



**Effects of Inquiry-based Learning on the Performance of the Learners:
A Literature Review**

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ABSTRACT

Learners of all ages deserve the best instructional strategies and methods that equip them with the skills and learnings they need to keep up with the changing world. The educational system around the world has been doing its best to provide quality education for all. For over four decades, Inquiry-based Learning (IBL) has been utilized along with different disciplines (Callison, 2015; Addison & Meyers, 2013) and has become pivotal in changing classrooms into delightful, engaging and, student-centered learning environments (Farooqi, 2020). This paper reviewed different articles and journals that talk about the Effects of Inquiry-based Learning on the Performance of the Learners and be able to identify research gaps of this study. The various articles included in this review date back from 2011-present (2021). This paper revealed that Inquiry-based learning is indeed an effective learning and teaching strategy as the reviewed articles suggest and has a positive effect on the performance of learners along with the different contributing factors to learners' achievement.

Keywords: Effects of Inquiry-based Learning, IBL, Learner Performance

INTRODUCTION

Education is the pillar of the advancements of technology and the developing world. The call for improvement and pursuit of quality education has been the lingering topic of research and scholarly papers all this time. The need to compensate for the growing demand for improvement to cope up and produce competitive and better human resources is the main task of the educational sector.

This life-changing goal of education drives all sectors of society to look for ways to improve the strategies, approaches and, methods used in the teaching and learning process. Varied disciplines of the teaching and learning process have been the backbone of many different classrooms that contributed to the kind of society we have right now. IBL or Inquiry-based Learning has already been used along with these disciplines for a long time.

Different jurisdiction of education around the world has introduced circular initiatives that emphasize the need for students to practice and engage in Inquiry-based Learning (Scott, D.M.

et. al, 2018). Many see Inquiry-based Learning (IBL) as the key to better learners as it gives deeper meanings to what is learned.

There is a long and strong tradition of the use of inquiry-based learning approaches especially in science education (Avsec & Kocijancic, 2014). But it is easily incorporated and can be used in all subjects.

This literature review will open an avenue for a wider perspective about the subject matter and will give way for researchers to better understand how IBL affects the learners' performance. Identifying the gaps in existing and available articles and related kinds of literature is very crucial to address the points where improvement is needed. Moreover, this study will provide a better picture for studies about Inquiry-based learning and similar topics.

DISCUSSIONS

Inquiry-based Learning as an Approach

Young children and humans are naturally curious about the world around them. The thirst for knowledge is somewhat insatiable that pushes us to seek out new experiences and challenges and try novel things with utmost enthusiasm (Saltman, 2012). This is the same reason why it is a must to provide a better and quality education for mankind.

It is essential to understand the core topic of this paper before discussing its effects on learners' performance. As an educator, IBL or inquiry-based learning strategy or method is still hard to facilitate especially for young learners. Moving away from the traditional way of teaching is still a challenge that we tend to overcome over time. The fast pace of change in education challenges most educators to find ways to encourage learners to be more active and involved in the teaching and learning process.

Inquiry-based learning is a kind of approach to learning that focuses on the involvement of students in the hunt for their learning. It is a learning model that is student-centered and is in pursuit of a question or a problem. It provides an alternative process of an aural description of autonomy, experience, motivation, and academic challenges (Buchanan et. al.,2016).

Based on studies conducted, Inquiry-based learning leads to better engagements among students throughout a class period and provides a greater grasp and understanding of the content knowledge, and creates an atmosphere of overall engagement (Wheatley, 2018). Through IBL, students experience academic engagement that gives the feeling of relevance and choice that delves them to value their work and matters learned (Buchanan et.al., 2016).

In the traditional way of teaching, teachers are the fountain of learning. In Inquiry-based learning, students are the main actors. Hands-on working is an essential part of inquiry-based learning that helps in the formation of understanding in the theoretical knowledge and ideas (Schmid & Bogner 2018).

In the study conducted by Johnson & Cuevas, 2016, An inquiry approach requires students to construct and discover knowledge through meaningful activities and personal investigations. It is an act of gaining skills and knowledge through asking for information. Inquiry-based learning

stimulates active engagement of learners in the cognitive and discovery of learning activities (Lee, 2014).

Gomez and Suarez, 2020, suggests that among the approaches or strategy for developing intellectual autonomy and complex thought process, Inquiry-based learning has positioned itself to the top. It is considered as the most recommended “active” methodologies that can be used by teachers that allow optimum learner involvement.

Inquiry-based learning showed suitability for both genders (Schmid & Bogner 2018) it provides equal opportunity for all to deepen their knowledge about what is taught. It is suggested to improve students’ critical thinking skills because the method aims to enhance students’ interpretation, evaluation, analysis, inference, self-regulation, and explanation skills which are the essential core of critical thinking skills (Wale & Bishaw, 2020).

Rather than being passive audiences that receive knowledge, Inquiry-based learning and instruction allow students to be more self-directed and act as active participants in the learning process. This shift in increased autonomy combined with responsibility and self-direction improves the higher thinking skills and more sophisticated understanding that are encapsulated in the theoretical benefits of Inquiry-based learning (Constantinou et. al., 2018). It is well-suited for helping learners become active students because it situates learning in real-world problems, and it makes students responsible for their learning or understanding (Avsec & Kocijancic, 2014).

Effects of Inquiry-based Learning on the Performance of Learners

Numerous studies suggest that inquiry-based learning is beneficial to the performance of learners. Inquiry-based learning or IBL requires the involvement of the learners in their learning process. To ensure students’ success and achievement, learners must fully understand and apply the content material as IBL encourages and involves students in the process of scientific discovery and makes science relevant toward the real-world concerns (Darling-Hammond et.al., 2020).

In the study conducted by Lindsey Bailey (2018), she found out that Inquiry-based Learning has allowed greater comprehension and understanding of the content covered and provided a strong connection on the essential question that resonated through six weeks of intervention amongst her students.

A similar study where Nadim Farooqi (2020) applied Inquiry-based Learning in teaching Mathematics in early childhood found out that the use of Inquiry-based Learning whilst young will provide a strong foundation in mathematics. Many of the participants in his study gave positive feedback on the impact of Inquiry-based Learning on student engagement and building a foundation of skills. An increase in student achievement in math classes that utilized Inquiry-based Learning was noticed and reported. Teachers together with the administrators believe that IBL will yield a positive impact and success for learners in mathematics.

Shahleen et. al., (2015), concluded that compared to the traditional way of teaching, Inquiry-based learning is more effective. She suggested that elementary level students should be taught using innovative methods of teaching like Inquiry-Based Learning to better understand scientific concepts. In her study, it is proven that students showed better science performance when taught using Inquiry-based Learning.

Inquiry-based learning unleashes the ability to think critically and posed positive results in learners' performance in the fields of science. These findings were reflected in the studies of Sutrisno et. al., 2020, Cairns, D. (2019), Baker & Robinson (2018), Laksana (2017), Johnson & Cuevas (2016), Schmid & Bogner (2015), Ergül (2011). IBL had much more significant effects on students' achievement than the process skills and their attitude towards science as a subject (Aktamiş, H., Hiğde, E. & Özden, B. (2016)). The implementation of IBL has a direct and positive relationship with the performance and achievement of learners. However, the key to its success lies in the hands of the teacher and the way of its execution. Planning and developing inquiry-based learning lessons can be time-consuming and resources may be limited but it is all worth it as students can make direct connections and experience a deeper understanding through hands-on experiential and first-hand learning experiences that have an overall positive impact and benefit for student achievement, retention, and knowledge-recall (Wilson, 2020). Some Inquiry-based learning practices shown a significant linear positive relationship to science achievement particularly contextualizing science learning outcomes (Cairns, D. 2019). This learning approach aspires to engage learners in an authentic discovery process (Pedaste et. al., 2015) which is very evident whilst imploring the said approach. However, Inquiry-based learning cannot be applied as a universal method. Teachers still need to adjust according to learners' particularities (Skoda, et. al., 2015) and find the best-suited way to ensure high learning outcomes.

Science and inquiry-based learning have a very intimate relationship. Inquiry is a vital part of learning scientific concepts, and it is crucial to tickle the interests of learners to unleash the scientists in them. In another field of science, Septyastuti, H.L. et. al., 2021, used Inquiry-based learning as the goal to attain by the OE3R strategy for learning hydrocarbon topics for undergraduate learners and the results revealed that OE3R strategy as inquiry-based learning is effective for learning chemistry.

Inquiry-based Learning can also be used along with different strategies to attain optimum beneficial results for the learners. Yuliati, Rigatoni & Mufti (2018) have employed IBL along with Physics Educational Technology (PhET) Simulations and found out that the application of IBL has encouraged students to change the approach used by the students in problem-solving, thus, learners showed better problem-solving skills.

Inquiry-based learning can lead to a definite increase in student engagement, motivation, and academic performance with long-term retention of knowledge (Wilson, 2020). Inquiry-based learning gives students opportunities to talk about their familiarity and collaboratively participate actively in the learning process (Lynn, 2012).

Performance and achievement of learners are the results of many other factors that sum up how the learners are being developed. Extrinsic Goal orientation is defined as the evaluation of themselves and comparing it with friends, Inquiry-based learning has developed this domain in learners (Bayram et. al., 2013) It allowed learners to scientifically construct new-found knowledge, and lessons are more question-driven. The better level of inquiry that the learners implement, the more involved they become (Elthanahy & Furrow, 2019).

Applications of Inquiry-based learning result in harnessing effective thinking and metacognitive skills (Damopoli et. al., 2020, Nunaki, Jan et. al., 2019). It can yield more effectiveness than the more expository approaches to instruction as long as the learners are supported adequately (Lazonder & Harmsen, 2016). School climate is also a factor that helps in the success of the learning approach.

It is not a secret that one of the reasons why educational sectors are looking for ways to improve the quality of education of today's generation is that there is still the existence of low learning outcomes of students despite the efforts given. Low learning outcomes are the results of learning models (Andrini, 2016) that do not meet the needs of the present learners' of today. Learning models are important because it is the design that is implemented by the teacher inside the classroom. If the learning model is inappropriate to the needs of the learners, it will result in boredom, burnout, monotonous activities, and less grasping of the content that makes the learners less motivated to learn (Andrini, 2016).

In the context of other fields or subjects, Inquiry-based learning has also proven its effectivity and different studies supported these findings. In the published study of Kogan & Laursen, 2013, the application of inquiry-based learning in mathematics has engaged students not just in exploring mathematical problems but as well as proposing and testing hypothetical guesses and developing proofs to support their solution and explain their ideas about the subject matter. His study suggests that the benefit of active learning may be lasting and significant for some students (if not all). The same sentiments regarding effectivity of Inquiry-based learning in mathematics subjects were also the focus of the journal written by Caitriona Rooney, 2012. Samuel Kai Wah Chu, S.K. Tse, Ken Chow, 2011, found out that inquiry-based learning has a positive effect and impact on the development of students' information and literacy skills in different aspects of the field. Ali, Abdi 2014, has given proof that learners whose teacher applied Inquiry-based learning achieved higher scores than the ones that are taught traditionally while in the study conducted by Demet SEVER, Ph.D & Meral GÜVEN, Ph.D. (2014), results showed a significant difference between the pre and post-tests. There is a greater increase in the scores obtained by the experimental group than the controlled group and proven that Inquiry-based learning yields positive results and students had changed resistance behaviors.

SYNTHESIS

The articles, studies, and journals reviewed in this expository paper revealed that Inquiry-based learning has a positive effect on the performance of the learners across most fields of learning. However, it cannot be considered as a universal method (Skoda et. al., 2015) and the key to reaching its optimum positive results lies in the execution and application of the teachers as it needs to take planning and developing inquiry-based learning lessons into deep consideration (Wilson, 2020). Inquiry-based learning can be used in all fields of learning and is expected to yield promising results to learners' performance. However, the identified learning gaps for this study or topic are "The Effects of Teacher execution or application on the success rate of Inquiry-based Learning" and "Effects of Inquiry-based Learning on the Performance of Learners in an Online Class". The bottom line still entails the importance of the roles of the teachers and educators to the success of this learning approach.

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