

Podcast Multimedia in Inquiry Learning: Fostering Environmental Awareness and Attitudes for Geography Students

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Abstract

This research is purposely to discover the influence of inquiry learning model with assistance of podcast based learning media in increasing the awareness and environmental care for geography students. Additionally, this research is done to know the difference of student activity between the class that uses inquiry learning model assisted by podcast and the class that uses conventional learning model. This research uses quasi-experimental design. The data was collected using awareness and environment care in pretest and posttest in experiment and control classes. The selected population is students of Muhammadiyah 2 Genteng High School Banyuwangi of 2021/2022 school year in social studies faculty. Experiment group originated from XI IIS class and control group originated from XI 2 IIS class with 60 students in number. Data was analyzed using ANCOVA with SPSS 25 version software for Windows. Results of this research proved that inquiry learning model with assistance of podcast has significant influence towards shifting of awareness and environment care of geography students. The student activities in experiment class is more active in comparison to those in control class.

Keywords: Inquiry Learning Model Assisted by Podcast, Environmental Awareness, Environmental Care Attitude

1. INTRODUCTION

Environmental problems is a frequent problem in developing countries such as Indonesia. Environment issues become something we often hear these days, where there is plenty of environmental damage and overuse of natural resources without continual conservation. Indonesian Center for Environmental Law (ICEL) in 2019 in their study elaborated that human activities is one of main causes of environmental damage cases. Some of those human activities are throwing waste carelessly, the usage of vehicles that caused air pollution, illegal logging, forests switching into plantations, and so on (Soto-Cruz et al, 2014). Environmental issues is one of the problems difficult to solve by the government (Abdulredha et al., 2020; Desa et al., 2012; Kaur, 2017). This is caused by lack of awareness, sense of responsibility and a caring attitude in preserving environment.

To address these challenges, raising awareness and fostering a caring attitude toward the environment among students can be achieved through both formal and informal education. An integrated approach between school curricula and the enforcement of responsible attitudes is essential to reduce environmental damage. Educational programs focusing on character-building in students—such as promoting environmental awareness and care—are key to success in addressing environmental issues. Raising awareness and environmental care attitude for students can be done through formal and informal education, so integrated effort is needed between school study and enforcement of attitude and responsibility in lowering the

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case of environmental damage (Sumarmi, 2017). Learning directed at student character building (awareness and environmentally caring attitude) is able to become a key of success in lowering damage in the environment. If the attitude based on environmental care has been developed, then the awareness in preserving the environment continually would be formed (Mullenbach & Green, 2018; Nazarenko & Kolesnik, 2018).

Reinforcing an awareness and environmental care attitude can be done by means of learning instructions that focus on cognitive, affective, and psychomotor domains. Inquiry learning model is a contextual model based on investigation. This model is used to raise student's curiosity through a discovery process and creative and innovative studying activity. But not many have put an inquiry learning model into use in raising awareness and environmental care attitude while involving students in inquiry learning model based in outdoor studying activities (on the field) can form awareness and an environmental care attitude (Al.Balushi & Al-Aamri, 2014; Hosnan, 2014).

Inquiry learning model has strengths that distinguished it from other learning models. The strengths of an inquiry learning model are balanced aspects of student's cognitive, affective, and psychomotor, demanding students to participate more actively and motivating study, also encouraging student's independence (Bell et al., 2010; Capps & Crawford, 2013; Dudu & Vhurumuku, 2012; Jeffery et al., 2016). Aside from that, inquiry learning model also has its weaknesses in its applications. The weaknesses of an inquiry learning model are time consuming, it needs to be well prepared, and isn't easy to be developed well in larger classes.

The usage of learning media based on technology is beneficial in covering the weakness of inquiry learning. One of the usable technology media is Podcast. The researcher chose this media is so that the students are involved in usage of new and up-to-date technology improvement. Podcast has been widely used in advanced countries such as the UK, Australia, and Europe. However, this media is still rarely used for learning process in Indonesia (Bozkurt & Sharma, Ramesh, 2020; Merante, 2016; Nunes & McPherson, 2013; Schreiber & Klose, 2017). Podcast has a strength in which it is able to be accessed on a massive scale regardless of boundaries of time and space. Podcast is used as innovation in long distanced learning due to COVID-19 pandemic. The usage of podcast supports a more effective and efficient learning process.

The modern and innovative display of podcast is highly suitable in inquiry learning that purposely demands students to investigate, construct, and analyze a phenomenon as a final result. Podcasting as geography learning media still requires numerous research to develop a set of practices in an education landscape. Hereby, the researcher shall do integrated experiment between the use of inquiry learning model with podcast as media to enhance a student's academic performance on a geography subject in raising awareness and an environmental care attitude. This research is purposely to test the impact of applying podcast media in inquiry learning model in enhancing awareness and environmental care attitude.

2. METHOD

Design

This research is a type of quasi-experiment, with the design being used are pretest and posttest. In the first phase, the researcher determined the experiment class and control class. The

selected experiment class is XI IIS 1 and the selected control class is XI IIS 2, then pretest was done in the first meeting using the instrument of awareness and environmental care attitude on August 23rd 2021. The designing of environmental awareness is measured with using the indicators: accepting, responding, and organizing characteristics based on grade; while the designing of attitude instrumentation is measured by the indicators: replicating, manipulating, and naturalization. From those indicators, the list of questions would be made to measure each indicators. Second phase is applying the inquiry learning model with assistance of podcast with material of environmental damage on lands, mountains, beaches, and seas based on analysis regarding environmental impact (AMDAL) with duration of 15 minutes on experiment classes, with the specific purpose of usage so that the students are able to identify the cause and consequences of natural damage phenomenon that influenced the spacial condition of earth by using a geographical approach (spacial, regional, and environmental), and applying a conventional learning model, which is expository on control classes. The third phase is making a final evaluation (posttest) by using the same test problem.

Participant

The location of this research is done at Banyuwangi Regency, Province of East Java, Indonesia. The subject of this research is the students of XI class Faculty Social Sciences Muhammadiyah 2 Genteng High School from school year of 2020-2021. The researcher selected classes that possess equal academic competence based on the grade mean of the final semester exam.

Table 1. Distribution based on gender and group

Gender	Experiment Group	Control Group
Male	11	9
Female	19	21
Total	30	30

Data Collection

During the first meeting on August 23rd 2021, 60 students were given a pretest using the instrument of awareness and environmental care attitude directly. Instrument is tested using validity with product moment correlation technique and reliability using Cronbach's Alpha method. The problems are 25 questions in number, valid and proper to be used for pretest and posttest. Instrument of environment awareness are 15 questions in number with value of Cronbach's Alpha in the amount of 0,630 and attitude indicator is 10 questions in number with Cronbach's Alpha in the amount of 0,651. The results of pretest are used to identify awareness and attitude towards the environment before learning activity is implemented. The final test (posttest) is done at the fifth week meeting with the same instrument to measure the awareness and environmental attitude of the students.

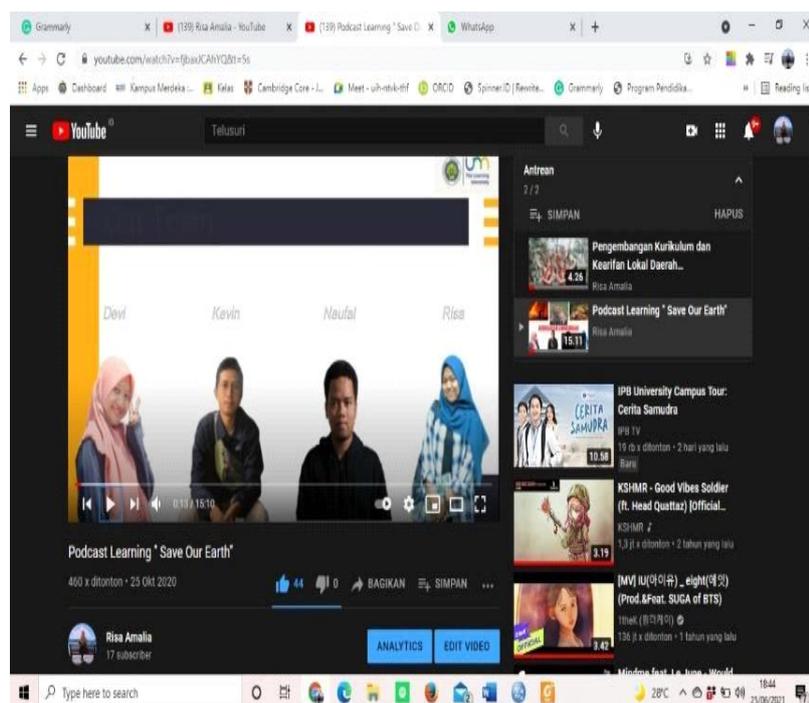
Data Analysis

Pretest and posttest results are statistically tested with Kolmogorov-Smirnov test, Sapiro-Wilk, levene's test and ANCOVA with the usage of software SPSS 25 for Windows.

Implementation

The phases of implementing the inquiry learning model includes: the teacher designs a scenario for their student's learning process, the students are taught to analyze the spreading

and management of forestry, mining, marine, and tourism resources based on principles of continual development with assistance of podcast media made by the researcher titled "Save Our Earth" through YouTube. The podcast can be considered as multimedia due to the availability of audio, text, imagery, and video that will ease students with various learning methods shown in picture 1, then the researcher given up criteria of grading process to the students, the students understood the instructed steps, then students did field investigation reflecting on the acquired data, students did an in depth study by correlating secondary data, students presented their investigation results to review strengths and weaknesses, and students did further investigation to search for a solution from the acquired problems.



Picture 1 Students in experiment class are using podcast recommended by the teacher

The research is adjusted with the Indonesian national curriculum of basic knowledge competence 3.3 analyzing spreading and management of forestry, mining, marine, and tourism resources according to the principles of continual development and basic skills competence 4.3 of mapping the spreading of forestry, mining, marine, and tourism resources in Indonesia.

In this lesson students are given explanation of natural phenomenon happening on earth and its impacts. Researcher engaged students to study the discovered natural problems, one of the examples founded by students of class XI IIS 1 is discovering the problem of environment pollution due to fish processing factory in Muncar, Banyuwangi. To prove the problem of the natural pollution, students of class XI IIS 1 were investigating as shown on picture 2.

Investigation was done by collecting physical data of environment quality and social environmental data around the research location. Physical data of environment quality was collected in the form of biophysical environment consisted of biotic and abiotic related and influence one another. Biotic components are animals, plants and humans, while abiotic includes objects such as soil, water, air, and sunlight. Social data is found as demographic data and processing of industrial waste. The collected data is then gathered and discussed to find the correlation. The final result is formed as reports are presented in front of the class to identify the relation between environmental quality and local activities of the citizens around the research location.

a. Location 1: 80 55'73.89''S



b. Location 2: 80 52'29.73''S



c. Location 3: 80 00'15.25''S



Picture 2. Investigation Location of Industrial Waste Disposal at Muncar Harbour, Banyuwangi.

3. RESULT AND DISCUSSION

RESULTS

First data processing is testing the normality and homogeneity of data. The data analysis results of normality and homogeneity can be seen on table 2, 3, 4 and 5.

Table 2. Normality Test of Environmental Awareness

	Research Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	p	Statistic	df	p
Result of Environmental Attitudes	Pretest Exp	.085	30	.200*	.966	30	.523
	Posttest Exp	.093	30	.200*	.823	30	.161
	Pretest Con	.112	30	.200*	.960	30	.260
	Posttest Con	.142	30	.153	.952	30	.173

Table 3. Normality Test of Environmental Attitudes

	Research Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	p	Statistic	df	p
Result of Environmental Awareness	Pretest Exp	.165	30	.036	.964	30	.521
	Posttest Exp	.284	30	.200*	.821	30	.159
	Pretest Con	.131	30	.200*	.958	30	.258
	Posttest Con	.140	30	.139	.950	30	.171

Based on table 2 and 3, the data analysis result using Kolmogorov-Smirnov and Saphiro-Wilk tests above, the error rate in decision making is established $\alpha = 5\%$. Criteria of decision making is using sig.a or p-value. If sig.a $> \alpha$ then H1 is accepted or data is distributed normally. If sig.a $< \alpha$ then H0 is denied or data is distributed abnormally. From the data analysis results above it is found that p-value value of Kolmogorov test are 0,136, 0,200, 0,200, 0,139, 0,200, 0,200, 0,200, and 0,153 where each of these values are larger than α . so it is valid that data of awareness and environmental care attitude are distributed normally.

Table 4. Homogeneity Test of Environmental Awareness

Environmental Awareness			
Levene Statistic	df1	df2	p
747	1	58	.391

Table 5. Homogeneity Test of Environmental Attitudes

Environmental Attitudes			
Levene Statistic	df1	df2	p
536	1	57	.467

Based on table 4 and 5, it is identified that significant values (p) are in the amount of 0,391 and 0,467. Because the significant value $> 0,05$, then it is concluded that the data is proven homogenous, so the data resulted from normality and homogeneity is testable using ANCOVA test to see the impact of inquiry learning model assisted by podcast towards the indicators of attitude and environmental awareness. Following is the mean of pretest and posttest results for the indicators.

Table 6. Pretest and Posttest Results of Experiment and Control Classes

Fostering Environmental	Group	Pretest	Posttest	Improvement	
				Score	%
Awareness	Experiment	71,27	85	14,37	20,54
	Control	69,23	76,79	8,57	12,09
Attitudes	Experiment	31,07	38,33	8,26	25,14
	Control	28,04	32,59	3,55	14,67

In the table above, it is elaborated that both experiment classes are experiencing enhancement on both indicators reviewed from median of pretest and posttest. Commonly, experiment class has grades of awareness and environmental care attitudes higher than the control class. Enhancement of posttest result in experiment class occurred by the implementation of inquiry learning model assisted by podcast that stimulates students to find a solution and investigating on the field to be able to enhance their awareness and environmental care attitude well.

Table 7. ANCOVA Test Results for Environmental Awareness

Source	df	MS	F	p
Corrected Model	2	547.457	46.498	.000
Intercept	1	1590.836	100.535	.000
Pretest	1	136.612	10.996	.005
Group	1	812.645	54.400	.000
Error	53	14.963		
Total	56			
Corrected Total	55			

R Squared = .565 (Adjusted R Squared = .550)

Based on table 7, the environmental awareness result of the students of Muhammadiyah 2 Genteng High School, Banyuwangi, it is explainable that value $F = 10,996$ with significance rate $0,005$ ($p > 0,05$) shown that there is a significant impact towards student's studying result, while the influence of implementing inquiry learning model assisted by podcast towards student's environmental awareness has result $F = 54.400$, with rate of significance $0,000$ ($p > 0,05$).

Table 8. ANCOVA Test Results for Environmental Attitudes

Source	df	MS	F	p
Corrected Model	2	115.098	30.287	.000
Intercept	1	493.829	85.867	.000
Pretest	1	29.316	10.150	.020
Group	1	147.413	38.750	.000
Error	53	4.108		
Total	56			
Corrected Total	55			

R Squared = .484 (Adjusted R Squared = .465)

Based on table 8 environmental care attitude of students of Muhammadiyah 2 Genteng High School, Banyuwangi, it is explainable that value $F = 10,150$ with significance rate $0,020$ ($p > 0,05$) shown that there is significance change on student's environmental attitude, while the influence of inquiry learning model assisted by podcast towards student's environmental care attitude has result $F = 39,750$ with rate of significance $0,000$ ($p > 0,05$).

DISCUSSION

The usage of Podcast multimedia using the inquiry learning model has significant influence towards a student's awareness and environmental care attitude (Ramdhani et al, 2022). This

can be seen from the gain score of the experiment class is higher compared to control class. It is also supported by the opinion that Indonesia is one of the countries that experienced a myriad of environmental damage, so the knowledge of awareness and environmental care attitudes is absolutely needed. The anthropogenic, geological, climatologic, and geomorphology conditions are factors that caused the environmental vulnerability in Indonesia.

Podcast learning titled "Save our earth" influences the high score of awareness and environmental care attitude on experiment class. Students have a big opportunity to listen, read, and comprehend the multimedia podcast. The skills of listening, reading, and comprehension can provide knowledge and enhance awareness and environmental care attitude of students (Rosida & Adi, 2017; Suharto et al, 2020).

The results of awareness and environmental care attitudes at school is vital because Indonesia is a country with high risk of environmental damage. The data collected from school elements such as the headmaster/headmistress, teachers, and administration staff are much needed to study about awareness and environmental care attitudes. One of them is done at Banyuwangi Regency, East Java, Indonesia, with the exact location on industrial waste disposal of Muncar Harbour. The survey results show that school readiness still needs to be upgraded (Puspitasari et al, 2016; Sumarmi, 2015). Therefore, learning to develop awareness and environmental care attitude is still needed to be done in various ways, such as using the assistance of podcast media.

During the learning process, students who used inquiry learning models assisted by podcast media were directly involved in outdoor learning for experimenting, researching, observing, interviewing, and discussing. Based on the learning process, the students will develop attitude and environmental awareness, because basically environmental caring and awareness attitude is insufficient by merely implementing a conventional learning model. The data analysis of experiment classes is more focused during the learning process. This is due to students understanding what would be analyzed according to their experience and referring to learning objectives. With good analysis, the learning conclusion can be afforded with a more precise process. From each process experienced by students, they are able to afford their cognitive ability to develop well. Their studying results specifically on attitude and environmental awareness that uses inquiry learning models assisted by podcast gained satisfying results compared to the studying results of students who used conventional learning. Result comparison of student's attitude and environmental awareness who used the inquiry learning model assisted by podcast and the conventional learning model were shown very clearly. Students who used inquiry learning models had direct experiences in learning, so they had better studying results than students who used conventional learning models who directly learned from teachers and memorized them.

The research result (Aliman et al., 2019) also describes that student's knowledge towards environmental damage is still lacking. Student's attitude to lower the risk of a drop in water quality upstream of Brantas river stream in Malang City, East Java Province is quite low with the attitude of still disposing trash carelessly. Other research result by (Kovak & Koc, 2019) shown that correlation between education and knowledge of environmental awareness and care has a high correlation value of product-moment $r = 1,0$. Hence the improvement of podcast media is important to enhance a student's comprehension in developing awareness and environmental care attitudes.

4. CONCLUSION

This research is done purposely to identify the impact on using podcast in an inquiry learning model to enhancing awareness and environmental care attitude on students. Results shown that mean of research class that implementing inquiry learning model assisted by podcast media has higher awareness and environmental care attitude compared to research class that implementing conventional learning model. The strength of using podcast media is facilitating students in independent exploration and present new learning experience for students. On the other hand, the approach of exploration enables students to solve complex problems supported by precise decision making.

REFERENCES

- Abdulredha, M., Kot, P., Al Khaddar, R., Jordan, D., & Abdulridha, A. (2020). Investigating municipal solid waste management system performance during the Arba'een event in the city of Kerbala, Iraq. *Environment, Development and Sustainability*, 22(2). <https://doi.org/10.1007/s10668-018-0256-2>
- Al-Balushi, S. M., & Al-Aamri, S. S. (2014). The effect of environmental science projects on students environmental knowledge and science attitudes. *International Research in Geographical and Environmental Education*, 23(3). <https://doi.org/10.1080/10382046.2014.927167>
- Aliman, M., Budijanto, Sumarmi, & Astina, I. K. (2019). Improving environmental awareness of high school students' in Malang city through earthcomm learning in the geography class. *International Journal of Instruction*, 12(4). <https://doi.org/10.29333/iji.2019.1246a>
- Amijaya, L. S., Ramdani, A., & Merta, I. W. (2018). PENGARUH MODEL PEMBELAJARAN INKUIRI TERBIMBING TERHADAP HASIL BELAJAR DAN KEMAMPUAN BERPIKIR KRITIS PESERTA DIDIK. *Jurnal Pijar Mipa*, 13(2). <https://doi.org/10.29303/jpm.v13i2.468>
- Amin, S., Sumarmi, Bachri, S., Susilo, S., & Bashith, A. (2020). The Effect of Problem-Based Hybrid Learning (PBHL) Models on Spatial Thinking Ability and Geography Learning Outcomes. *International Journal of Emerging Technologies in Learning*, 15(19). <https://doi.org/10.3991/ijet.v15i19.15729>
- Bell, T., Urhahne, D., Schanze, S., & Ploetzner, R. (2010). Collaborative inquiry learning: Models, tools, and challenges. *International Journal of Science Education*, 32(3). <https://doi.org/10.1080/09500690802582241>
- Bozkurt, A., & Sharma, Ramesh, C. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian Journal of Distance Education*, 15(1).
- Budiarti, S., Nuswowati, M., & Cahyono, E. (2016). Guided Inquiry Berbantuan E-Modul Untuk Meningkatkan Keterampilan Berpikir Kritis. *Journal of Innovative Science Education*, 1(1).
- Capps, D. K., & Crawford, B. A. (2013). Inquiry-Based Instruction and Teaching About Nature of Science: Are They Happening? *Journal of Science Teacher Education*, 24(3). <https://doi.org/10.1007/s10972-012-9314-z>
- Celaya, I., Ramírez-Montoya, M. S., Naval, C., & Arbués, E. (2020). Uses of the podcast for educational purposes. Systematic mapping of the literature in WoS and Scopus (2014-2019). *Revista Latina de Comunicacion Social*, 2020(77). <https://doi.org/10.4185/RLCS-2020-1454>

- Chen, X., Huang, B., & Lin, C. Te. (2019). Environmental awareness and environmental Kuznets curve. *Economic Modelling*, 77. <https://doi.org/10.1016/j.econmod.2019.02.003>
- Delita, F., Elfayeti, & Sidauruk, T. (2016). Peningkatan Soft Skills Dan Hard Skills Mahasiswa Melalui Project-Based Learning Pada Mata Kuliah Perencanaan Pembelajaran Geografi. *Journal Geografi Universitas Negeri Medan*, 8(2).
- Desa, A., Abd Kadir, N. B., & Yusoooff, F. (2012). Environmental Awareness and Education: A Key Approach to Solid Waste Management (SWM) – A Case Study of a University in Malaysia. In *Waste Management - An Integrated Vision*. <https://doi.org/10.5772/48169>
- Dudu, W. T., & Vhurumuku, E. (2012). Teachers' Practices of Inquiry When Teaching Investigations: A Case Study. *Journal of Science Teacher Education*, 23(6). <https://doi.org/10.1007/s10972-012-9287-y>
- Geng, M. M., & He, L. Y. (2021). Environmental regulation, environmental awareness and environmental governance satisfaction. *Sustainability (Switzerland)*, 13(7). <https://doi.org/10.3390/su13073960>
- Hosnan. (2014). Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Abad 21 Kunci Sukses Implementasi Kurikulum 2013. In *Bogor: Ghalia Indonesia* (Issue 2014).
- Imedadze, I. (2019). TBILISI 1979 YEAR SYMPOSIUM ON THE UNCONSCIOUS – LOOKING BACK. *Problems of Psychology in the 21st Century*, 13(1). <https://doi.org/10.33225/ppc/19.13.4>
- Indahsari, D. (2020). Using podcast for EFL students in language learning. *JEES (Journal of English Educators Society)*, 5(2). <https://doi.org/10.21070/jees.v5i2.767>
- Jeffery, E., Nomme, K., Deane, T., Pollock, C., & Birol, G. (2016). Investigating the role of an inquiry-based biology lab course on student attitudes and views toward science. *CBE Life Sciences Education*, 15(4). <https://doi.org/10.1187/cbe.14-11-0203>
- Kaur, J. (2017). Environmental Awareness among +1 class school students of Hoshiarpur District. *IOSR Journal of Humanities and Social Science*, 22(07). <https://doi.org/10.9790/0837-2207020712>
- Kinkaid, E., Emard, K., & Senanayake, N. (2020). The Podcast-as-Method?: Critical Reflections on Using Podcasts to Produce Geographic Knowledge. *Geographical Review*, 110(1–2). <https://doi.org/10.1111/gere.12354>
- Kuvac, M., & Koc, I. (2019). The effect of problem-based learning on the environmental attitudes of preservice science teachers. *Educational Studies*, 45(1). <https://doi.org/10.1080/03055698.2018.1443795>
- Lundström, M., & Lundström, T. P. (2020). Podcast ethnography. *International Journal of Social Research Methodology*. <https://doi.org/10.1080/13645579.2020.1778221>
- Merante, R. (2016). BLOGS, WIKIS, PODCASTS, AND OTHER POWERFUL WEB TOOLS FOR CLASSROOMS (THIRD EDITION) - BOOK REVIEW. *European Journal of Education Studies*, 1(1).
- Mitchell, G., Scott, J., Carter, G., & Wilson, C. B. (2021). Evaluation of a delirium awareness podcast for undergraduate nursing students in Northern Ireland: a pre-/post-test study. *BMC Nursing*, 20(1). <https://doi.org/10.1186/s12912-021-00543-0>

- Mullenbach, L. E., & Green, G. T. (2018). Can environmental education increase student-athletes' environmental behaviors? *Environmental Education Research*, 24(3). <https://doi.org/10.1080/13504622.2016.1241218>
- Nazarenko, A. V., & Kolesnik, A. I. (2018). Raising environmental awareness of future teachers. *International Journal of Instruction*, 11(3). <https://doi.org/10.12973/iji.2018.1135a>
- Nunes, M. B., & McPherson, M. (2013). Proceedings of the International Association for Development of the Information Society (IADIS) International Conference on e-Learning (Prague, Czech Republic, July 23-26, 2013). In *International Association for Development of the Information Society*.
- Puspitasari, E., Sumarmi, & Ach Amirudin. (2016). Integrasi Berpikir Kritis dan Peduli Lingkungan Melalui Pembelajaran Geografi Dalam Membentuk Karakter Peserta Didik SMA. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 1(2).
- Ramdani, A., Jufri, A. W., & Jamaluddin, J. (2022). Interactive Multimedia Inquiry Based on Local Wisdom: Alternative Media to Improve Students' Environmental Care Attitude. *Prisma Sains : Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika Dan IPA IKIP Mataram*, 10(4), 881–889. <https://doi.org/10.33394/j-ps.v10i4.6109>
- Rosida, F., & Adi, K. R. (2017). Studi Eksplorasi Pengetahuan Dan Sikap Terhadap Kesiapsiagaan Bencana Banjir Di SD Pilanggede Kecamatan Balen Kabupaten Bojonegoro. *Jurnal Teori Dan Praksis Pembelajaran IPS*, 2(1). <https://doi.org/10.17977/um022v2i12017p001>
- Salam, R. (2017). MODEL PEMBELAJARAN INKUIRI SOSIAL DALAM PEMBELAJARAN IPS. *Harmony : Jurnal Pembelajaran IPS Dan PKN*, 2(1).
- Schreiber, C., & Klose, R. (2017). Mathematical audio-podcasts for teacher education and school. *Teachers and Curriculum*, 17(2). <https://doi.org/10.15663/tandc.v17i2.161>
- Soto-Cruz, R. A., Lebgue-Keleng, T., Balderrama, S., Vélez-Sánchezverin, C., Aguilar-Palma, N., Viramontes-Olivas, O., & Durán, A. (2015). Environmental awareness of the young in a rural community in the Sierra Tarahumara, Chihuahua, Mexico. *Journal of Education and Practice*, 5(4), 197–201.
- Suharto, N. T., Slamet, P. H., Jaedun, A., & Purwanta, H. (2020). The effectiveness of a school-based disaster risk reduction program in Indonesia: A case study in the Klaten Regency's junior high schools. *International Journal of Innovation, Creativity and Change*, 12(12).
- Sumarmi, S. (2015). Local Wisdom of Osing People in Conserving Water Resources. *KOMUNITAS: International Journal of Indonesian Society and Culture*, 7(1). <https://doi.org/10.15294/komunitas.v7i1.3429>
- Sumarmi, S. (2017). A Study of Local Wisdom of Balinese Aga and Samin People to Develop Environmental Awareness Characteristics. *Proceedings of the 1st International Conference on Geography and Education (ICGE 2016)*. <https://doi.org/10.2991/icge-16.2017.41>
- Tamara, R. M. (2016). Peranan Lingkungan Sosial Terhadap Pembentukan Kabupaten Cianjur. *Jurnal Pendidikan Geografi*, 16(1).
- Turan, E. Z. (2019). Teacher candidates' environmental awareness and environmental sensitivity. *International Journal of Higher Education*, 8(4). <https://doi.org/10.5430/ijhe.v8n4p202>

- Yeritia, S., Wahyudi, W., & Rahayu, S. (2017). PENGARUH MODEL PEMBELAJARAN INKUIRI TERBIMBING TERHADAP PENGUASAAN KONSEP DAN KEMAMPUAN BERPIKIR KRITIS FISIKA PESERTA DIDIK KELAS X SMAN 1 KURIPAN TAHUN AJARAN 2017/2018. *Jurnal Pendidikan Fisika Dan Teknologi*, 3(2). <https://doi.org/10.29303/jpft.v3i2.398>
- Zellatifanny, C. M. (2020). Trends in Disseminating Audio on Demand Content through Podcast: An Opportunity and Challenge in Indonesia. *Journal Pekommas*, 5(2). <https://doi.org/10.30818/jpkm.2020.2050202>.