



ANALYSIS OF TEACHER NEEDS FOR THE DEVELOPMENT OF CHEMISTRY TEACHING MATERIALS INTEGRATED WITH THE PROCESS ORIENTED GUIDED INQUIRY LEARNING MODEL

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ABSTRACT

This needs analysis is meticulously executed in alignment with the initial phase of the ADDIE instructional design model, which is commonly referred to as the Analysis stage. To accomplish the aims of this study, the research employs a survey methodology, which facilitates the systematic gathering of data from the participants. The subjects selected for this investigation consisted of a total of four chemistry instructors who are currently engaged in teaching at Satrya Budi Senior High School, providing a focused context for the study. The process of data collection was systematically conducted utilizing a questionnaire designed to elicit qualitative data, which is crucial for understanding the nuanced requirements of the teachers. Upon completion of the data collection phase, the research findings underwent a thorough descriptive analysis, which revealed that there exists a significant demand for integrated chemistry teaching materials tailored specifically for the Process Oriented Guided Inquiry Learning model. Remarkably, this need was highlighted with a striking percentage of 100%, indicating unanimous agreement among the educators regarding the necessity of such resources. It is anticipated that the development and implementation of these targeted teaching materials will play a vital role in enhancing the motivation of students towards their learning endeavors in chemistry. Ultimately, this research seeks to contribute valuable insights to the field of chemistry education, paving the way for improved instructional strategies that align with contemporary pedagogical frameworks.

Keywords: Needs Analysis, Teaching Materials, Process Oriented Guided Inquiry Learning, Chemistry

A. INTRODUCTION

The comprehension of chemistry as a discipline that is inherently abstract often leads a considerable number of students to harbor the belief that the subject is exceedingly challenging, primarily due to the imaginative capacities required to fully grasp its intricate concepts and theoretical frameworks, as articulated (Jannah, 2019). The very concept of chemistry, which is frequently categorized as being inherently complex, necessitates not only a solid understanding of foundational knowledge but also the ability to apply this knowledge in practical, everyday scenarios, a reality that can present significant challenges during the educational teaching and learning process, as noted (Nurfajriani, 2022). One of the pivotal themes within the realm of chemistry is the topic of Atomic Structure and Nanoparticles, a subject area that is frequently perceived by students as exceptionally difficult and, consequently, represents a segment of the chemistry curriculum that contains numerous problems that students find particularly arduous to resolve. Given the inherent challenges students face when attempting to navigate and solve these complicated problems within the field of chemistry, it is not uncommon for a range of misconceptions to arise among them, which can significantly affect their overall understanding of the subject.

These varying misconceptions that manifest among the student population are of paramount importance to address, as they can serve as substantial barriers to students'

abilities to effectively acquire new information by facilitating connections to the pre-existing knowledge they have previously assimilated, thereby obstructing the formation of new cognitive frameworks, as articulated (Fahreza et al., 2023). B Indeed, it has been observed that a significant number of participants express a lack of interest in the study of chemistry, a phenomenon that can often be attributed to their inability to achieve a satisfactory level of understanding after engaging with the subject, as highlighted (Alkan, 2016).

In order to foster a more effective educational learning process, one of the critical supporting factors that must be taken into consideration is the quality and appropriateness of the teaching materials that are utilized within the instructional framework. Teaching materials encompass a broad spectrum of informational resources, tools, and media that educators employ in the execution of the teaching and learning process, which includes the creation of an environment that actively motivates and encourages students to engage with the material being presented. It is essential for educators to possess reliable teaching materials that can serve as a comprehensive guide throughout the various activities involved in the teaching and learning process, as emphasized (Zakaria et al., 2020). Furthermore, it is crucial for effective teaching materials to remain in alignment with the ongoing advancements in technology, the evolution of artistic expressions, and the realities of life in an increasingly interconnected global society. The benefits associated with utilizing teaching materials in the learning process are manifold, as they can provide valuable feedback that fosters interaction during the educational experience, thereby enabling teachers to engage directly with students and identify any challenges or deficiencies that may arise during the learning process. This direct interaction serves to empower educators to address these identified issues promptly and effectively, ultimately enhancing the overall educational experience for students, as indicated (Harta et al., 2014).

In order to effectively foster a heightened interest among students in the pursuit of learning, it is imperative to utilize teaching materials that not only serve to captivate their attention but also substantially bolster their intrinsic motivation and overall learning outcomes; thus, it becomes essential to seamlessly integrate these teaching materials into an innovative and interactive learning model. One such pedagogical approach that has shown considerable promise in this regard is the POGIL (Process Oriented Guided Inquiry Learning) model, which is characterized by its process-oriented framework designed specifically for students. The POGIL learning model empowers learners by encouraging them to actively engage in the processing of information and knowledge, thereby facilitating the development of a deeper understanding through the application of a structured learning cycle embedded within guided inquiry activities, as highlighted (Barthlow, 2014).

Empirical evidence derived from various research studies indicates that the implementation of the POGIL model significantly enhances students' science process skills and overall learning outcomes, which can be attributed to the notable differences observed in the initial competencies of students who are exposed to the POGIL model in contrast to those who are not, as demonstrated by the findings (Amirul & Dasna, 2020). Consequently, the primary aim of this research endeavor has been meticulously designed to identify and analyze the specific needs of educators in the context of developing effective chemistry

teaching materials, with the ultimate objective of improving student learning outcomes at Satrya Budi Private High School. The significance of this research lies in its potential to provide targeted insights that can inform the creation of teaching resources tailored to the unique challenges faced by teachers in this educational setting. By engaging in a comprehensive analysis of the requirements of teachers, this study seeks to bridge the gap between pedagogical theory and practical application in the realm of chemistry education. In doing so, the research aspires to contribute valuable knowledge that can enhance instructional practices and, in turn, lead to improved academic performance among students. Through the integration of the POGIL model and the development of relevant teaching materials, the overarching goal is to cultivate an enriching learning environment that nurtures both student engagement and academic achievement

B. RESEARCH METHOD

This particular research endeavor is classified as a qualitative study, which implies that it seeks to explore and understand the complexities and nuances of a specific phenomenon rather than merely quantifying data through statistical means. In this scholarly investigation, a comprehensive analysis was conducted to ascertain the specific needs of educators in the context of developing effective and engaging chemistry teaching materials that cater to the diverse learning requirements of their students. This needs analysis was meticulously executed in alignment with the initial phase of the ADDIE instructional design model, which emphasizes the critical importance of the analysis stage as a foundational step in the development of educational resources. The methodological approach employed in this research is characterized by the utilization of the survey method, which allows for the systematic collection of data that reflects the perspectives and experiences of the subjects involved.

The participants selected for this study consist of four dedicated chemistry teachers who are currently engaged in teaching at Satrya Budi Private High School, a recognized institution of learning. The process of data collection was carried out by means of a well-structured questionnaire, which ultimately yielded qualitative data that provides valuable insights into the teachers' perspectives and needs. Through the implementation of this research framework, the study aims to contribute to the existing body of knowledge regarding the development of chemistry teaching materials, with a particular focus on the practical implications for educators. Furthermore, the findings of this research are anticipated to inform future instructional design practices and curriculum development within the field of chemistry education. Ultimately, this study seeks to enhance the overall effectiveness of chemistry teaching methodologies and to ensure that they are aligned with the evolving needs of both educators and students alike.

C. RESULTS AND DISCUSSION

The dissemination of the questionnaire represents a fundamental and preliminary phase in the extensive process of research and development, which aims to meticulously ascertain the specific requirements and needs of educators engaged in the chemistry instructional process that unfolds within the confines of the classroom environment. The

subsequent findings derived from this meticulously designed needs assessment questionnaire are subsequently utilized as a foundational framework for the systematic development of integrated pedagogical materials specifically tailored for chemistry education, employing the innovative Process Oriented Guided Inquiry Learning model as the instructional approach. It is noteworthy that the data generated from the responses to the questionnaire can be comprehensively analyzed and is succinctly presented in an organized manner in Table 1, which serves as a visual representation of the collected information. This table not only encapsulates the responses but also provides a critical insight into the overarching trends and patterns that emerge from the educators' feedback, thereby facilitating a deeper understanding of their pedagogical needs and preferences.

Table 1. Teacher Needs Analysis for the Development of Integrated Teaching Materials Using the Process Oriented Guided Inquiry Learning Model.

NO	Question	Question	Question
1	Does this school use special teaching materials, especially for the chemistry subject?	Ada	100 % 0 %
2	What teaching materials do you use in the learning process?	None LKPD Chemistry textbook	0 % 50 % 50 %
3	Are the teaching materials you use already integrated with the learning model?	Teaching module Not yet	100 % 0 %
4	Have you created learner-centered learning?		25%
		Already Yes	75 % 0 %
5	According to you, how is the motivation of students in learning chemistry using teaching materials at school?	Sometimes No High	25 % 50 % 25 %
6	According to you, is the use of integrated teaching materials based on the Process Oriented Guided Inquiry Learning (POGIL) model in the chemistry learning process in class in line with current needs?	Medium Low	100 % 0 %
7	What is your opinion on developing teaching materials for 10th-grade Chemistry by integrating them with the Process Oriented Guided Inquiry Learning model? Can it improve learning outcomes?	Yes No	100 % 0 % 0 %

According to the information presented in Table 1, it is evident that every single teacher involved in this educational study has actively employed various teaching materials throughout the instructional process, particularly within the domain of chemistry subjects, as substantiated by an impressive percentage of 100%. Among the teaching materials that have been utilized, it is noteworthy that chemistry textbooks were utilized by two educators, which represents a substantial 50% of the total, while teaching modules were also employed by the same proportion of two individuals, thereby accounting for another 50%, and it is particularly striking to note that none of the teachers opted to use LKPD (Lembar Kerja Peserta Didik).

Furthermore, when analyzing the pedagogical approaches taken by the teachers, it is revealed that 25% of them, which corresponds to one individual, place a strong emphasis on student-centered teaching methodologies, while a significantly larger portion,

amounting to 75% or three individuals, adopt a more intermittent focus on student-centered techniques. In discussions with the four participating educators, they collectively express that the students exhibit a high level of motivation towards learning chemistry through the utilization of teaching materials provided at the school, with a distribution of motivation levels indicating that 25% of students demonstrate high motivation, 50% exhibit medium motivation, and the remaining 25% display low motivation. The research findings suggest that there exists a pressing need for the development of integrated chemistry teaching materials that are informed by the Process Oriented Guided Inquiry Learning model, a necessity that is overwhelmingly supported by all participating teachers, as evidenced by the unanimous agreement of 100% (four individuals) who have indicated their preference for this innovative instructional approach, which is anticipated to substantially enhance students' academic performance and learning outcomes in chemistry. In conclusion, the data clearly illustrates the critical importance of effective teaching materials and student-centered pedagogical strategies in fostering a stimulating and productive learning environment, particularly in the context of chemistry education, where the integration of progressive teaching methodologies is deemed essential for optimizing student engagement and achievement.

D. CONCLUSION

Upon careful examination and analysis of the results derived from the teacher needs assessment, which serves as a foundational element for the creation and development of integrated teaching materials specifically tailored for chemistry education through the implementation of the Process Oriented Guided Inquiry Learning model, it can be conclusively stated that the current teaching materials presently utilized within educational institutions do not exhibit any significant integration with the aforementioned pedagogical model, and furthermore, the motivation levels among students to engage with and learn chemistry remain markedly low. It is imperative that educators are provided with teaching resources that are cohesively integrated with the Process Oriented Guided Inquiry Learning model, as this will ensure that the learning experience is predominantly centered around the students, thereby fostering a more engaging and interactive educational environment, which is anticipated to lead to a substantial enhancement in students' intrinsic motivation to pursue the study of chemistry. Consequently, the implementation of such integrated teaching materials is not merely a beneficial addition to the existing curriculum but a critical necessity that could revolutionize the chemistry learning experience for students, ultimately resulting in improved educational outcomes and a deeper appreciation for the subject matter among learners.

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