. *Academy of Management Learning & Education*, 13(2), 171–186.
- Chen, J., & Gardner, H. (2018). Assessment from the perspective of multiple intelligences theory. *Contemporary Intellectual Assessment: Theories, Tests, and Issues*, 164–173.
- Choi, H. S., Johnson, B., & Kim, Y. K. (2014). Children's development through sports competition: Derivative, adjustive, generative, and maladaptive approaches. *Quest*, 66(2), 191–202. <https://doi.org/10.1080/00336297.2013.861757>
- Cooley, S. J., Holland, M. J. G., Cumming, J., Novakovic, E. G., & Burns, V. E. (2014). Introducing the use of a semi-structured video diary room to investigate students' learning experiences during an outdoor adventure education groupwork skills course. *Higher Education*, 67, 105–121. <https://doi.org/10.1007/s10734-013-9645-5>
- Fernandes, V. R., Ribeiro, M. L. S., Melo, T., de Tarso Maciel-Pinheiro, P., Guimarães, T. T., Araújo, N. B., Ribeiro, S., & Deslandes, A. C. (2016). Motor coordination correlates with academic achievement and cognitive function in children. *Frontiers in Psychology*, 7, 318.
- Garst, B., Scheider, I., & Baker, D. (2001). Outdoor adventure program participation impacts on adolescent self-perception. *Journal of Experiential Education*, 24(1), 41–49. <https://doi.org/10.1177/105382590102400109>
- Gehris, J., Myers, E., & Whitaker, R. (2012). Physical activity levels during adventure-physical education lessons. *European Physical Education Review*, 18(2), 245–257. <https://doi.org/10.1177/1356336X12440365>
- Gibbons, S., & Ebbeck, V. (2011). Team Building through Physical Challenges in Gender-Segregated Classes and Student Self-Conceptions. *Journal of Experiential Education*, 34, 71–86. <https://doi.org/10.1177/105382591103400106>
- Gilbertson, K., & Ewert, A. (2015). Stability of motivations and risk attractiveness: The adventure recreation experience. *Risk Management*, 17, 276–297. <https://doi.org/10.1057/rm.2015.16>

- Goodnight, C. J. (2015). Multilevel selection theory and evidence: a critique of Gardner, 2015. *Journal of Evolutionary Biology*, 28(9), 1734–1746. <https://doi.org/10.1111/jeb.12685>
- Harper, N. J. (2017). Wilderness therapy, therapeutic camping and adventure education in child and youth care literature: A scoping review. *Children and Youth Services Review*, 83, 68–79. <https://doi.org/10.1016/j.chidyouth.2017.10.030>
- Hernawan, H. (2023). Literature Review: Physical Activity In Elementary School Students' Outdoor Educational Learning. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, 7(3), 673–681. <https://doi.org/10.33369/jk.v7i3.29349>
- Houge Mackenzie, S., & Hodge, K. (2020). Adventure recreation and subjective well-being: a conceptual framework. *Leisure Studies*, 39(1), 26–40. <https://doi.org/10.1080/02614367.2019.1577478>
- Koszałka-Silska, A., Korcz, A., & Wiza, A. (2021). The impact of physical education based on the adventure education programme on self-esteem and social competences of adolescent boys. *International Journal of Environmental Research and Public Health*, 18(6), 3021. <https://doi.org/10.3390/ijerph18063021>
- Li, H. C. W., Lopez, V., Chung, O. K. J., Ho, K. Y., & Chiu, S. Y. (2013). The impact of cancer on the physical, psychological and social well-being of childhood cancer survivors. *European Journal of Oncology Nursing*, 17(2), 214–219. <https://doi.org/10.1016/j.ejon.2012.07.010>
- Meerts-Brandsma, L., Sibthorp, J., & Rochelle, S. (2020). Using transformative learning theory to understand outdoor adventure education. *Journal of Adventure Education and Outdoor Learning*, 20(4), 381–394. <https://doi.org/10.1080/14729679.2019.1686040>
- Merve, C. (2018). Effect of nature-activities education program on the multiple intelligence level of children in the age group of 8 to 12 years. *Educational Research and Reviews*, 13(10), 365–374. <https://doi.org/10.5897/err2018.3493>
- Moorman, M. K., Schlatter, B. E., & Hurd, A. R. (2007). Adventure recreation: Coming soon to your community. *Journal of Physical Education, Recreation & Dance*, 78(9), 22–26. <https://doi.org/10.1080/07303084.2007.10598094>
- Moos, D. C., & Honkomp, B. (2011). Adventure learning: Motivating students in a Minnesota middle school. *Journal of Research on Technology in Education*, 43(3), 231–252. <https://doi.org/10.1080/15391523.2011.10782571>
- Nathan, N., Elton, B., Babic, M., McCarthy, N., Sutherland, R., Presseau, J., Seward, K., Hodder, R., Booth, D., & Yoong, S. L. (2018). Barriers and facilitators to the implementation of physical activity policies in schools: a systematic review. *Preventive Medicine*, 107, 45–53. <https://doi.org/10.1016/j.ypmed.2017.11.012>
- Núñez, M. T. D. V., Romero, F. J. C., Sánchez, R. C., & Aránega, A. Y. (2018). Developing management skills through experiential learning: The effectiveness of outdoor training and mindfulness. *European Journal of International Management*, 12(5–6), 676–694. <https://doi.org/10.1504/EJIM.2018.094473>
- Nyberg, G., Backman, E., & Larsson, H. (2020). Exploring the meaning of movement capability in physical education teacher education through student voices. *European Physical Education Review*, 26(1), 144–158.
- Opstoel, K., Chapelle, L., Prins, F. J., De Meester, A., Haerens, L., Van Tartwijk, J., & De Martelaer, K. (2020). Personal and social development in physical education and sports: A review study. *European Physical Education Review*, 26(4), 797–813. <https://doi.org/10.1177/1356336X19882054>
- Potter, T. G., & Dymont, J. E. (2016). Is outdoor education a discipline? Insights, gaps and future directions. *Journal of Adventure Education and Outdoor Learning*, 16(2), 146–159. <https://doi.org/10.1080/14729679.2015.1121767>
- Quennerstedt, M. (2019). Physical education and the art of teaching: Transformative learning and teaching in physical education and sports pedagogy. *Sport, Education and Society*. <https://doi.org/10.1080/13573322.2019.1574731>

- Safitri, A., Wulandari, D., & Herlambang, Y. T. (2022). Proyek Penguatan Profil Pelajar Pancasila: Sebuah Orientasi Baru Pendidikan dalam Meningkatkan Karakter Siswa Indonesia. *Jurnal Basicedu*, 6(4), 7076–7086. <https://doi.org/10.31004/basicedu.v6i4.3274>
- Santoso, N., Pambudi, A. F., Prayadi, H. Y., Utami, N. S., Yudhistira, D., & Virama, L. O. A. (2024). How do the Learning Models of Teaching Game for Understanding and Problem-Based Learning Influence Fundamental Football Skills in Physical Education? Conducting an Analysis in the Elementary School Context. *Physical Education Theory and Methodology*, 24(5 SE-Original Scientific Articles), 793–798. <https://doi.org/10.17309/tmfv.2024.5.15>
- Schweighardt, S. L., Sachs, M. L., & Hineline, P. N. (2018). Goal-Directed, Nature-Based Physical Activity Training Program Improves Personal Management Behavior of an Adolescent Female with Attention Deficit-Hyperactivity Disorder. *Ecopsychology*, 10(4), 301–316. <https://doi.org/10.1089/eco.2018.0048>
- Shafie, M. S., & Che Mat, H. (2014). Advancing Recreational Studies: An Analysis of Mental Toughness in Outdoor Adventure Program. *Proceedings of the International Colloquium on Sports Science, Exercise, Engineering and Technology 2014 (ICoSSEET 2014)*, 267–276. https://doi.org/10.1007/978-981-287-107-7_28
- Sottolare, R. A., Shawn Burke, C., Salas, E., Sinatra, A. M., Johnston, J. H., & Gilbert, S. B. (2018). Designing adaptive instruction for teams: A meta-analysis. *International Journal of Artificial Intelligence in Education*, 28, 225–264. <https://doi.org/10.1016/j.compeleceng.2022.107957>
- Sproule, J., Martindale, R., Wang, J., Allison, P., Nash, C., & Gray, S. (2013). Investigating the experience of outdoor and adventurous project work in an educational setting using a self-determination framework. *European Physical Education Review*, 19(3), 315–328. <https://doi.org/10.1177/1356336X1349562>
- Sutherland, S., & Legge, M. (2016). The possibilities of “doing” outdoor and/or adventure education in physical education/teacher education. *Journal of Teaching in Physical Education*, 35(4), 299–312. <https://doi.org/10.1123/jtpe.2016-0161>
- Sutherland, S., Ressler, J., & Stuhr, P. T. (2011). Adventure-based learning and reflection: The journey of one cohort of teacher candidates. *International Journal of Human Movement Science*, 5(2), 5–24. <https://doi.org/10.4324/9780203136928-26>
- Sutherland, S., & Stroot, S. (2010). The impact of participation in an inclusive adventure education trip on group dynamics. *Journal of Leisure Research*, 42(1), 153–176. <https://doi.org/10.1080/00222216.2010.11950199>
- Warren, K., Mitten, D., D’Amore, C., & Lotz, E. (2019). The Gendered Hidden Curriculum of Adventure Education. *Journal of Experiential Education*, 42(2), 140–154. <https://doi.org/10.1177/1053825918813398>
- Yuliana, T. (2024). Implementation of Adventure Education-Based Physical Education Learning on the Kinesthetic Intelligence Class X Students of SMAN 9 Semarang. *PHEDHERAL*, 21(2), 23–29. <https://doi.org/10.20961/phduns.v21i2.91927>
- Zeidner, M., & Matthews, G. (2017). Emotional intelligence in gifted students. *Gifted Education International*, 33(2), 163–182. <https://doi.org/10.1177/0261429417708879>
- Zhou, P., & Lau, P. W. C. (2022). The impact of adventure education on psychosocial well-being in adolescents: A systematic review. *International Journal of Physical Education*, 59(2), 2–16. <https://doi.org/10.5771/2747-6073-2022-2-2>