

The impact of online learning during the Covid-19 pandemic on learning outcomes

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Abstract

This study focuses on the impact of online learning during the Covid-19 pandemic on the learning outcomes of students in class XI Multimedia at SMK Negeri Hulu Gurung, Kapuas Hulu Regency. This study aims to analyze the implementation of online learning, its impact on students, and changes in learning outcomes during the pandemic. The research method used is a qualitative method with data collection techniques through observation, interviews, and documentation. The results showed that online learning caused a significant decline in student learning outcomes, where the average student absorption was below the 85% classical standard. This decline shows that although online learning has been implemented in accordance with the direction of the relevant agencies, constraints such as limited internet access and adaptation to new methods reduce the effectiveness of the learning process. This study suggests the need for regular evaluation and adjustment of learning methods to improve student learning outcomes in the future.

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Introduction

The global outbreak of COVID-19 has led to unprecedented changes across various sectors, with education being one of the most significantly impacted. As governments implemented social distancing measures to curb the spread of the virus, educational institutions worldwide were compelled to transition from traditional face-to-face learning to online learning environments. This abrupt shift presented numerous challenges, particularly in regions with limited technological infrastructure and internet access [1], [2]. The effectiveness of online learning has been widely debated, with concerns about its impact on student engagement, comprehension, and overall academic performance [3], [4].

In the context of Indonesia, where the digital divide remains a significant issue, the challenges of implementing online learning have been pronounced. In rural areas, such as Kapuas Hulu Regency, where internet connectivity is often unreliable or unavailable, schools have faced considerable obstacles in delivering effective online education. SMK Negeri Hulu Gurung, a vocational high school in this region, exemplifies the struggles encountered during the pandemic. The shift



to online learning in this school raised critical questions about the quality of education being provided and the impact on students' learning outcomes [5].

This study focuses on the effects of online learning during the COVID-19 pandemic on the academic performance of students in the XI Multimedia class at SMK Negeri Hulu Gurung. The research aims to explore the implementation of online learning, its effectiveness, and its consequences on student achievement. By examining these aspects, this study seeks to provide insights into the challenges and opportunities associated with online education in under-resourced settings, and to contribute to the broader discourse on the sustainability of online learning in the face of future disruptions.

Literature Review

The rapid shift to online learning during the COVID-19 pandemic has prompted a significant body of research exploring its implications across various educational settings. The effectiveness of online learning, particularly in comparison to traditional face-to-face instruction, has been a central theme in the literature. Scholars have identified both potential benefits and challenges associated with online learning environments.

A. Online Learning: Theoretical Perspectives

Online learning is rooted in constructivist theories, which emphasize the active role of learners in constructing knowledge through interaction with content, peers, and instructors [6]. The flexibility of online learning allows for personalized learning experiences, where students can progress at their own pace and access a wealth of digital resources. However, the success of online learning heavily relies on students' self-regulation skills, motivation, and the quality of the instructional design [7].

B. Challenges of Online Learning in Developing Regions

In developing regions, the digital divide poses a significant challenge to the effective implementation of online learning. Limited access to reliable internet connections, digital devices, and technical support has been documented as major barriers [8]. Research indicates that these challenges are particularly pronounced in rural areas, where infrastructure is often lacking [9]. In such contexts, online learning can exacerbate existing educational inequalities, as students from disadvantaged backgrounds may struggle to access or engage with digital platforms [10], [11].

C. Impact of Online Learning on Student Performance

The impact of online learning on student performance has been mixed. While some studies suggest that online learning can be as effective as traditional classroom instruction when implemented properly [12], other research highlights the potential for decreased academic performance, particularly among students who are less prepared for self-directed learning [13]. During the pandemic, studies have shown a general decline in student performance, which has been attributed to factors such as reduced interaction with instructors, difficulties in adapting to online formats, and the lack of social learning opportunities [14].



D. Online Learning in Vocational Education

Vocational education presents unique challenges for online learning, given the emphasis on practical, hands-on training. Studies have noted that while theoretical components can be delivered online, the absence of in-person practical sessions can hinder skill acquisition and competency development [15]. In the context of vocational education in Indonesia, where the focus is on preparing students for specific trades and professions, the limitations of online learning are particularly concerning. Research in similar settings has shown that students often experience a significant reduction in practical skill development, leading to lower overall competency levels [16].

E. Case Studies on Online Learning in Indonesia

Several studies have examined the implementation of online learning in Indonesia during the COVID-19 pandemic. A common theme is the struggle to maintain educational quality in the face of technological and infrastructural challenges. For example, research by [17] highlights the significant obstacles faced by students and teachers, including limited access to technology and a lack of digital literacy. Similarly, studies by [18] have documented the psychological and academic toll on students, noting increased levels of stress and a decline in academic performance.

While existing literature provides valuable insights into the challenges and outcomes of online learning, there is a need for more focused studies on the specific impact of online learning in rural vocational schools in Indonesia. This study aims to fill this gap by examining the effects of online learning on student performance at SMK Negeri Hulu Gurung, a rural vocational high school. By doing so, the research will contribute to a deeper understanding of how online learning can be optimized in under-resourced settings and provide recommendations for improving educational outcomes in similar contexts.

Research Methods

A. Research Design

This study employed a qualitative research design to explore the impact of online learning on student performance in a rural vocational school during the COVID-19 pandemic. Qualitative methods were chosen due to their effectiveness in capturing the nuanced experiences, perceptions, and challenges faced by both students and educators in a context where digital learning infrastructure is limited. The study sought to provide in-depth insights into the implementation of online learning and its effects on academic outcomes, particularly in the context of a vocational high school in a rural area [19]. Qualitative Research Design is presented in figure 1



Figure 1. Qualitative Research Design

B. Research Setting and Participants

The research was conducted at SMK Negeri Hulu Gurung, a vocational high school located in Kapuas Hulu Regency, Indonesia. The school was selected due to its rural setting, which presents unique challenges for online learning, including limited internet access and technological resources. Participants included 15 teachers and 40 students from the XI Multimedia class, chosen through purposive sampling to ensure a representative sample of individuals directly involved in online learning during the pandemic. The selection criteria for students included those who actively participated in online learning during the pandemic and those who had varying levels of access to technological resources.

C. Data Collection Methods

Data were collected using a combination of interviews, observations, and document analysis.

1. Interviews: Semi-structured interviews were conducted with teachers and students to gather detailed insights into their experiences with online learning. The interviews focused on the challenges encountered, the strategies employed to overcome these challenges, and perceptions of the impact of online learning on student performance. Each interview lasted between 30 to 60 minutes and was conducted in person or via online platforms, depending on the participants' availability and preference.
2. Observations: Non-participant observations were carried out during online classes to assess the level of student engagement, the effectiveness of teaching strategies, and the overall learning environment. These observations were documented using field notes and focused on both synchronous (real-time) and asynchronous (self-paced) learning activities.
3. Document Analysis: The study also included the analysis of academic records, including students' grades before and during the online learning period. This allowed for a comparison of academic performance and provided quantitative data to complement the qualitative findings. Additionally, school policies, guidelines for online learning, and relevant correspondence from the education authorities were reviewed to understand the institutional framework within which online learning was implemented.

D. Data Analysis

The data were analysed using a thematic analysis approach, which involved several stages:

1. Data Familiarization: The first step involved reading and re-reading the collected data to become familiar with the content. This process included transcribing interviews and organizing observation notes and documents for detailed analysis.
2. Initial Coding: The data were then coded by identifying key themes and patterns related to the research questions. Codes were assigned to segments of data that represented similar concepts or ideas, which were then grouped into broader themes.



3. Theme Development: After coding, the themes were reviewed and refined to ensure they accurately reflected the data. This involved collapsing similar codes into broader categories and identifying sub-themes where appropriate.
4. Data Interpretation: The final stage of analysis involved interpreting the themes in relation to the research questions and the broader literature. This process included linking the findings to existing theoretical frameworks and drawing conclusions about the impact of online learning on student performance in the specific context of the study.

Research Results

The results of the data analysis obtained about how the implementation of online learning is implemented, how the impact of online learning on the learning outcomes of students in class XI Multimedia of SMK Negeri Hulu Gurung, and how the learning outcomes of students in class XI Multimedia of SMK Negeri Hulu Gurung during online learning are as follows:

A. Implementation of Online Learning at SMK Negeri Hulu Gurung

The transition to online learning at SMK Negeri Hulu Gurung was necessitated by the COVID-19 pandemic, which required adherence to government directives to continue educational activities while maintaining public health protocols. The school's approach to online learning was guided by the standard operating procedures set by the Kapuas Hulu Regency's Department of Education, Youth, and Sports (DISDIKBUDPORA). Despite the challenges, such as limited internet connectivity and technological resources, the school managed to deliver educational content through WhatsApp groups, a strategy chosen due to the widespread availability of mobile phones among students.

The qualitative data collected through observations, interviews, and document analysis revealed that while the school adhered to the prescribed online learning protocols, significant variations in implementation existed due to the diverse conditions of students' home environments. The school's administration and teaching staff demonstrated adaptability by utilizing available resources to ensure that learning could continue, even though the delivery method was constrained by technological limitations. However, this mode of delivery raised concerns about the adequacy of learning materials and the effectiveness of communication between teachers and students.

B. Impact of Online Learning on Student Performance

The shift from face-to-face instruction to online learning introduced substantial changes in both teaching methods and student learning behaviors. Teachers had to quickly adapt to new technologies and develop digital competencies, while students were required to become more autonomous in managing their learning. The study identified several negative impacts associated with the online learning model implemented during the pandemic.

Firstly, students exhibited lower levels of engagement and motivation, viewing online learning as a less serious alternative to traditional classroom instruction. This attitude was exacerbated by the perception that online learning was akin to a holiday, leading to reduced participation and focus.



Additionally, the lack of direct supervision and the challenges posed by inadequate internet access further hindered students' ability to fully engage with the learning materials.

Secondly, the study found that the absence of face-to-face interaction with teachers and peers diminished students' ability to fully grasp and understand the subject matter. The online environment often limited students to merely completing assignments without a deep comprehension of the content. This superficial engagement with learning tasks was identified as a key factor contributing to the decline in academic performance.

C. Student Learning Outcomes During Online Learning

An analysis of the students' academic performance before and during the online learning period revealed a noticeable decline in their learning outcomes. Prior to the shift to online learning, students in the XI Multimedia class consistently achieved scores that met or exceeded the school's established academic standards. However, during the period of online instruction, a significant portion of the students' grades fell below the expected benchmarks.

The study utilized simple statistical methods to calculate the average formative scores before and after the implementation of online learning. The results indicated that the students' mastery of the material, measured by their ability to achieve an 85% pass rate, was significantly compromised during the online learning period. This decline in performance was corroborated by qualitative data, which highlighted several contributing factors, including reduced student motivation, limited access to learning devices, poor internet connectivity, and the students' perception of online learning as a less formal or serious educational experience.

D. Discussion

The decline in student performance can be attributed to a combination of factors, including technological constraints, reduced student engagement, and the inherent limitations of the online learning environment in supporting practical instruction and essential components of vocational education.

These results align with existing literature on the digital divide and its impact on educational outcomes, particularly in under-resourced regions. Previous studies have highlighted similar challenges in other rural settings, where inadequate infrastructure and limited access to technology exacerbate educational inequalities [20]. The findings also support the notion that online learning, while a necessary adaptation during the pandemic, may not be an entirely suitable substitute for traditional, in-person instruction, especially in contexts where direct, practical engagement is crucial.

This study contributes to the broader discourse on the effectiveness of online learning by providing empirical evidence from a rural vocational school in Indonesia. It highlights the need for more tailored approaches to online education in such settings, where technological limitations and socio-economic factors significantly impact students' ability to learn effectively. Future research should explore alternative models of online instruction that better accommodate the unique needs of students in rural and vocational



educational settings, ensuring that educational quality is maintained even in times of crisis.

Conclusion

This study has demonstrated that the implementation of online learning during the COVID-19 pandemic at SMK Negeri Hulu Gurung faced significant challenges, particularly due to the limited infrastructure and resources available in a rural setting. Despite the school's adherence to government directives and the efforts of educators to deliver content via accessible platforms like WhatsApp, the transition to online learning resulted in a marked decline in student engagement and academic performance. The findings indicate that the online learning model, while necessary under the circumstances, was insufficient in maintaining the same level of educational quality as face-to-face instruction. Students in the XI Multimedia class experienced a noticeable drop in their learning outcomes, largely attributable to reduced motivation, limited access to digital tools, and inadequate internet connectivity. The shift also exposed broader issues related to the digital divide, which exacerbated existing educational inequalities. In conclusion, while online learning provided a critical stopgap during the pandemic, more robust and inclusive strategies are needed to ensure that educational outcomes are not compromised in similar situations in the future. Policymakers and educators must consider the unique challenges faced by students in rural and under-resourced areas when designing and implementing online learning frameworks. Future initiatives should focus on enhancing digital infrastructure, providing better access to learning tools, and developing more effective online pedagogies that can accommodate the diverse needs of all learners, particularly in vocational education contexts where practical skills are paramount.

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Author Contributions

Ridho Dedy Arief Budiman: conceptualization; formal analysis; data curation; methodology; writing- review and editing. Husna Juma Mlwale: data curation; methodology; writing- review and editing. Syafruddin: formal analysis; data curation; methodology. Muh Hamka: formal analysis; writing- review and editing. Sigit Purnomo: formal analysis; writing- review and editing.

Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

Additional information

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