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Review Article

Phenomenon-Based Learning for Teaching ICT Subject through other Subjects in Primary Schools

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Abstract

Due to the lack of practical usage of the learned subject, traditional learning is becoming an obstacle in front of further knowledge gaining. Classical learning methods are out-dated for the modernized world that required more productive, collaborative, and more curious individuals. Therefore, a new learning method is essential to provide knowledge and skills to pursue world development without falling behind. The purpose of this study is to find the positive effects of using Phenomenon-Based Learning (PhenoBL) as a studying approach in teaching ICT skills to students and its impact on giving the motivation and improving ICT skills for students at primary schools of Sulaimani city in Iraq. The key method is to teach ICTs through other classes with a universal as PhenoBL, the cross-curricular approach which is built into the classes. Then, a survey is established to uncover the reason behind making students learn about the ICT from places other than school and shortage in keeping those skills in student's mind for a longer time. Our results showed that using Phenomenon-based learning students' scores are improved by more than 10% which makes using this method significantly effective. Furthermore, using phenomenon-based learning allows the student to keep and maintain gained skills for longer periods of time.



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Introduction

Phenomenon-Based Learning (PhenoBL) provide significant growth in skill learning by students and supply them with creativity, critical thinking, refined communication, game-based learning, and collaboration. It depends on studying a real-world phenomenon in a holistic manner by covering every entity related to that phenomena by passing through the outlines between subjects. The most important demand of such learning process is originality and authenticity. PhenoBL is not established on a firm set of rules. It is mostly about student's active role in the comprehension of the phenomenon. in contrast with classical learning which students' role was passive, and depends on memorization of the

subject, PhenoBL actively makes the student participate in collaborative activities with the purpose of problem solving and question answering (Blogger, 2018; Silander, 2015; Zhukov, 2016).

On top of that puts the word with the idea of providing experimental learning and improved student autonomy to allow for deeper learning appearance. Deeper learning qualifies the student to bridge between gaps of a variety of subject areas. This fact is reported by a two-year study which established Dynamic Problem-based Learning in Chemistry performed by researchers at Hull University. The results of their work showed affirmative outcomes regarding skill enhancement, development, engagement, and critical thinking (Francis, Breland, Østergaard, Lieblein, & Morse, 2013). PhenoBL has four major advantages which are holistic learning, cross-subject learning, group learning, and cross-subject learning. Also, a student with PhenoBL curriculum does not become a passive receiver in the class, but rather proactive participant who contributes and learns from the subject (Raahan, 2016). Finland is one of the PhenoBL approaches in its curriculum which has been given a lot of attention by media. Their approach was taken into consideration that required teachers to teach one topic per year for every student and to be conducted based on PhenoBL program. exploiting the outside environment of the school and innovative utilization of technology play a considerable role in engaging, attract, and activate students in learning (Spiller, 2017).

As these facts above show that using PhenoBL in classes allows for improving learning skills by students to a further extent. It also helps students to expand their knowledge about many subjects and extends the period which they can use any learned skills. Using PhenoBL in schools and witnessing its effect in different places in the world beside Finland is crucial to find the effectiveness of this learning approach in different places. Since no PhenoBL related studies have not been done at Sulaimani city in Iraq. Therefore, finding the outcome of using PhenoBL as a part of the curriculum is important in the Iraq in term of students' overall score skills, and knowledge improvement.

In this study, we tested the effects of PhenoBL on students in primary schools at Sulaimani city in Iraq. We embedded PhenoBL into Kurdish language, math, and social subjects by teaching these subjects using ICT subject, which ICT subject is a new subject in studying for learning computer skills because ICT has issues for learning, an overview about issues presented in (İlgaz & Çelen, 2017). We intended to make the students learn and improve ICT skills using these subjects. Our analysis showed that using PhenoBL to teach

ICT skills using other subjects significantly improves their skills and helps them to maintain any learned skills for longer periods of time. This study is organized as follows: Related works discusses the previous research attempts in the area of PhenoBL. Methodology presents the plan for solving the issue of this study, Finding presents the working method and the results of the research process implementation. Finally, Discussion and Conclusion presents some concluding remarks and points for future works.

Related Works

In this section, we are going to discuss the previous researches which have been conducted in this area. In (Francis et al., 2013) the authors conducted a study to see the effects of PhenoBL on agroecologist to bring a rational connection between society and academia. They performed teaching based on experiences farm in communities which provided foundations of agroecologist course in Norway. The students, teachers and stockholders worked as teams in open-ended cases to indicate the key restrictions and possibilities in the future. They used real-world circumstance and situations on the farms where not know to neither clients nor instructors. Harnessing the social and natural science methods, the team tested and evaluated the social, economic, production, and environmental dimensions, as merged into the system. Their results became the base for earnest behavior in students' future efforts in education and development.

In (Valanne, Al Dhaheri, Kylmalahti, & Sandholm-Rangell, 2017) the authors conducted a case study they called Abu Dhabi School Model (ADSM) which intends to find the positive impact of integrating PhenoBL with storytelling on students' reading skills and improving their reading motivation. They constructed their study using a curriculum with a cross-curricular, holistic approach which was built into the stories. They chose classic stories for children, and the outcomes were taken and joined based on various stories to build a holistic picture. After conducting the study for three terms, the outcome showed that the reading skills of the students were improved in a significant way that (30%) students achieved a level beyond their age range in reading during the two terms. The student had an increased motivation to read and learn from the stories.

In (Symeonidis & Schwarz, 2016) the authors tried to test the PhenoBL method in learning and teaching, using the pedagogical philosophy of phenomena. They debated about the approach specification which is integrated into the curriculum, the ties to constructivism,

and theoretical grounding. They also explored the entangling learning and teaching a phenomenological point of view. They concluded that an active link between teaching and learning is curtailed when the objective is educational. Students are a side of the learning process; they do are not beginning it. Furthermore, the teachers cannot fully instruct it. Therefore, finding the meaning of the area between teaching and learning is an attempt to rectify learning for pedagogy.

In our previous works we concluded that using technology is more effective for learning than traditional learning (Ismajli, & Krasniq, 2018; Nawzad, Rahim, & Said, 2018; Wakil, Khdir, Sabir & Nawzad, 2019; Mohammed, Wakil, & Nawroly, 2018; Wakil, Muhamad, Sardar, & Jalal, 2017a; Wakil, Nasraddin, & Abdulrahan, 2018; Wakil, Omar, & Omar, 2017b; Wakil, Qaisar, & Mohammed, 2017c), in these works we present that the technology more useful for improving teaching and learning, but should be keeping balance between using and student healthy. In this study, we have present eda new way of learning techniques such as ICT class.

Purpose of This Study

The purpose of this study is to find the positive effects of using Phenomenon-Based Learning (PhenoBL) as a studying approach in teaching ICT skills to students and its impact on giving the motivation and improving ICT skills for students at primary schools of Sulaimani city in Iraq.

Method

To indicate the effects of utilizing Phenomenon-based learning, we conducted our work at three Basic schools in Sulaimani city in Iraq. Our purpose is to show how can phenomenon-based learning affect improve learning ICT modules such as Office Suit (i.e., Access, Excel, PowerPoint, and Word). This work has been conducted in three basic schools which are Hawar Basic school, Brayaty Basic school, and Rwansar Basic school. The students were from 7,8,9 grades. The students were divided into two groups, classical and Phenomenon.

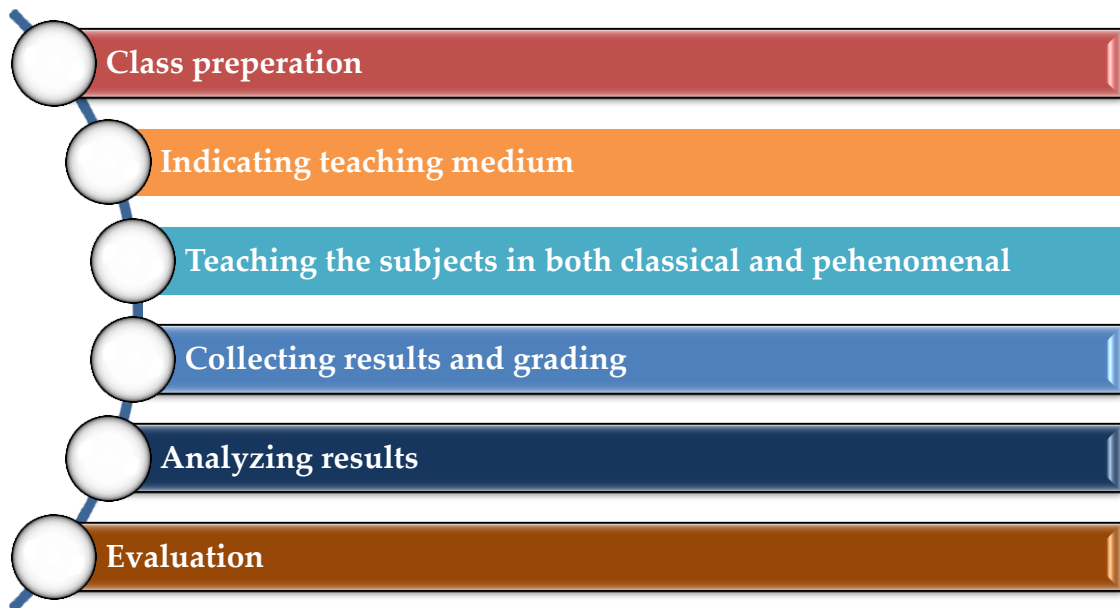


Figure 1. The working steps of this research

Then, they took classes for the duration of two weeks with their learning methods. The classical group took classes in ICT, Math, Kurdish language, and social subjects individually. While the phenomenon learned about ICT by studying Math, Kurdish language, and social subjects using ICT. After two weeks, and the exam had been held and the scores are collected, analyzed, and then evaluated. Finally, we compare the results of our evaluation to indicate the outcome of this study

Findings

The base of our work is to show the impact of PhenoBL on integrating other subjects with the ICT subject. We conducted our work at three different primary schools. We chose from 7,8, and nine grades with a total of 121 students. Then we divided them between two groups for each grade based on the learning method between PhenoBL and classical learning as shown in Table 1.

Table 1. Student distribution in the conducted study

Grades	Number of Students (PhenoBL)	Number of Students (Classical)
Grade 7	24	24
Grade 8	9	8
Grade 9	26	30
Total	59	62

The students in PhenoBL groups were studying the subjects integrated with ICTs. Such teaching allows the students to learn about ICT subject as well as their subjects.

However, the classical group was taking the subject in classical learning methods. After going through the learning process, the students completed their final exams' scores, and we could see the impact of the learning method on their scores. After checking the students' scores, we discovered that using PhenoBL helps the students to get a better understanding of the subjects in the class and thus improve the overall scores. Table 2 shows the exam scores for all three grades in both groups.

Table 2. The scores for all students in the study

Grades	Scores Percentage (PhenoBL)	Scores Percentage (Classical)
Grade 7	76%	56.54%
Grade 8	65.55%	68.25%
Grade 9	66.69%	58.68%
Average	69.41%	61.16%

As the results show, using PhenoBL can improve the students' understanding, and engagement of the taught subject increases thus improves their learning capabilities and skills. This fact is also supported in previous researches done in this area (Francis et al., 2013; Symeonidis & Schwarz, 2016; Valanne et al., 2017). After the exams, we had an interview with participated students in and asked them about whether they still can use the skills that they learned in the ICT while studying. The answers are shown in Figure 2.



Figure 2. Can you still use the ICT skills that you learned from your study?

As Figure 2 shows, 53% of students could still tap into the skills that they have learned during class. This is a good indication that using PhenoBL can help the students to use their skills for a longer period. From these results that we collected, and analyzed, we can indicate that teaching any subject in a holistic approach such as in PhenoBL can

significantly boost their engagement and learning capability. Also, using PhenoBL can have a considerable impact on student skills improvement and enhancing their scores. Furthermore, the skills that they learned from PhenoBL can last longer in their mind, and they can use whenever they need.

Discussion and Conclusions

Classical learning methods are becoming dull and less effective in the world's ever-growing knowledge. Therefore, utilizing a new learning approach is mandatory for students to help them to keep up with the fast pace of development in the modern world. In this work, we showed the positive impact of PhenoBL on overall student's learning. We conducted our work in few primary schools by teaching ICTs integrated with other subjects (i.e., Kurdish language, math, and social subjects) using PhenoBL side by side with a group that takes the same subjects and ICTs in classical teaching methods. We collected results formed both groups and analyzed them to draw valid results from them. Our analysis showed that using PhenoBL can significantly improve overall student skills in ICT and keeping those skills for a longer time in a student's mind. Also, PhenoBL helped the students to have better scores in their exams. Keeping learned skills and better scores are a very good fact which can show the positive impression of PhenoBL in student's overall knowledge.

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