Symmetry | Pasundan Journal of Research in Mathematics Learning and Education
Volume 8 Nomor 1, Juni 2023
e-ISSN: 2548-2297 • p-ISSN: 2548-2297

ANALYSIS OF STATISTICAL LEARNING OUTCOMES WITH ONLINE AND OFFLINE LEARNING METHODS

Indra Kurniawan[1*], Andri Rahadyan[2]
[1,2] Universitas Indraprasta PGRI
[1]indra.kurniawan@unindra.ac.id, [2]andri.rahadyan@unindra.ac.id

Corresponding Author: Indra Kurniawan

ABSTRAK

Tujuan penelitian ini adalah menganalisis secara mendalam terkait dengan faktor apa yang menjadikan hasil pembelajaran daring lebih baik dibandingkan dengan luring karena sangat penting diketahui apakah ada faktor pendukung lain ataukah faktor dari kemampuan siswa itu sendiri. Metode yang digunakan dalam penelitian ini ada penelitian deskriptif yang menggunakan pendekatan kualitatif dengan subjek penelitian enam orang. Pemilihan subjek pada penelitian ini adalah dengan *purposive sampling*. Pengumpulan data dalam penelitian ini dilakukan dengan cara wawancara berbasis tugas, yaitu: (1) memilih subjek penelitian; (2) menentukan waktu pengambilan data; (3) melaksanakan pengambilan data; (4) menganalisis data adalah dengan menggali informasi terkait dengan pemahaman materi, interaksi belajar, motivasi dan kemandirian belajar dan permasalahan lain yang dihadapi pada saat pembelajaran daring dan luring; (5) membandingkan hasil analisis data daring dan luring; dan (6) menyimpulkan hasil analisis. Hasil analisis yang sudah dilakukan didapat bahwa penerapan metode pembelajaran daring dan metode luring tidak begitu berpengaruh besar terhadap pemahaman materi, semangat dan kemandirian belajar hal yang perlu diperhatikan adalah bukan dari metode pembelajarannya akan tetapi dari bagaimana cara kita dapat menumbuhkan semangat belajar yang baik dan konsisten terutama pada mahasiswa yang memiliki kemampuan sedang dan rendah, semangat belajar sangat penting untuk ditingkatkan pada semua metode pembelajaran karena dengan semangat belajar yang konsisten maka mahasiswa akan senang dan aktif saat mengikuti pembelajaran di kelas baik dengan metode daring ataupun luring.

Received 5 Juni 2023 • **Accepted** 24 Juni 2023 • **Article DOI:** 10.23969/ symmetry. v8i1.8244

ABSTRACT

This study analyses what factors make online learning outcomes better than offline. It is crucial to know whether there are other supporting factors or factors from the students' abilities. The method used in this research is descriptive research using a qualitative approach with six research subjects. The selection of subjects in this study was by purposive sampling. Collecting data in this study using task-based interviews, namely: (1) selecting research subjects; (2) determining the time of data collection; (3) carrying out data collection; (4) analysing the data to dig up information related to material understanding, learning interactions, motivation and independence in learning and other problems encountered during online and offline learning; (5) comparing the results of online and offline data analysis; and (6) concluding the analysis results. The results of the analysis of this study are that the application of online learning methods and offline methods has little effect on material understanding, enthusiasm and independence in learning. The things that need attention are not the learning method but how we can foster a good and consistent spirit for education, especially for students with medium and low abilities, it is vital to increase the excitement for learning in all learning methods because, with a consistent enthusiasm for learning, students will be happy. And active when participating in class learning both with online and offline modes.

Kata Kunci: analisis, metode, pembelajaran, daring, luring

Cara mengutip artikel ini:
Kurniawan, I, & Rahadyan, A. (2023). Analysis of Statistical Learning Outcomes with Online and Offline Learning Methods. *Symmetry: Pasundan Journal of Research in Mathemetics Learning and Education*. 8(1), hlm. 72-80

INTRODUCTION

Online learning that uses digital platforms is applied in the learning process carried out by students directed to help students solve mathematical problems and critical attitudes. It follows the opinion of Yulianto et al. (2020), which states that through online learning, digital platform users and students' necessary attitudes toward learning are growing and

creating student responsibility in carrying out teacher assignments independently. Online learning is a very efficient learning method in terms of time, effort, and expenses because if we apply online learning, we do not need to be tired of going to and from campus. If this online learning, we can understand well, and our learning outcomes will increase. It follows the opinion of Sri et al. (2022), which states that online learning affects efficient time, effort, spending, and gives freedom to study, ask questions, and do assignments, and increases GPA achievement.

The implementation of online learning experiences obstacles related to the learning process in general, namely the problem of interaction between students and educators as well as between students, demands mastery of technology, issues with student guidance, achievement of learning objectives, the learning process tend to be boring, students tend to be passive and problems with student honesty effect on student learning outcomes (Yulianti & Utomo, 2022). It follows the opinion of Effendi et al. (2021), who states that online learning is less effective because it is caused by several things, including a lack of flexibility in providing lecture material, not a few students have difficulty understanding lecture material provided online, quota limitations, the network is not good, the way lecturers deliver lecture material, students are not used to online learning, and the many assignments given by each lecturer. Online learning provides an overview of the need for optimal understanding of the material and the many tasks assigned to students resulting in a less effective lecture process (Widiyono, 2020). When learning is done online, students need more time to study. It is evidenced by students who need to be on time in submitting assignments (Wahyudi & Yulianti, 2021).

However, during offline learning, students are more enthusiastic about doing tasks. It is because if students experience difficulties, students can directly ask the teacher, so they try to complete their assignments. Online learning is student-centred, so students must have responsibility and autonomy. Apart from that, on the educator side, online learning also has challenges. Independent learning between students and teachers means that teachers cannot monitor students' learning processes directly as they did before in offline learning (Ukur et al., 2021).

The offline learning system is an acronym for offline learning system, a teaching and learning activity carried out where teachers and students are in the same room. This learning is generally referred to as face-to-face learning. Meanwhile, an online learning system (online) is an acronym for an online learning system, a teaching and learning activity carried out where teachers and students are not in the same room. Online learning requires teachers and students to use specific technological media such as e-learning applications, video conferencing, social media, and so on (Septiani, 2021).

From the observations, it was found that the average results of learning statistics in the best classes that apply the online method get an average score of 73. In contrast, the intermediate best course that involves the offline approach receives an average score of 68, from the average obtained shows that student learning outcomes with online methods are better than offline methods. It is in line with the research of Pratika & Wahyuni (2022), which states that the results of their study show that student learning outcomes in mathematics when online learning is better than students' learning outcomes in mathematics during learning limited offline. It means that the independence of learning when applying the online method is perfect and maximal, while classes taught using the offline method must be even more enthusiastic. It follows the opinion of Permatasari et al. (2021), which states that student learning independence needs to be developed so that students have mathematical resilience. In addition to learning independence, another factor is students' interest in learning the material because, with good student interest, they will be more enthusiastic

about independent learning or studying together with friends. It follows the opinion of Fadila et al. (2022), which states that the level of student interest is one factor that determines student learning outcomes. Student learning interest is one thing that needs attention.

From the problems above, this study aims to analyse in depth what factors make online learning outcomes better than offline. It is essential to know whether there are other supporting factors or factors from the students' abilities.

METHOD

This research was conducted on informatics engineering students at Universitas Indraprasta PGRI who had completed the statistics lecture. The method used in this research is descriptive research using a qualitative approach with six research subjects in the odd semester 2022-2023 Academic Year. The selection of subjects in this study was by purposive sampling by considering several criteria, namely: (1) the student has studied Statistics material so that he can work on related problems in everyday life; (2) the student has a grade category: high, medium, and low; (3) the student can communicate his thoughts, both in the form of written expressions and oral expressions. The procedure for selecting subjects in this study, namely: (1) selecting a class that has the best average in implementing online learning and offline learning; (2) choosing a subject with a predefined category; and (3) getting six research subjects.

Data collection in this study was carried out through task-based interviews, namely: (1) selecting research subjects based on categories and based on predetermined criteria; (2) determining the time for data collection by discussing with the student concerned by considering his class schedule; (3) carrying out student data collection in the following ways: (a) ask students to work on problem analysis accompanied by communicating what is used when solving problems, (b) ask questions to students related to readiness to accept online and offline learning; (4) analysing the data to dig up information related to material understanding, learning interactions, motivation and independence in learning and other problems encountered during online and offline learning; (5) comparing the results of data analysis on students learning the online method and data on students learning the online method; and (6) summarising the results of the analysis of statistical learning outcomes with online and offline learning methods.

RESULTS AND DISCUSSIONS

The average results of learning statistics in the best class that applied the online method got an average score of 73, while the average of the best lesson that used the offline mode got an average score of 68. After obtaining the class data, six research subjects were selected based on predetermined categories. This study's subjects were students in each class with high, medium, and low-grade types. The value of each research subject in each learning method can be seen in the table below.

Table 1. Student Grade Category Recap

Number	Student Grade Categories	Online	Offline
1	High	85	100
2	Moderate	78	76
3	Low	50	40

After obtaining the research subject, an in-depth analysis was carried out with task-based interviews. The following results of assignment-based interviews in courses with the online method and the offline method are presented in the table below.

Table 1. Results of Task-based Interviews in Online Method Classes

No	Categories	Online Methods			
		Material Understanding	Learning Interaction	Motivation and Self-regulated Learning	Other issues
1	Tall	When learning can understand 90% of the material delivered	Active during learning, often ask and answer questions	The spirit of learning is very good and likes to study independently to solve practice problems	When online learning sometimes has signal obstacles, but for assignments and exam work, the time is better
2	Keep	When learning can understand 60% of the material presented, so you must repeat a lot of material yourself	Interaction during learning is good but needs to be improved	The spirit of learning is good, and the independence of learning needs to be improved	When online learning sometimes has signal obstacles, but for assignments and exam work, the time is better
3	Low	When learning can understand 30% of the material presented, and do not learn the material alone.	Interaction has not been so optimal because when learning takes place there tend to be no comments	The spirit of learning needs to be improved because it rarely participates in learning and learning independence needs to be improved because it rarely does practice questions	When online learning sometimes has signal obstacles, but for assignments and exam work, the time is better

From the data above, it can be observed that when learning with the online method the following data can be obtained: (a) students with high abilities with a test score of 85 can understand the material very well, are active during learning, high enthusiasm and independence of learning, are very happy in online learning because the time for working on assignments and exams is quite long, but sometimes constrained by the internet network is not good; (b) students with moderate ability with a test score of 78 can understand the material well and are willing to learn independently material that has not been understood, activeness when learning needs to be improved, enthusiasm and independence of learning well, happy in online learning because the time for doing assignments and exams is quite long, but sometimes constrained by the internet network is not good; (c) students with low abilities with a test score of 50 are less able to understand the material, activeness during learning must be improved, enthusiasm and independence of learning are not good, happy in online learning because the time to work on assignments and exams is quite long, but sometimes constrained by the internet network is not good.

Table 2. Results of Task-based Interviews in the Offline Method Class

No	Categories	Offline Method			
		Material Understanding	Learning Interaction	Motivation and Self-regulated Learning	Other issues
1	Tall	When learning can understand 92% of the material delivered	Highly interactive During learning	The spirit of learning is very good and likes to study independently to solve practice problems	-
2	Keep	When learning can understand 70% of the material presented, so you have to repeat the material a lot by studying alone and discussing with friends	Interaction during learning is good but must be more active in discussion	The spirit of learning is good, and the independence of learning needs to be improved	The time for the exam is too fast
3	Low	When learning can understand 30% of the material presented, and not learn the material alone	Interaction is not good because when learning takes place tend to chat alone	The spirit of learning needs to be improved because it rarely participates in learning and learning independence needs to be improved because it rarely does practice questions	Multiple assignments and short exam time

From the data above, it can be observed that during learning with the offline method, the following data can be obtained: (a) students with high abilities with a test score of 100 can understand the material very well, are active during learning, have the enthusiasm and independence of learning are high; (b) students with moderate ability with a test score of 76 can understand the material well and are willing to study independently or by a discussion with friends to understand the material that does not understand, activeness during learning needs to be improved, enthusiasm and independence of learning well, exam work time is minimal so many questions have not been answered; (c) students with low abilities with a test score of 40 are less able to understand the material, and there is no willingness to learn the material on their own, activeness when learning must be improved, enthusiasm and independence of learning are not good, exam work time is minimal so many questions have not been answered.

From the learning analysis on the online and offline methods, an in-depth analysis was carried out to look for obstacles experienced in the field when learning. The results of the analysis on the two learning methods can be seen in the table below:

Table 3. Results of Task-based Interviews in Online and Offline Method Classes

No	Category	Material Understanding		Learning Interaction		Motivation &; independence		Other issues	
		Online	Offline	Online	Offline	Online	Offline	Online	Offline
1	Tall	Understand the material very well	Understand the material very well	Very active	Very active	Enthusiastic and independent in learning	Enthusiastic and independent in learning	Sometimes the signal is not good	-
2	Keep	Understand the material well	Understand the material well	Quite active in learning	Quite active in learning	Lack of enthusiasm and independence in learning	Lack of enthusiasm and independence in learning	The exam time is very long	The exam time is only 2 hours
3	Low	Lack of understanding of the material	Lack of understanding of the material	Inactivity instead does other things	Inactivity instead does other things	Not passionate and independent in learning	Not passionate and independent in learning	The exam time is very long	The exam time is only 2 hours

To make it easier to analyse data, it is made in the form of a simple table to show how online and offline learning is different. The data analysis table can be seen in the table below:

Table 4. Analysis of Task-based Interviews in Online and Offline Method Classes

No	Category	Online Methods	Offline Method
1	Tall	Understand the material very well, Understand the material very well, Very active, Enthusiastic and independent in learning, Sometimes the signal is not good.	Understand the material very well, Understand the material very well, Very active, Enthusiastic and independent in learning.
2	Keep	Understand the material well, Quite active in learning, Less enthusiastic and independent in studying, The exam time is very Long.	Understand the material well, Quite active in learning, Less enthusiastic and independent in studying, The exam time is only 2 hours.
3	Low	Lack of understanding of the material, not active even doing other things, not enthusiastic and independent in studying, the exam time is very Long.	Lack of understanding of the material, not active even doing other things, not enthusiastic and independent in learning, The exam time is only 2 hours.

From the data above, it can be observed that during learning with online and offline methods, the following data can be obtained: (1) Students with high abilities: in online and offline learning, students can understand the material very well, be active during learning, and have enthusiasm and independence for education are high. It means that students with high abilities do not experience learning problems. They will remain focused and enthusiastic in learning statistics material. Although sometimes online learning students are constrained by signals, they are still excited about learning to master the material so that later they will get results maximum value. It follows the opinion of Nasriani (2022), which states that online learning is one of the successes in creating social distancing behaviour to minimise the emergence of crowds which are considered to have the potential to spread covid 19 in the school environment further. However, it still needs to be more effective in its implementation due to various obstacles such as economic capabilities, mastery of technology, internet quota, and inadequate networks. (2) Students with moderate abilities: in online and offline learning, students can understand the material well and want to study independently or by discussing with friends to understand the material that does not understand, activeness when learning needs to be improved, enthusiasm and independence of learning well, in online learning the exam time is minimal so many have not been

answered while in offline learning the exam time is limited. For the ability of students with medium categories with the application of Online and Offline learning, there is not much difference in terms of the ability to understand the material, enthusiasm for learning, activeness, and independence of learning are all lacking, it will have an impact on their learning outcomes only getting good grades, this happens because these students do not understand the material well and are not balanced with maximum learning. If he does not master the learning material during the exam, even if given a long and short time, he will not get full results. It follows the opinion of Amaliah et al. (2021) that students should follow learning. Interaction in online learning is sufficient, especially since students tend to find it easier to do group tasks than individuals, even though the tasks given by teachers in online learning tend to be more than during face-to-face learning. (3) Students with low abilities: in Online and Offline learning, students are less able to understand the material, and there is no willingness to learn it themselves. Activeness, when learning must be improved, enthusiasm and learning independence, is not good, exam work time is minimal, so many have yet to be answered. From these data, it can be analysed that students with low abilities, if applied online and offline learning, do not experience differences that need to be considered is how to foster the spirit of learning, learning independence and activeness in class so that these students will be more enthusiastic about participating in learning, hopefully, with them already excited they will be active and willing to learn well, their final results will slowly begin to understand the material learning well so that their grades will experience a good improvement. It follows the opinion of Nengrum et al. (2021) that offline and online learning has advantages and disadvantages regarding methods, media, and the learning process. Furthermore, in that regard, both offline and online learning processes do not guarantee that basic competence in the curriculum can be fully achieved optimally.

The application of online and offline learning methods only significantly affects understanding the material. The spirit and independence of learning things that need to be considered are not from the learning method but from how we can foster a good and consistent spirit of learning, especially in students with medium and low abilities. The essence of knowledge must be improved in all learning methods because, with the spirit of learning consistently, students will be happy and active in the classroom in both the online and offline modes. It follows the opinion of Himmah (2021) that states how to overcome the obstacles of Online and Offline learning, among others: keeping focused, communicating with teachers and classmates, and making schedules so children stay active. The efforts made by the teacher make the class remain conducive, among others: conveying rules firmly and having a humorous nature, communicating well with students and parents, and providing support.

CONCLUSIONS

The analysis found that applying online and offline methods has little effect on material understanding, enthusiasm and learning independence. Things that need attention are not from the learning method but from how we can foster a good and consistent spirit of learning, especially in students with medium and low abilities. The spirit of learning is vital to be improved in all learning methods because, with a consistent learning spirit, students will be happy and active when participating in classroom learning both with the Online and Offline methods. With a strong learning spirit and being active in class discussions, later, the ability to understand the material will automatically increase to impact learning outcomes positively.

ACKNOWLEDGEMENTS

The authors would like to thank the Research and Community Service Institution of Universitas Indraprasta PGRI for permitting this research to be carried out well.

REFERENCES

Amaliah, N. W., Rismawanti, E., & Hamran, H. (2021). Persepsi Peserta Didik Terhadap Efektifitas Pembelajaran Daring Pada Masa Pandemi Covid-19 Di SMAN 13 Watampone. *Jurnal Pendidikan Dan Konseling (JPDK)*, *3*(2). https://doi.org/10.31004/jpdk.v3i2.2036

Effendi, A., Fatimah, A. T., & Amam, A. (2021). Analisis Keefektifan Pembelajaran Matematika Online Di Masa Pandemi Covid-19. *Teorema: Teori Dan Riset Matematika*, *6*(2). https://doi.org/10.25157/teorema.v6i2.5632

Fadila, A., Revilla Malik, L., & Razak, A. (2022). Perbandingan Minat Belajar Siswa Antara Sistem Pembelajaran Luring Dan Daring Di Kelas V Sdi Al Azhar 47 Samarinda. *INSTRUKTUR*, *1*(2). https://doi.org/10.51192/instruktur.v1i2.302

Himmah, A. F. (2021). Implementasi Strategi Metode Ceramah Dalam Pembelajaran Daring Dan Luring Pada Siswa Kelas II Mi Nurul Islam 02 Balung Kulon Di Masa Pandemi. *PESAT: Jurnal Pendidikan, Sosial, Dan Agama*, *6*(6).

Mela Pratika, M. P., & Wahyuni, S. (2022). Analisis Komparasi Hasil Belajar Matematika Siswa SMP saat Pembelajaran Daring dan Luring Terbatas. *Kognitif: Jurnal Riset HOTS Pendidikan Matematika*, *2*(1). https://doi.org/10.51574/kognitif.v2i1.443

Nasriani. (2022). Efektifitas Pembelajaran Daring Pada Masa Pandemi Covid 19 Di Mts Negeri 2 Tolitoli. *Jurnal Inovasi Penelitian*, *2*(8).

Nengrum, T. A., Pettasolong, N., & Nuriman, M. (2021). Kelebihan dan Kekurangan Pembelajaran Luring dan Daring dalam Pencapaian Kompetensi Dasar Kurikulum Bahasa Arab di Madrasah Ibtidaiyah 2 Kabupaten Gorontalo. *JURNAL PENDIDIKAN*, *30*(1). https://doi.org/10.32585/jp.v30i1.1190

Permatasari, D., Maziyah, K. N., & Fadila, R. N. (2021). Pengaruh Kemandirian Belajar Terhadap Mathematical Resilience Mahasiswa Dalam Pembelajaran Daring. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(1). https://doi.org/10.31004/cendekia.v5i1.479

Septiani, I. S. (2021). Perbandingan Hasil Belajar Matematika Dalam Pembelajaran Daring dan luring Pada Siswa Kelas IV MIN 1 Kota Bengkulu. *E-Repositoryiainbengkulu*.

Sri, D., Khairunnisa, F. D., & Anggraini, A. (2022). *Efektifitas Pembelajaran Daring dan Luring: Suatu Studi Komparasi*.

Ukur, J. E., Wijoyo, S. H., & Wicaksono, S. A. (2021). Analisis Pengaruh Peserta Didik, Pendidikan, Dan Lingkungan Terhadap Efektivitas Sistem Pembelajaran Daring Dan Luring Pada Masa Pandemi Covid-19 (Studi Kasus: Peserta Didik SMK Bhakti Anindya Kota Tangerang). *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, *5*(10).

Wahyudi, A., & Yulianti, Y. (2021). Studi Komparasi: Motivasi Belajar Siswa Pada Pembelajaran Daring dan Luring di UPT SDN X Gresik. *Jurnal Basicedu*, *5*(5), 4292–4298. https://doi.org/10.31004/basicedu.v5i5.1555

Widiyono, A. (2020). Efektifitas Perkuliahan Daring (Online) pada Mahasiswa PGSD di Saat Pandemi Covid 19. *Jurnal Pendidikan*, *8*(2). https://doi.org/10.36232/pendidikan.v8i2.458

Yulianti, K., & Utomo, U. (2022). Perbandingan Implementasi Pembelajaran Daring dan Luring di Sekolah Dasar. *Jurnal Basicedu*, *6*(2). https://doi.org/10.31004/basicedu.v6i2.2231

Yulianto, D., La, S., & Mashiro, T. (2020). Pengaruh Pembelajaran Daring Pengguna Platform Digital Terhadap Pemecahan Masalah Matematis Dan Sikap Kritis Siswa Di Ma Daar El Qolam. *Symmetry | Pasundan Journal of Research in Mathematics Learning and Education*, *5*(1).