available online at http://journal.uny.ac.id/index.php/jolahraga

Jurnal Keolahragaan, 10 (2), 2022, 282-291

The effect of teachers' perceptions of the TAM learning model seen on the student's learning outcomes in high school

Ugi Nugraha*, Ekawarna, Muhammad Ali, Try Arianto Adhanegara

Sports and Health Education, Universitas Jambi, Indonesia

*Coressponding Author. E-mail: ugi.nugraha@unja.ac.id

Received: 2 February 2022; Revised: 15 March 2022; Accepted: 3 July 2022

Abstract: Technology is an important aspect in improving the process of student development This study attempts to examine how are the descriptive results of teacher perceptions and student learning outcomes and how are the perceptions of the application of the tam model applied to student learning outcomes. The sample of this research is as many as fifty teachers who teach subjects physical education with a working period of 1-8 years and 9-16 years. The method used in this research is a mixed method with quantitative data as primary data and qualitative data as reinforcing data. In the results obtained, it can be seen that there is an influence between teacher perceptions of the Technology Acceptance Model (TAM) learning model which measures the level of understanding of students in interactive multimedia learning media on student learning outcomes, and the results of teacher interviews that today's technology needs are very important to improve learning. Therefore, this test is very important because there are no researchers who have tested these variables and there is an influence from the variables being tested. Therefore, this study aims to examine the results of descriptive statistics on teacher perceptions which are seen from student learning outcomes and measure the effectiveness of the perception of the application of the Tam model on student learning outcomes.

Keywords: football, sports education, TAM.

How to Cite: Nugraha, U., Ekawarna, E., Ali, M., & Adhanegara, T. A. (2022). The effect of teachers' perceptions of the TAM learning model seen on the student's learning outcomes in high school. *Jurnal Keolahragaan, 10* (2), 282-291. doi: http://doi.org/10.21831/jk.v10i2.47810

INTRODUCTION

The very rapid development of technology in the current era of globalization has provided many benefits in various aspects of education, society, culture, and economy (Nikou & Aavakare, 2021; Usmeldi et al., 2017; Varpanen, 2021). The development of information technology supported by infrastructure, computers, and the internet has had an impact on all aspects of life, especially education (Das, 2021; Gathong & Chamrat, 2019; Martini et al., 2018). Educational technology aims to process one's quality maturation for future development (Astuti et al., 2021; Papadakis, 2021; Shanmugam & Balakrishnan, 2019).

In the world of education, technology is an important aspect of improving the process of student development. One of the uses of technology is in physical education lessons (Fitri & Winarni, 2016; Fitriadi & Rachman, 2014). With the existence of adequate technology in physical education learning can develop the self-potential of students (Artyhadewa, 2017; Cahyati & Suherman, 2014). Physical education is one of the subjects that trains students in psychomotor aspects (Ardiyanto & Fajaruddin, 2019; Susanto & Lismadiana, 2016). One of the materials that can develop the potential of students is football.

Football is one of the physical education materials that develop the ability to cooperate between students (Arianto & Setyawan, 2019; Sucipto & Widiyanto, 2016; Sumarno & Irianto, 2019). Football today is closely related to the development of existing technology. With technology, soccer material can be developed, one of which is the virtual procedure for playing soccer (Adam & Sukoco, 2015; Anggitasari et al., 2019; Susanto & Lismadiana, 2016). Such as research (Ilissaputra & Suharjana, 2016; Mardhika & Dimyati, 2015; Nasution & Suharjana, 2015) explains physical education learning

on students' learning interests, but there is no perception from teachers on the use of technology in physical education learning.

Based on the learning outcomes of students in the physical education subject for soccer material, it was found that there were gaps between genders. Where the male gender is more dominant than the female gender due to the soccer material male students are more active and can practice the material. Based on the results of interviews with physical education subject teachers in accordance with student learning outcomes where there are differences between genders in soccer material. In addition, such as research (Arianto & Setyawan, 2019) which explains the relationship of gender to physical education learning.

Therefore, the urgency of this research is to find out the results of descriptive statistical tests and the influence of the application of technology on student learning outcomes and the perception of educators on the application of the TAM model. By looking at how important the application of technology is to student learning outcomes, there is a problem formulation from this research, namely: 1) What is the perception of educators on the application of the TAM model; 2) How are students' learning outcomes on soccer material; 3) How does the perception of the application of the Tam model affect student learning outcomes.

METHODS

This study used a mixed-method approach that combined qualitative and quantitative methods (Khun-Inkeeree et al., 2021; Maharani & Subanji, 2018; Wu et al., 2020). By using a sequential explanatory design in this study, quantitative data becomes supporting data from qualitative data (Bátyi, 2017; Daguay-James & Bulusan, 2020). Sources of data used in this study in the form of qualitative data, namely the results of interviews with teachers who teach physical education subjects and quantitative data in the form of questionnaires on student learning outcomes and teacher performance observation sheets. The sample of this study was 40 teachers consisting of 20 high school teachers in West Bangko sub-district with a total of 12 male teachers and 8 female teachers. Then in the West Pamenang sub-district, there are 20 high school teachers with 15 male teachers and 5 female teachers in Merangin District. The working period of each teacher consists of 1-8 years and 9-18 years. The sampling technique in this research is total sampling. The reason for taking the research subject is because the sub-district has done a lot of physical education learning so that it can be seen the perception of teachers and student learning outcomes. The instruments were a sheet for learning outcomes and an observation sheet for teacher performance. The sheet consists of perceptions that there is a significant influence on teacher understanding on aspects of attitude toward using, behavioral intention to use, and actual use simultaneously on physical education learning outcomes in Merangin Regency. There is a valid statement item on this instrument using a Likert scale. The scale consists of 5 points with a very good score of 4, good which is 3, less good is 2, and not good is 1. Each statement is a representative of each indicator (See Table 1).

Table 1. Instrument Grid

Variable	Indicator	Sub Indicator	Item
TAM	Attitude toward using	a. Convenience to interact b. Happy to use c. Enjoy using d. Not boring	10 question
	Behavioral intention use	a. Has helpful features b. Always try to use c. Continue in the future	10 question
	Actual Use	a. Usage Time b. Frequency of Use	10 question

The data were collected through interviews, as well as observation sheets, and learning outcomes question sheets. Structured interviews included a question list that had been prepared before conducting direct interviews (Husband, 2020; Kell et al., 2017). Interviews were conducted with the physical education teachers. The observation sheet is given to the teacher to measure performance and

the learning outcome questionnaire is distributed to students. After the data were collected and analyzed, for quantitative data analysis using SPSS, conclusions were obtained.

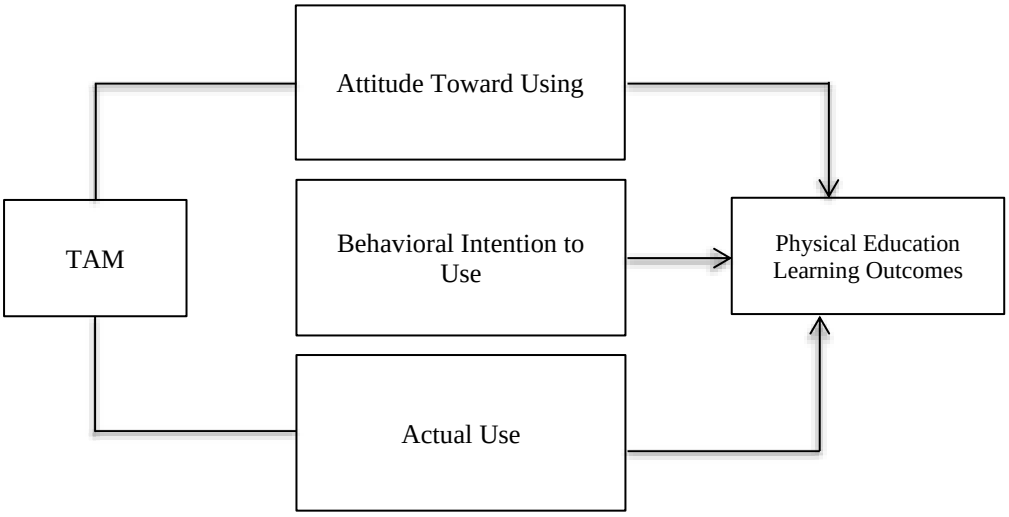

Figure 1. Research Procedure

This study used qualitative data analysis, descriptive statistics and inferential statistics of quantitative data. Inferential statistical analysis aims to estimate parameters and test hypotheses of a study. The descriptive statistics used in this research is a numerical approach method by presenting the mean, median,, min and maximum data. The inferential statistics used the assumption test, linearity test and regression test. Before performing the regression test, the assumption test and linearity test were carried out first. The first step in this research is to determine the normality and linearity of a data using the normality test and linear test. The results of the interviews used a gradual qualitative data analysis test.

RESULTS AND DISCUSSION

The following describes the descriptive statistical results of perception variables. Perception indicators: teacher's perception of attitude towards using technology, teacher's perception of the desire to use technology, teacher's perception of the use of technology in learning. The results obtained from the distribution of questionnaires in schools are shown in Table 2.

Table 2. Description of Teachers' Perceptions of Attitudes in Using Technology

Response		Interval	F	%	Category	Mean	Me	Min	Max
High School in West Bangko District	M	8.0 – 14.4	0	0%	Not very good	3.69	4.2	2.0	5.0
		14.5 – 20.8	4	11.1%	Not good				
		20.9 – 27.2	10	27.8%	Enough				
		27.3 – 33. 6	15	41.7%	Good				
		33.7 – 40.0	7	19.4%	Very good				
	F	8.0 – 14.4	1	2.8%	Not very good	3.52	3.50	1.0	5.0
		14.5 – 20.8	4	11.1%	Not good				
		20.9 – 27.2	13	36.1%	Enough				
		27.3 – 33. 6	11	30.6%	Good				
		33.7 – 40.0	7	19.4%	Very good				
High School in West Pamenang District	M	8.0 – 14.4	0	0%	Not very good	3.91	4.0	2.0	5.0
		14.5 – 20.8	1	2.9%	Not good				
		20.9 – 27.2	11	32.4%	Enough				
		27.3 – 33. 6	12	35.5%	Good				
		33.7 – 40.0	10	29.4%	Very good				
		8.0 – 14.4	0	0%	Not very good	3.76	4.0	2.0	5.0

F	14.5 – 20.8	2	5.9%	Not good
	20.9 – 27.2	11	32.4%	Enough
	27.3 – 33. 6	14	41.2%	Good
	33.7 – 40.0	7	20.6%	Very good

Based on Table 2, the category of teacher perceptions of the attitude toward using technology in the West Bangko sub-district is superior, it can be seen from the percentage of very good scores from the teacher's response.

Table 3. Description of Teacher's Perception of Desire to Use Technology

Response		Interval	F	%	Category	Mean	Me	Min	Max
High School in West Bangko District	M	7.0 – 12.6	0	0%	Not very good	4.41	5.0	3.0	5.0
		12.7 – 18.2	0	0%	Not good				
		18.3 – 23.8	4	11.2%	Enough				
		23.9 – 29.4	13	36%	Good				
		29.5 – 35.0	19	52.8%	Very good				
	F	7.0 – 12.6	0	0%	Not very good	4.41	4.5	3.0	5.0
		12.7 – 18.2	0	0%	Not good		0		
		18.3 – 23.8	3	8.3%	Enough				
		23.9 – 29.4	15	41.7%	Good				
		29.5 – 35.0	18	50%	Very good				
High School in West Pamenang District	M	7.0 – 12.6	0	0%	Not very good	4.55	5.0	3.0	5.0
		12.7 – 18.2	0	0%	Not good				
		18.3 – 23.8	3	8.8%	Enough				
		23.9 – 29.4	9	26.5%	Good				
		29.5 – 35.0	22	64.7%	Very good				
	F	7.0 – 12.6	0	0%	Not very good	4.50	5.0	3.0	5.0
		12.7 – 18.2	0	0%	Not good				
		18.3 – 23.8	2	5.9%	Enough				
		23.9 – 29.4	13	38.2%	Good				
		29.5 – 35.0	19	55.9%	Very good				

Based on Table 3, the category of teacher perceptions of the desire to use technology at the West Pamenang High School is superior, it can be seen from the percentage of very good scores.

Table 4. Description of Teacher's Perception of the Use of Technology in Learning

Response		Interval	F	%	Category	Mean	Me	Min	Max
High School in West Bangko District	M	5 – 9	0	0%	Not very good	3.58	3.0	2.0	5.0
		10 – 13	1	2.8%	Not good				
		14 – 17	19	52.8%	Enough				
		18 – 21	10	27.8%	Good				
		22 - 25	6	16.7%	Very good				
	F	5 – 9	0	0%	Not very good	3.38	3.0	2.0	5.0
		10 – 13	2	5.8%	Not good				
		14 – 17	21	58.3%	Enough				
		18 – 21	10	27.8%	Good				
		22 - 25	3	8.3%	Very good				
High School in West Pamenang District	M	5 – 9	0	0%	Not very good	3.44	3.0	3.0	5.0
		10 – 13	0	0%	Not good				
		14 – 17	22	64.7%	Enough				
		18 – 21	9	26.5%	Good				
		22 - 25	3	8.8%	Very good				
	F	5 – 9	0	0%	Not very good	3.44	3.0	3.0	5.0
		10 – 13	0	0%	Not good				

14 – 17	21	61.8%	Enough
18 – 21	11	32.4%	Good
22 - 25	2	5.9%	Very good

Based on Table 4, the category of teacher perceptions of the use of technology in learning at West Bangko District Senior High School is superior, it can be seen from the percentage of good scores.

Table 5. Description of Physical Education Learning Outcomes

School	Interval	Category	F	%	Mean	Me	Min	Maks
High School in West Bangko District	25,00 – 43,75	Very Not Good	1	2,5	76,4	76	40	92
	43,76 – 62,50	Not good	8	20				
	62,51 – 81,25	Good	19	47,5				
	81,26 – 100	Very good	12	30				
High School in West Pamenang District	25,00 – 43,75	Very Not Good	3	7,5	74	76	40	92
	43,76 – 62,50	Not good	9	22,5				
	62,51 – 81,25	Good	14	35				
	81,26 – 100	Very good	14	35				

Based on Table 5, the physical education learning outcomes of students in West Bangko District Senior High School and West Pamenang District High School have good to very good categories with percentages of 77.5% and 70.0% respectively. Furthermore, the researchers tested the assumptions in the form of a normality tests and linearity test. Data is normally distributed if the significant value obtained is greater than 0.05.

Table 6. Normality test of TAM perception of teachers in West Bangko District Senior High School and West Pamenang District High School

School	**Variable**	**Kolmogorov-Smirnov**		
		Statistic	**Df**	**Sig.**
High School in West Bangko District	Attitude toward using	.073	46	.200*
	Behavioral intention use	.239	46	.200
	Actual Use	.074	46	.200*
High School in West Pamenang District	Attitude toward using	.175	46	.200*
	Behavioral intention use	.078	46	.200
	Actual Use	.175	46	.200*

Based on Table 6, it can be concluded that the data is normally distributed. The normality test was obtained by the Kolmogorov-Smirnov test, the significance value was > 0.05. The linearity test of TAM perceptions of teachers at West Bangko District Senior High School and West Pamenang District High School is described in Table 7.

Table 7. The linearity test of TAM perceptions of teachers in Bangko Sub-district Senior High School and Pamenang District High School

School	**Variable**	**Kolmogorov-Smirnov[a]** **Sig**	**Deviation from linearity** **Sig**
High School in West Bangko District	Attitude toward using	0.041	0.034
	Behavioral intention use	0.042	0.035
	Actual Use	0.043	0.036
High School in West Pamenang District	Attitude toward using	0.046	0.036
	Behavioral intention use	0.047	0.037
	Actual Use	0.036	0.042

Based on Table 7, the linearity test of the variables above has a linear relationship between West Bangko High School and West Pamenang District High School. It is proven that the result of sig < 0.05. For the results of the description of the TAM perception regression test for teachers at Bangko District High School and Pamenang District High School(See Table 8).

Table 8. TAM Perception Regression Test on teachers at Bangko Sub-district Senior High School and Pamenang District High School

School	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
High School in West Bangko District	64.386	12.116		5.314	.000
	.126	.166	.122	.760	.042
High School in West Pamenang District	65.142	11.223		5.804	.000
	.101	.154	.106	.656	.016

From Table 8, it is found that there is an influence on the perception of TAM on teachers in West Bangko District Senior High School and West Pamenang District High School on physical education subjects. This is evidenced by the value of sig < 0.05.

Interview results were obtained from several teachers who teach physical education subjects at West Bangko District High School and West Pamenang District High School as follows:

1. Question 1**:** Are you able to use technology? If you use this technology, in what ways do you use it?

   Teacher 1: Yes, technology is very complex and provides many benefits, one of which makes it easier for me to carry out teaching and learning activities and also communicate remotely with guardians and students directly. Teacher 2: Sure. In this modern era, technology is inseparable from human life, I use technology in various aspects of life, especially in teaching activities.
2. Question 2: How do you respond to technology that is rapidly advancing in human life?

   Teacher 1: I think the development of advanced technology is a virtue that can make things easier in everyday life.

   Teacher 2: In my opinion, the development of increasingly sophisticated technology must be accompanied by supervision and also accompanied by virtuous education and can make education more quality
3. Question 3: Do you apply technology to physical education learning?

   Teacher 1: I apply technology in physical education learning, one of which is soccer material in the form of using the computer room to analyze strategies and soccer games.

   Teacher 2: the application of technology in physical education learning is very important because it can facilitate the course of learning and communication, one of which is a smartphone in the learning that I teach, namely physical education, by creating a classroom, group chat, and so on, to facilitate communication.

The qualitative data shown in the results show that the teacher knows the learning outcomes of students through observing attitudes, actions, and skills in doing assignments. This shows that the teacher only understands the outstanding student skills, without paying attention to other students. Where, these students need guidance and understanding of their interests so that students can develop skills according to their interests (Abbott, 2017; Z. Luo et al., 2020; Sari & Sarwanto, 2018).

This study shows the application of the teacher perception model application on student learning outcomes evidenced by the difference in technology used by teachers between the districts of West Bangko and West Pamenang which can determine student learning outcomes. On the other hand, there are differences in student gender in learning outcomes because in soccer the male gender has a higher dominance. This research can have an impact on students, teachers, and even schools. For students, this research is a place to voice their opinions on learning outcomes in the physical education subject matter of soccer (Cain, 2020; Jufrida et al., 2019; Kapici et al., 2020). For teachers, this research can be used as a basis for developing and making the learning process even better and improving physical education learning technology, so that learning objectives can be achieved (Effendi & Hendriyani,

2020). For schools, this research can be used as a basis for developing technology and knowing the skills of students at the school, so that schools can take action to improve the skills of their students (J. M. Luo et al., 2019; Parrish & Lanvers, 2019; Sarid, 2018). Which will have an impact on increasing the results that students have, especially on soccer material

This research is in line with previous literature regarding the use of technology in physical education subjects on student learning outcomes. Researchers (Arianto & Setyawan, 2019) discussed the differences in student skills in learning physical education in junior high schools. Then the researchers (Sumarno & Irianto, 2019) discussed the relationship between technology use in physical education learning. Meanwhile, this study, it focuses more on how the effect of using the TAM model application on student learning outcomes. Therefore, this test is very important because there are no researchers who have tested these variables and there is an influence from the variables being tested. Therefore, this study aims to determine the results of descriptive statistics on teacher perceptions and student learning outcomes, and can determine the effect of the perception of the application of the TAM model on student learning outcomes.

CONCLUSIONS

Based on the results of research that has been done in the West Bangko High School district and West Pamenang High School district, tt can be concluded that the use of technology for physical education students has a very positive effect on student learning outcomes, especially student learning outcomes in West Bangko High School district and West Pamenang High School district. Judging from the perception of teachers who use the TAM learning model, they can provide technology benefits to students in physical education subjects on soccer material. With the help of existing technology, it can improve students' abilities to make learning outcomes better. In addition to the use of technology, teachers who can develop their lessons with the help of technology can have a new impact on the students they teach.

REFERENCES

Abbott, A. L. (2017). Fostering student interest development: An engagement intervention. *Middle School Journal*, *48*(3), 34–45. https://doi.org/10.1080/00940771.2017.1297666

Adam, G., & Sukoco, P. (2015). MENINGKATKAN HASIL BELAJAR SEPAK BOLA MAHASISWA PGSD STKIP St. PAULUS RUTENG MELALUI PENDEKATAN TAKTIK. *Jurnal Keolahragaan*, *3*(2), 150–163. https://doi.org/10.21831/jk.v3i2.6228

Amaro-Gahete, F. J., Sanchez-Delgado, G., Alcantara, J. M. A., Martinez-Tellez, B., Acosta, F. M., Helge, J. W., & Ruiz, J. R. (2019). Impact of data analysis methods for maximal fat oxidation estimation during exercise in sedentary adults: Data analysis maximal fat oxidation. *European Journal of Sport Science*, *19*(9), 1230–1239. https://doi.org/10.1080/17461391.2019.1595160

Anggitasari, E. D., Dieny, F. F., & Candra, A. (2019). Hubungan somatotype dengan kesegaran jasmani atlet sepak bola. *Jurnal Keolahragaan*, *7*(1), 11–22. https://doi.org/10.21831/jk.v7i1.21188

Ardiyanto, H., & Fajaruddin, S. (2019). Tinjauan atas artikel penelitian dan pengembangan pendidikan di Jurnal Keolahragaan. *Jurnal Keolahragaan*, *7*(1), 83–93. https://doi.org/10.21831/jk.v7i1.26394

Arianto, A. T., & Setyawan, C. (2019). Efektivitas small sided games dan interval training terhadap peningkatan daya tahan aerobik pada pemain sepakbola U-17. *Jurnal Keolahragaan*, *7*(2), 182–191. https://doi.org/10.21831/jk.v7i2.27039

Artyhadewa, M. S. (2017). Pengembangan model permainan sepak takraw sebagai pembelajaran pendidikan jasmani bagi anak SD kelas atas. *Jurnal Keolahragaan*, *5*(1), 50. https://doi.org/10.21831/jk.v5i1.12804

Astuti, M., Arifin, Z., Mutohhari, F., & Nurtanto, M. (2021). Competency of Digital Technology: The Maturity Levels of Teachers and Students in Vocational Education in Indonesia. *Journal of Education Technology*, *5*(2), 254–262. https://doi.org/10.23887/jet.v5i3.35108

Bátyi, S. (2017). The role of attitudes in the development of Russian as a foreign language: A retrospective study. *Studies in Second Language Learning and Teaching*, *7*(1), 149–167. https://doi.org/10.14746/ssllt.2017.7.1.8

Cahyati, S., & Suherman, W. S. (2014). Pengembangan Media Pembelajaran Pendidikan Jasmani Olahraga Dan Kesehatan Berbasis Komputer Untuk Sma. *Jurnal Keolahragaan*, *2*(1), 69–76. https://doi.org/10.21831/jk.v2i1.2604

Cain, J. P. (2020). A qualitative study on the effect of podcasting strategies (studycasts) to support 7th grade student motivation and learning outcomes. *Middle School Journal*, *51*(3), 19–25. https://doi.org/10.1080/00940771.2020.1735867

Daguay-James, H., & Bulusan, F. (2020). Metacognitive strategies on reading english texts of ESL freshmen: A sequential explanatory mixed design. *TESOL International Journal*, *15*(1), 20–30.

Das, K. (2021). Integrating E-Learning & Technology in Mathematics Education . *Journal of Information and Computational Science*, *11*(1), 310–319.

Effendi, H., & Hendriyani, Y. (2020). The Conceptual and Hypothetical Model of Interactive Blended Problem Based Learning. *JPI (Jurnal Pendidikan Indonesia)*, *8*(2), 285. https://doi.org/10.23887/jpi-undiksha.v8i2.24162

Fitri, A. H., & Winarni, S. (2016). Model pembelajaran integratif penjasorkes materi atletik dengan pendidikan IPA materi Biologi untuk siswa SMP. *Jurnal Keolahragaan*, *4*(1), 1. https://doi.org/10.21831/jk.v4i1.8108

Fitriadi, A., & Rachman, H. A. (2014). *Pengembangan Multimedia Pendidikan Jasmani Materi Budaya Hidup Sehat ... Arief Fitriadi, Hari Amirullah Rachman 1*. *2*(1), 1–10.

Gathong, S., & Chamrat, S. (2019). The implementation of science, technology and society environment (STSE)-based learning for developing pre-service general science teachers' understanding of the nature of science by empirical evidence. *Jurnal Pendidikan IPA Indonesia*, *8*(3), 354–360. https://doi.org/10.15294/jpii.v8i3.19442

Husband, G. (2020). Ethical data collection and recognizing the impact of semi-structured interviews on research respondents. *Education Sciences*, *10*(8), 1–12. https://doi.org/10.3390/educsci10080206

Ilissaputra, D. A., & Suharjana, S. (2016). Pengaruh metode latihan dan VO2 Max terhadap dasar sepak bola. *Jurnal Keolahragaan*, *4*(2), 164. https://doi.org/10.21831/jk.v4i2.10892

Jufrida, J., Kurniawan, W., Astalini, A., Darmaji, D., Kurniawan, D. A., & Maya, W. A. (2019). Students' attitude and motivation in mathematical physics. *International Journal of Evaluation and Research in Education*, *8*(3), 401–408. https://doi.org/10.11591/ijere.v8i3.20253

Kapici, H. O., Akcay, H., & de Jong, T. (2020). How do different laboratory environments influence students' attitudes toward science courses and laboratories? *Journal of Research on Technology in Education*, *52*(4), 534–549. https://doi.org/10.1080/15391523.2020.1750075

Kaufmann, M. (2020). Vocations, visions and vitalities of data analysis. An introduction. *Information Communication and Society*, *00*(0), 1981–1995. https://doi.org/10.1080/1369118X.2020.1777320

Kell, H. J., Martin-Raugh, M. P., Carney, L. M., Inglese, P. A., Chen, L., & Feng, G. (2017). Exploring Methods for Developing Behaviorally Anchored Rating Scales for Evaluating Structured Interview Performance. *ETS Research Report Series*, *2017*(1), 1–26. https://doi.org/10.1002/ets2.12152

Khun-Inkeeree, H., Mohd Yaakob, M. F., WanHanafi, W. R., Yusof, M. R., & Omar-Fauzee, M. S. (2021). Working on primary school teachers' preconceptions of organizational climate and job satisfaction. *International Journal of Instruction*, *14*(3), 567–582. https://doi.org/10.29333/iji.2021.14333a

Luo, J. M., Chau, K. Y., Lam, C. F., & Cheng, M. (2019). The relationship of student's motivation, program evaluation, career attitudes and career aspirations in university–industry cooperation program. *Cogent Education*, *6*(1). https://doi.org/10.1080/2331186X.2019.1608686

Luo, Z., Jingying, C., Guangshuai, W., & Mengyi, L. (2020). A three-dimensional model of student interest during learning using multimodal fusion with natural sensing technology. *Interactive Learning Environments*, *0*(0), 1–14. https://doi.org/10.1080/10494820.2019.1710852

Maharani, I. P., & Subanji, S. (2018). Scaffolding Based on Cognitive Conflict in Correcting the Students' Algebra Errors. *International Electronic Journal of Mathematics Education*, *13*(2), 67–74. https://doi.org/10.12973/iejme/2697

Mardhika, R., & Dimyati, D. (2015). Pengaruh Latihan Mental Dan Keyakinan Diri Terhadap Keberhasilan Tendangan Penalti Pemain Sepak Bola. *Jurnal Keolahragaan*, *3*(1), 106–116. https://doi.org/10.21831/jk.v3i1.4973

Martini, Rosdiana, L., Subekti, H., & Setiawan, B. (2018). Strengthening students' characters and ecopreneurship through science, environment, technology, and society course. *Jurnal Pendidikan IPA Indonesia*, *7*(2), 162–171. https://doi.org/10.15294/jpii.v7i2.14338

Matteson, S. M. (2021). Chex MixTM Data Analysis Activity. *College Teaching*, *69*(3), 121–125. https://doi.org/10.1080/87567555.2020.1843389

Nasution, I. E., & Suharjana, S. (2015). Pengembangan Model Latihan Sepak Bola Berbasis Kelincahan Dengan Pendekatan Bermain. *Jurnal Keolahragaan*, *3*(2), 178–193. https://doi.org/10.21831/jk.v3i2.6241

Nikou, S., & Aavakare, M. (2021). An assessment of the interplay between literacy and digital Technology in Higher Education. *Education and Information Technologies*, *26*(4), 3893–3915. https://doi.org/10.1007/s10639-021-10451-0

Papadakis, S. (2021). Advances in Mobile Learning Educational Research (A.M.L.E.R.): Mobile learning as an educational reform. *Advances in Mobile Learning Educational Research*, *1*(1), 1–4. https://doi.org/10.25082/amler.2021.01.001

Parrish, A., & Lanvers, U. (2019). Student motivation, school policy choices and modern language study in England. *Language Learning Journal*, *47*(3), 281–298. https://doi.org/10.1080/09571736.2018.1508305

Sari, N., & Sarwanto. (2018). The Analysis of Student Learning Motivation On Physics Learning in Senior Secondary School. *Jurnal Pendidikan Dan Kebudayaan*, *3*(1), 17–32. 10.24832/jpnk.v3i1.591

Sarid, A. (2018). A theory of education. *Cambridge Journal of Education*, *48*(4), 479–494. https://doi.org/10.1080/0305764X.2017.1356267

Shanmugam, K., & Balakrishnan, B. (2019). Motivation in information communication and technology-based science learning in tamil schools. *Jurnal Pendidikan IPA Indonesia*, *8*(1), 141–152. https://doi.org/10.15294/jpii.v8i1.16564

Sucipto, E., & Widiyanto, W. (2016). Jurnal Keolahragaan. *Pengembangan Model Pembelajaran Lempar Lembing Untul Siswa Sekolah Menengah Pertama(Smp)*, *4*(April), 111–121. vfile:///C:/Users/ACER/Downloads/pdf latihan beban dan kekuatan otot.pdf

Sumarno, S., & Irianto, D. P. (2019). *Studi eksplorasi klub sepakbola pada Liga 2 Indonesia 2018 : Bagaimana cara bertahan dalam keterbatasan ? Exploratory study of football clubs in Liga 2 Indonesia 2018 : How to survive within limitedness ? 7*(2), 104–115.

Susanto, N., & Lismadiana, L. (2016). Manajemen program latihan sekolah sepakbola (SSB) GAMA Yogyakarta. *Jurnal Keolahragaan*, *4*(1), 98. https://doi.org/10.21831/jk.v4i1.8133

Usmeldi, Amini, R., & Trisna, S. (2017). The development of research-based learning model with science, environment, technology, and society approaches to improve critical thinking of

students. *Jurnal Pendidikan IPA Indonesia*, *6*(2), 318–325. https://doi.org/10.15294/jpii.v6i2.10680

Varpanen, J. (2021). *Escaping the Dark Side of Technology via Subject-ness Sustainable Technology Education and Holistic Craft*. *28*(2), 2021–2046.

Wu, Y., Hutagalung, F. D., & Chew, F. P. (2020). A comparative study of novice and experienced EFL teachers' codeswitching in Chinese university EFL classroom. *Journal of Language and Linguistic Studies*, *16*(3), 1523–1533. https://doi.org/10.17263/jlls.803886