

ANALYSIS OF SENTIMENTS IN ONLINE DISCUSSION FORUMS AS A TOOL TO IMPROVE SCHOOLER COMPATIBILITY IN DISTANCE LEARNING

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Abstract

This research aims to analyze the use of sentimental analysis in online discussion forums in the context of distance learning. This research method is literary research, in which we review publications and previous research in this field. The results of the study show that sentimental analysis can be used effectively in analyzing student responses to distance learning through online discussion forums. In some studies, it has been found that sentiment analysis can help in measuring student involvement, identifying student needs, and evaluating the effectiveness of teaching. The use of sentiment analysis has successfully improved the quality of student interaction and provided educators with a better understanding of student needs. Moreover, sentimental analysis can also help in assessing the efficiency of the teaching methods used, so that educators can take necessary corrective action.

Keywords: Emotional analysis, Online discussion, Student involvement, Distance learning.

Introduction

School education is one of the most important aspects of Indonesian education system. Within the scope of education in Indonesia, there are various kinds of educational institutions such as public schools, private schools, and exceptional schools that are responsible forining structured education.

School education is also part of the responsibility of the Ministry of Education and Culture of the Republic of Indonesia (Kemdikbud). The Ministry has an important role in overseeing and developing the education system in schools in Indonesia (Sitopu et al., 2024; Afni et al, 2024). (Guna et al., 2024). Despite this, there are still challenges such as the number of children and adolescents who do not attend school, especially those from poor families, persons with disabilities, and remote environments. (Hairiyanto et al., 2024).

Education is not independent of the teaching learning process that teachers teach their pupils at school. Learning is the process of acquiring new knowledge, skills, or understanding through interaction with information or experience (Fitriani et al., 2024). It

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involves the cognitive process of an individual to assimilate and process information received so as to produce changes in thought, attitude, or behavior. Learning can happen in a variety of contexts such as in school, in a social environment, or in personal experiences. (Antika et al., 2024).

Learning is a broader process and involves interaction between individuals, teachers, and learning environments. Learning involves designing, setting up, and organizing learning environments that facilitate learning. It involves using methodologies, strategies, and use of resources designed to support and enhance student learning processes. (Tubagus et al., 2023; Aslan & Shiong, 2023). Distance learning is a formal education based on communication and information technology that requires an interactive telecommunications system to connect students and their instructors (Li et al., 2023). (DeMatthews et al., 2023). Distance learning can be done using online platforms and remote-accessible learning applications. This means that distance learning allows students to learn from a distance without having to be in a classroom environment. Students need to participate actively in acquiring knowledge and skills without direct interaction with teachers or classmates. (Tashtoush et al., 2023).

In distance learning, parents or guardians also play an important role in assisting students in distance learning. They are asked to take on challenging tasks while also dealing with other tasks and demands at home (Lister et al., 2023). However, the challenges that arise in distance learning can affect student involvement and lower the quality of learning. One of the problems faced frequently in distance learning is the lack of interaction between students and teachers, student well-being, as well as interaction among students and teacher, especially in rural areas with poor internet connections. It can make students less motivated and less focused on learning (Martin, F., & Oyarzun, B. 2023).

Therefore, an innovation is needed to increase student involvement in distance learning. On the other hand, distance learning can also be a solution in the context of future education. For example, in situations where a student has to move to another country, distance learning can enable them to continue their education. One of the innovations that can be used is sentiment analysis in online discussion forums (Wen, M., Yang, D., & Rose, C. 2014; Li, N., & Wu, D. D. 2010). Through sentiment analysis, we can understand the feelings and attitudes of students in the discussion forum, so that teachers can provide appropriate responses to enhance student participation (Wang, K., & Zhang, Y. 2020). In distance learning, the interaction between students and teachers is so limited that it is highly likely that misinterpretation or ignorance of students' feelings and attitudes will occur. Therefore, by using sentimental analysis in online discussion forums, it is expected that teachers will be able to provide more appropriate responses and increase student involvement in learning. With a rapidly evolving discipline of sentimental analysis, it can be applied to develop effective distance learning models capable of enhancing student involvement.

Research Method

The research carried out in this study is using literary studies. Literary research method is one of the research methods used in scientific research in various fields (Ratislavová & Ratislav, 2014; Richardson, 2018). This method includes the collection, documentation, analysis, and interpretation of data from various literary sources. There are several techniques that can be used in literary research methods, including keyword search, content analysis, and synthesis (Antin et al., 2015; Marshall et al. 2013). Content analysis is performed by identifying themes and patterns in literary data, while synthesis is done by integrating data found from different sources and developing a new argument or concept. (Punch, 2013; Adhabi & Anozie, 2017).

In conducting literary research methods, the credibility and relevance of the literary sources used becomes of paramount importance. (Champe & Kleist, 2003; Zed, 2004). Therefore, researchers choose reliable and relevant sources and consider the weaknesses and advantages of each source.

Result and Discussion

Student Engagement in Learning

School education is an integral part of the education system in Indonesia. Education in Indonesia covers all education organized in the country, both structured and unstructured (Muharrom et al., 2023). (Nurhayati et al., 2023).

Moreover, the education system in Indonesia has undergone significant development since colonial times to the present day. The Government of Indonesia has regulated the scope, objectives, general provisions, policies, and changes in the education system through applicable laws, such as Act No. 20 of 2003 on the National Education System. (Nurdiana et al., 2023; Erwan et al., 2023).

School is not out of the learning system. School and learning are closely linked as part of the education system. Schools are formal institutions dedicated to providing an environment and facilities for the learning and teaching process. In schools, students learn from teachers or educators who have knowledge and skills relevant to the subject being taught (Sarmila et al., 2023). Learning is a process in which students acquire knowledge, skills, values, and attitudes through interaction with teachers, classmates, and learning environments. Learning usually involves direct teaching by the teacher, student-to-student discussions, tasks, exams, and also practical activities. (Sulastri et al., 2023).

School is the primary place where learning takes place. In the classroom, students learn from teachers and perform assigned tasks through direct interaction. In addition, the school also provides facilities such as libraries, laboratories, and halls to facilitate learning. (Aslan, 2023).

In addition to in-class learning, learning can also take place outside the classroom through extracurricular activities, field visits, or enrichment programs. Learning can also be done through remote learning methods using communication and information technology. In the context of formal education, schools provide a framework and

structure for learning, while educators have an important role in guiding and implementing effective learning. Effective learning combines proper teaching strategies, use of relevant resources, and thorough evaluation (Tuhuteru et al., 2023; Aslan & Pong, 2023).

Overall, school and learning support each other and are an integral part of the educational process aimed at developing the knowledge, skills, and attitudes of students to become educated individuals and ready to face challenges in life.

In order to support the learning process at school, there is a need for student involvement in learning. When students are actively involved in learning, they have a greater opportunity to understand and apply the knowledge they have acquired. (Astuti et al., 2023).

Here are some ways students' involvement in learning can be enhanced; 1) Active learning: Teachers can use learning methods that actively involve students, for example with group discussions, collaborative projects, or simulations. These methods allow students to participate actively in solving problems, exchanging information, and collaborating with classmates. 2) Associate learning with the student's life experience: Teachers can associate learning materials with student life experiences, for example by using real examples or cases relevant to their lives. It helps students see the relevance of learning materials to their daily lives, which can increase their interests and motivation. 3) Project-based learning: Teacher can design project-based learning activities in which students must work actively to complete tasks related to the learning material. It allows students to apply the knowledge they learn into real-world contexts and develop collaborative, problem-solving, and analytical skills. 4) Give the opportunity to speak: Teachers can give the students the chance to speak and participate in class discussion. This can help students develop critical thinking skills, argue, and articulate their understanding of the learning material. 5) Provide feedback: Teachers can provide meaningful and constructive feedback to students about their progress in learning. It helps students to understand their strengths and weaknesses, as well as give them clear directions to improve their understanding. 5) Promote student independence: Teacher can design learning that encourages students to take initiative, apply their own knowledge, and explore topics of interest. This can be done through self-employment, research, or individual projects (Mukaromah et al., 2018; Marpaung, J. N., & Cendana, W. 2020; Christanty, Z. J., & Cendana, W. 2021).

By increasing student involvement in learning, they will be more active, emotionally engaged, and have a higher motivation to learn. This can have a positive impact on student understanding, retention, and application of knowledge in real life.

Analysis of sentiment and its application in the context of distance learning

Distance learning, or distance learning, is a form of education that uses technology to connect educators and students who are physically distant. It is a formal educational method that relies on interactive telecommunications systems to facilitate instruction and communication between teachers and students. (Bieliaieva et al., 2023).

In the Indonesian context, distance learning has become increasingly important, especially during the COVID-19 pandemic when face-to-face learning faces challenges. The Ministry of Education and Culture has provided guidelines for distance learning to ensure the survival of current education.

Various technologies, such as the Internet, radio, television, and satellite, facilitate distance learning by providing a platform for instructional materials and communication. Internet usage has grown significantly worldwide, producing a variety of digital content and resources that can be utilized in distance learning. (Vidergor, H. E. 2023).

While distance learning offers opportunities for sustainable education, it also faces challenges. For example, a lack of social interaction and restricted access to resources and support in remote areas with poor internet connectivity can affect student well-being and learning experiences. However, it is worth noting that distance learning has the potential to continue after the pandemic. It can be a solution for individuals who face challenges in accessing traditional education, such as students who move to another country and face difficulties in enrolling in local schools. (Firdaus et al., 2023; Gurcan, F., & Cagiltay, N. E. 2023). So that requires a program for distance learning known as sentiment analysis and its application to distance learning. Sentiment analysis is the process of using computational and artificial intelligence techniques to identify, understand, and evaluate the sentiment or opinion contained in the text. In the context of distance learning, sentiment analysis can provide valuable insights into how students and teachers respond to the distance learning experience. (Natasuwarna, A. P. 2020).

Applications of sentiment analysis in the context of distance learning can cover several aspects: 1) Student response evaluation: By analyzing the sentiment in student response to learning material or distance learning experience, educational institutions can gain a better understanding of the extent to which students feel engaged, satisfied, or troubled with the learning format used. This allows them to make the necessary improvements to improve the student's learning experience. 2) Student welfare monitoring: In distance learning, problems such as social isolation, stress, and anxiety can affect student mental and emotional well-being. By applying sentimental analysis to content generated by students through digital learning platforms, educational institutions can identify signs of negative sentiment or anxieties early and provide appropriate support. 3) Teacher influence assessment: Sentiment analysis can also be used to evaluate the reputation and effectiveness of teachers in the context of distance learning. By monitoring student responses to teachers and the teaching methods used, educational institutions can gain insights to improve and improve the quality of teaching (Grandis et al., 2021; As-Salafiyah, A., & Rusydiana, A. S. 2022).

However, it is important to remember that sentimental analysis is not a perfect method and may need to be combined with other approaches, such as student surveys, live interactions, or group discussions, to gain a more complete understanding of student experiences in distance learning.

In practice, sentiment analysis can be applied using natural language processing and machine learning algorithms to classify text into positive, negative, or neutral sentiment categories. Many platforms and analytical tools are available to apply sentimental analysis in a variety of contexts, including distance learning (Nababan, D. 2021).

Implementation of Sentiment Analysis in Online Discussion Forums

Implementation steps

Here are the steps to implement sentiment analysis in the context of distance learning: 1) Definition Objective: The first step is to define the purpose of the sentiment analysis to be performed. Determine whether you want to evaluate student response to distance learning, monitor student well-being, or evaluate teacher influence, and define the parameters that will be the focus of the analysis. 2) Data collection: Relevant data is required to conduct sentimental analysis. Data can be student responses to learning materials, discussions on online learning platforms, or reviews of distance learning experiences. Make sure the data collected is representative and gives an accurate picture. 3) Data processing: This step involves cleaning and processing the data to prepare it for sentiment analysis. The data processing includes tokenization (dividing text into individual words), removal of stopwords, and cleaning of irrelevant data. 4) Sentiment analysis: Use natural language processing (NLP) methods and machine learning algorithms to perform sentiment analysis on data that has been processed. For example, classify text as positive, negative, or neutral sentiment, or use a particular sentiment scale to measure the level of sentiment. 5) Result Assessment: Assess the results of sentimental analysis to gain valuable insights. Identify unique patterns of sentiment, trend, or pattern in data that can help in decision-making related to distance learning strategies. 6) Implementation of Corrective Action: Based on the results of sentimental analysis, make an appropriate plan of corrective action to improve student learning experience or their well-being. Implements the necessary improvements in teaching methods, student interaction, or student welfare support. 7) Advanced Monitoring and Evaluation: Perform periodic monitoring of data and sentiment related to distance learning. Continuous evaluation and making corrections or adjustments when necessary to ensure the effectiveness of the implementation of sentiment analysis (Wang, K., & Zhang, Y. (2020; Davcheva et al., 2019; Kechaou et al., 2011).

By following these steps, the implementation of sentimental analysis in the context of distance learning can provide significant benefits in improving the quality of education and student learning experience.

Tools used

There are various tools and platforms that can be used for the implementation of sentimental analysis in the context of distance learning. Some commonly used tools include: 1) MonkeyLearn: A sentiment analysis platform that provides an easy-to-use and

customizable user interface. 2) Google Cloud Natural Language API: an API from Google Cloud Platform that provides sentiment analysis functionality. You can integrate this API into your system to perform sentiment analysis on student text. 3) IBM Watson Natural Language Understanding: A service provided by IBM watson that can be used to analyze sentiments in texts, obtain entities and categories, and perform syntax analysis. 4) RapidMiner: A platform for visual data processing and predictive analysis that can be used to implement sentiment analysis. 5) Python Libraries: There are several Python libraries that can be used to perform sentimental analysis, such as NLTK (Natural Language Toolkit), TextBlob, sklearn, and many others. (Wen et al., 2014; Li, N., & Wu, D. D. 2010).

The choice of tools to be used depends on the needs, the level of technical expertise available, and the existing framework in the remote learning system used. It is important to evaluate the features, functionality, and suitability of the tool to your needs before choosing and implementing it.

Implementation Stage

Here are the stages of implementation that can be followed for the implementation of sentimental analysis in the context of distance learning: 1) Planning: Determine the objectives, scope, and parameters to be analyzed. Identify the relevant data source to be used for sentiment analysis. 2) Tool Selection: Choose a tool or platform that fits your technical needs and capabilities. Evaluate the features and functionality provided by the tool. 3) Data collection: Collect the data necessary for sentimental analysis. Data can be student responses, reviews, or comments related to distance learning. Make sure the data collected is representative and gives an accurate picture. 4) Data processing: Clean and prepare data for sentiment analysis. Do pre-processing such as removing stopwords, tokenizing, or stemming to prepare text ready for analysis. 5) Sentiment analysis: Apply natural language processing (NLP) methods and machine learning algorithms to perform sentiment analysis on data that has been processed. Identify positive, negative, or neutral sentiment in the text, or use a specific sentiment scale to measure the level of sentiment. 6) Evaluation and Interpretation of Results: An evaluation of the results of the sentimental analysis performed. Identify unique patterns, trends, and pattern in data that can provide valuable insights. Interpret the results of sentimental analysis to gain a better understanding of students' response to distance learning. 7) Corrective Action: Based on the results of sentimental analysis, make an appropriate plan of corrective action to improve student learning experience or their well-being. Implement the necessary improvements in teaching methods, student interaction, or student welfare support. 8) Advanced Monitoring: Perform periodic monitoring of data and sentiment related to distance learning. Evaluate results and make adjustments when necessary to ensure the effectiveness of the implementation of sentiment analysis (Kechaou et al., 2011; Thoms et al., 2017; Georgescu, M. R., & Bogoslov, I. A. 2019).

Each of the above implementation stages may require different time and effort depending on the complexity of the problem and the choice of tools used. It is important to involve relevant stakeholders, such as teachers, students, or administrators, in the

sentiment analysis process to ensure comprehensive understanding and proper implementation.

Conclusion

Through sentimental analysis on online discussion forums in the context of distance learning, some conclusions can be drawn are: 1) Measuring Student Responses: Sentimental analysis can help measure student response to distance learning. By analyzing feelings, opinions, and attitudes expressed in student text, we can better understand how students respond and participate in online discussions forums. 2) Identification of Student Needs: Through sentimental analysis, the needs and challenges faced by students in distance learning can be identified. This analysis can help educators or administrators in identifying areas that need to be enhanced or further supported to enhance student involvement. 3) Measuring Teaching Effectiveness: By analyzing student sentiment towards online discussion forums, we can measure the effectiveness of teaching methods in distance learning. It can be seen whether students feel involved, helped, or frustrated with communication and interaction through discussion forums. This information can help educators in adapting teaching approaches and improving student learning experience. 4) Corrective Action and Monitoring: Results of sentiment analysis can provide valuable insights in designing appropriate corrective action. If analysis shows negative sentiment or unmet needs, educators or administrators can design strategies to improve the quality of discussions or provide additional support to students. Furthermore, periodic monitoring can help track changes in sentiment over time to ensure the successful implementation of distance learning. By understanding student responses, identifying their needs, and measuring the effectiveness of teaching, educators can take appropriate action to improve student learning experience and learning goals.

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