Traditional versus Experiential Learning. A Comparative Microstudy of Instructional Techniques on Children's Achievement in Primary School

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Abstract

Introduction: *In recent years, after Romania's accession to the European Union, educational policy has become a major political priority of the entire Romanian society. As the nation struggles to attain the achievement levels necessary to compete in a global society, the national education reform continues to be in a dynamic state of change. In this context of innovation in education, the implementation of an Experiential Learning methodology has emerged as a viable option for providing students with the core competency skills needed to succeed.*

Objectives: *The aim of this this study was to explore the differences in the achievements on standardized tests: Progress in International Reading Literacy Study (PIRLS) and Trends in International Mathematics and Science Study (TIMMS) obtained by students who had benefitted from Experiential Learning, in contrast with those following direct learning instructional methods.*

Methods: *The study compares performances of students in the fourth grade who used Experiential Learning methods in PIRLS and TIMMS exams, in contrast with their peers who were taught according to traditional instructional methods. The student test scores on the PIRLS and TIMMS examinations, from the session of May 2019, were analyzed both concerning the Experiential Learning and the Traditional Learning groups. To determine the differences in the students' mean scores, descriptive as well as inferential statistical analyses were performed on the data.*

Results: *This study found that the Experiential Learning group had statistically significant greater mean scores in overall performance on TIMMS Exam and in PIRLS Exam than the Traditional Learning group.*

Conclusions: *This paper concludes that Experiential Learning should be considered as a comprehensive school reform model to increase students' performance on standardized examinations.*

Keywords: Experiential Learning, Traditional Learning, experience, innovation in education

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I. Introduction

According to Stanciu (2013), the impasse of the contemporary education is caused by three categories of explosions: the explosion of knowledge (due to the development of science and technology, the immense amount of information exceeds the assimilation possibilities offered by the training techniques of the past); the demographic explosion (with all the structural expansion of the last decades, education cannot cope with the demand for education, the growth rate of the population), and the explosion of aspirations (even simple people aspire to higher education, as a reflection of the occupational profile with more complex skills demanded by the labor market; in other words they demand equal opportunity, regardless of the social or geographical environment of origin, not just equality of access). All these have led to the reconsideration of the educational system and to the production of changes in the vision of education: the objective of education will no longer be learning but learning how to learn, how to search and effectively use the information one needs to live in the society in harmony with different individuals. An active participant in the process of permanent education, the beneficiary of this type of education ceases to be the passive object of education, in order to become its active subject.

In this context, primary education is considered to provide the premise and basis for building a conscious, coherent, up-to-date education system, in accordance with the requirements of the current and future society. The quality of early education constitutes an imprint on the formation of the basis of the child's personality, as well as of the behavior and social values that he (the future adult) will internalize and respect in life. For the educational success of the child, it is necessary that all "actors" with whom he interacts, starting with the family members, the personnel from the educational institutions and ending with the community, to be trained.

The aims of the primary education are centered on the global development of the child, by becoming familiar with a multidisciplinary approach to the fields of knowledge; establishing a set of values consonant with a democratic society and pluralism, encouraging talent, experience and expression in different art forms, forming responsibility for one's own development and health. The preparation of the child for life must also take into account academic competences, in addition to different abilities, skills, and attitudes. Therefore, the new Curriculum must be seen as a step forward, a real professional challenge, responding optimally to innovative approaches and standards in the field. The framework and reference objectives are formulated on experiential domains, taking into account the benchmarks established by the development domains. Experiential domains become tools for attaining knowledge, in the context in which they indicate skills, abilities, contents specific to the development domains.

In this setting of reforming the education system and granting it to local and global social requirements, the main international standardized instruments for assessing the degree of achievement of general and specific educational objectives for primary classes are the PIRLS and TIMMS tests.

PIRLS (Progress in International Reading Literacy Study, International Literacy) is a comparative study of reading performance obtained by the participating states at the end of the primary cycle. The objective of this enterprise consists in supporting each state, as a result, to make fundamental decisions in improving the results. The study follows the progress of reading skills and testing is resumed every five years with most items used. PIRLS is running on the representative sample, which is configured by experts in educational statistics. The structure of the tests is carried out by an international committee, so that the items are compatible with the organization of the national curriculum and are adequate despite the differences of the participating students.

TIMSS (Trends in International Mathematics and Science Study, International in Mathematics and Sciences) is also a type of international assessment which aims to measure the level of knowledge, in the field of mathematics, among students from the 4th to the 8th grade. The examinations are organized every four years, and unlike PISA, TIMSS assessments are oriented towards the evaluation of the raw knowledge, without insisting especially on the transposition of information in solving everyday problems.

Despite all mentioned changes, the ineffectiveness of the system is revealed by the scores obtained by Romanian students in the international tests PIRLS and TIMSS. Thus, since 2000, when Romania participated in the first test round, and up to present, our country has consistently been situated on the last places in Europe, concerning the capacity of 15-year-olds to understand the texts they read. The percentage of children who fail to reach level 2 of competency is the lowest at European level (47% at Reading, in 2009, 37% in mathematics, in 2012). Competency Level 2 means that students know the letters, can read words, and only understand extremely simple sentences. In 2011, Romania occupied place 36 out of 45 from all

participating States, compared with 22, as was in the 2001 assessment.

This may be due to the fact that, despite effective reforms in primary education, the methods of teaching and learning in the classroom have remained outdated, still based on the accumulation of information and focused on testing.

Traditional Learning

Traditional Instruction (TI) refers to teaching practices where the maximum control on the learning experiences lies in the hands of the teacher (Kierstead, 1985). Traditional Instruction is the prevailing teaching methodology that can be observed in most classrooms today (Baker, 2012). Teachers are more comfortable with this teaching method, as it allows them to maintain the tradition of the authoritative figure in the classroom (Breunig, 2005). Additionally, administrators see traditional methodology as more cost-effective, and it remains the preferred learning method for students, because it has formed the majority of their learning experiences (Breunig, 2005).

The traditional teaching methodology, as described by Kierstead (1985), is teacher-centered, with virtually all activities and decision-making done by the teacher, and with minimal student input. The lesson typically follows a format of "introduction, input, modelling, guided practice, periodic checking for understanding and concluding with independent practice" (Kierstead, 1985, p. 25). Eubanks (2014) further concurred that the educational system requires a shift in pedagogical practice, from direct instruction to "graduated opportunities for group learning, practice, and reflection" (p. 29). These expectations are congruent with Experiential Learning, that provides students with opportunities to learn and acquire content through well-designed, purposeful activities and tasks.

Experiential Learning

Experiential education is a philosophy which intersects many methodologies, in which educators purposefully engage with learners in direct experience and focused reflection, in order to increase knowledge, clarify values, develop skills and people's capacity to contribute to their communities (Association of Experiential Education, 2014, para. 1).

The Kolb Experiential Learning Theory, developed by David A. Kolb, is a well-known premise of how students may learn experientially. Kolb built his theory on six propositions, shared by prominent scholars, which are:

• Learning should not be based on the outcome but on the process.

• All learning is relearning, a process in which students' ideas can be examined, tested and adjusted, as the learning process continues.

• The learning process involves conflict and differences, as a student reflects, thinks, and acts to arrive at a resolution, which, with more learning, will put them back into the cycle of conflict and resolution.

• Learning is a holistic process, not only of cognition, but also of thinking, feeling, perceiving, and behaving.

• Learning evolves through an individual's interaction with the environment and the assimilation of new experiences into existing concepts from previous experiences.

• Learning is based on a constructivist theory that learning is created and recreated by the learner (Kolb & Kolb, 2005, p. 194).

Kolb's theory of teaching and learning is a cyclical process, comprised of four components: a concrete experience, reflection and observation, abstract conceptualization, and experimenting with novel situations (Peterson, 2012).

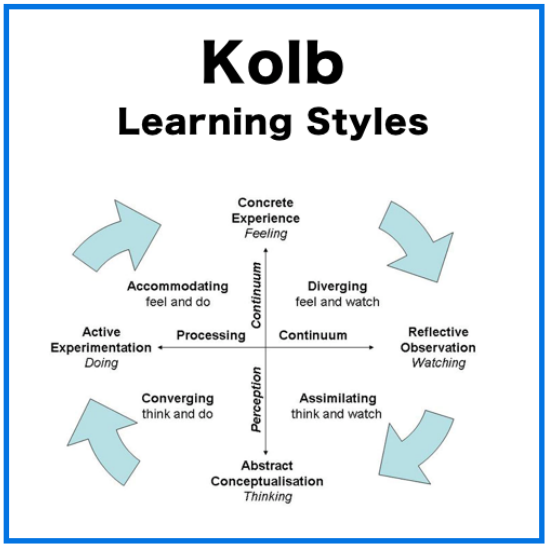

Figure 1: The four stages Kolb's Experiential Learning Model. Source: https://sport102blog2017.wordpress.com/2017/09/04/cassidy-chapter-8/

Experiential Learning and Student Achievement

A myriad of studies have demonstrated positive gains in achievement when students are taught using Experiential Learning methodologies. Adulwaheed and Nagy (2009) demonstrated in a study that students taught by means of Experiential methods achieved better

results in a laboratory class than students taught by means of traditional methods. In the Shuptrine study (2013), high school students, in an advanced video class, engaged in project-based learning, where they partnered with an outside organization, to collaborate, plan and develop advertising videos. Furthermore, research has demonstrated that student engagement and motivation are predictors of success in high school and in college (Shruptine, 2013). Mohan (2015) demonstrated, in a study conducted in New York public schools, that students in the Experiential Learning group outperformed their peers on science state exams.

II. The current study

The aim of this study was to explore the differences in achievements on state standardized tests, such as Progress in International Reading Literacy Study (PIRLS) and Trends in International Mathematics and Science Study (TIMMS), obtained by students who had benefitted from Experiential Learning, in contrast with those following direct learning instructional techniques.

Research question 1:

Is there any statistical difference between students' overall mean scores on PIRLS exams after learning employing Experiential Learning methodology and Traditional Learning methods?

Research question 2:

Is there any statistical difference between students' overall mean scores on TIMMS exams after learning employing Experiential Learning methodology and Traditional Learning methods?

III. Methods

The research program involved the use of a wide range of psychometric and pedagogical methods, in order to achieve the proposed objectives. Among them there are Experiential Learning techniques, pedagogical evaluation methods and statistical tests for the processing of results. The most important technique in the experience is considered to be Experiential Learning, with the role of helping students experience here and now, explore, self-knowledge and discover their inner resources.

Participants

The sample population in this study comprised of primary school students (in the fourth grade), from urban environment. They were divided into two groups, each consisting of 60 children. The first group was the experimental group and the second was the control group.

Instrumentation

The instruments for this research were the PIRLS and TIMMS, which are international assessments that monitor trends in student achievement in mathematics, science, and reading. These standardized examinations are administered to students at the end of the fourth grade. The two instruments are briefly described below.

PIRLS 2016 Assessment Framework, 2nd Edition explains that the PIRLS test focuses on the two overarching purposes of reading, that account for most of the reading done by young students, both in and out of school: for the literary experience, to acquire and use information. In addition, the PIRLS assessment integrates four broad-based comprehension processes, within each of the two purposes of reading: focus on and retrieve explicitly stated information, make straightforward inferences, interpret and integrate ideas and information, and evaluate and critique content and textual elements.

TIMSS 2019 Assessment Frameworks explains that in TIMMS test each content domain consists of topic areas, and each topic area, in turn, includes several subdomains. Across the fourth-grade mathematics assessment, each topic receives approximately equal weight in terms of time allocated to assessing the subdomain. The fourth-grade content domains are: numbers, geometric shapes and measures, data display.

Procedure

The main stages of the research were:

1. Establishment of the 2 research groups, the first being the control group and the second the experimental group.

2. Completing the Traditional Learning program during the fourth grade, for the first group and of Experiential Learning, for the second group.

3. Examination of the 2 groups, using the TIMMS and PIRLS tests, according to the indicated examination standards.

Experimental design:

The independent variable is instructional methodologies and the dependent variable is student achievement.

IV. Results

One tailed two-sample t-tests were performed for all research questions to compare the mean scores, in order to determine the significance in difference between employing Experiential Learning

methodologies and Traditional Learning methodologies. The results of these statistical analyses were organized by research questions and presented in the following tables and accompanying analysis.

Research question one results:

Is there any statistical difference between students' overall mean scores on PIRLS exams after learning employing Experiential Learning methodology and Traditional Learning methods?

The results depicted in Table 1 demonstrate an Experiential Learning group mean test score of 88.62, compared to the mean of the Traditional group, 80.98. The results of the one-tail two-sample t-test, depicted in Table 2, produce an output with a p value of $p \leq 0.001$. For this analysis, $p \leq 0.05$, thereby rejects the null hypothesis. A $p \leq 0.05$ is an indication that the difference in mean scores was not a result of chance and could be attributed to actual differences in instructional methodologies experienced by students. The results concluded that the Experiential Learning (EL) group produced a mean score that was 7.64 points greater than the Traditional Learning methods group's and this difference was statistically significant.

	N	Mean	Std. Deviation	Std. Error Mean
TRADITIONAL	60	80.98	13.719	1.771
EXPERIENTIAL	60	88.62	8.803	1.136

Table 1. One-tail Two Sample t-test Analysis for the PIRLS scores

	t	df	Sig. (1-tailed)	95% Confidence Interval of the Difference	
				LL	UL
TRADITIONAL VS EXPERIENTIAL	3.003	59	p<0.001	0.32329	1.69503

Table 2. Descriptive Statistics for the PIRLS scores
One-Sample Statistics

Research question 2 results:

Is there any statistical difference between students' overall mean scores on TIMMS exams after learning employing Experiential Learning methodology and Traditional Learning methods?

The results depicted in Table 3 indicated an Experiential Learning group mean test score value of 88.10, compared to the mean value of the Traditional group of 79.78. The results of the one-tail two-sample t-test depicted in Table 4 produce an output with a p value of $p \leq 0.001$. For this analysis, $p \leq 0.05$ rejects the null hypothesis. A $p \leq 0.05$ is an indication that the difference in mean scores was not a result of chance and could be attributed to actual differences in instructional methodologies experienced by students. The results concluded that the EL group produced a mean score that was 8.32 points greater than traditional group and this difference was statistically significant.

	N	Mean	Std. Deviation	Std. Error Mean
TRADITIONAL	60	79.78	13.170	1.700
EXPERIENTIAL	60	88.10	8.352	1.078

Table 3. One-tail Two Sample t-test Analysis for the TIMMS scores

	t	df	Sig. (1-tailed)	95% Confidence Interval of the Difference	
				LL	UL
TRADITIONAL VS EXPERIENTIAL	3.4786	59	p<0.001	0.30497	1.69503

Table 4. Descriptive Statistics for the TIMMS scores
One-Sample Statistics

V. Discussion

Findings from this study showed that students who followed an Experiential Learning program during the fourth grade achieved higher scores on TIMMS and PIRLS assessments than their counterparts who followed the Traditional Learning program. These findings have a very important meaning in the context of a society in search of effective solutions to the difficulties in the educational system.

The new reforms in the Romanian education system entail two major needs: the first is that of adapting the entire teaching-learning-evaluation process to the bio-psycho-emotional needs and availability by renewing the teaching-learning methods, and the second need is to adapt the teaching-learning methods, to make available all the creative resources of the child through a unified process of personal development.

Through interactive group methods, children exercise their ability to select, combine, learn what they need in their school and adult lives. Because several generations have not been taught how to learn, by applying these interactive methods we also intend to solve our problems: relationship, communication, accountability, mutual learning. The purpose of the educational system is not to produce uniformity among individuals who have a bag of knowledge which they can

then apply in a certain professional area, but rather to make use of the knowledge and skills acquired through the instructional-educational activities, channeling them into an integrative and synthesizing direction.

Starting from the desire to identify an Experiential model that corresponds as much as possible to the expression possibilities of the young pupil and to serve at the same time the purpose of optimizing the instructional-educational process of learning new knowledge, abilities and skills, a model has emerged, which interweaves through the richness of techniques providing the freedom of creative expression, the experimentation in the "here and now" of the facets of reality, the connection to one's own and others' pulse, as a group supporter.

This program started from the premise that an Experiential Learning program through Experiential techniques, in the primary education cycle, could facilitate students' access to new information, being extremely useful for developing their cognitive, emotional and somatic potential. At the same time, we considered that such an approach will prove much more efficient in assimilating new information, than a Traditional teaching-learning program, based on a teacher-student front activity.

Through this program, applied to an experimental group, the elaboration of an innovative Experiential Learning teaching model for primary education, in accordance with the requirements of the curriculum, has been followed and adapted to the personal needs of the present and prospective society.

As presented above, the basis of these educational desires becomes achievable as we emphasize the importance of building a strong foundation from the first contact of the child with the school. It must be a pleasant, meaningful and provocative environment for the child, able to open the way for further knowledge, integration and unification.

The intention of this study to determine if there were significant differences between students' achievement on PIRLS and TIMMS examinations when using the two types of instructional methodology, specifically, Experiential Learning methodology and Traditional Learning methodology, was achieved. Two classes (60 students) that employed the Experiential Learning methodology and two classes (60 students) that employed the Traditional Learning methodology were the participants in the study. The findings demonstrated that students who were taught according to the Experiential Learning methodology resulted in an overall significantly greater mean test score than their counterparts who were taught according to Traditional Learning methods. This finding substantiates the claim that Experiential Learning does have a positive impact on students' learning outcome.

In the implemented Experiential Learning program, teaching and development were unique processes. This learning-development has led to the acquisition of adaptive skills, the student and teacher experiencing different roles of witness-spectator and actor. As an actor, the student lived, felt, he experienced freely. As a spectator, he observed, he learnt to look at a phenomenon from different perspectives (social roles), to think creatively and critically. The teacher was in the actor's position when he facilitated learning and in the observer's position when he continually evaluated the student's evolution in the development process, providing adequate, mature and healthy feedback. He was simultaneously involved in a process of self-development through the actor role and in self-evaluation through the role of witness to his performance.

Holistically designed learning includes different adaptive activities that vary over time and space. The immediate reaction to any situation is not considered learning, but performance. The adaptations throughout life are not considered learning, but development. Performance, learning and development, when viewed from the perspective of Experiential Learning theory, form a continuum of adaptive approaches to the environment. Performance is limited to short-term adaptations to immediate circumstances, learning includes long-term mastery of some classes and situations, and development includes lifetime adaptations to the overall life situation.

Besides the aspects listed above, the added value brought by the model of Experiential Learning also resides in the orientation towards the emotional sphere, towards the affective maturation and the development of the child as a whole. A failure, most of the time, causes certain emotional reactions. Redefining one's relationship with failure refers to the fact that we must learn to regulate such a relationship, so that in the course of Experiential Learning no blockages appear that interrupt this process. Learning to accept our own bottlenecks leads to an emotional and cognitive unlocking, but also to a smooth learning path. Acceptance of emotions is perhaps one of the most difficult parts. This must be consciously reflected, because only then does Experiential Learning manifest its holistic nature, adaptive to the environment. The monitoring of the messages we send refers to the attention we must pay to talking to oneself.

In conclusion, Experiential Learning integrates both the cognitive and the emotional spheres, proposes models by which the individual manages to learn new things and to adapt creatively and harmoniously to the environment. At the same time, by using fun and easily accessible techniques for all age classes, Experiential Learning becomes a necessary factor in the teaching-learning process.

VI. Implications for practice and conclusions

In the context of a dynamic society, constantly undergoing major changes, teaching and learning methods must be the first to cross transformation and restructuring for better adaptation to the present educational needs. In this respect, Experiential Learning proposes a playful, relaxing methodology, which, above all, emphasizes experiences, brings them to present and causes their holder to transform them, enriches them with new information, in order to produce the holistic meaning of learning, the main factor of progress and school success.

This paper investigated if there was a difference in student achievement between students who engaged in Experiential Learning methodology, compared to those who engaged in Traditional Learning methodology. The findings in this study could significantly contribute to national policy stakeholders, seeking to leverage viable teaching and learning methodologies to support student achievements. Although there are clear limits of this pilot research, its efficiency, Experiential approach and openness to such a teaching method represent the premises for future studies in this direction, for the improvement of the program and for its implementation in schools, in an organized manner.

As this study has shown, schools which use Experiential Learning should deepen this method and even implement promotion strategies among other institutions. It is also imperative that training courses be conducted in this teaching-learning method for teachers who use Traditional teaching-learning methods. Additionally, it requires principals and district leaders to fiscally prioritize distribution of funds, to ensure Experiential Learning is robust and implemented with fidelity. Since this study focused on school-wide utilization of Experiential Learning methodology, it is further recommended that inspectors and leaders charged with innovation in education consider Experiential Learning as a viable solution.

As for the opportunity for further research, this study was a quantitative research that compared the effectiveness of Experiential Learning methodology to Traditional Learning methodology, using students test scores from standardized tests as the instrument. It is recommended that further study be conducted, to identify and analyze the elements of Experiential Learning that significantly contribute to student achievement.

The second recommendation for a future study is based on the efficacy of the staff and school in teaching according to Experiential Learning methodology. It is recommended that further research should be conducted to identify if there is variability in student performance between Experiential Learning organized classes, and to determine what the contributing factors to those variabilities are, in order to mitigate inadequate outcomes in student performance.

The third recommendation for further study is based on the adaptability of Experiential Learning. This study was conducted in a single urban school; it is recommended that additional studies be conducted in other urban schools, as well as suburban and rural areas, to determine if such findings are replicable.

The fourth and final recommendation for further study is based on the potential scalability of Experiential Learning. This study focused on two particular sub-groups, ‘experiential’ and ‘traditional’ students; it is recommended that additional studies be conducted for other populations in our country, such as Roma students, to determine if Experiential Learning methodology is a viable option in closing the achievement gap.

In conclusion, as we have seen, Experiential Learning is an area still in development; multiple researches may go deeper and study further the processes and optimization of the educational act, in order to reach the most important goal of education: to train students developed from a bio-psycho-individual point of view, according to the demands of the current society and perspective.

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