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ONTOLOGY, EPISTEMOLOGY, AND AXIOLOGY REVIEW FOR CASE BASED BLENDED LEARNING MODEL ASSISTED BY MIND MAPPING TO TEACH STUDENTS CREATIVE SCIENTIFIC IDEAS, COLLABORATION, AND SOCIAL COMMUNICATION

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Abstract: Effective learning requires a deep understanding of the ontology, epistemology, and axiology underlying the learning model used. This article presents a review of the ontology, epistemology, and axiology underlying the Case Based Blended Learning with Mind Mapping (CBBL-MP) Model in the context of teaching students' creative scientific ideas, collaboration, and social communication. In this review, we explore the ontological view of reality, epistemological view of knowledge, and axiological view of values and ethics relevant to the application of this learning model. The ontological exploration looks at assumptions about the learning universe, epistemology addresses the sources and validity of knowledge, and axiology highlights the values that are valued in the context of collaborative learning. With a deeper understanding of these foundations, it is expected that the use of the CBBL-MP Model can improve the quality of teaching and learning in developing students' scientific creative ideation, collaboration, and social communication skills.

Keywords: Ontology, Epistemology, Axiology, CBBL-MP, Scientific Creative Ideas

Abstrak: *Pembelajaran yang efektif memerlukan pemahaman yang mendalam tentang ontologi, epistemologi, dan aksiologi yang mendasari model pembelajaran yang digunakan. Artikel ini menyajikan sebuah tinjauan ontologi, epistemologi, dan aksiologi yang mendasari Model Case Based Blended Learning berbantuan Mind Mapping (CBBL-MP) dalam konteks mengajarkan ide kreatif ilmiah, kolaborasi, dan komunikasi sosial bagi mahasiswa. Dalam tinjauan ini, kita mengeksplorasi pandangan ontologis tentang realitas, epistemologis tentang pengetahuan, serta aksiologis tentang nilai dan etika yang relevan dengan penerapan model pembelajaran ini. Penelusuran ontologi melihat pada asumsi tentang alam semesta pembelajaran, epistemologi membahas sumber dan validitas pengetahuan, dan aksiologi menyoroti nilai-nilai yang dihargai dalam konteks pembelajaran kolaboratif. Dengan pemahaman yang lebih dalam tentang fondasi- fondasi ini, diharapkan penggunaan Model CBBL-MP dapat meningkatkan kualitas pengajaran danpembelajaran dalam mengembangkan kemampuan ide kreatif ilmiah, kolaborasi, dan komunikasi sosial mahasiswa.*

Kata Kunci: *Ontologi, Epistemology, Aksiologi, CBBL-MP, Ide Kreatif Ilmiah*

INTRODUCTION

Effective learning depends not only on the learning model applied, but also on a deep understanding of ontology (knowledge about reality), epistemology (knowledge about knowledge), and axiology (knowledge about values and ethics) (Aulia et al., 2022; Dyah Permata Sari & Madlazim, 2015). In this context, the CBBL-MP model promises to be a potentially effective approach in teaching students creative scientific ideas, collaboration, and social communication.

Effective learning is one of the main pillars in achieving comprehensive educational goals (Susiyawati et al., 2021). In an effort to improve the quality of learning, the development and application of learning models that suit the needs and characteristics of students are very important (Dyah P. Sari et al., 2020). One of the learning models that attracts attention in this context is the CBBL-MP Model. This CBBL-MP model offers a holistic and integrated approach in teaching scientific creative ideas, collaboration, and social communication to students.

The importance of understanding the philosophical foundations underpinning a learning model has become a major focus in modern educational studies. Ontology, epistemology and axiology are three philosophical areas that provide a framework for understanding the essence and underlying principles of learning. In the context of the Case Based Blended Learning Model aided by mind mapping, a review of ontology, epistemology and axiology is important to understand how this model can effectively deliver meaningful learning experiences for students. In this introduction, we will explore ontological views on the reality of learning, epistemological theories on the sources and validity of knowledge, and values and ethics relevant to the use of Case Based Blended Learning aided by mind mapping. Through a deeper understanding of ontology, epistemology, and axiology, we hope to see how this learning model can be an effective instrument in improving the quality of teaching and learning in higher education.

METHOD

The method used in this research is library research, also known as library research, which is an approach that relies on collecting information from various relevant literature sources and is available in written form, such as books, journals, articles, theses, and electronic sources. This method is used to explore existing knowledge on a particular topic, analyze it, and present it in the context of the research being conducted. The first step in using the library research method is to determine the research topic to be studied. After that, the researcher collects sources of information that are relevant to the topic. These sources can be found through physical libraries or online sources such as academic databases. The sources collected are then evaluated to assess their reliability, relevance and credibility. This is important to ensure that the sources used in the research are the best in supporting the argument or hypothesis proposed. Next, the researcher analyzed the sources carefully. In the last step, the researcher looks for important patterns, findings or trends that can be used to support or strengthen the research argument. The results of this analysis are then interpreted in the context of the research being conducted.

RESULT AND DISCUSSION

Ontology of CBBL-MP Model

The ontology of the CBBL-MP model emphasizes the view of learning reality as a social construction. As a model, CBBL-MP recognizes that learning reality is not only limited to the physical environment of the classroom, but also includes virtual and social interactions involving various learning agents. This reality is seen as the result of interactions between lecturers, students, learning materials and the wider social context.

As Smith, (2003) states, "...the ontology of learning is that learning takes place in a social context where learners and teachers interact and co-construct new understandings of the world." The CBBL-MP ontology provides a conceptual framework that maps the key elements of case-based learning and blended learning approaches. It sets out the characteristics, steps and principles underlying the implementation of CBBL-MP in the context of teaching scientific creative ideas, collaboration and social communication. According to P. L. Smith & Ragan, (2005), case-based learning involves the use of complex real or abstract situations to facilitate problem solving, analysis and reflection. This approach encourages students to connect theoretical concepts with practical applications through engineered case studies. Meanwhile, the blended learning approach combines elements of online and offline learning to provide a diverse and flexible learning experience. Mind mapping is an effective visual technique in stimulating creative thinking, clarifying concepts, and facilitating the organization of information.

The implementation of mind mapping in CBBL-MP allows students to develop scientific creative ideas by visualizing relationships between concepts, creating deep understanding, and identifying solutions to complex problems. Generating ideas also involves social processes as creativity is often considered a social or collaborative phenomenon (Sawyer, 2015). In many cases, great innovations are the result of group work, and social judgment plays an important role in developing creative products (Glăveanu, 2018). Research shows that group creativity can be influenced by various factors such as task nature (e.g., task complexity), group composition (e.g., size, skills, background diversity), group processes (e.g., sharing, negotiation), and contextual factors (e.g., social environment) (Paulus et al., 2010). Among them, group processes, i.e., group communication and interaction processes, are considered as determinants of group creativity.

According to Buzan & Buzan, (1994), mind mapping combines the key elements of thoughts, words, images, and colors to create a holistic visual representation of an idea or concept. This approach strengthens the connection between the left brain (analytical) and right brain (creative), facilitates associative thinking, and improves lateral thinking ability. The use of CBBL-MP has several significant benefits in the context of teaching students scientific creative ideas, collaboration, and social communication. Some of these benefits include: (a) Encouraging creative and innovative thinking through visualization of complex ideas. (b) Facilitating collaboration between students in problem solving and joint projects. (c) Improving concept understanding through clear and structured visual representations. (d) Strengthening social communication skills through discussion and exchange of ideas in a group context.

Ontology The mind mapping-assisted CBBL model is an effective approach in integrating case-based learning, blended learning approaches, and visual techniques to teach students scientific creative ideas, collaboration, and social communication. By providing a structured and immersive framework, and leveraging the potential of mind mapping in visualizing complex ideas, this approach can enrich students' learning experience and enhance skills relevant to contemporary needs.

Epistomology of CBBL-MP Model

The Case Based Blended Learning (CBBL) model with the aid of Mind Mapping (MP) is a learning approach that combines case studies, blended learning approaches, and visual mind mapping techniques to teach students creative scientific ideas, collaboration, and social communication. The epistemology of CBBL-MP aims to understand the nature of knowledge produced, the learning processes that occur, and the construction of understanding that is possible through the use of this model. With respect to unproductive group processes, researchers have identified several patterns of group communication that can result in productive teamwork in creativity tasks, for example by paying attention to others' contributions, building shared understanding, taking a shared perspective, and building on others' ideas (Paulus et al., 2010). Paying attention to others' ideas can increase the opportunity to create new combinations, help raise questions and disagreements, trigger new ways of looking at a problem, and bring about changes to the current trajectory to avoid fixation of the mind (Mercer & Hodgkinson, 2008).

The epistemology of CBBL-MP emphasizes the construction of knowledge through experience and reflection. This model views knowledge as a product of mental activity involving analysis, synthesis, and reflection on the information presented. Through mind mapping, students are given the opportunity to organize, connect, and represent their knowledge, facilitating deeper understanding and better retention. As stated by (Bruner, 1990), "...knowledge is not just about the reception of information but also about the construction of understanding through active interaction with learning materials." The epistemology of CBBL-MP is based on two main paradigms, namely constructivism and connectivism. Constructivism emphasizes the active role of students in constructing their knowledge through interaction with learning materials and real-world experiences (Jonassen, 1999). Connectivism underlines the importance of information networks and connectivity in the learning process, where students not only create knowledge but also integrate external sources through technology (Siemens et al., 2005).

Mind mapping is used as a visual tool to represent scientific creative ideas, build relationships between concepts, and facilitate collaboration and social communication between students. Through mind mapping, students can organize information hierarchically, discover new patterns, and illustrate their understanding of learning materials (Novak & Canas, 1997). The application of CBBL-MP epistemology provides several significant benefits in the context of learning students' scientific creative ideas, collaboration, and social communication: (a) It encourages deep and sustainable knowledge formation through active interaction and reflection. (b) Facilitates connectivity between learning concepts and practical applications through visual representations. (c) Promotes collaboration and social communication in the context of learning together and working together on group projects. (d) Strengthening problem-solving and critical thinking skills through the exploration of scientific creative ideas in a structured learning environment.

The epistemology of CBBL-MP combines the paradigms of constructivism and connectivism with the implementation of mind mapping to create a rich and diverse learning experience for students. By emphasizing the active role of students in constructing their own knowledge and utilizing technology to facilitate interaction and collaboration, this approach can help prepare students to face real-world challenges with relevant and competitive skills.

Axiology of CBBL-MP Model

The axiology of the CBBL-MP model emphasizes the value of collaboration, openness, and ethics in learning. It encourages respect for differences, cooperation between individuals, and moral responsibility for the use of knowledge. Mind mapping also promotes openness to new ideas and constructive criticism, which are essential values in a collaborative learning context. As outlined by Freire, (2020), "...effective learning requires an environment in which students feel supported to express, collaborate, and actively participate in the formation of their knowledge." The axiology of the Case Based Blended Learning (CBBL) Model assisted by Mind Mapping (MP) refers to the values, goals, and moral principles that underlie the application of the model in learning. In this context, the axiology of CBBL-MP aims to create a learning environment that promotes scientific creative ideas, collaboration, and sustainable social communication for students.

The axiology of CBBL-MP is based on key values such as: (a) Openness: Encouraging the opening of students' minds and perspectives in exploring scientific creative ideas. (b) Collaboration: Facilitating cooperation between students in solving problems and producing innovative solutions. (c) Creativity: Encouraging the exploration of new ideas and critical thinking through the use of mind mapping as a visual tool. (d) Empathy: Developing students' ability to understand and appreciate the views of others through collaboration and social communication. Mind mapping is used as a visual aid in CBBL-MP to help students organize their ideas, clarify relationships between concepts, and facilitate collaboration. By visualizing information in the form of mind maps, students can more easily explore and understand complex concepts and develop their creative ideas (Buzan & Buzan, 1994).

The axiology of CBBL-MP also involves the application of moral principles such as a) Fairness: Ensuring fair opportunities for all students to participate and develop in learning. (b) Responsibility: Encouraging students to take responsibility for their own learning and contribute positively to the group learning process. (c) Respect: Rewarding students' hard work, creativity and contribution in achieving learning objectives. The axiology of CBBL-MP creates a framework of values and moral principles that direct the design and implementation of this learning model. By reinforcing values such as openness, collaboration, creativity, and empathy, and applying moral principles such as fairness, responsibility, and respect, CBBL-MP can be an effective means of teaching creative scientific ideas, collaboration, and social communication that builds students for a successful future.

CONCLUSION

Through the review of ontology, epistemology, and axiology, we can understand the philosophical basis of the CBBL-MP Model in teaching students' scientific creative ideas,

collaboration, and social communication. A deeper understanding of the ontological assumptions, sources of knowledge, and values underlying this learning model can help improve the quality of teaching and learning, and produce more skilled and value-oriented students in an increasingly complex society.

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