Journal of Education and Educational Research
ISSN: 2957-9465 | Vol. 7, No. 1, 2024

The Multiple Functionality of Input Material in Learning: Environment, Knowledgeable Guide, and Mediators of Social Interaction

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Abstract: Learning materials often play a significant role in the learning process, but their specific roles can vary depending on the situation. Based on Vygotsky's (1978) sociocultural theory and Piaget's (1952) stages of cognitive development, we can propose three channels through which children learn: the environment, more knowledgeable individuals, and intermediaries of social interaction. Surprisingly, learning materials can assume all three roles in different situations. A child's environment determines the learning materials and resources they have access to. When students learn without the involvement of a teacher, the learning materials become their source of knowledge. Teachers and peers also utilize learning materials as intermediaries during instruction.

Keywords: Learning Materials; Mediators of Social Interaction; Knowledgeable Guide.

1. Introduction

Learning materials play a crucial role in the learning process as they serve as valuable tools that contain the knowledge we seek to acquire. These materials encompass a wide range of formats, including textbooks, electronic files, or even simple pieces of paper. Despite their widespread use in education, the specific role of learning materials in the learning process has been a subject of inquiry and has elicited varying perspectives from renowned psychologists.

One prominent psychologist, Lev Vygotsky, a former Soviet psychologist, emphasized the social nature of learning and cognitive development. According to Vygotsky's (1978) sociocultural theory, children are viewed as social beings whose cognitive growth is greatly influenced by social interaction. Vygotsky proposed that children learn by engaging in interactions with individuals who possess more knowledge or expertise than they do. These more knowledgeable individuals, such as teachers or peers, serve as guides and mediators, scaffolding the child's learning process. In this context, learning materials can be seen as intermediaries that assist in facilitating social interaction and knowledge transmission. Books, for example, can provide a bridge between the learner and the expertise of authors, directing attention to important features of the environment, facilitating information rehearsal, aiding in planning, and clarifying steps to solve problems.

In contrast to Vygotsky's sociocultural perspective, the Swiss psychologist Jean Piaget proposed a cognitive constructivist theory of development. Piaget (1952) emphasized the importance of self-centered and focused activities in a child's cognitive growth. According to Piaget, children actively construct their understanding of the world through their direct experiences and interactions with the environment. Piaget posited that children's development occurs through a series of stages, where they gradually build more complex mental structures by assimilating new information into existing cognitive frameworks and accommodating their existing schemas to incorporate new knowledge. In Piaget's view, the environment plays a vital role in providing the necessary stimuli and experiences for children to acquire knowledge. Although the focus of Piaget's theory is primarily on direct interaction with the environment, learning materials can still be seen as an integral part of the environment, providing opportunities for exploration, manipulation, and discovery.

While learning materials themselves are not categorized as environments, intermediaries, or more knowledgeable individuals, they can integrate into and fulfill each of these roles depending on the context and instructional design. Learning materials can function as mediational tools, bridging the gap between the learner and the desired knowledge. They can provide access to information, present concepts in an organized manner, and offer opportunities for practice and application. Moreover, learning materials can facilitate self-directed learning, allowing individuals to engage in independent exploration and inquiry.

2. Co-Construction of Input Materials and Learners

2.1. Input Material as an Environmental Factor

Learning materials can be considered as an integral part of an individual's environment, playing a significant role in shaping their learning experiences. The environment, in this context, refers to the external factors that influence an individual's access to information and resources. Learning materials as input material contribute to the environmental factors that impact learning.

One aspect influenced by the environment is language and speech. Sociocultural aspects of cognitive development benefit from language because language and speech shapes individual and collective mental processes (Rogoff, 1990; Vygotsky, 1978; Wertsch, 1991). The availability of learning materials and resources in different languages can vary based on the geographical location. For example, a child growing up in a cosmopolitan city like Shanghai or Hong Kong is more likely to have access to learning materials in multiple languages compared to a child in a more traditional city.

Multiple linguistic resources can enhance early language and cognitive development. The linguistic aspect is just one dimension affected by the environment. Educational resources and regional disparities also influence the diversity and quality of available learning materials. A child born in a rural area might have limited access to higher education, leading to a narrower range of learning materials and resources.

The influence of the region on children extends beyond its international or traditional nature or its level of development; it also encompasses the learning atmosphere within that region. While some may assume that a well-developed region automatically possesses good educational resources, this is not always the case. The developmental level of a region represents the average progress across various aspects, and while certain areas may excel in education, other factors could lower the overall developmental average. For instance, Maotanchang County in Lu'an City, Anhui Province, China, has a relatively low average developmental level but boasts one of the top middle schools in China. Therefore, the impact of the learning atmosphere on children should not be underestimated. Intent participation in socioculturally relevant activities and learning atmosphere promote cognitive development (Rogoff, Paradise, Arauz, Correa-Chávez & Angelillo, 2003; Wenger, 1998). Assessing the quality of a region's learning atmosphere is complex, as different children thrive in different learning environments. Some children may thrive in active learning atmospheres, while others prefer a calmer setting. However, if a child is exposed to an unsuitable learning environment, their learning potential may be severely hindered. For example, an active child placed in a repressive and introverted learning environment may have their learning abilities and even their personality stifled, preventing them from reaching their full potential.

The family, as the most critical factor of learning environment, affects the learning materials and resources available to them, thus shaping children's cognitive development (Bronfenbrenner, 1979; Crosnoe, Leventhal, Wirth, Pierce, & Pianta, 2010). The family's location, values, and financial means play a crucial role in determining the access children have to diverse and high-quality learning materials and resources. However, family-related factors go beyond resource availability. The family's emphasis on different subjects or disciplines, such as liberal arts or sciences, arts or sports, also influences the resources accessible to the children. Since children do not consciously choose the subjects they wish to learn, their education is primarily controlled by their parents, and the availability of learning materials and resources is closely tied to their family's priorities and values.

In summary, learning materials and resources are encompassed within the broader concept of the environment, which includes the family and region. The environment, including the availability of diverse learning materials and resources, can significantly impact an individual's learning experiences and opportunities. Factors such as language, regional disparities, learning atmosphere, and family influence all contribute to the environmental factors that shape the accessibility and quality of learning materials for individuals.

2.2. Input Material as a Knowledgeable Other

Vygotsky (1978) did not solely emphasize the role of input material (i.e. books) in knowledge acquisition, nonetheless, as cultural tools, books, mediate thinking and provide access to knowledge and expertise beyond an individual's immediate experience. When individuals opt for learning through reading, the learning material takes on the role of a knowledgeable source, providing information and insights to the learner. While it is ideal for the writer of the learning material to possess greater knowledge, during the learning process, the learner directly interacts with the material and derives knowledge from the writer. Thus, at that moment, the learning material assumes the position of a more knowledgeable entity, guiding the learner's educational journey.

However, relying solely on learning materials for knowledge acquisition is not always the most efficient approach, primarily due to two reasons. Firstly, when the learning material becomes the primary source of knowledge, the efficiency of acquiring that knowledge can be significantly reduced. Authors of learning materials often employ concise and effective language to convey information. However, due to variations in individuals' comprehension and memory abilities, readers may require additional time to fully understand and digest the content. The author's succinct language may pose challenges for some readers, making it difficult for them to grasp the intended meaning and absorb the knowledge efficiently. Secondly, if readers encounter difficulties or misunderstandings while engaging with the learning material, there is no immediate recourse for clarification or correction. Learning materials, as static entities, cannot actively address specific questions or misconceptions unless a more knowledgeable person serves as a mediator and provides explanations. In such scenarios, the learning material often serves as an intermediary, lacking the interactive and dynamic nature of human interaction that can efficiently resolve uncertainties and enhance understanding.

Is there a way to optimize learning efficiency while still utilizing learning materials as knowledgeable sources? In my opinion, one of the most effective and widely employed methods is note-taking and annotation. These techniques have been utilized for thousands of years to aid individuals in better recording and summarizing knowledge. When learning materials act as the more knowledgeable source, note-taking and annotation assist learners in improving their learning efficiency.

Note-taking and annotation create a temporary mediation between the learner and the learning material. By actively engaging with the content and documenting key points, learners can solidify their understanding and personalize their learning experience. Through note-taking, individuals can capture essential concepts, summarize information in their own words, and highlight significant details. This process fosters active processing of the material, enabling learners to organize their thoughts, identify gaps in knowledge, and establish connections between concepts. Annotations, including underlining, highlighting, or adding marginal comments, provide visual cues that aid memory retention and serve as reference points for later review.

The mediation in the learning process allows learners to bridge the gap between the author's concise language and their own understanding. By actively mediating their interaction with the learning material through note-taking and annotation, individuals transform the static text into a dynamic and personalized learning experience. These techniques facilitate a deeper level of engagement, allowing

learners to construct their understanding and make the knowledge their own.

In conclusion, while learning materials can serve as knowledgeable sources, relying solely on them for knowledge acquisition may hinder learning efficiency. The concise language used by authors and the lack of interactive support can pose challenges for learners. However, note-taking and annotation provide effective strategies to enhance learning efficiency. These techniques create a temporary mediation that records the learner's thought process and preferred understanding method. By actively engaging with the material and personalizing their learning experience, individuals can optimize their comprehension, retention, and application of knowledge. Mediation through note-taking and annotation empowers learners to derive maximum benefit from learning materials and make their educational journey more effective and enriching.

2.3. Input Material as a Mediational Tool

Learning materials play a crucial role as mediators in the learning process. As mentioned earlier, when learners rely solely on the learning material as the more knowledgeable source, they may encounter certain challenges. However, these problems can be effectively addressed when learners themselves become the more knowledgeable entity and utilize the learning material as an intermediary. In situations where learners struggle to understand the material, a living person with more knowledge on the subject can step in and rephrase the content in a way that facilitates quick comprehension. Similarly, if learners misunderstand the knowledge presented in the learning material, the knowledgeable person can promptly correct their misconceptions, preventing further misunderstandings from arising.

The primary purpose of learning materials is to provide a teaching outline or framework to the knowledgeable person, enabling them to convey information more efficiently to learners. By adopting the role of the more knowledgeable source while utilizing the learning material as a mediator, the learning process becomes more streamlined and effective. However, it is important to recognize that the choice of the individual acting as the knowledgeable source can significantly impact the efficiency of the learning experience. Collaborative interactions within a group can create a shared zone of proximal development (ZPD), where teachers and learners collectively scaffold and support each other's learning (Mercer & Littleton, 2007). For example, in a classroom setting where a teacher addresses a class of 20 students, the best approach is to identify the group ZPD for these students and tailor the teaching accordingly. However, it is challenging for all 20 students to have the exact shared ZPD. Consequently, some students may find themselves listening to material they already know, while others may struggle to keep up, leading to a lack of understanding. On the other hand, in a one-on-one teaching scenario, where a teacher instructs only one student, they can fully comprehend that student's individual ZPD and customize the content accordingly. This allows the teacher to closely monitor the student's progress and provide personalized support when the student falls behind. It seems that one-on-one teaching is more efficient than one-to-many teaching due to the ability to tailor instruction to the specific needs of an individual learner. However, it is worth noting that even in one-on-one teaching scenarios, the effectiveness can still be influenced by the capabilities of the individual acting as the knowledgeable source. For instance, a teacher may possess extensive knowledge of the learning material but struggle to bridge the potential gap between them and the student. As a student, unless I encounter a teacher with whom I have a strong rapport, I may not feel comfortable opening up to them. In a school environment, teachers often have additional roles as managers or authority figures, which can inadvertently create barriers between them and their students.

Nevertheless, there is another situation that can further enhance the efficiency of one-on-one teaching, and that is mutual assistance among students. Learner-to-learner mediation can be seen as closely aligned with what Vygotsky referred to as 'internalization' (Guk & Kellogg, 2007). My personal experience can illustrate the utility of peer mediation. In my precalculus class, I had a good friend named Ning'er who approached the teacher for help before the final exam because he had not fully understood one of the units. Despite the teacher's efforts, Ning'er still could not grasp the knowledge points of that unit. Consequently, he approached me, hoping that I could assist him. Since I knew Ning'er both inside and outside of class, I was able to provide examples that were relatable to his life or use language that was easier for him to understand. This personalized approach enabled Ning'er to grasp the knowledge points more easily. Classmates and friends often have a deeper understanding of each other compared to what teachers know about their students. The familiarity and connection shared among classmates can break down the perceived barriers between teachers and students, leading to improved communication and significantly enhancing teaching efficiency.

In summary, learning materials serve as mediators in the learning process, bridging the gap between learners and knowledge. When learners themselves become the more knowledgeable entity and utilize the learning material as a mediator, the learning process becomes more efficient. However, the choice of the individual acting as the knowledgeable source, whether a teacher or a peer, can impact the effectiveness of the teaching process. One-on-one teaching allows for personalized instruction but can still be influenced by factors such as rapport and communication. Mutual assistance among students further enhances teaching efficiency by leveraging the deeper understanding and familiarity that classmates have of each other. By leveraging learning materials as mediational tools and fostering supportive learning environments, we can optimize the efficiency of the learning process, promote better understanding, and facilitate effective knowledge acquisition.

3. Conclusion

In conclusion, the primary factor determining the information available to an individual is the environment they are in (the people they interact with, the city's culture, etc.). Learning materials only act as a more knowledgeable source when individuals use them for self-study. Personally, I do not believe it is a good choice for learning materials to be the sole source of knowledge. However, taking notes and making annotations can effectively improve learning efficiency under such circumstances. On the other hand, when we have a more knowledgeable person available, which is a preferable situation, they can use the learning material as a mediation tool for teaching. The availability of a more knowledgeable person depends on the environment one is in, and their explanation and choice of materials can also be influenced by their own perspective and understanding. The learning

material obtained depends on the environment, and in turn, the availability of a more knowledgeable person depends on the environment as well. Therefore, the environment plays the most significant role in determining the effectiveness of learning materials, and while it doesn't directly affect the materials themselves, it does impact the availability of a more knowledgeable person. However, when learning materials act as the sole source of knowledge, it is not an ideal choice.

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