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RESEARCH PAPER

Effect of Experiential Learning on Academic Achievements of Student at Secondary Schools of Lahore

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ABSTRACT

The main objective of this study was to measure experiential learning's effect on students' academic achievement. The researcher used quantitative research design and under the umbrella of quantitative research design ABA experimental research design was used. The researcher used convenient sampling technique to select the sample of the study. One-way ANOVA was applied to find out the effect of experiential learning on students' academic achievement at secondary school level, the results shows that there is significant difference of students' academic achievement through experiential learning in secondary schools of district Lahore. In the present study, it is concluded that students at secondary school level of District Lahore have significant difference of academic achievement. It was concluded that when students learn through experiential learning they show positive increase in their academic achievement. The study recommends that proper teacher training may be provided to the teachers to equip them with experiential learning techniques. The teachers also need to put more focus to teach the students through experiential learning techniques.

KEYWORDS: Academic Achievement, Experiential Learning, Practical Skills and Collaborative Learning

Introduction

Experiential learning is an ideal learning model that allows for direct, primary engagement with academic materials and course content. This model of learning encourages students to constantly reflect on their experiences. They develop practical skills and better understanding of themselves in relation to their communities, both local and global. With this model, students are given the opportunity to practically apply the skills they learn in the classroom. Through engagement with the outside world, students are able to connect with their communities and realize their passions in a more tangible way than with traditional schooling. In such a rapidly changing world, hands-on experience with problem solving, project building, and collaborative learning are important skills students need to succeed (Akpınar et al., 2022).

In its simplest form, experiential learning means learning from experience or learning by doing. Experiential education first immerses adult learners in an experience and then encourages reflection about the experience to develop new skills, new attitudes, or new ways of thinking. During the last decade experiential learning has moved from the periphery of education to the center. No longer supplemental to the acquisition of content, experiential approaches are considered fundamental to meaningful learning (Brame & Biel, 2022).

Experiential learning is a philosophy of education based on what Dewey (2022) called a theory of experience. He argued that while traditional education had little need for theory since practice was determined by tradition, the new experiential approach to

education needed a sound theory of experience to guide its conduct. In this context researcher has examined the theory of experiential learning (Hanisyah et al., 2022) to explore how this knowledge can be used to enhance learning and how experiential learning affects cognitive abilities of students.

Experiential learning theory draws on the work of prominent 20th century scholars who gave experience a central role in their theories of human learning and development notably (Dewey, 2022; Wheeler, 2008), and others - to develop a holistic model of the experiential learning process and a multilinear model of adult development (Hanisyah et al., 2022). The theory is built on six propositions that are shared by these scholars:

Learning is best conceived as a process, not in terms of outcomes. To improve learning in higher education, the primary focus should be on engaging students in a process that best enhances their learning - a process that includes feedback on the effectiveness of their learning efforts. As Dewey notes, Education must be conceived as a continuing reconstruction of experience: the process and goal of education are one and the same thing (Dewey, 2022).

All learning is relearning. Learning is best facilitated by a process that draws out the students' beliefs and ideas about a topic so that they can be examined, tested, and integrated with new, more refined ideas.

Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. Conflict, differences, and dis- agreement are what drive the learning process. In the process of learning one is called upon to move back and forth between opposing modes of reflection and action and feeling and thinking.

Learning is a holistic process of adaptation to the world. Not just the result of cognition, learning involves the integrated functioning of the total personal thinking, feeling, perceiving, and behaving.

Learning results from synergetic transactions between the person and the environment. In Piaget's terms, learning occurs through equilibration of the dialectic processes of assimilating new experiences into existing concepts and accommodating existing concepts to new experience.

Learning is the process of creating knowledge. ELT proposes a constructivist theory of learning whereby social knowledge is created and re- created in the personal knowledge of the learner. This stands in contrast to the transmission model on which much current educational practice is based, where preexisting fixed ideas are transmit- ted to the learner. ELT defines learning as the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience (Hanisyah et al., 2022)

The experiential learning portrays two dialectically related modes of transforming experience Reflective Observation and Active Experimentation. Experiential learning is a process of constructing knowledge that involves a creative tension among the four learning modes that is responsive to contextual demands. This process is portrayed as an idealized learning cycle or spiral where the learner touches all the bases experiencing, reflecting, thinking, and acting - in a recursive process that is responsive to the learning situation and what is being learned. Immediate and concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can be drawn. These implications can be actively tested and serve as guides in creating new experience (Carr et al., 2021).

Teachers know that a student at secondary school level learns more quickly and retains more information when the subject matter pertains to them personally. The act of *doing* makes learning extremely personal. As Sir Richard Branson says, you don't learn to walk by following rules. You learn by doing, and by falling over. The process of experiential learning involves both self-initiative and self-assessment, as well as hands-on activity. Students may tune out lectures if they think the material doesn't pertain to the "real world." Experiential learning takes data and concepts and makes them "real" by applying them to hands-on tasks, with real results. As the student interacts with the information, it becomes real to them. In the "real world," problems often have more than one solution, and "two heads are better than one." Experiential learning enables the student to engage the creative portions of their brains and seek their own unique and most fulfilling solution to a hands-on task. This creativity, and the variety of results produced, enriches the classroom – and society – as a whole. The experiential learning engages the students' emotions as well as enhancing their knowledge and skills. When students see the concrete fruits of their labor, they experience greater gratification and pride, thus enhancing their enthusiasm for continued learning (Haak et al., 2022).

Many experiential learning projects are career-oriented, because they are, by nature, grounded in "real-world" activities. Through these activities, students start to discover and develop their own skills, aptitudes and passions. Secondary school education is very important for students because at this level student take decisions about their future career. Experiential learning develops skills and aptitude in students and they start to discover their potentials and future goals. Experiential learning helps students to select a more defined path to their higher education after matriculation. This study will examine the effect of experiential learning on academic achievement of secondary school students (Johnson & McCoy, 2011).

Statement of Problem

Experiential learning provides students with the hands-on and minds-on learning. Basically experiential learning is "learning by doing". In Pakistan traditional learning technique is being used and no work is done on implementation of experiential learning technique in classroom. The Government of Pakistan is trying to implement experiential learning technique in schools but it is not working due to less provision of teacher-training-programs. Also it is difficult for the teachers to accept the change. Students are future of the nation because their contribution can bring advancements in many fields. The students should be equipped with the practical and meaningful knowledge. The present research will be designed to investigate the effect of experiential learning on academic achievement of the students at secondary school level.

Research Hypothesis

H_{01}: There is no significant effect of experiential learning on academic achievement of students at secondary school level.

Literature Review

The current study will focus on the effect of Kolb's Experiential Learning Technique on student's academic achievement. (Lorenzo et al., 2019) claims that since the instructional approaches around the cycle of learning models are similar, it is not important, which learning style instrument has been chosen. Among the various learning style theories, Hanisyah et al. (2022) defines learning as the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience was chosen to underpin this study. (Felder, 2007) describes learning styles in the ELT of Kolb as the individual's intellectual approach to the processing of information.

Experiential learning approach asserts that acquisition of skills and construction of knowledge by the learners is direct result of experience. The learner is said to have the ability to select and to participate in experiences that will further their growth (Wheeler, 2008). Experiential learning can exist without a teacher and relates solely to the meaning making process of the individuals' direct experience. This is in agreement with (Akpınar et al., 2022) who asserts that experiential learning is equivalent to personal growth and change. According to (Brame & Biel, 2022) experiential learning approach elevates students' cognition levels, increases use of critical thinking skills and therefore enhances students' ability to obtain, retain and retrieve knowledge hence increased achievement. Learning is a cycle that begins with experience continues with reflection and later leads to action which itself becomes a concrete experience for reflections. (Hanisyah et al., 2022) developed a model of how students can learn. In the Kolb's experiential learning model the process of learning is divided into four stages all of which must be gone through for learning to be most effective. The stages include:

a) **Concrete Experience**: This provides the basis for the learning process. The lessons at this stage engage the individual personally and learning relies on open mindedness and adaptability rather than a systematic approach to situation or problem. There is involvement in personal experiences and an emphasis on feeling over thinking. The role of the teacher is to describe the activity while the students perform. Creative work involves a certain amount of pre-existing domain knowledge and its transformation into new knowledge (Carr et al., 2021).

b) **Reflective Observation:** In this stage the learners make sense of the experience. They focus on understanding the meaning of ideas and concepts by careful observations. They are also concerned with how things happen by attempting to see them from different perspectives. Learning occurs as a result of patience, objectivity, careful judgement and observation. Reflection helps students break their experiences into parts and to categorize them for use in the next stage of learning. Students develop logical thoughts, verbalize those thoughts, relate to others in the group and compare experiences and opinions. The applications of classroom knowledge in the context of real world situations are the focus of learning (Arnold, Warner & Osborne, 2006). The role of the teacher is to promote an atmosphere of acceptance of individual participants and diverse thinking. For learners to become creative in mathematics learning it is important for the teacher to design activities that help learners to construct meaning and think for themselves by having a critical mathematical eye (Felder, 2007)

c) **Abstract Conceptualization:** This is where the learner assimilates and distils the observation and reflections into a theory. The students come to understand the general concept of which their concrete experience was one example by assembling their experience into a general model. Abstract conceptualization requires student to use logic and a systematic approach to problem solving. There is emphasis on thinking manipulation of abstract symbols and tendency to neat and precise conceptual systems. The students share their reactions and observations about their experiences. The learners at this stage provide answers to the questions arising from the experiences by providing solutions and making generalizations. According to National Council of Mathematics Teachers (NCTM) (2000) the ability to solve a problem with several strategies or the ability to reach different answers in a specific task are valuable evidences of the development of mathematical reasoning (Dewey, 2022).

d) **Active Experimentation**: Emphasis in on practical applications, testing theories that lead into new experiences. In this stage students use the theories they developed during the abstract conceptualization stage to make predictions about the real world situations. They connect subject matter and life skills discussion to the larger world. Students' actions are a new concrete experience. The learners are expected to use or test the conclusion, generalizations and solutions in new situations (Hanisyah et al.,

2022). The learner involvement facilitates personal growth and skill development, giving a measure of empowerment to the learners. Figure 1 shows these stages with the activity for each stage.

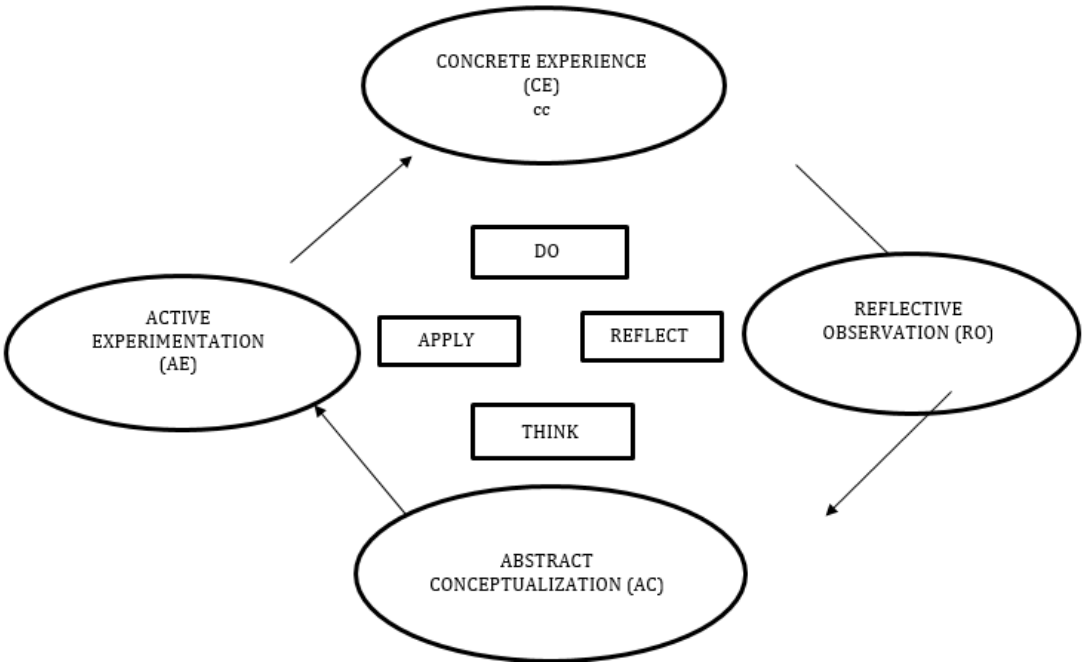

Figure 1 Conceptual Model

The second word in each of the four stages indicates what the learner experiences. The learner begins by having an experience that involves him or her in a situation (experience) and then reflects on the experience from several perspectives (observation). From these reflections the learner draws concepts or conclusion and formulates them into theories or models (conceptualization) that lead them to experiment or act also called as experimentation (Haak et al., 2022).

Experiential Learning Technique (ELT) suggests that learning is a cycle that begins with experience, continues with reflection and later leads to action that becomes a concrete experience for reflection (Hanisyah et al., 2022). In the Experiential Learning Model, there are four phases of the learning cycle, namely concrete experience (CE), reflective observation (RO), abstract conceptualization (AC) and active experimentation (AE).

However, most of the studies showed that not all learners equally experience each phase of the cycle, nor is any phase of the cycle more important than the other phases. This suggests that the preference of learners among the phases of the cycle does not make them any better or worse learners (Lumpkin et al., 2015).

Accommodating learners perceive through concrete experience (CE) and process by active experimentation (AE). Accommodating learners are most interested in doing things. They grasp their environment concretely through their feelings and utilize action to transform information (Hsu, 1999). They are risk takers and they enjoy finding out new experiences. They solve problems using a trial-and-error method instead of using their analytical abilities. Also, these learners rely on others for information and they prefer to work with others to do assignments, to set goals, to do field work and to test various approaches for design alternatives (Partin et al., 2013).

Diverging learners perceive through concrete experience (CE) and process by reflective observation (RO). These learners are imaginative and emotional (Wulandari &

Wulandari, 2013). They have the ability to synthesize and/or assimilate various observations for new idea generation (Partin et al., 2013). They are less concerned with theorems and generalizations. Their approach to problem solving is not systematic, but is more creative in comparison to the other learning styles. These learners when working in-groups listen to the suggestions of others and accept critiques from them.

Assimilating learners perceive through active conceptualization (AC) and process by reflective observation (RO). They experience their world symbolically and transform information through thought (Johnson & McCoy, 2011). They are more concerned with abstract concepts rather than practical applications. These learners prefer readings, lectures and exploring analytical models (Hanisyah et al., 2022).

Converging learners perceive through active conceptualization (AC) and process by active experimentation (AE). These learners bring logical, pragmatic and unemotional perspective to the problem solving process. Their knowledge is organized and they do hypothetical-deductive reasoning while focusing on a specific problem (Smith & Kolb, 1996). They are unemotional and prefer to focus on things rather than people (Smith & Kolb, 1996). These learners prefer to experiment with new ideas, simulations and practical applications (Hanisyah et al., 2022)

Research Methodology

This section deals with methodology strategy under which research was carried out. All the steps taken from the beginning to the end of the research work were technically known as a research methodology. Following were the steps that would be adopted to conduct this research.

Nature of the Study

The study was quantitative in nature. The type of the study was experimental. A-B-A research design was used in this study. Intact group was assigned randomly. For this purpose, research design was divided into three distinct phases. In the first phase (baseline-phase) researcher has collected the data without any intervention. In the second phase (intervention-phase) the researcher has introduced an intervention. In the third phase (reversal-phase) the researcher have removed the treatment (independent variable) and collected data on dependent variable. The experiment took place over a period of 10 weeks of 45minutes.

Population of the Study

The current research study has focused on the students at secondary school level of Lahore district. According to the census of School Education Department (2018), there are 334 secondary level public sector schools in District Lahore. Detail about schools, teachers and students are given below in table 1.

Table 1
Number of Secondary Schools, Teachers and Students in Lahore District

Name	Boys	Girls	Total
Schools	155	179	334
Students	19375	17337	46146
Teachers	1024	1047	2071

Sample of the Study

The sample of the study was comprised of conveniently selected public sector urban school of district Lahore. For this research design intact group was selected at

secondary level. One section/class at public schools mostly contains 30 to 35 students approximately at secondary level. So, the sample of the study was 25 students of secondary school.

Instrumentation

In order to find out the effect of experiential learning, academic achievement tests were used. Tests were developed by the researcher itself. Tests were developed by constructing table of specifications. Three levels of Bloom's Taxonomy (knowledge, comprehension and application) were taken into considerations while constructing the tests. The weightage of knowledge, comprehension and application levels in each test was according to the national curriculum of Biology for each unit. This test was used to check the effect of experiential learning on student's academic achievement. As there are three phases of research experiment that is ABA, and tests were conducted at each phase. The intervention phase that is ABA was repeated and tests were taken at this repeated phase as well. So, total number of tests taken were 6. The scores of 6 tests were compared with each other. Academic achievement test contains multiple choice questions, short questions and long questions. Tests has been attached in the Appendix. The validity of this instrument was ensured through different experts particularly subject specialists. Their opinion was considered and amendments were made as per given opinion of the experts.

Data Collection

The researcher has visited the school personally to collect the data. A formal permission from the head of schools have sought. It was assured through a letter that this study will not be harmful in any way i.e. mentally or physically for the students. The information was collected in the result of research would not be misused and strictly be confidential.

Results and Discussion

Table 2
Difference in the Mean Scores of Test after Baseline Phase 1 and Test after Intervention Phase in First Stage

Variables	N	Mean	*SD*	*t-value*	*df*	*p*
Test after baseline phase 1 (stage 1)	25	8.48	3.11	19.5	24	0.000
Test after intervention phase (stage 1)	25	12.6	3.25			

A paired-samples t-test was conducted to find out the effect of experiential learning on academic achievement of students at secondary school level. Total number of respondents was 25. There was statistically significant effect of experiential learning on academic achievement of students in the test after baseline phase 1 in first stage (M = 8.48, SD = 3.11) and test after intervention phase in first stage (M = 12.6, SD = 3.25), t (24) = 19.5, $p < 0.05$ (two-tailed). The mean increase in scores was 4.12 with a 95% confidence interval. The eta squared statistics (.94) indicated a large effect size (Cohen, 1988).

The value of significance (p value) indicated that the null hypothesis 'there is no significant effect of experiential learning on academic achievement of students at secondary school level' was rejected, as there was a significant effect between the mean scores of the two tests.

Table 3
Difference in the Mean Scores of Test after Intervention Phase and Test after Baseline Phase 2 in First Stage

Variables	N	Mean	*SD*	*t-value*	*df*	*P*
Test after intervention phase (stage 1)	25	12.6	3.25	13.7	24	0.000
Test after baseline phase 2 (stage 1)	25	10.0	3.21			

A paired-samples t-test was conducted to find out the effect of experiential learning on academic achievement of students at secondary school level. Total number of respondents was 25. There was statistically significant effect of experiential learning on academic achievement of students in the test after intervention phase in first stage (M = 12.6, SD = 3.25) and test after baseline phase 2 in first stage (M = 10.0, SD = 3.21), t (24) = 13.7, $p < 0.05$ (two-tailed). The mean increase in scores was 2.6 with a 95% confidence interval. The eta squared statistics (.88) indicated a large effect size (Cohen, 1988).

The value of significance (p value) indicated that the null hypothesis 'there is no significant effect of experiential learning on academic achievement of students at secondary school level' was rejected, as there was a significant effect between the mean scores of the two tests.

Table 4
Difference in the Mean Scores of Test after Baseline Phase 2 in First Stage and Test after Baseline Phase 1 in Second Stage

Variables	N	Mean	SD	t-value	df	P
Test after baseline phase 2 (stage 1)	25	10.0	3.21	4.15	24	0.000
Test after baseline phase 1 (stage 2)	25	8.04	2.37			

A paired-samples t-test was conducted to find out the effect of experiential learning on academic achievement of students at secondary school level. Total number of respondents was 25. There was statistically significant effect of experiential learning on academic achievement of students in the test after baseline phase 2 in first stage (M = 10.0, SD = 3.21) and test after baseline phase 1 in second stage (M = 8.04, SD = 2.37), t (24) = 4.15, $p < 0.05$ (two-tailed). The mean increase in scores was 1.96 with a 95% confidence interval. The eta squared statistics (.41) indicated a large effect size (Cohen, 1988).

The value of significance (p value) indicated that the null hypothesis 'there is no significant effect of experiential learning on academic achievement of students at secondary school level' was rejected, as there was a significant effect between the mean scores of the two tests.

Table 5
Difference in the Mean Scores of Test after Baseline Phase 1 and Test after Intervention Phase in Second Stage

Variables	N	Mean	SD	t-value	df	P
Test after baseline phase 1 (stage 2)	25	8.04	2.37	19.8	24	0.000
Test after intervention phase (stage 2)	25	15.8	2.61			

A paired-samples t-test was conducted to find out the effect of experiential learning on academic achievement of students at secondary school level. Total number of respondents was 25. There was statistically significant effect of experiential learning on academic achievement of students in the test after baseline phase 1 in second stage (M = 8.04, SD = 2.37) and test after intervention phase in second stage (M = 15.8, SD = 2.61), t (24) = 19.8, p < 0.05 (two-tailed). The mean increase in scores was 2.24 with a 95% confidence interval. The eta squared statistics (.94) indicated a large effect size (Cohen, 1988).

The value of significance (p value) indicated that the null hypothesis 'there is no significant effect of experiential learning on academic achievement of students at secondary school level' was rejected, as there was a significant effect between the mean scores of the two tests.

Table 6
Difference in the Mean Scores of Test after Intervention Phase and Test after Baseline Phase 2 in Second Stage

Variables	N	Mean	SD	t-value	df	P
Test after intervention phase (stage 2)	25	15.8	2.61	14.8	24	0.000
Test after baseline phase 2 (stage 2)	25	11.2	2.73			

A paired-samples t-test was conducted to find out the effect of experiential learning on academic achievement of students at secondary school level. Total number of respondents was 25. There was statistically significant effect of experiential learning on academic achievement of students in the test after intervention phase in second stage (M = 15.8, SD = 2.61) and test after baseline phase 2 in second stage (M = 11.2, SD = 2.73), t (24) = 14.8, p < 0.05 (two-tailed). The mean increase in scores was 4.60 with a 95% confidence interval. The eta squared statistics (.90) indicated a large effect size (Cohen, 1988).

The value of significance (p value) indicated that the null hypothesis 'there is no significant effect of experiential learning on academic achievement of students at secondary school level' was rejected, as there was a significant effect between the mean scores of the two tests.

Table 7
Difference in the Mean Scores of Test after Baseline Phase 2 in Second Stage and Test after Baseline Phase 1 in First Stage

Variables	N	Mean	*SD*	*t-value*	*df*	*P*
Test after baseline phase 2 (stage 2)	25	8.48	3.11	7.90	24	0.000
Test after baseline phase 1 (stage 1)	25	11.2	2.73			

A paired-samples t-test was conducted to find out the effect of experiential learning on academic achievement of students at secondary school level. Total number of respondents was 25. There was statistically significant effect of experiential learning on academic achievement of students in the test after baseline phase 2 in second stage (M = 8.48, SD = 3.11) and test after baseline phase 1 in first stage (M = 11.2, SD = 2.73), t (24) = 7.90, p < 0.05 (two-tailed). The mean increase in scores was 2.72 with a 95% confidence interval. The eta squared statistics (.72) indicated a large effect size (Cohen, 1988).

The value of significance (p value) indicated that the null hypothesis 'there is no significant effect of experiential learning on academic achievement of students at secondary school level' was rejected, as there was a significant effect between the mean scores of the two tests.

Discussion

Various researches have been conducted to measure the effect of experiential learning on students' academic achievement. As findings of different studies seems different in terms of results. Few researches show difference of results while a very few number of studies seems similar on the basis of results. Differences and resemblances in the results of current study have been compared and discussed below.

A study was conducted by Carr et al. (2021) established the same findings i.e. applications of classroom knowledge in the context of real-world situations are the focus of learning also similar to the study conduct by (Felder, 2007). The role of the teacher is to promote an atmosphere of acceptance of individual participants and diverse thinking. For learners to become creative in mathematics learning it is important for the teacher to design activities that help learners to construct meaning and think for themselves by having a critical mathematical eye (Haak et al., 2022) also describe the same in their study.

The findings of the study Lorenzo et al. (2019) are similar which indicates experiential learning approach elevates students' cognition levels, increases use of critical thinking skills and therefore enhances students' ability to obtain, retain and retrieve knowledge hence increased achievement. Learning is a cycle that begins with experience continues with reflection and later leads to action which itself becomes a concrete experience for reflections.

The results of the study are similar to the model developed by Hanisyah et al. (2022) how students can learn. In the Kolb's experiential learning model, the process of learning is divided into four stages all of which must be gone through for learning to be most effective. The stages include concrete experience- this provides the basis for the learning process, Reflective observation – in this stage the learners make sense of the experience, Abstract Conceptualization – this is where the learner assimilates and distils the observation and reflections into a theory and Active Experimentation – emphasis in on practical applications, testing theories that lead into new experiences. Experiential learning approach asserts that acquisition of skills and construction of knowledge by the learners is direct result of experience. The learner is said to have the ability to select and to participate in experiences that will further their growth.

Hanisyah et al. (2022) suggests the same findings that, students develop a preference for learning in a particular way. Students may adopt different learning styles in different situations, but they tend to favor some learning behaviors over others. He identifies four learning styles, each of which is associated with a different way of solving problems. Diverges view situations from many perspectives and rely heavily upon brain-storming and generation of ideas, Assimilators use inductive reasoning and have the ability to create theoretical models, converges rely heavily on hypothetical- deductive reasoning and Accommodators carry out plans and experiments and adapt to immediate circumstances. The particular choice of learning style reflects the individual's abilities, environment, and learning history as also described by (Carr et al., 2021).

According to the results of the study, it has been confirmed that experiential learning approach has a significant effect on the academic achievement of students. The effect of experiential learning approach on academic achievement may also be studied in

different grades and levels of education. Experiential learning approach could be applied to other units and subjects of science lesson.

Findings

Based on above analysis of quantitative data following subsequent findings were drawn from the study.

The results show the mean and standard deviation of achievement tests conducted at different times. The highest mean value was 14.41 with minimum standard deviation .242 of achievement test 5 which showed that the mean score was maximum after the intervention phase in second stage of ABA. This test was conducted after intervention phase in second stage of ABA. The lowest mean score value was 9.13 with a standard deviation of .328 indicated that in achievement test 1 the performance of students was not well in the start of the experiment. Achievement test 6 contains the second highest mean score value 14.06 with a standard deviation of .221 indicated that the average score of students was good.

One-way ANOVA was applied to compare students' scores in six achievement tests. Because the tests were taken on six different times therefore repeated measure ANOVA was used. Tests were conducted in each phase of experiment that is baseline phase and in intervention phase. There was a significant effect of intervention because a significant difference was observed. Effect size indicates the relative magnitude of the difference present between two sets of data. The value ranges from 0-1, where .2 is regarded as small effect size, .5 as medium effect size, and .8 as large effect size (Cohen, 1988). Wilks' Lambda = .238, F (5, 20) = 16.19, p< .0005, multivariate partial eta squared = .787 which showed large effect size. As results were significant for further analysis pair-wise comparison of the tests was done.

The results showed a pair-wise comparison of six achievement tests. A significant difference was found when test-1 was compared with other tests. Test-1 scores were significantly different from test-2, test-3, test-4, test-5 and test-6 it means that students gained scores in test 1 was significantly different from others. While comparing the achievement test-2 there was a significant difference of test-2 with test-1 and test-5 only. It infers that students' gained scores were significantly different in test-1 in baseline phase and test-5 after the intervention phase. Achievement test-3 has only a significant difference with test-5 it shows that gained scores of students in test- 4 of before intervention was different from test- 5 after intervention phase it supports the improvement in test scores after intervention phases.

While comparing the significant difference of test-4 it has a difference with test-1. Test-4 was taken after 1st stage of ABA, and in baseline phase of 2nd stage and it showed a significant difference so it showed a positive effect of the intervention phase. Test-5 was significantly different from test-1, 2, 3, and these tests were taken in 1st stage of experiment (ABA), it showed improvement in students' scores. Test-6 was significantly different from test-1 so, it showed a positive effect of experiential learning. As the test results were significant hence null hypothesis was rejected which means that there was a statistically significant effect of the intervention (experiential learning) on students' academic achievement.

Conclusion

For present study, when one-way repeated measure ANOVA was applied to find out the effect of experiential learning on students' academic achievement at secondary school level, the results shows that there is significant difference of students' academic achievement through experiential learning in secondary schools of district Lahore. In the

present study, it is concluded that students at secondary school level of District Lahore have significant difference of academic achievement. Frequency was also applied to measure the effect of experiential learning on students' academic achievement. It was concluded that when students learn through experiential learning they show positive increase in their academic achievement.

Recommendations

Following recommendations were made on the basis of conclusions:

- Teachers should provide opportunities to students, to learn through experiential learning instead of the traditional learning methods.
- It is highly recommended that further future researches should be carried out to examine the effect of experiential learning on academic achievement of students.
- Teachers should select the activity and AV aids in the light of topic and learners need and level.
- Audio- Visual aids should be used more frequently by the teachers to make their teaching effective.

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