

YouTube-based Learning on the Knowledge of Swimming Concepts and Swimming Speed of Elementary School Students

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Abstract. Swimming learning was temporarily suspended, as well as the learning process that should be face-to-face, changed to an online learning process that requires educators to be able to produce a learning innovation to maintain student achievement. This is what underlies the research which aims to analyze the impact of YouTube-assisted learning on the understanding of concepts and swimming speed of elementary school students. The design of this study was a quasi-experimental design in the form of a posttest control group design. the population of this study was 48. The data collection process used was the test and documentation method. The data analysis method of this research is descriptive analysis and inferential statistical analysis with manova. The results showed that youtube-based learning had a positive and significant impact both simultaneously and partially on the understanding of the concept and swimming speed of students, this was indicated by the sig value. < 0.05. From the results of descriptive data, research results are also obtained in the form of the variable speed of students is more influenced by youtube-based learning than the variable understanding of the concept. So, it can be recommended that youtube-based learning can be used as an innovative learning for swimming.

Keywords: speed, concept knowledge; swimming; and youtube.

1 Introduction

Swimming is one of the most popular sports from all walks of life, be it children, adults or the elderly. Swimming requires the coordination of most of the upper and lower limbs [1]– [4], demands complex muscle performance [5], [6], requires complex skills and good basic knowledge [7]. In the sport of swimming there are four styles and each style has a different level of difficulty [8]. The four styles are butterfly stroke (butterfly stroke), backstroke (backstroke), breaststroke (breaststroke), and freestyle (freestyle / crawl) [9]– [11].

The benefits that exist in swimming sports activities include maintaining and improving fitness, maintaining body health, for personal safety, to form physical abilities such as endurance, muscle strength and also beneficial for children's physical development and growth, for educational facilities and infrastructure, recreation, rehabilitation and achievement [12]– [15].

Swimmer's achievement is influenced by several factors of swimming technique (including start, turn and finish), endurance, power, speed, and mentality [16]. One of the factors that determine the achievement of swimmers is the knowledge of the basic concepts of swimming.

Concept understanding is a person's ability to master a number of subject matters, which is not just remembering but can explain in different ways [17]. Concept understanding is the underlying mechanism for meaningful learning, meaningful learning here means a person's ability to understand content together with connecting new ideas with previous knowledge and experience [18]. Concept understanding is closely related to one's working memory in the learning process [19]. The description also illustrates that in the process of solving problems, understanding concepts have a very important role, understanding concepts as one of the prerequisites and the ability to relate concepts and mental readiness in the learning process [20], as well as a comprehensive understanding of concepts is an absolute requirement in achieving learning success [21], [22]. This also applies to the achievement of swimmers with a good understanding of the concept that will affect student achievement in learning to swim. Achievements that can be seen directly is speed.

Speed is one of the most important components of physical condition in swimming, the speed in swimming is the cyclical maximum speed or the speed with which the movement is repeated, the same form of speed as the speed in sprinting [4], [23]. Speed is a conditional quality that allows a person to make movements and

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react quickly to stimuli [24], [25]. Speed in swimming can be developed to the maximum because in essence every human being has the nature to compete and compete to always excel [26]. Achievement in this case speed is influenced by factors that come from within and outside the swimmer. The internal factor that cannot be separated is the knowledge of concepts related to swimming techniques. With good concept knowledge will provide the ability to apply swimming techniques. To develop knowledge of swimming concepts, of course, obtained from the learning process. The learning process that is able to provide a good understanding of the concept is of course learning that focuses on students. This has something to do with students learning and finding their own will make learning more meaningful. Meaningful learning will have an impact on the development of students' experiences and emotional development [27]– [29]. In other words, innovative learning that involves students will be more meaningful [30].

However, currently the problem faced by education in Indonesia is the COVID-19 pandemic, which causes all activities that involve many people and outdoor activities to be eliminated. Likewise with swimming lessons temporarily suspended. The learning process, which should be face-to-face, is changed to an online learning process. Although the online learning process currently has a positive impact, this learning has a negative impact. Some of the weaknesses of online learning in learning are the lack of facilities in the form of integrated technology to support the online learning process [31], [32], insufficient internet quota barriers and abnormal internet networks [33], low levels of student understanding when conducting online learning processes, lack of variety. in learning [34], learning cannot be conveyed effectively [35], and feeling lazy and difficult to concentrate [36]. The problems encountered in online learning if left unchecked will certainly have a bad impact on the learning process. Likewise, practical learning such as Penjasrek requires a good understanding of concepts to achieve better performance. If this problem is left unchecked, it will certainly have a bad impact on student achievement. One solution is to implement online media-based learning, one of the media that can be used is YouTube media.

YouTube media can help students understand the material that is being taught repeatedly whenever students are interested in understanding the material [37], [38]. Youtube media can also be used both online and offline [39]. Learning to use youtube channels is an alternative solution in increasing understanding [40], increasing interest during learning [41], [42], increasing knowledge and getting a lot of other information [43]. The existence of youtube media will help the learning process carried out online, this statement is supported by the results of research which states that the impact of using YouTube content as a teaching medium has a positive influence on interest in learning [44]. The results of the study stated that there was an influence of YouTube-based learning media on learning outcomes [45]. Research which states that Youtube also has a significant positive role in increasing learning

motivation [46]. The results of the study which stated that Youtube media had an effect on students' motivation and learning outcomes [47]. Based on some of the results of these studies, it can be said that the existence of YouTube media in the learning process has a positive impact. Based on this, this research aims to analyze the impact of YouTube-assisted learning on the understanding of concepts and swimming speed of elementary school students. This research has a difference with the existing one, the difference is that Youtube media is used to help learning swimming. The YouTube media used will be adjusted to the swimming techniques that students must learn to make learning easier. In addition, this research will also focus more on discussing the understanding of concepts and speed in learning swimming. The existence of learning with the help of YouTube is expected to contribute to innovative learning that can be used by teachers/coaches in swimming lessons.

2 Research Methods

This study used a quasi-experimental research design. The research design is a quasi-experimental design in the form of a posttest control group design [48]. The research implementation process is grouped into the experimental class and the control class. The experimental group was treated with Youtube-based learning. This YouTube-based learning is done by combining learning usually with YouTube. The videos used are swimming technique training videos that are packaged attractively so that students are interested in watching. As for the control class, it is only done with ordinary practical learning. Both groups were given a preliminary test both with regard to concept understanding and speed. From the initial test, it was found that students from both groups came from groups that had the same ability. The data that will be obtained in this study are (1) understanding of the concept (Y1) in the Experiment class; (2) understanding the concept (Y1) of the Control class; (3) Speed (Y2) in the Experiment class; (4) speed (Y2) Control class.

The trial was carried out in elementary schools that took swimming lessons; the population of this study was 48 people who were all used considering the research subjects were limited. This population consists of grade 4-6 elementary school students. The research sample was taken from all populations that had previously been tested for equality where children had the same ability, from 48 samples would be grouped into 2 groups, namely experimental and control with random sampling technique. From the results of random sampling obtained 24 people in the experimental group and 24 people in the control group. In this study, the data collection process used was the test and documentation method. The test is used to measure students' conceptual understanding. The developed test is adjusted to the material of swimming techniques, this test is in the form of a description consisting of 10 saols at level C2. The steps for developing this test are 1) creating a test instrument grid; 2) make questions in the form of descriptions; 3) consult the grid and questions

developed by experts. The question grid is described in Table 1.1. In testing the validity of the concept understanding test instrument, it is necessary to test the validity of the instrument items, the validity of the content of the instrument, the reliability of the test, the level of difficulty of the test items and the level of difficulty of the test equipment.

Testing the validity of the concept understanding test instrument items is carried out using the CVR formula. The CVR result from the calculation of each instrument item is 1 and the total CVR of all concept understanding test instruments is 10 and can be declared valid based on the validation provisions of each instrument item in the CVR formula. The content validity test of the concept understanding test instrument was carried out using the CVI formula with the results that the CVI value was 1 and the concept understanding test instrument was declared very good based on the content validation provisions of the entire instrument in the CVI formula. The reliability test of the concept understanding test whose data is in the form of polytomies using the Alpha Coefficient formula with the results obtained is 0.93 and is in the range of $0.60 < r11 < 0.93$. So, the reliability of the concept understanding test is in the high criteria. The level of difficulty of the critical thinking ability test items obtained the results that of the 10 questions made there were 4 questions that were in the medium criteria and 6 questions were in the high criteria. While the level of difficulty of a test device is in the difficult criteria. Meanwhile, for speed, the document collection method is used.

Table 1 Results of Descriptive Analysis of students' understanding of concepts and swimming speed

	Basic competencies	Indicator	Cognitive Level	Number of Questions
No	Mastering swimming techniques	Breathing techniques Deep swimming breathing techniques	C2	2
		Basic Leg Techniques for freestyle swimming and backstroke swimming	C2	2
		Basic technique of arm movement for freestyle swimming	C2	2
		Techniques for training coordination and alignment of swimming movements	C2	1
		Starting technique, reversal technique	C2	1

		and freestyle swimming finish technique		
		Reverse technique in freestyle swimming and backstroke	C2	1
		Backstroke swimming finish technique	C2	1

The data analysis method of this research is descriptive analysis and inferential statistical analysis. The descriptive analysis carried out in this study was processed with the help of SPSS 25.0 for Windows. The values sought in the statistical test include the mean, standard deviation, maximum and minimum values. Meanwhile, for inferential analysis used the MANOVA test. Prior to the Manova test, the Manova test was carried out, the prerequisite test was carried out, namely the normality test with Kolmogorof-Smirnov, homogeneity test with Levene Statistic and Box's Test of Equality of Covariance Matrices and the linearity test aims to determine whether there is a linear relationship in each dependent variable. analyzed. The MANOVA test and the prerequisite test were carried out with the help of SPSS 25.0 for Windows.

3 Result and Discussion

After students are taught according to the learning design that has been made, namely youtube-based learning, the results of descriptive analysis show that there is a significant influence on the implementation of youtube-based learning. Completely the results of the descriptive analysis are shown in Table 1.2. The results of the descriptive analysis show that there are differences in conceptual understanding and swimming speed of students who are taught with youtube-based learning with students who learn by learning without youtube. This is shown from the difference in the concept understanding score of 3.86 where the average value of the concept understanding of students who are taught by learning youtube with youtube is greater than that of students who are taught by learning without youtube. Meanwhile, the swimming speed of students shows a difference score of 12.38, where the mean score of students who are taught by learning youtube is shorter than students who are taught by learning without youtube. From the descriptive data, the research results in the form of student speed variables are more influenced by youtube-based learning, this is seen from the large difference in the mean value compared to the concept understanding variable.

Table 2. Results of Descriptive Analysis of understanding concepts and swimming speed of students.

Treat	Dependent variable	mean	Std. Deviation	Min.	Max.	Range
Youtube assisted learning	Concept understanding	82.55	12.36	56.25	100.00	43.75
	Speed	85.03	35.17	40.06	141.74	101.68
Learning without the help of youtube	Concept understanding	78.69	7.58	62.50	90	27.50
	Speed	97.41	34.48	53.88	156.20	102.32

After the results of the descriptive analysis are carried out, the next test stage is the prerequisite test, the prerequisite tests carried out include the normality test of the data distribution, the homogeneity of variance test, the multivariate homogeneity test, and the linearity test of the dependent variable. The first prerequisite test was the normality test with Kolmogorov-Smirnov. The results of the analysis show that all data come from groups of data that are normally distributed, this can be indicated by the value of Sig. > 0.05, which is presented in Table 1.3. After the normality conditions are met, the next prerequisite test is the homogeneity test. In this study, the homogeneity test was carried out with two analyzes, namely the homogeneity of variance test with Levene's Test of Equality and the multivariate homogeneity test with Box's Test of Equality of Covariance Matrices.

Table 3 Results of analysis Normalitas

	Learning approaches	Kolmogorov-Smirnov ^a		
		Statistic	df	Sig.
Concept understanding	Youtube assisted learning	0,15	24	0,20
	Learning without the help of youtube	0,15	24	0,20
Speed	Youtube assisted learning	0,15	24	0,89
	Learning without the help of youtube	0,15	24	0,89

The results of the homogeneity analysis carried out show the same meaning, namely the research data comes from homogeneous data groups, this can be seen from the sig value. each test showed a value of more than 0.05. Value of Sig. Levene's Test of Equality test is 0.14 for understanding the concept while the value of Sig. speed of 0.935. Meanwhile, homogeneity test with Box's Test of Equality of Covariance Matrices obtained sig. of 0.16 with an F value of 1.74. The next prerequisite test is the linearity test, which aims to determine whether there is a linear relationship in each of the analyzed dependent variables. The results of the analysis show that the value of sig. on Deviation from Linearity of 0.57 (>0.05). This means that there is a linear relationship between concept understanding data and speed. The prerequisite test for MANOVA analysis has been fulfilled, where the research data obtained are normally distributed, homogeneous so that hypothesis testing with Manova can be carried out. The results of the complete analysis are described in Table 4 and Table 5.

Table 4 Analysis results of Manova Tests

Multivariate Tests ^a						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	0.991	2363.422 ^b	2.000	45.000	0.000
	Wilks' Lambda	0.009	2363.422 ^b	2.000	45.000	0.000
	Hotelling's Trace	105.041	2363.422 ^b	2.000	45.000	0.000
	Roy's Largest Root	105.041	2363.422 ^b	2.000	45.000	0.000
Treat	Pillai's Trace	0.048	1.127 ^b	2.000	45.000	0.003
	Wilks' Lambda	0.952	1.127 ^b	2.000	45.000	0.003
	Hotelling's Trace	0.050	1.127 ^b	2.000	45.000	0.003
	Roy's Largest Root	0.050	1.127 ^b	2.000	45.000	0.003
a. Design: Intercept + Perlakuan						
b. Exact statistic						

The results of the analysis obtained several findings. First, based on Pillai's Trace, Wilks' Lambda Hotelling's Trace, and Roy's Largest Root with it shows that the F coefficient is 2363,422b with a Sig value. 0.00. This means that there is a difference in conceptual understanding and speed between students who are taught with YouTube-based learning and students who are taught by learning without YouTube. Second, the results of the Tests of Between-Subjects Effects analysis show an F value of 1,696 with Sig. 0.01 which is smaller than 0.05, this shows that there is an effect of youtube-based learning on concept ability. And Third, the results of the Tests of Between-Subjects Effects analysis show an F value of 1837.81b with Sig. 0.02 which is smaller than 0.05. This shows that there is an effect of youtube-based learning on speed.

Table 5 Analysis results Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Understanding_concept	178.255 ^a	1	178.26	1,696	0.01
	Speed	1837,811 ^b	1	1837.81	1.515	0.02
Intercept	Understanding_concept	312018.750	1	312018.75	2968.307	0.00
	Speed	399406,770	1	399406.77	329,262	0.00
Treat	Understanding_concept	178.255	1	178.26	1,696	0.01
	Speed	1837,811	1	1837.81	1.515	0.02
Error	Understanding_concept	4835370	46	105.117		
	Speed	55799,721	46	1213.037		
Total	Understanding_concept	317032.375	48			
	Speed	457044302	48			
Corrected Total	Understanding_concept	5013,625	47			
	Speed	57637.532	47			

The results showed that youtube-based learning had a positive and significant impact both simultaneously and partially on the understanding of the concept and swimming speed of students. This condition is certainly inseparable from the learning that is carried out, learning with YouTube will make students more interested in participating in learning. YouTube will provide a lot of information that students want packaged in the form of interesting videos. This will certainly make students' interest in the learning process higher which of course will have an impact on students' mastery of the material. The existence of YouTube media can help students

understand the material that is being taught repeatedly whenever students are interested in understanding the material [37], [38]. Youtube media can also be used both online and offline [39]. Learning to use youtube channels is an alternative solution in increasing understanding [40], increasing interest during learning [41], [42], increasing knowledge and getting a lot of other information [43]. So, with YouTube, students' understanding of the concepts given will be better.

Concept understanding is a person's ability to master a number of subject matters, which is not just remembering but can explain in different ways. Concept understanding is the underlying mechanism for meaningful learning, meaningful learning here means a person's ability to understand content together with connecting new ideas with previous knowledge and experience [18]. Concept understanding is closely related to one's working memory in the learning process [19]. The description also illustrates that in the process of solving problems, understanding concepts have a very important role, understanding concepts as one of the prerequisites and the ability to relate concepts and mental readiness in the learning process [20], as well as a comprehensive understanding of concepts is an absolute requirement in achieving learning success [21]. With a good understanding of the concept, it will certainly have a good impact on student achievement, especially in this case student achievement in the swimming sport branch.

The existence of YouTube will provide experience to students regarding the techniques or strategies that are carried out to master the techniques in swimming. With the understanding and ability to analyze swimming techniques, students are able to apply them or practice them in swimming lessons. Ofcourse this will be able to increase speed in the sport of swimming. With good knowledge and strategies, students will reach maximum speed. We know that in the sport of swimming, speed is an indicator of the success of a swimmer. Speed is one of the most important components of physical condition in swimming, the speed in swimming is the cyclical maximum speed or the speed with which the movement is repeated, the same form of speed as the speed in sprinting [23]. Speed is a conditional quality that allows a person to make movements and react quickly to stimuli [24], [25]. Speed is influenced by factors that come from within and outside the swimmer. The internal factor that cannot be separated is the knowledge of concepts related to swimming techniques. Good concept knowledge will provide the ability to apply swimming techniques and can foster better self-confidence. With self-confidence, it will be able to stimulate students to achieve good achievements.

The results of this study are in line with the results of research which states that the impact of using YouTube content as a teaching medium has a positive influence on interest in learning [44]. The results of the study stated that there was an influence of YouTube-based learning media on learning outcomes [45]. Research which states that Youtube also has a significant positive role in increasing learning motivation [46]. The results of the study which stated that Youtube media had an effect on students'

motivation and learning outcomes [47]. Based on some of the results of these studies, it can be said that the existence of YouTube media in the learning process has a positive impact. This research has a difference with the existing one, the difference is that Youtube media is used to help learning swimming. The YouTube media used will be adjusted to the swimming techniques that students must learn to make learning easier. In addition, this study also focuses more on discussing the understanding of concepts and speed in learning swimming. The existence of learning with the help of YouTube is expected to be able to contribute to Innovative learning that can be used by teachers/coaches in learning to swim.

4 Conclusion

The results showed that youtube-based learning had a positive and significant impact both simultaneously and partially on the understanding of the concept and swimming speed of students. From the descriptive data, the research results in the form of student speed variables are more influenced by youtube-based learning, this is seen from the large difference in the mean value compared to the concept understanding variable. The existence of learning with the help of YouTube is expected to contribute to innovative learning that can be used by teachers/coaches in swimming lessons.

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References

- [1] F. Baskoro, ... S. M.-... M. B. I., and undefined (2018), "Pemanasan Fisik Menurunkan Kejadian Kram Otot Triceps Surae pada Atlet Renang," *jurnal.unimus.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <https://jurnal.unimus.ac.id/index.php/APKKM/article/view/3337>
- [2] R. Jatra, N. S. Risma, and U. Islam Riau, "Analisis Teknik Renang Gaya Bebas Pada Mahasiswa Mata Kuliah Renang Program Studi Penjaskesrek FKIP UIR," *journal.uir.ac.id*, (2019), doi: 10.25299/sportarea.(2019).vol.4,(1).2319.
- [3] L. J.-M. and Microsystems and undefined (2021), "Research on 3D simulation of swimming technique training based on FPGA and virtual reality technology," *Elsevier*, Accessed: Jul. 27, (2022). [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0141933120308036>
- [4] P. Sanjaya, ... B. S.-M. J. K., and undefined (2019), "MODEL LATIHAN KECEPATAN RENANG GAYA BEBAS," *ejournal.unmus.ac.id*, vol. 6, no. 1, pp. 2019–52, (2019), Accessed: Aug. 05, (2022). [Online].

- Available:
<http://ejournal.unmus.ac.id/index.php/magistra/article/view/1132>
- [5] K. RENANG GAYA KUPU-KUPU MELALUI PENDEKATAN BERMAIN DALAM PEMBELAJARAN AKUATIK Sriningsih and S. Tinggi Keguruan dan Ilmu Pendidikan Pasundan, “Keterampilan Renang Gaya Kupu-Kupu melalui Pendekatan Bermain dalam Pembelajaran Akuatik,” *ejournal.upi.edu*, vol. 2, no. 2, (2017), Accessed: Jul. 27, (2022). [Online]. Available: <https://ejournal.upi.edu/index.php/penjas/article/view/8178>
- [6] S. Sartono, F. A.-J. J. Olahraga, and undefined (2018), “pengaruh metode pembelajaran renang terhadap kondisi fisik pada anak usia 8 tahun,” *jurnal.upmk.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <http://jurnal.upmk.ac.id/index.php/juara/article/view/262>
- [7] V. S.-J. Porkes and undefined (2020), “Peningkatan penguasaan teknik renang gaya dada dengan metode pembelajaran resiprokal,” *core.ac.uk*, Accessed: Jul. 27, (2022). [Online]. Available: <https://core.ac.uk/download/pdf/327208985.pdf>
- [8] K. Teori, P. Pendidikan, D. Pembelajaran, M. Syamsul, A. T. Sugiarto, and U. Wahyudi, “Pengembangan variasi latihan teknik dasar renang gaya bebas dan gaya dada melalui video compact disk pada kegiatan ekstrakurikuler renang di SMP,” *journal2.um.ac.id*, vol. 1, no. 1, (2017), Accessed: Jul. 27, (2022). [Online]. Available: <http://journal2.um.ac.id/index.php/gpji/article/download/929/1848>
- [9] Y. A. andira, ... D. R.-J. E. F., and undefined (2021), “Pengaruh Latihan Menggunakan Hula Hoop Terhadap Kecepatan Renang Gaya Kupu-Kupu Pada Atlet Caruban Aquatic Club Cirebon,” *ejournal.unma.ac.id*, vol. 7, no. 2, pp. 317–321, (2021), doi: 10.31949/education.v7i2.615.
- [10] V. Pradana, A. N.-J. S. Area, and undefined (2018), “Hubungan Motor Educability dan Percaya Diri Dengan Hasil Belajar Renang Gaya Bebas Pada Siswa Putra Kelas X SMA Budi Mulia Jakarta,” *core.ac.uk*, Accessed: Jul. 27, (2022). [Online]. Available: <https://core.ac.uk/download/pdf/233056498.pdf>
- [11] R. Gani, A. Sukur, S. N.-M. J. Pendidikan, and undefined (2019), “Peningkatan kemampuan renang gaya kupu-kupu melalui strategi pembelajaran variatif bagi mahasiswa,” *researchgate.net*, (2019), doi: 10.20527/multilateral.v18i2.7621.
- [12] C. N.-K. J. I. P. Jasmani and undefined (2018), “ANALISIS KELAYAKAN KOLAM RENANG,” *ejournal.unib.ac.id*, vol. 2, no. 1, (2018), Accessed: Jul. 27, (2022). [Online]. Available: <https://ejournal.unib.ac.id/index.php/kinestetik/article/view/9184>
- [13] D. Haking, Y. S.-J. Kajian, and undefined (2019), “Pengembangan Media Video Pembelajaran Renang pada Mata Pelajaran PJOK untuk Siswa Kelas V SD,” *download.garuda.kemdikbud.go.id*, Accessed: Jul. 27, (2022). [Online]. Available: <http://download.garuda.kemdikbud.go.id/article.php?article=1683874&val=11409&title=Pengembangan%20Media%20Video%20Pembelajaran%20Renang%20Pada%20Mata%20Pelajaran%20PJOK%20untuk%20Siswa%20Kelas%20V%20SD>
- [14] E. A.-J. P. Education, H. and Recreation, and undefined (2018), “Motivasi Belajar Siswa Smk N 1 Payakumbuh Dalam Pembelajaran Renang,” *jurnal.unimed.ac.id*, vol. 2, no. 2, (2018), Accessed: Jul. 27, (2022). [Online]. Available: <https://jurnal.unimed.ac.id/2012/index.php/jpehr/article/view/9557>
- [15] S. Sugito, ... M. A.-... K. R. K., and undefined (2020), “Manajemen kepelatihan klub renang Kota Kediri tahun (2019),” *repository.unpkediri.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <http://repository.unpkediri.ac.id/id/eprint/4155>
- [16] W. Nugroho, F. Umar, D. I.-J. Menssana, and undefined (2021), “Peningkatan Kecepatan Renang 100 Meter Gaya Bebas Melalui Latihan Interval Akuatik Pada Atlet Para-Renang,” *menssana.ppj.unp.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <http://menssana.ppj.unp.ac.id/index.php/jm/article/view/172>
- [17] M. F.-K. J. Pendidikan and undefined (2017), “Pembelajaran berbasis masalah untuk meningkatkan pemahaman konsep matematika pada materi segiempat siswa smp,” *kalamatika.matematika-uhamka.com*, vol. 2, no. 1, p. 51, (2017), Accessed: Jul. 27, (2022). [Online]. Available: <http://kalamatika.matematika-uhamka.com/index.php/kmk/article/view/34>
- [18] M. Farrokhnia, H. Pijeira-Díaz, O. N.-C. & Education, and undefined (2019), “Computer-supported collaborative concept mapping: The effects of different instructional designs on conceptual understanding and knowledge co-construction,” *Elsevier*, Accessed: Jul. 27, (2022). [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0360131519301939>
- [19] S. M. Rhodes, J. N. Booth, L. E. Palmer, R. A. Blythe, M. Delibegovic, and N. J. Wheate, “Executive functions predict conceptual learning of science,” *British Journal of Developmental Psychology*, vol. 34, no. 2, pp. 261–275, Jun. (2016), doi: 10.1111/BJDP.12129.
- [20] F. Nomleni, T. M.-S. J. P. Dan, and undefined (2018), “Pengembangan media audio visual dan alat peraga dalam meningkatkan pemahaman konsep dan pemecahan masalah,”

- ejournal.uksw.edu*, Accessed: Jul. 27, (2022). [Online]. Available: <https://ejournal.uksw.edu/scholaria/article/view/1408>
- [21] N. Widyantari, S. A.-J. P. F. dan, and undefined (2020), "Pengaruh Model Brain Based Learning Terhadap Pemahaman Konsep dan Kemampuan Berpikir Kritis Fisika SMA," *jurnalfkip.unram.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <http://jurnalfkip.unram.ac.id/index.php/JPFT/article/view/1387>
- [22] P. S.-T. J. S. S. A. Physical, "PENERAPAN MODEL NHT UNTUK MENINGKATKAN AKTIFITAS DAN HASIL BELAJAR RENANG GAYA BEBAS," *jurnal.untad.ac.id*, Accessed: Aug. 05, (2022). [Online]. Available: <http://jurnal.untad.ac.id/jurnal/index.php/PJKR/article/view/16191>
- [23] M. Gilang Ramadhan *et al.*, "Pengembangan Instrumen Pengukur Kecepatan Renang Gaya Bebas 50 Meter Berbasis Microcontroller Arduino UNO," *ejournal.upi.edu*, vol. **01**, (2016), Accessed: Jul. 27, (2022). [Online]. Available: <https://ejournal.upi.edu/index.php/JTIKOR/article/view/2646>
- [24] L. Plyometrics *et al.*, "Latihan plyometrics dan panjang tungkai terhadap kecepatan renang gaya dada atlet renang sumatera selatan," *journal.unnes.ac.id*, vol. **6**, no. **3**, (2017), Accessed: Jul. 27, (2022). [Online]. Available: <https://journal.unnes.ac.id/sju/index.php/jpes/article/view/15056>
- [25] H. Yeni, F. Surahman, ... R. S.-J., and undefined (2019), "PENGARUH LATIHAN PUSH-UP TERHADAP KECEPATAN RENANG GAYA DADA 50 METER PADA ATLET RENANG PUTRA USIA 15-17," *ejurnal.universitaskarimun.ac.id*, vol. **1**, no. **1**, (2019), Accessed: Jul. 27, (2022). [Online]. Available: <http://ejurnal.universitaskarimun.ac.id/index.php/mindafkip/article/view/14>
- [26] F. Imansyah, A. T.-J. Penjaskesrek, and undefined (2020), "Analisis Kecepatan Renang Gaya Bebas Pada Atlet Sekolah Olahraga Negeri Sriwijaya (SONS)," *ejournal.bbg.ac.id*, vol. **7**, no. **1**, p. 188, (2020), Accessed: Jul. 27, (2022). [Online]. Available: <https://ejournal.bbg.ac.id/penjaskesrek/article/view/1017>
- [27] E. Kostiainen, T. Ukskoski, ... M. R.-L.-T. and T., and undefined (2018), "Meaningful learning in teacher education," *jyx.jyu.fi*, Accessed: Jul. 27, (2022). [Online]. Available: <https://jyx.jyu.fi/bitstream/handle/123456789/59365/1/meaningful%20learning%20in%20teacher%20education.pdf>
- [28] D. Bressington, W. Wong, K. Lam, W. C.-N. education today, and undefined (2018), "Concept mapping to promote meaningful learning, help relate theory to practice and improve learning self-efficacy in Asian mental health nursing students: A mixed," *Elsevier*, Accessed: Jul. 27, (2022). [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0260691717302307>
- [29] P. Riyanto, P. S.-3rd I. C. on, and undefined (2020), "Youth Sports Activities on Emotional Intelligence," *atlantis-press.com*, (2020), Accessed: Aug. 05, (2022). [Online]. Available: <https://www.atlantis-press.com/proceedings/icss-20/125944978>
- [30] P. S.-M. J. of P. E. and and undefined (2021), "Implementasi Model TGT untuk Meningkatkan Aktivitas dan Hasil Belajar Renang Gaya Punggung," *ejournal.unmus.ac.id*, (2021), doi: 10.35724/mjpes.v%vi%i.3546.
- [31] A. Effendi, A. Fatimah, A. A.-T. T. D. Riset, and undefined (2021), "Analisis keefektifan pembelajaran matematika online di masa pandemi covid-19," *jurnal.unigal.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <https://jurnal.unigal.ac.id/index.php/teorema/article/view/5632>
- [32] P. Mahajendra, "A CASE STUDY ON PARENTS' PERCEPTION OF THEIR PRIMARY SCHOOL CHILDREN'S ONLINE LEARNING EXPERIENCE IN COVID-19 PANDEMIC," (2021), Accessed: Aug. 05, (2022). [Online]. Available: <https://repo.undiksha.ac.id/id/eprint/7273>
- [33] M. Sholichin, Z. Zulyusri, L. Lufri, A. R.-Biodik, and undefined (2021), "Analisis Kendala Pembelajaran Online Selama Pandemi Covid-19 Pada Mata Pelajaran IPA di SMPN 1 Bayung Lencir:(Analysis of the Obstacles of Online Learning," *online-journal.unja.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <https://online-journal.unja.ac.id/biodik/article/view/12926>
- [34] G. al Haddar, S. Puspita Ningrum, P. Fkip, and U. Widya Gama Mahakam Samarinda Kalimantan Timur, "Analisis Permasalahan Dalam Pembelajaran Daring Masa Pandemi Covid-19," *journal.y3a.org*, vol. **1**, no. **2**, pp. 147–151, (2022), doi: 10.54259/diajar.v1i2.660.
- [35] F. Surahman, R. Oktaviana, and T. M. Dewi, "Analisis Proses Pembelajaran Daring Pada Masa Pandemi Covid-19 Di SDS 018 Plus Avicena Pada Masa Pandemi Covid-19 Tahun (2020)," *ejurnal.universitaskarimun.ac.id*, vol. **2**, no. **2**, (2021), Accessed: Jul. 27, (2022). [Online]. Available: <http://www.ejurnal.universitaskarimun.ac.id/index.php/mindafkip/article/view/335>
- [36] R. Melina, R. Yanti Hasibuan, P. Tri Armita, N. Hasanah, and A. Nur Alasindo, "Analisis Permasalahan Pembelajaran di Masa Pandemi di SMA Negeri 1 Panai Tengah," *jurnal-id.com*, vol. **2**, no. **1**, pp. 25–28, (2022), doi: 10.54082/jupin.40.
- [37] V. Pembelajaran Berbantuan Youtube untuk Meningkatkan Daya Tarik Siswa Belajar Perubahan Wujud Benda Ni Luh Putu Purhita

- Pebriani, I. Gusti Ngurah Japa, P. Aditya Antara, and J. Pendidikan Dasar, "Video Pembelajaran Berbantuan Youtube untuk Meningkatkan Daya Tarik Siswa Belajar Perubahan Wujud Benda," *ejournal.undiksha.ac.id*, vol. **9**, no. 3, pp. 397–407, (2021), Accessed: Jul. 27, (2022). [Online]. Available: <https://ejournal.undiksha.ac.id/index.php/JJPGSD/article/view/37980>
- [38] E. KUSUMA, ... G. G.-I. J. of, and undefined (2018), "The Development of Problem-Based Quantum Learning Model in Elementary Schoolin," *dergipark.org.tr*, (2018), Accessed: Jul. 27, (2022). [Online]. Available: <https://dergipark.org.tr/en/pub/ijere/issue/36244/412267>
- [39] S. Suratun, I. Irwandani, S. L.-I. J. of, and undefined (2018), "Video pembelajaran berbasis problem solving terintegrasi chanel youtube: pengembangan pada materi cahaya kelas VIII SMP," *ejournal.radenintan.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <http://ejournal.radenintan.ac.id/index.php/IJSM/article/view/3602>
- [40] Y. A.-J. P. M. Raflesia and undefined (2022), "Peran Channel Youtube Sebagai Media Alternatif untuk Membantu Proses Pembelajaran Matematika dan Media Informasi pada Tingkat Perguruan Tinggi," *ejournal.unib.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <https://ejournal.unib.ac.id/index.php/jpmr/article/view/20966>
- [41] N. H.-J. E. F. UNMA and undefined (2021), "Peningkatan Keterampilan Pidato Melalui Metode Demonstrasi Berbantuan Unggah Tugas Video di Youtube," *ejournal.unma.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <https://ejournal.unma.ac.id/index.php/educatio/article/view/1566>
- [42] E. Nuraini, ... E. E.-P., and undefined (2021), "Pengaruh Video Pembelajaran pada Kanal YouTube terhadap Minat Belajar Daring," *jurnal.stkipkusumanegara.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <http://jurnal.stkipkusumanegara.ac.id/index.php/semnara2020/article/view/1252>
- [43] S. M.-T. J. I. K. Ilmiah and undefined (2021), "PENGARUH YOUTUBE TERHADAP MINAT BELAJAR DAN PEMAHAMAN KONSEP BIOLOGI PADA PESERTA DIDIK KELAS X IPA DI SMAN 1 CIAMPEL," *jurnalp4i.com*, Accessed: Jul. 27, (2022). [Online]. Available: <https://jurnalp4i.com/index.php/teacher/article/view/764>
- [44] J. Juitania, I. I.-S. (Susunan Artikel, and undefined (2020), "Dampak Penggunaan Konten Youtube terhadap Minat Belajar Bahasa Inggris Mahasiswa Universitas Pamulang," *journal.lppmunindra.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <https://journal.lppmunindra.ac.id/index.php/SA/article/view/6539>
- [45] A. Wulandari, M. Masturi, F. F.-E. J. I. Pendidikan, and undefined (2021), "Pengaruh media pembelajaran berbasis youtube terhadap hasil belajar IPA siswa di sekolah dasar," *edukatif.org*, Accessed: Jul. 27, (2022). [Online]. Available: <https://www.edukatif.org/index.php/edukatif/article/view/1251>
- [46] J. Komunikasi, H. Pemikiran, D. Penelitian, and H. Mujiyanto, "Pemanfaatan Youtube sebagai media ajar dalam meningkatkan minat dan motivasi belajar," *journal.uniga.ac.id*, vol. **5**, no. 1, pp. 135–159, Accessed: Jul. 27, (2022). [Online]. Available: <http://journal.uniga.ac.id/index.php/JK/article/view/588>
- [47] D. Yuliana, N. A.-J. Pendidikan, and undefined (2020), "Pengaruh Media Video Youtube Terhadap Motivasi Dan Hasil Belajar Siswa Kelas Xi Simulasi Digital Di Smk Negeri 1 Suboh," *journalstkipppgrisitubondo.ac.id*, Accessed: Jul. 27, (2022). [Online]. Available: <http://journalstkipppgrisitubondo.ac.id/index.php/PKWU/article/view/61>
- [48] J. Rogers, ... A. R. of research methods in applied, and undefined (2019), "Experimental and quasi-experimental designs," *taylorfrancis.com*, Accessed: Jul. 28, (2022). [Online]. Available: <https://www.taylorfrancis.com/chapters/edit/10.4324/9780367824471-12/experimental-quasi-experimental-designs-john-rogers-andrea-r%C3%A9v%C3%A9sz>