THE IMPACT OF AUTHENTIC LEARNING ON ACHIEVEMENTS OF GEOGRAPHY STUDIES STUDENTS AND THEIR ATTITUDES IN THE DIRECTION OF GEOGRAPHIC INFORMATION SYSTEM

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ABSTRACT

The study objective was to check the impact of authentic learning (AL) on the achievements of Geography studies and attitudes in the direction of the geographic information system (GIS). For this purpose, mixed method studies research design was applied, and quantitative data gathered from the academic achievement test and through GIS attitude scale and qualitative data was collected through semi structured interviews. The data was collected in two groups. 40 students were consisting of control group and 40 were consist of experimental group of tenth class geography study students in Malaysia. Among of these, experimental group has been taught through the AL activities, whereas the control group has been taught through activities of textbook which was prepared according to the geography studies curriculum. The quantitative results shown that it was found a significant change within experimental groups scoring and was also a significant change within the experimental groups of average pre-test and post-test scoring in the GIS attitude scale. On the other hand, the qualitative results had shown that student were not bored during the classroom lectures in the course of geography studies, and they were being more active in the class. Along with these findings, the study added a body of literature that could helped to increase the new research area in future and could helped to the geography teachers and academic policy makers to know about the importance of GIS scale.

INTRODUCTION

Geography programs in schools teach a substantial percentage of the information, abilities, and principles that pupils will learn (Kılıçoğlu, 2014). The primary goal of ST is to assist students in developing specific skills and capabilities that will enable them to understand their role and obligations toward surroundings, society, and human values, as well as to improve people's lives and accomplish their social obligations (Aykaç, 2007). Living circumstances, on the other hand, were rapidly altering. Therefore, Life has become more difficult as a result of these developments (Baysal et al., 2018). The capacity to get required information, collect, utilize, and enhance this knowledge in many methods, being well-equipped by higher-level abilities, while becoming efficient and profitable are all methods which are adapted in today's situations (Akkus, 2015).

For assist students learn and develop high-order as well as analytical mental capabilities, several strategies have been developed and applied (Güneş et al., 2020). Many teaching methods nowadays motivate students should study from outside the class. Using today's modern resources, like computers or programs, after class activities may be performed thru the classroom (Ramazan & OKUMUŞ, 2018). While activities remain analogous to real-life circumstances, learning may be beneficial and long-lasting. Authentic learning (AL) tasks, in reality, may make a big difference in the learning environment. Situated learning is the foundation of AL (Bouw et al., 2019; Gulikers et al., 2005; Herrington et al., 2014).

The AL activities is combined inside this situational learning method, as can be seen in Figure 1 below. As a result, the phrases method and theory are deemed to be inappropriate for AL. For AL, it might be more suitable using the term model. Within the genuine learning paradigm, several teaching tactics and techniques, including presentation, creativity, analysis, lecturing, question-answer, debate, research papers, demonstration, challenge, and single, group, as well as then out-class teaching approaches, can be employed. There is "Problem-based learning, project-based learning, inquiry-based learning, situated learning, cooperative learning, and attached learning" is some of the strategies and processes which are utilized by AL method, according to the national literature. All of them, although are learning/teaching strategies rather than methodologies and tools (Abdeljaber et al., 2021; Adak et al., 2020; Afitah & Isra, 2021; Amirbek et al., 2020; Arau, 2020).

Learning information, abilities, and behaviors in a situation is referred to as situated learning (ARIKAN & ÇETİN, 2020). Brown, Collins, & Duguid's work "Situated Cognition and the Culture of Learning, published in 1989", is regarded as pivotal in the development of a situated learning paradigm. On the other hand, Jean Lave was the first to propose a theory for situated learning that is associated with the theory of social constructivism that relates to a circumstance that one experiences within a social system. Cognitive apprenticeship entails students' engagement using information and also the effective ability to apply knowledge inside a framework while they solve challenges and obstacles. However, contextual learning, like the apprenticeship

system, emphasizes the value of teaching methods in daily life by context (Herrington & Oliver, 1995). As give you an example, tailor apprentices acquire experience for cutting as well as stitching final items simply ironing them, which is a basic, important, and very real action (Walker, 2003). "Stories," "reflection," "cognitive apprenticeship," "collaboration," "coaching," "multiple practices," "articulation of learning skills," and "technology" are the eight core elements of situated learning. When employing this situated learning strategy together in educational environment, several elements must be taken into account for the purpose of better learning outcomes (Borrasca et al., 2014).

Another element that contextual learning emphasizes is interaction. Teachers must motivate pupils to learn through allowing them to connect with one another in social setting (Klç et al., 2015). Individuals develop their knowledge by observing the opinions, experiences, and methods of knowing of those in their immediate environment. Information also isn't absolute; rather, this is a product of the culture of the social context where it is found (Klç et al., 2004). Because learning occurs best in a framework, artificial and restricted educational environments fall short of establishing a background for learning. Students' wants and needs must be connected to what they learn, according to situated cognition. Education is a procedure of deducing meaning from real-life circumstances. As a result, courses must be linked to students' life and explained in practical situations (Ott et al., 2017). Situated learning highlights the importance of providing rich settings which represent the actual world and everyday activities and allowing students to implement their skills in circumstances that are comparable to realistic surroundings. Students could then apply the material in as realistic a setting as feasible, making links within various circumstances. This allows for a thorough grasp of such newly acquired knowledge, and the knowledge transfer towards other certain areas as needed. When confronted with real-world challenges during the process of learning, students will be able to perform their duties when receiving professional assistance (Saglam et al., 2003).

Instructors use the genuine learning model established as part of the situational learning strategy for the purpose of establishing learning scenario relevant with students' lives and associate it to actual occurrences in intended to facilitate students better organize the knowledge. The learning process turns out to be more significant, efficient, and beneficial as a result (Vignon et al., 2008). The AL focuses on ensuring long-term learning by recognizing the need for learning to be connected to actual situations (Öztürk et al., 2013). Dilmac et al. (2014) define AL as a process that begins using authentic tasks but also ends through authentic behaviors and assessments. The rest of the statement is also one of the things to be addressed in the implementation of the Ministry of National Education's updated curriculum in Malaysia: "Besides implies of events within and without the school, students should be exposed to actual problems and situations as well as allowed to apply conceptual understanding about social problems which they are face." geography seems to be a course, which because of its nature, focuses on real-world topics in designed to enable students handle social situations. Course of geography is, without a doubt, the best subject of educating students for social relationships in both a personal and social context, including for solving real-world challenges (ARIKAN & ÇETİN, 2020).

Through the geography course, students need to prepare for social life through real-world experiences (Güneş et al., 2020). As a result, both related to teaching and assessing topics, the AL model appears to be significantly related with the geography course. The experimental approach inside current research remained conducted out from the Tenth Level geography Syllabus Section "People, Places, and Environments." Landforms, its Influence of Atmosphere upon Human Activities, Population and Settlement, Catastrophic events and Environmental Challenges, and the Influence of Environmental Disasters at Our Everyday are among the topics and circumstances which students encounter virtually every day. Kab and Açıkalın (2016) point out that course can also provide students with information and interactions, but that comprehending daily situations is only feasible with participation-oriented observations that impact students' lives, or through genuine and AL. As a result, the AL model can be regarded toward being important in accomplishing the unit's learning objectives (Acar & Kayaoglu, 2020; Angus & Carson, 2020; Balbay, 2020; Deshmukh et al., 2020; Heland-Kurzak, 2020).

The majority of past research on genuine learning has concentrated on science, mathematics, especially language teaching (Abada et al., 2019; Akca et al., 2012). Tezer and Aynas (2018); Horzum and Bektas (2014); Belaid and Murray (2015); BELET BOYACI et al. (2017); Roberston and Barber (2017); Cotofana et al. (2020); Dadlı (2017); Dennis and O'hair (2010); Şahin et al. (2018); Finch and Jefferson (2013). On the other hand, In Malaysia, there's been a few researches inside the topic of ST learning (Baştürk & Alver, 2019; Gürgil, 2018). Thanks to the introduction of fresh technological advancement into the learning setting, Ajayi et al. (2017) argued that AL may be accomplished through scenario-, evidence-, as well as study teaching techniques. Development has enabled experimentation in ST as well, according to their research. AL practices, according to Baştürk and Alver (2019), help students build critical thinking abilities while also boosting their perspective toward the subject. AL practices, according to Tüzün et al. (2009), are more successful in changing attitudes about the course than traditional ones.

According to Dong et al. (2017), geo-media-supported AL activities are more successful after that traditional technique in enhancing students' educational success and views about the course, yet these activities must be connected with technology resources. Gonen et al. (2019) discovered that AL activities boost students' engagement for the course by providing the contents more real, relevant, and entertaining in an action study. The researcher also stated that students loved this activity and wished to do more of it; nevertheless, throughout the process of the study, various issues such as noise, big class sizes, seating areas, limited insufficient time, the conventional approach's influence, and the complexity of the subject have been detected. Inside this setting of Malaysia, there are just a few published research about use of AL activities in geography classes. For find out what students thought, the researchers utilized a mixed research methodology. As a result, this is hoped that the latest research can add to that same literature (Ajah et al., 2020; Akanle & Shadare, 2020; Altounjy et al., 2020; Heinrich et al., 2020; Nundkumar & Subban, 2020).

The purpose of this research would be to see how AL experiences affected social geography proficiency and attitudes about GIS. The following are the research's sub problems:

• Will there be a substantial change in the research group's mean pre - test and post attaining scores after implementing real learning process?
• Would there be a significant difference in mean pre and post - test final grades of the control condition that were taught utilizing geography curricular activities?
• Would there be a substantial difference within the experimental and controlling categories' mean posttest achievement scores?
• Would there be a notable change inside the experimental group's mean GIS Perspective Scale post - test scores?
• What are the opinions of students on the genuine learning model?

The independent variable was AL based instruction, whereas dependent variables were student accomplishment and attitudes about GIS. The researchers chose such independent variables because they believe real learning practices will have an impact on students' success and opinions regarding GIS. GIS provides genuine environments where students may gather and generate actual data relevant to their everyday lives, according to Goodchild et al. (1990)and Keiper (1999). Furthermore, case research has demonstrated that computers may be utilized to improve constructive participation in complicated, authentic work (Jonassen, 1996; Means & Olson, 1994). GIS, according to Alibrandi and Palmer-Moloney (2001), fosters real learning. In December, in accordance with standards, an experimental technique remained implemented. In December, AL processes were held in the classrooms based on seasonal drawbacks. Geographic Information Systems (GIS) were designed as being the most effective teaching method tool for both instructors and learners. Such technology enables students can view locations they hadn't seen before draws their attention, making studying easier (Alvinius, 2012; Amarulla Octavian, 2020; Auriacombe & Sithomola, 2020; de Souza et al., 2020; Van Schalkwyk & Bevan-Dye, 2020).

THEORETICAL BACKGROUND

The learning could be considered effect and permanent when the activities are considered to be similar on the situations of actual life. In reality, the authentic learning (AL) could be considered a big contribution in the environment of learning. The AL had their roots in the leaning of situation (Gulikers, 2005). The AL model is incorporated within situational learning approach that is predicted in Figure.1. As a result, it is believed that the approach and theory could ne be used for the real learning. This could be more accurate to refer to authentic learning as a model (Duke & Osim, 2020; Kyurkchiev, 2020; Moral-Campillo et al., 2020; Virginia-Añez et al., 2020). Within the ALA model, a range of teaching tactics and methods, such as presentation research, lecture, question answer, solving of problem, group learning, individual learning and teaching techniques out the class etc. could be used. According to the national literature, the authentic learning (AL) models' methodologies and approaches contain "problem-based learning, project-based learning, inquiry-based learning, contextual learning, cooperative learning, and connected learning."

All these could not consider to be technique or methods in and of themselves but rather learning approaches.

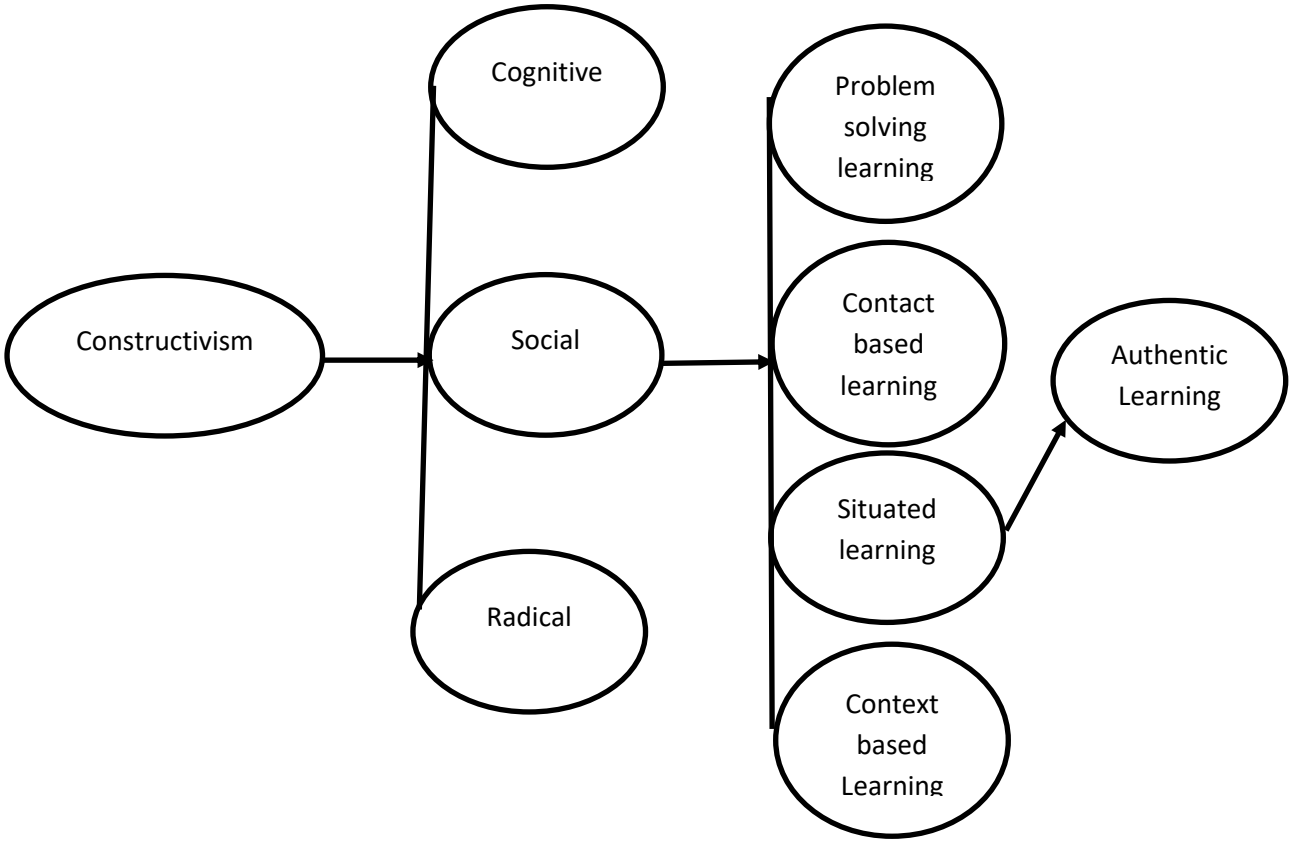

Figure.1: Theoretical Construction of Authentic Leaning

RESEARCH METHODOLOGY

The researchers used an explanatory mixed methods strategy in their study, which included quantitative and qualitative research processes (Creswell et al., 2011). The influence of authentic learning (AL) and geography curricular tasks upon this learning environment was depicted using primary and secondary methods. For the duration of the quantitative component of the investigation, the quasi-experimental nonequivalent management team pretest-posttest approach has been used. The six-week judge sentenced 6 weeks in total. The experiment must be done on two 10th sections, which were assigned to the experimental class and the other to the control group at random. Throughout the experiment, both groups were measured. The courses were delivered using actual learning activities in the experimental group and geography curriculum in the control group. Semi-structured interviews involving nine students first from experimental group were used to collect data for such qualitative phase. These nine children were chosen in the following order: three had the highest accomplishment test marks; three obligated the lowest achievement test marks, as well as three had a medium accomplishment test mark. The discussion of both the qualitative and quantitative data had been discussed jointly.

Respondents and Research Instruments

The research population for the 2019-2020 academic years was made up of tenth-grade students from Kedah state of Malaysia. The participants in the study were tenth graders representing 2 sections of the school system that were chosen at random from the general population. There were 80 students in the study group; half of participants were placed inside the control group, while the other halves were placed in group of experimental. The independent T-test was employed to analyses the pre-test gathered data. Both groups namely experimental group and control group are considered to be a analogous of achievement of geography and attitude towards the GIS technology as per the findings.

The geography academic ability exam employed in this current research was designed with the 2020-2021 school year's Tenth-Grade geography Curriculum in mind. The achievement test questionnaire items were written to match the learning goals those students are anticipated to acquire over the course of the six-week experimental technique. The researchers created 44 four-choice questions. The geography education professional, a geography teacher, an assessment, and reporting specialist, as well as a Malaysian education expert all scored the questions. Based on their comments, six questions have been removed from the achievement test. Preliminary research was established to assess the proficiency question's reliability and validity. The final edition of the achievement test currently includes of 20 questions. On the other hand, the geographic Information Systems (GIS) Attitude items adopted from the study of Baloğlu Uğurlu (2007) which was measured on five point Likert Scale by 20 items (11 positive and 9 negative). Negative things are scored in the reverse way. The scale has a highest score of 100 and lowest values of 20. 81 to 100 denotes strongly agree, 61 to 80 denotes agree, 41 to 60 denotes average, 20 to 40 denotes disagree, while 0 to 20 denotes strongly disagree. The variance inside this attitude scale is explained by three components, which explain about 54% of such variance. Therefore, Cronbach's alphas for the entire scale were determined toward being 0.87. The experimental group's Cronbach's alpha coefficient was 0.924 before the test and 0.901 after the test. At each measurement, the coefficient of KR-20 and the value of crohn bach alpha was greater than 0.70. Therefore, the achievement test and aptitude test utilized in this study can thus be confidently characterized as reliable measurement tools.

On the other hand, the semi structured interviews were utilized for the authentic teaching (AL) to study the perception of the study about the instruction of geography teacher. The semi-structured interview form's intelligibility and application were assessed by two geography education professionals from the geography educational professionals and Malaysia education specialist. Based on their feedback, the form was updated. In addition, the accessibility of the interview questions was determined by polling a tenth-grade ST instructor. As a result, the interview form was given its final shape. The interview form was used to interview nine children with varying levels of achievement. Their responses, as well as those of their parents, were recorded with their permission. The following questions are included on the interview form: Would you believe the course's AL methodology aroused your interest? Whatever makes you

consider of the course as well as the AL activities you participated in? What are your thoughts on using GIS software for geography classes? Where are the advantage of incorporating an AL paradigm into a ST class?

DATA ANALYSIS

The research was planned an experiment. This was based on six-week method that lasted eighteen course hours, as described in the Tenth-Grade geography Curriculum Unit. This unit is crucial in the development of high-level talents. According to the Pradana et al. (2020), the unit shall assist pupils in developing abilities including such environmental knowledge, map literacy, and observation, and also awareness towards the environment and collaboration. The experimental group received instruction through actual learning activity, while the control group received instruction through geography textbook exercises. The clippings, working sheets, taboo games, films, scenario assessment report, stories and painting where employee were laboring within the duration of six weeks along with the eighteen course hours of experimental group. In keeping with the idea of genuine learning, the actions were intended and accessible towards the pupils in terms of actual situations. To keep up with current and topical problems, the knowledge and skills were considered throughout the activities design. As a result, pupils' curiosity was maintained throughout the activities, allowing for a variety of results and solutions. Pupils were assisted at the start of a learning process in recalling earlier knowledge and examples of real life. Careful consideration was given to assisting students in questioning subjects and applying their learning in real-life settings. Furthermore, throughout in activities, the process of learning was aided by the constant use of technical capabilities, especially GIS. There geography education professional, an evaluation and monitoring professional, and an educational sciences specialist were consulted for their expert opinions on the activities produced by the researchers. The tenth-grade geography teacher was given the instruction the genuine learning model and the proper accomplishments must be carried out prior to the experimental process. The teacher willingly took part in the experimental technique.

Content analysis was used to analyze the semi-structured interview material. The researchers analyzed the content of such semi-structured interview data. The researchers coded independently of one another. It might be argued that the coding is reliable in this study. The female students were coded by FE and male were coded by MA. Six of the pupils were female, while three were male. SPSS (IBM) version 23.0 was used to analyze the quantitative data. The threshold for significance was set at 0.05.

DATA ANALYSIS RESULTS

The First, second and third sub problem results was test. For this purpose, the data normality was being verified, and the "Kolmogorov Smirnov and Shapiro-Wilk" (KMO) test findings, as well as skewness and kurtosis values were analyzed to choose the proper analysis solve the study's 1^{st}, 2^{nd}, and 3^{rd} sub problems. The results of the research revealed that the data was normally distributed. Repeated measures ANOVA had been used in this case, as well as the findings are provided in table. 1.

Table.1: Repeated-Measures ANOVA Results

	Squares Sum	**df**	**Square Mean**	**F Test**	**P Values**	**Significance Difference**	**η2**
Pre Post-Pre Post Error	571.868 1421.492	3 88	187.253 15.190	12.438	.0000	1-2 2-3	.288
Total	**1993.460**	**91**					

The repeated measures ANOVA was confirmed by Mauchly's test of sphericity (W (5) = 807; p =0.312). As a result, it was found difference which was significant within experimental and control groups' mean pretest and posttest scores, with a substantial effect size (F (3; 77) = 13.337; p = 0.000; 2 = 0.397). The source of variation was identified using the Bonferroni multiple comparison test. In this regard, the difference within the groups average pretest and posttest scores had been in favor of both the posttest (X pretest = 8.33; X posttest = 16.14). There was also a difference within the mean of experimental groups post-test scores and mean of the control group pretest scores (X posttest = 16.14; X pretest = 16.90) in favor of the experimental group's mean posttest scores. Nonetheless, there was no statistically significant change within the control group's mean pretest and posttest scores (X pretest = 16.90; X posttest = 13.10). There had been a differential, but it was not statistical significance within both the experimental group's average posttest scoring (X posttest = 16.14) as well as the control group's average posttest scoring (X posttest = 13.10) in favor of the experimental group.

Moreover, the study four sub problems were "What are student's perceptions on the AL model?" For this purpose, the 9 pupils were interviewed. Among of them the 6 were female and 3 of those were male. The interview collected data was examined through the content analysis. Table 3 summarizes the study's findings.

The 9 student's perspective was being classified learning model into the four categories and divided into two themes. In addition, the codes were thematically categorized in conjunction with each student's statements. Student enthusiasm and engagement in the course, benefits of GIS, academic accomplishment, and expectations of student are among the categories. The motivation of student and in course enthusiasm had the most codes (F21), whereas "student expectations" had the fewest (f: 9). Student responses to a course's contributions to AL have included codes "active learning (9), fun learning (8), inspiring curiosity (3), and belief in achievement (1)." Such codes have been grouped together under the heading "student engagement and motivation inside the course." These exact reasons given by students for every code:

"We were always studying before; thanks to these activities, our classes are more fun. I do not get bored but rather enjoy learning" (FE1).

"I used to think geography was boring, but now I enjoy it and I think I will be successful" (FE2, MA9).

"I did not enjoy the geography course, but now I enjoy it. Listening to the lecturing alone was very boring at first, but the classes have become more enjoyable thanks to the activities and my interest had increased a lot" (FE3).

Table.3: Students Perceptions About the Authenting Learnings

Themes	**Categories**	**Codes**
Contributions to the study	**Student Motivation enthusiasm in the Course**	Arousing curiosity (AC)
		Belief in achievement (BA)
		Active learning (AL)
		Fun learning (FL)
	GIS benefits	Learning landforms (LL)
		Bringing detached places (BDPN)
		Permanent Learning (PL)
		Locations explored (LE)
	Academic accomplishment	Reminding knowledge (RK)
		Exam success (ES)
		Fast Learning (FL)
		No memorization (NM)
Limitations	**Student Expectations**	Inadequate course hours (ICH)
		Continence of activities (CO
		Authentic learning in different courses (ALDC)

Note: FE: Female, MA: Male

"I never get bored with this course and 40 minutes session is like a one minute long one" (MA5).

According to the students' perspectives on AL, previously they were originated that course was very dull because they were studying constantly without activities, and at the present the course really wasn't boring; rather, the activities they completed made the course engaging. Moreover, they were also stated that they now loved the course and had a greater fun while with the studying and the interest of the students had increased with the course grew, and they are being felt now more confident in their ability to complete the course. The codes were also included in student opinions on the active learning authentication to the course. "Locations explored (7), permanent learning (3), bringing distant places nearer (3), and learning landforms (2)". These subsequent codes remained being categorized underneath the heading of GIS assistances". The coding reasons about the students are below.

"Using GIS, I have gained all the geographic information I did not know. GIS brings distant places near to us" (FE1).

"We can check the places we want to travel to and learn about their geographical location and landforms immediately. It is like going to places we do not know, to the places we have not seen. It is like as if even faraway places are coming to us" (FE2).

"With GIS, I have seen plains, mountains, and rivers I have never been to. When you see faraway places, it feels as if you were going there. Now I can see any place in the world" (MA5).

"I like the GIS software because it showed us places, we did not know" (FE6). According to the students' perspectives on AL, they thought that distant areas were closer since, owing to GIS, they indicated distant places which have not seen earlier, and so they enjoyed this exercise. They further stated that they can somehow travel to any location on Earth and learn about geography very swiftly.

Students' perspectives on the course's contribution of actual learning involved the codes "Reminding knowledge (3), exam success (3), fast learning (2), and no memorization (2)." Following codes composed underneath the heading "academic success." The following causes given from code of every student:

"I do not forget the subjects thanks to GIS. When I am asked about these, I answer immediately" (FE1).

"I could keep the subjects we were taught in my mind for a longer time. I could learn without getting bored or memorizing" (FE2, FE7).

"It was a very fun process. So, my achievement increased, and my exam grades were higher in this course" (MA4).

"I easily retained most of the information in my mind. I am better prepared for exams. When the teacher asks questions, I give better answers. I make fewer mistakes in exams" (FE6).

"I used to have difficulty solving questions about geography and now I am better. I answered all the exam questions pertinent to this unit" (MA9).

The pupils indicated that we learnt various themes along without any revisions and without boring in the class, that were not forget about their learnings, and that they were available for questions about the issues provided. On the other hand, they were also identified that the process was quite enjoyable, that they made fewer errors in both of assessments of exams and quizzes, and that their success rates improved.

The code was used by students to express their opinions on the constraints of AL. "inadequate course hours (3), continence of activities (3), and AL in different courses (3)". The categorization was under "student expectations" subheadings. The following are the explanations specified by the students about each code:

"Geography lasts three hours, so I did not have time to play taboo. Sometimes I did it at home because I did not have time" (FE1).

"I think authentic learning should be used for every course" (FE8).

"I think I will understand more quickly if such activities are always used in geography or in other courses" (FE3).

"I want authentic learning processes to continue and to be used in other courses" (MA4).

"I want authentic learning classes to continue. I want to do more activities and have more geography courses" (FE6).

Students claimed that due to short geography subject hours, they have been unable to complete certain exercises, and that they finished these responsibilities at home. In addition, they also highlighted the importance of continuing these exercises and implementing them into future courses.

Overall, it has been found that students were not being tensed from the geography course due the activities of classrooms which shows the participations of the study more effectively and this is a reason they enjoy. They also believe that they will be more effective under the categorization of the "student motivation and enthusiasm in the subject. According to the category of GIS benefits," the students had seen and learnt about remote landscapes that they would have not previously had the opportunity to see, and their understanding was better and more permanent as a result. Within the "academic success" it was found that classes were taught by using the AL technique which improve the student's exam ability and test scores and students also learned the subjective without memorizing their concepts and were not forget their concepts dues to the class activities. It was also found that geography course hours were insufficient for completing their activities, and they further examined that AL activities must also be used in the classrooms other than geography under the heading of "student expectations."

DISCUSSION AND FUTURE RECOMMENDATIONS

The average performance on the pretest and posttest averages of the experimentally given subjects utilizing AL accomplishments were shown to differ significantly, with a substantial effect size. The control group's mean pretest as well as posttest academic outcomes employing activities from the geography curriculum, however, did not differ significantly. The control group's mean achievement score increased, although this existed not significant, according to the results of the analysis. These findings be situated in line with previous research that has found that engaging in AL activities improves academic performance (Aynas, 2018; Bay et al., 2008; Çelebi & Aydın, 2019). There is AL enhances learning, according to earlier research (Gürdoğan & Aslan, 2016), creates concepts easier to comprehend (Akca et al., 2012) This significantly enhances the learning experience (Safuan & Soh, 2013).

Pre and post-test GIS Attitude Mean scores of the experimental educated through actual learning activities were found to be significantly different in this study. The difference had a medium effect size. This conclusion is in line with prior study, which has found that AL exercises have just a significant positive influence on the attitudes concerning courses. (Aynas, 2018; Baştürk & Alver, 2019; Belaid & Murray, 2015), ensures student happiness (Wornyo, Klu, & Motlhaka, 2018), as well as improving student interest (Gürdoğan & Aslan, 2016; Rieländer et al., 2014). Yeen-Ju et al. (2015) originate the employment of AL observes in technology-enabled classrooms in academic organizations has been demonstrated to be effective. Learners were a little more motivated to take part for the duration of class as well as appreciated the process of AL after they established an online educational platform for developing a more AL atmosphere. The page of blog use that assimilated the internet with the course allowed primary school learners to complete activities in AL environment, according to Guner-Ozer and Belet Boyac (2020), and they were pleased that such actions were considered to be visible to everyone. GIS exercises have also been demonstrated to increase student motivation. (Akinci et al., 2004; Bulut et al., 2007).

Through semi-structured interviews, the study evaluated student perspectives on the AL paradigm in the qualitative phase. The content analysis of the interview data resulted in the creation of the following categories: "student motivation and excitement in the course, advantages of GIS, academic accomplishment, and student expectations." The results of the investigation revealed that pupils did not become bored with geography, but rather enjoyed it. Because of the activities they undertook in the classroom, they believed they would succeed and participated more actively in the course. Because of GIS, they were capable to see structures they hadn't seen previously and develop a better knowledge of them. They were capable of learning for longer periods of time. They discovered that the amount of time given for geography classes was insufficient for actual learning. They believed that AL accomplishments must be utilized in other classes, including geography. These findings corroborate previous research that true learning experiences are pleasurable. Hamurcu et al. (2016), Enable learners to take an active role in classroom (Coşkun et al., 2017; Ulusoy & Dilmaç, 2012), Enhanced student engagement (Motlhaka & Wadesango, 2014; Westberg & Leppien, 2018), Problem-solving, creative planning, as well as communication abilities should all be improved (Hockings et al., 2015), foster collaboration (Güneş et al., 2020), critical thinking, and creative (Karabulut et al., 2016), make it easier to connect course topics to existent-life circumstances (Aynas, 2018; Kern et al., 2018), present students with a one-of-a-kind learning opportunity inside a actual-world setting (Church et al., 2013), can result in a beneficial shift in students' intellectual capacity (Kristan et al., 2018). In addition, Dennis and O'hair (2010) most significant impediment to AL seems to be a shortage of time creating materials, as well as the AL procedure necessitates construction schedule and time management skills.

In the discipline of geography, a literature search identified little research mostly on authentic learning (AL) approach. Having stated that, there is no research on the impact of AL on views regarding GIS in the literature. As a

result, this study addresses a gap in literature by looking into the impact of AL activities on geogrpay achievement and attitudes toward GIS. The utilization of a mixed method for the methodology of research and numerous data assortment instruments, effect size ratings measurement, and the justifications of the theoretical framework were all strengths of the study. Authentic activities and GIS had been found to be in good harmony within the study's scope. The usage of technology enhanced student motivation for the course, as according to student assessment. Based on previous discussion, the current study had some practical and theoretical implications. Firstly, this study added a body of literature that could become new research area in future. Secondly, the study could also help to researchers and academicians to know about the importance of this topic to increase the strength of future study. Thirdly, the research could help to teachers of geography department to know about the importance of authentic learning and geographical information's system that could helped in the classroom teaching and to increase the learning capacities of the students. Fourthly, the study could also help to the educational policy makers and to the higher and lower educational authorities to improve the educational system.

This study has certain limitations in addition to the positives indicated above. The study used only tenth-grade pupils as a sample, but future research might use different samples. Planning AL exercises with no single correct solution is especially crucial. Students should be able to create a new perspective on subjects through activities. Students' questioning, criticism, and critical thinking skills, as well as the ability to respect others' perspectives, develop as a result of this activity. Using other disciplines like physics and mathematics as part of an interdisciplinary approach throughout AL activities is beneficial and draws students' attention. Further research may be conducted to see if the genuine learning paradigm had an impact the taut of skills in the curriculum. Teachers can share strategies with the students for the AL activities on the internet sites. Moreover, future research could be done on other developing nations to increase the generalizability of the study. The future could also be done from taking respondents of college level to increase the variations in the results.

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