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Research Article

Optimizing the Learning Process through Theory-based Media Selection: Constructivist, Cognitive, Collaborative, and Motivational Perspectives

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ABSTRACT

The learning process is an important element in education, where learning media acts as a tool that helps deliver material effectively to learners. Learning media triggers students' interest, attention and engagement, which in turn can improve their motivation and learning outcomes. This paper discusses the classification of learning media based on the theoretical basis of their use, focusing on constructivist, cognitive, collaborative and motivational theories. Each of these approaches emphasizes different learning methods, ranging from active interaction with the material, deep information processing, to cooperation and motivation. In addition, this paper also outlines a variety of learning media, both technology-based and non-technology-based, that can be used to meet various instructional needs. The results of this study show that the selection of learning media in accordance with a particular learning theory can strengthen the effectiveness of the educational process and help students achieve optimal learning outcomes.

Keywords: Learning Media; Constructivist; Cognitive; Collaborative; Motivation; Learning Effectiveness

1. INTRODUCTION

The learning process is a way to support individuals in acquiring knowledge. This process takes place in an educational arena that involves interaction between teachers and learners. In the learning process, there are important supporting factors, such as learning tools, teaching materials and so on. In developing student potential, an educator must at least have expertise in supervising, guiding, and improving student competence, both in terms of personal, social, and managerial. However, in reality, many teachers have not carried out their role optimally. One of the obstacles faced is the ability of the teacher himself in supporting the implementation of these tasks. One of the abilities in question is the use, provision and mastery of learning media technology.(Muhson, 2010). Learning media is anything that can convey messages so that it can trigger thoughts, emotions, attention, and interest of students to engage in the learning process. The use of media in learning is also able to foster new desires and interests for students, increase learning motivation, and even have a psychological impact on students. In addition, it can also strengthen students' learning motivation and improve their understanding of the subject matter.(Dwijayani, 2019).

There are various types of learning media as explained by Rudy Bretz that there are ways to identify types of media, namely through three main elements, sound, visual, and motion, from these three elements terbgai into 7 groups of learning media, namely: audio, print, silent visual, motion visual, semi-motion audio, semi-motion media, silent audio visual, and motion audio visual.3 Meanwhile, Ramli classifies learning media into five, namely, media without two-dimensional projections, media without three-dimensional projections, audio media, media with projections, and television and video tape recorders.(Kozma, 1991). Education is a complex process, where various factors interact with each other to support the development of learners. One important factor in education is the use of effective learning media. The right learning media can facilitate communication between teachers and learners, and strengthen students' understanding of the material being taught. The use of diverse and innovative media can make the learning process more interesting and interactive, thus increasing students' motivation and interest in learning.(Snyder, 2013)

Learning media also plays a crucial role in strengthening student learning outcomes. By using appropriate media, teachers can deliver material in a way that is easier to understand, interesting and fun. This is certainly very important to improve the quality of learning, especially in the growing digital era. The diversity of learning media, whether

audio-based, visual, or a combination of both, provides a great opportunity to create a more dynamic and challenging learning experience for students.(Ginting, 2024). However, although learning media has great potential, not all teachers are able to utilize it optimally. Many factors affect teachers' skills in using learning media, ranging from limited access to technology, lack of training, to less supportive attitudes towards change. Therefore, it is important for educators to continue to improve their competence in managing learning media, in order to provide optimal learning experiences for students.(Manca & Ranieri, 2013)

In addition, the use of varied learning media can also help overcome various difficulties faced by students in understanding the subject matter. Well-designed media can make it easier for students to absorb information, improve memory, and clarify concepts that are difficult to understand. Therefore, teachers need to have a good understanding of the types of media that are suitable for the characteristics of students and the material being taught, so that the learning process can run more effectively.(Tamrin et al., 2017). The learning process in schools or other educational institutions is an activity that involves various aspects, ranging from teachers, students, to tools and media used to support the achievement of educational goals. One important aspect in this process is the selection of the right learning media, which can help students understand the material better. Effective learning media not only functions as a means of conveying information, but is also able to motivate and increase student involvement in the learning process. Therefore, the selection of media that is in accordance with the characteristics of the material and the needs of students is very important in designing optimal learning. Along with the development of information and communication technology, learning media has also undergone a rapid transformation. In the past, learning media were only textbooks and simple teaching aids, but now various digital media such as videos, animations, and computer-based applications are also used to support learning. This provides many options for educators in choosing media that are in accordance with learning objectives and learner characteristics. The media used in learning should be relevant, interesting, and able to answer the challenges in creating an effective and enjoyable learning environment.

However, although many learning media are available, not all media are suitable for all types of learning. Each type of media has certain characteristics and advantages that make it more effective to use for specific learning objectives. Therefore, it is important for teachers to have the knowledge and skills in choosing and using the right learning media. In this case, teachers are not only tasked to transfer knowledge to students, but also to create a learning atmosphere that facilitates students in developing the expected understanding, skills and attitudes. The use of appropriate learning media can also strengthen the application of various existing learning theories. For example, constructivism theory, which emphasizes the importance of active learning experiences, can be strengthened by the use of media that allows students to explore and experiment. On the other hand, cognitivism theory, which focuses on information processing in the brain, can be maximized with media that presents information systematically and gradually, such as well-structured textbooks or interactive learning software. By selecting media that are appropriate to the adopted learning theory, teachers can help students to achieve deeper understanding. However, the biggest challenge in using learning media is how to integrate various types of media with clear and directed learning objectives. The selection of media that is inappropriate or not in accordance with the learning context can reduce the effectiveness of the learning process. Therefore, research on the classification and selection of learning media is needed to provide guidance for educators in utilizing media optimally. By understanding the theories underlying the use of media and the appropriate ways to use them, it is hoped that more effective, enjoyable and meaningful learning can be created for students. With various types of learning media available, teachers are required to be wise in choosing the right media in accordance with learning objectives. Each type of media has its own characteristics, and can be applied in various learning situations and needs. Therefore, it is important for teachers to continue to develop their abilities and knowledge in choosing and using learning media that can support the achievement of the desired educational goals.

2. RESEARCH METHOD

In this study, researchers used the literature research method. Literature study is a method used to explore and analyze various literature or written documents related to research topics. In this research, researchers collect, analyze and organize data from various books, journals, articles, and other sources that have been published previously to gain a deep understanding of the issues under study. Then the researcher concludes and presents the data in accordance with the research topic.(Arief & Sugiarti, 2022). This research design is descriptive-qualitative, in which the researcher aims to describe in detail and in depth about various types of learning media, their classification, and their role in increasing the effectiveness of learning. The researcher will systematically compile and analyze data obtained from literature sources to compare and conclude various theories and applications of existing learning media. This process involves identifying important concepts in the literature related to learning media, such as the role of media in the theory of constructivism,

cognitivism, and teaching techniques that can be applied with various types of media.(Laanterä et al., 2011). The data collection technique used in this research is documentation technique, which is collecting data through written sources relevant to the research topic. The data collected will be in the form of theories regarding learning media, media classification based on various perspectives, as well as existing findings in previous studies. For data analysis, researchers use content analysis techniques with a qualitative approach. In this case, the researcher will analyze the content of various literature sources to extract relevant information, group the main ideas, and draw conclusions that can describe the application of learning media in the educational context.(Grosso et al., 2019).

3. RESULTS AND DISCUSSION

3.1 Variety of Learning Media from the Theoretical Basis of Its Use

Terminologically, the term "media" comes from the word "medium," which means intermediary. In Arabic, media is taken from the word wasaail, which means a tool to convey a message to the recipient. The main function of media in the learning process is as a connector, which facilitates the delivery of material to students in a clearer and easier to understand way. By using the right media, the information conveyed by the teacher can be received and understood by students without difficulty. Learning media plays an important role as a tool in delivering learning materials and experiences, as well as supporting the overall teaching process. The use of appropriate media can also increase student involvement in learning and motivate them to participate more actively, so as to encourage enthusiasm for learning and lead to improved learning outcomes.(Obar & Wildman, 2015)

There are various methods in classifying types of learning media. According to Rudy Bretz in his book quoted by Muhammad Hasan et al, media can be categorized based on three main elements, namely sound, visual, and movement. Based on these elements, Bretz grouped learning media into eight categories, including audio media, print media, silent visual media, motion visual media, semi-motion audio media, semi-motion media, silent audio-visual media, and motion audio visual media. Meanwhile, Anderson in his book categorizes learning media into ten categories, including audio, print, visual projection, and computer media. Each of these categories has different examples of application in learning, such as audio tapes, textbooks, overhead transparencies (OHT), sound motion pictures, and computer-based learning (CBI).(Sokal, 1974).

Table 1. Anderson's learning media

No.	Media Group	Example in Learning
1	Audio	Audio cassette, radio broadcast, CID, telephone
2	Print	Textbooks, modules, brochures, leaflets, pictures
3	Printed audio	Audio tapes with written materials
4	Still visual projection	Overhead transparency (OHT), movie frame (slide)
5	Silent audio-visual projection	Sound slides
6	Motion visuals	Silent movies
7	Motion audio visual	Motion picture, NCD video, television
8	Physical object	Real objects, models, specimens
9	Humans and the environment	Teachers, librarians, laboratorians
10	Computer	CIA (computer-aided learning) and CBI (computer-based learning)

Based on the **Table 1**, can be drawn a red thread that learning media can be categorized in various groups, each with diverse examples of application. These media include audio media such as audio tapes and radio broadcasts, print media such as textbooks and modules, and print audio media that combine sound with written materials. In addition, there are silent visual projection media such as overhead transparencies and frame films, as well as audio-visual media that combine sound and images such as sound motion pictures and television. Media can also be physical objects such as models or specimens, and involve people and the environment, such as teachers or librarians. In the digital era, computer-based media such as CIA and CBI have also become an integral part of learning. This diversity of media types allows educators to choose and combine media that best suit the learning objectives and characteristics of the learners.

Along with technological advances, learning media has also experienced rapid development. Media used ten years ago are now replaced by technology that is more efficient and effective. Grouping of learning media can be done based on whether the media uses technology or not. Non-technology media, such as print, visual and 3D-based media, remain relevant today. However, technology-based media, such as audio tapes, frame films, or overhead projectors (OHP), are now rarely used, as they have been replaced by new technological devices that are more practical and efficient, such as

computers and multimedia devices. This change shows how important it is to keep up with technological developments to create learning media that are more optimal in supporting the learning process.(Li & Wang, 2017).

3.2 Classification of Learning Media from the Theoretical Basis of Its Use

The classification of learning media can be seen from various theoretical foundations that categorize media based on their characteristics, functions, or technology used. According to Leshin et al.'s taxonomy, learning media are divided into several groups, such as human, print, visual, audio-visual, and computer-based media. Human-based media, such as teachers or librarians, serve to communicate information directly, while print-based media include textbooks and modules that assist in the delivery of material. Visual media play an important role in clarifying and reinforcing understanding, while audio-visual media combine sound and images, which require more preparation in their production. Computer-based media, such as Computer-Assisted Instruction (CAI) and Computer-Managed Instruction (CMI), are increasingly used to support interactive learning and learning management.(Fletcher-Flinn & Gravatt, 1995)

In addition, according to Bretz's taxonomy, media are classified based on three main characteristics: sound (audio), form (visual), and motion (motion), which results in eight media categories, ranging from audio-visual media that combine sound and moving images to print media that only display certain symbols. Schramm, on the other hand, divides media by size and reach, namely large media (film, television) which are complex and expensive, and small media (slides, audio, text) which are simpler and cheaper. Media can also be categorized based on its reach into mass, group, and individual media, each with different distribution and recipient characteristics.(Vuori & Jussila, 2016).

Table 2. Classification of Learning Media

Classification of Learning Media	Description
Lesin	1.Human-based media: Communicates direct messages (e.g. teachers, librarians). 2. Print-based media: Textbooks, modules, journals, brochures. 3. Visual-based media: Pictures, diagrams that clarify understanding. 4. Audio-visual based media: Combines sound and images (examples: movies, videos, television). 5. Computer-based media: Uses computers to support learning (e.g. CAI, CMI).
Bretz	1.Audio motion visual media: Sound, movement, and images (examples: television, video tape). 2. Audio still visual media: Sound and static images (e.g. sound film-strip). 3.Semi-motion audio media: Sound and limited movement (example: tele-writing). 4. Motion visual media: Moving images without sound (example: silent movies). 5. Still visual media: Images without movement (example: slides, pictures). 6. Semi motion media: Using writing and lines (example: tele autograph). 7. Audio media: Sound only (e.g. radio, telephone). 8. Printed media: Written symbols (e.g. books, texts).
Schramm	1. Large media: Expensive and complex (e.g. movies, television, video NCDs). 2. Small media: Simple and inexpensive (e.g. slides, audio, transparencies). 3. Mass media: Wide reach (example: radio, television). 4. Group media: Reach is limited to a certain space (examples: audio tapes, OHP, slides). 5. Individualized media: Used for individuals (e.g. textbooks, telephones, computer programs).
Conclusion	Although there are various classifications of learning media based on their characteristics, technology, and functions, the main purpose of this grouping is to facilitate the selection of media that are suitable for learning needs and conditions. Technological developments allow for more efficient use of learning media, and as educators, it is important to keep abreast of these advances in order to utilize media appropriately.

Based on the **Table 2**, we can draw a red line that the classification of learning media according to several experts, who categorize media based on the characteristics, functions, and technology used. According to Leshin et al, learning media are divided into five groups, ranging from human-based media (such as teachers or librarians) to computer-based media, which support learning through interactive technology. Bretz classifies media based on three main elements: sound (audio), form (visual), and motion, which results in eight categories, from audio media that only uses sound, to audio-visual media that combines sound, moving images, and visual forms. Schramm, on the other hand, divides media by size and reach, distinguishing between large media (such as film and television) which are complex and expensive, and small media (such as slides and audio) which are simpler and cheaper. Schramm also categorizes media based on audience reach, namely mass media (such as radio and television), group media (such as OHP and slides), and individual media (such as textbooks and computer programs). In conclusion, although there are various media classifications, each

has the same goal, which is to facilitate the selection of media that are in accordance with learning needs and technological developments, so that educators can choose the most appropriate media according to the objectives and conditions. Overall, although there are various media groupings, there is no one classification system that can cover all aspects of learning media thoroughly. Each media grouping aims to facilitate understanding and selection of media in accordance with learning needs. As an educator, it is important to follow the development of technology and learning media in order to utilize them appropriately according to the objectives and conditions in the field.

3.3 Variety of Learning Resources from the Theoretical Basis of Their Use

The variety of learning resources can be classified based on the type, origin, and method of use, which varies according to the learning objectives. According to Daryanto, learning resources are divided into two main categories. First, learning resources by design, which are deliberately made for instructional purposes such as modules, programmed teaching materials, or videos on certain topics. Second, learning resources that are easily available (learning resources by utilization), which are not originally for instructional purposes, but can be used in learning, such as botanical gardens, museums, or biography books.(Lau et al., 2018).

In addition, according to AECT (Association for Educational Communication and Technology), learning resources are divided into seven categories: messages, people, materials, tools, techniques, settings, and environments. Messages are information conveyed in learning, both formal and informal, while people refer to teachers or experts who deliver the material. Materials include media or devices that store the message, tools refer to the hardware used to deliver the message, and techniques are the procedures used in delivering the learning. Setting and environment refer to the places and situations that support the learning process, both physically and socially.(Conn & Gitonga, 2004)

Table 3. Learning Resources Category

Expert	Learning Resources Category	Example
Daryanto	1. Designed Learning Resources	Modules, instructional videos, slides, programmed teaching
	2. Available Learning Resources	materials. Botanical gardens, museums, biography books
AECT	1. Message	Information or ideas in learning
	2. People	Teacher, instructor, professional expert
	3. Materials	Maps, books, pictures, charts
	4. Tools	Computer, OHP, radio, television
	5. Techniques	Lecture, discussion, simulation, group learning
	6. Setting	Library, classroom, studio
	7. Environment	Park, market, museum
Ahmad Rohani	1. Print Source	Books, magazines, brochures
	2. Non-Print Sources	Movies, slides, audio tapes
	3. Facilities	Auditorium, classroom, library
	4. Activities	Interview, group work, observation
	5. Community Environment	Parks, terminals, tourist attractions
Abdul Majid	1. Place/Surrounding Environment	River, market, mountain, museum
	2.Objects that Support Behavior Change	Models, sites, props
	3. People with Special Skills	Doctor, lawyer, architect, public figure
	4.Books that can be read independently	Textbooks, encyclopedias
	5. Events and Facts that Happened	News, natural events, historical events

Based on the **Table 3**, a red thread can be drawn that the variety of learning resources classified by various experts includes various categories that complement each other in supporting the learning process. According to Daryanto, learning resources can be divided into those specifically designed for learning and those that are naturally available in the surrounding environment. AECT categorizes learning resources based on elements such as messages, people, materials, tools, techniques, settings, and environments, which show the role of various components in the learning process. Ahmad Rohani emphasizes learning resources in the form of print, non-print media, facilities, activities, and the community environment, while Abdul Majid adds the importance of places or physical environments as well as events and people with certain expertise as learning resources. All of these categories show that learning resources are not only limited to media or formal teaching materials, but also include various forms of environments, individuals, and activities that support effective learning processes.

The variety of learning resources is also identified by Ahmad Rohani and Abdul Majid with a simpler and more

applicable approach. Ahmad Rohani categorizes learning resources into print sources (such as books and magazines), non-print (such as films, audio tapes, and models), facilities (such as libraries or study rooms), activities (such as interviews or simulations), and the community environment (such as parks or terminals). Abdul Majid emphasizes more on the environmental aspects and human interaction, classifying learning resources as places or physical environments that support behavioral changes, objects that support the learning process, and people with expertise who can act as learning resources. All these categories show that learning resources can come from various aspects, be it specially designed media, the surrounding environment, or direct interaction with competent people.(Mohidem & Hashim, 2023).

3.4 Classification of learning resources from the theoretical basis of their use

The classification of learning resources can be understood from the various theoretical foundations behind their use. The selection of appropriate learning resources is highly dependent on the adopted learning theories, which will affect the learning process and effectiveness. Each learning theory approach has different characteristics and objectives, so learning resources must be adapted to the teaching objectives to be achieved. Therefore, it is important to consider the compatibility between teaching methods and learning resources used so that learning can run effectively and according to the needs of students.(Junaidi et al., 2023). One type of learning resource is constructivist learning resources. The constructivist approach emphasizes active learning, where students develop their own understanding through experience and interaction with materials. Resources that support this approach are designed to create an environment that encourages exploration, experimentation and reflection. Examples of constructivist learning resources include textbooks that contain case studies, assignments that trigger critical thinking, and reflective questions that challenge students to think more deeply about the topics studied. These resources aim to build students' knowledge through an active and collaborative process.(Bremgartner et al., 2015)

Furthermore, there are learning resources based on cognitive theory, which focuses more on the mental processes that occur in learning, such as information processing, pattern recognition and problem solving. In this approach, learning resources are designed to help students understand more complex concepts and develop higher cognitive skills. Textbooks that present concepts systematically, scientific journals that contain empirical data to analyze, and software that challenges students in thinking skills are examples of cognitive learning resources. These learning resources aim to enrich students' thinking process and build their ability to solve problems and construct deeper knowledge. Another approach is collaborative learning resources, which emphasizes social interaction in learning. In this theory, students learn through discussion, sharing ideas and working together with their peers. Collaborative learning resources are designed to create an atmosphere that supports cooperation and mutual support among students. Examples of collaborative learning resources include academic websites with discussion forums, collaborative projects where students work together to achieve a common goal, and e-learning platforms that allow interaction between students. With this approach, learners not only acquire knowledge, but also social and communication skills that are essential for self-development.

Table 4. Types of Learning Resources

No.	Types of Learning Resources	Theoretical Foundation	Example
1	Konstruktivis	Active learning, knowledge construction	Textbook with case studies, reflective assignments, discussions, experiments.
2	Cognitive	Information processing, pattern recognition, problem solving	Systematic textbooks, scientific journals, learning software
3	Collaborative	Social interaction, discussion, cooperation	Discussion forums, collaborative projects, e-learning platforms.
4	Drive Motivation	Increase student interest and engagement	Animated videos, educational games, relevant content with feedback.

Table 4, illustrates four types of learning resources designed based on different learning theories. Constructivist learning resources focus on active learning and knowledge formation through direct interaction with materials, such as textbooks with case studies or reflective assDrive Motivationignments. Cognitive learning resources emphasize mental processes such as information processing and problem solving, with examples being structured textbooks or learning software. Collaborative approaches emphasize social interaction and cooperation between students, such as discussion forums and group projects, to facilitate learning through collaboration. Finally, motivational learning resources are designed to maintain student interest by offering engaging experiences, such as animated videos and educational games that provide positive feedback. These four types of learning resources are tailored to the learning objectives and underlying theory, to create a more effective and enjoyable learning experience.

Finally, learning resources that encourage motivation are also important in learning. Motivation plays a big role in keeping students engaged during the learning process. Motivational learning resources are designed to grab students' attention and keep their interest high. Examples of motivational learning resources include learning videos with engaging animations, interactive educational games, as well as materials that are relevant and provide positive feedback. These learning resources aim to create a fun and challenging learning experience, so that students feel more engaged and motivated to continue learning. By understanding the variety of learning resources in accordance with learning theories, teachers and learners can choose the most effective materials in accordance with the learning objectives to be achieved (Fukuzawa, 2013).

4. CONCLUSION

The conclusion from the whole discussion about the classification of learning resources based on the theoretical basis for their use is that learning resources play an important role in supporting the learning process. Learning resources can be classified based on their type, form and presentation, as well as based on the underlying learning theory, such as constructivist, cognitive, collaborative and motivational theories. Constructivist approaches emphasize active learning, where individuals construct knowledge through direct interaction with materials. The cognitive approach focuses more on mental processes such as information processing and problem solving, while the collaborative approach emphasizes the importance of social interaction in learning. On the other hand, learning resources that encourage motivation are important to increase learner interest and engagement. In the use of learning media, various types of media such as audio, visual, print and multimedia can be selected based on needs, conditions and technological advances. Each type of media and learning resources has its own advantages in facilitating effective learning, depending on the context and instructional objectives. Therefore, choosing the right learning resources and media is very important to support the success of the learning process and maximize students' learning outcomes. The selection of appropriate learning media is one of the keys to success in the educational process. Media not only serves as a tool to convey material, but also plays an important role in motivating, increasing student engagement, and strengthening their understanding of learning materials. Therefore, it is important for educators to understand the various types of media available, both traditional and digital-based, and to know their characteristics and advantages in accordance with the desired learning objectives. That way, learning media can be used optimally to achieve optimal learning outcomes. It is also important to remember that the selection of learning media depends not only on the technology or tools used, but also on the underlying learning theories. By understanding various theories such as constructivism, cognitivism, and other learning theories, educators can more easily adapt the media to the needs and characteristics of students. Therefore, the successful use of learning media depends not only on technological sophistication, but also on teachers' knowledge and skills in designing and managing effective learning.

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