INTED 2024

18th International Technology, Education and Development Conference

4-6 March 2024
Valencia (Spain)

CONFERENCE PROCEEDINGS

Sharing the Passion for Learning

Published by
IATED Academy
iated.org

INTED2024 Proceedings
18th International Technology, Education and Development Conference
March 4th-6th, 2024
Valencia, Spain

Edited by
Luis Gómez Chova, *University of Valencia, Spain*
Chelo González Martínez, *Polytechnic University of Valencia, Spain*
Joanna Lees, *CEU Cardinal Herrera University, Spain*

DOI: 10.21125/inted.2024
ISBN: 978-84-09-59215-9
ISSN: 2340-1079

Book cover designed by J.L. Bernat

Bibliographic Information

Book Title
18th International Technology, Education and Development Conference

Book Series
INTED Proceedings

Editors
Luis Gómez Chova
Chelo González Martínez
Joanna Lees

Publication Year
2024

Publisher
IATED Academy

Publisher Address
Valencia, Spain

Book ISBN
978-84-09-59215-9

Series ISSN
2340-1079

DOI
10.21125/inted.2024

Conference Name
INTED2024

Dates
March 4th-6th, 2024

Location
Valencia, Spain

Topics
Education
Educational Research
Educational Technology

Editorial policy and Publication ethics:

The papers published in these proceedings reflect the views only of the authors. The publisher cannot be held responsible for the validity or use of the information therein contained.

The International Academy of Technology, Education and Development (IATED) aims to publish conference proceedings that contain original research articles of high quality meeting the expected ethical standards. The publication guidelines are provided for authors who submit articles to IATED conferences to maintain high ethical standards.

IATED shall guarantee the high technical and professional quality of the publications and that good practices and ethical standards are maintained. If unethical behaviors are identified, an investigation will be initiated, and pertinent actions will be taken.

More information about the publication ethics of IATED is available at iated.org/publication_ethics

Preface

The INTED2024 Conference Proceedings contain the papers presented at the 18th International Conference of Technology, Education and Development, held in Valencia, Spain, from the 4th to the 6th of March 2024. INTED takes place annually and its aim is to bring together academics and researchers to continue the exchange of innovative ideas and research. Participants from over 78 countries joined INTED2024 to learn about the changing world of education and learning technologies.

INTED's focus is on Education and Educational research. Since many international education experts attended the conference, participants were able to network and collaborate with other delegates from around the world, participating in thematic sessions, networking activities, workshops and interactive sessions. The keynote speeches are available at IATED Talks: iated.org/talks.

The INTED2024 Proceedings, exclusively in English, are included in the IATED Digital Library: library.iated.org. The INTED2024 International Program Committee was composed of lecturers and researchers from multiple countries. A blind peer review process was followed to guarantee the quality of the final publication, in which the following points were evaluated: information content, relevance to the educational field, general structure, clarity of contents, originality, and relation to the conference topics and disciplines.

IATED endeavors to publish original and high-quality research papers. Following the expected ethical standards, all authors that published their papers in the INTED2024 Proceedings signed the IATED copyright transfer form. More information about the publication ethics of IATED is available at iated.org/publication_ethics.

We wish to extend our most sincere thanks to all who contributed to the INTED2024 Proceedings. Thanks for your dedication and for sharing your passion for learning.

Organizing and Program Committee

Organizing Committee

Program Chairs
Luis Gómez Chova, *University of Valencia, Spain*
Chelo González Martínez, *Polytechnic University of Valencia, Spain*
Joanna Lees, *CEU Cardinal Herrera University, Spain*

Local Arrangements Chairs
David Martí, *Int. Academy of Technology, Education and Development, Spain*
Mª Jesús Suesta, *Int. Academy of Technology, Education and Development, Spain*
Meghan Stockwell, *Int. Academy of Technology, Education and Development, Spain*
Javi Doménech, *MSX International Techservices, Spain*
Miguel Peiró, *Progresa Vocational Training Center, Spain*

Publication Chairs
Agustín López Martínez, *University of Barcelona, Spain*
Ignacio Candel Torres, *Capgemini, Spain*

Publicity Chairs
Eladio Duque, *Int. Academy of Technology, Education and Development, Spain*
Juanan Herrero, *Graphimage Graffor, Spain*

Web Masters
Jose Luis Bernat, *Int. Academy of Technology, Education and Development, Spain*
Javier Martí, *IVIRMA Global IT, Spain*

Panel Chairs
Sarah Newman – *Harvard University, United States*
Mike Sharples – *The Open University, United Kingdom*

Workshop Chairs
Julie Smith – *Webster University in St Louis, United States*
Mike Sharples – *The Open University, United Kingdom*
Richard Powers – *Universität Stuttgart, Germany*
Tony Eng – *Massachusetts Institute of Technology, United States*
Tracey Tokuhama-Espinosa – *Harvard University Extension School, United States*
Vivian van Laarhoven – *UCLL University of Applied Sciences, Belgium*

Session Chairs
Achim Dannecker – *University of Applied Sciences and Arts Northwestern Switzerland, Switzerland*
Adriana Wilde – *University of Southampton, United Kingdom*
Alejandro Garza – *Tarrant County College, United States*

International Program Committee

Conference Tracks & Sessions

The INTED2024 conference program is available online at https://iated.org/inted2024

ORAL SESSIONS MONDAY

Fostering Critical Thinking
Virtual Reality
Learning Analytics & Data Science Experiences
Post-Pandemic Scenarios in Education
Exchange & Mobility Programmes
Barriers to Learning & Inclusive Practices
Science Popularization and STEM Education
English as a Medium of Instruction
Challenge and Problem-Based Learning
Augmented Reality
Digital Assessment
From COVID to Construction: Creating a Sense of Belonging
Intercultural and Multicultural Education
Inclusive Education Teacher Training
Learning Factories & Remote Laboratories
AI and Chatbots in Language Learning
Game-Based Learning
Extended Reality
Feedback and Assessment
Technology Enhanced Learning
Employability Trends and Challenges
Equality, Diversity and Inclusion
Teaching STEM
English for Special Purposes
Active Learning Experiences
e-Learning Experiences
Assessment in the Era of Generative AI
21st Century Skills
Tales from the trenches of Entrepreneurship Education and Innovation in HEIs
Special Education
Computer Science and Cybersecurity Education
Online and Technology-Enhanced Language Learning

POSTER SESSIONS MONDAY

Emerging Technologies in Education
Pedagogical Innovations in Education

ORAL SESSIONS TUESDAY

Making Learning Accessible to Diverse Students
Students' and Teachers' Perceptions of AI
Virtual Learning Environments
Digital and AI Skills for Educators
Workplace & Lifelong Learning 1
Curriculum Design Experiences
Mathematics in Higher Education
English as a Foreign Language
Service Learning & Community Engagement
Generative AI in Education
Mentoring & Tutoring

Pre-service Teachers' Experiences
Workplace & Lifelong Learning 2
Quality in Education
Promoting STEM Careers
Student Wellbeing
Pedagogical Innovations
Generative AI Chatbots
MOOCs & Open Educational Resources
Professional Development of Teachers
Entrepreneurship Education
Educational Management and Digitization
Science Outreach and Communication
Student Safety and Protection
Collaborative & Team-Based Learning
Research on Generative AI in Education
Blended and Hybrid Learning
ICT Skills among Teachers
University-Industry Cooperation
Leadership in Education
STEM in Schools
Health Sciences Education
Student Engagement
Application of AI in Education
Mobile Learning
Unlocking the Potential: Quality and Growth in Initial Teacher Education
Education for Sustainability
Institutional Cooperation in Education
Architecture & Civil Engineering Education
Transnational Medical Education: AIWMU Joint Medical Education Program

POSTER SESSIONS TUESDAY

Educational Trends and Experiences
Challenges in Education and Research

VIRTUAL SESSIONS

DIGITAL & DISTANCE LEARNING
MOOCs & Open Educational Resources
Blended & Mobile Learning
LMS & VLEs
e-Learning Experiences
Distance Education in COVID-19 Times

DIGITAL TRANSFORMATION OF EDUCATION
Data Science & AI in Education
Learning Analytics & Educational Data Mining
Digital Transformation
21st Century Skills

INNOVATIVE EDUCATIONAL TECHNOLOGIES
Virtual & Augmented Reality
Social Media in Education
Videos for Learning
Technology Enhanced Learning

TEACHER TRAINING & ED. MANAGEMENT
ICT & Digital Skills
Teacher Training and Support
Professional Development of Teachers
Educational Management

ACTIVE & STUDENT-CENTERED LEARNING
Gamification & Game-based Learning
Flipped Learning
Problem & Project-Based Learning
Pedagogical Innovations
Active & Experiential Learning
Cooperative & Team-Based Learning

ASSESSMENT, MENTORING & STUDENT SUPPORT
Assessment & Evaluation
Mentoring & Tutoring
Student Support & Motivation
Student Wellbeing
Developing Soft and Transversal Skills

EDUCATIONAL STAGES & LIFE-LONG LEARNING
From Pre-school to Secondary Education
Vocational Training
Transition to the Job Market
Developing Entrepreneurship in Education
Life-Long & Workplace Learning

QUALITY & IMPACT OF EDUCATION
Quality in Education
Learning Space Design
Service Learning & Community Engagement
Social Impact of Education

INCLUSION & MULTICULTURALITY
Inclusive Education
Diversity Issues
Special Educational Needs
Multicultural Education

LANGUAGE LEARNING AND TEACHING
Foreign Languages
New Technologies in Language Learning
Intercultural & Sociocultural Competences

DISCIPLINE-ORIENTED SESSIONS
Architecture & Interior Design
Health Sciences Education
Sustainable Development Goals in Education
Business & Tourism Education

STEM EDUCATION
Mathematics & Statistics
Engineering Education
Computer Science Education
STEM Experiences

EXPERIENTIAL LEARNING AS A CONSTRUCT FOR CHILD MOTIVATION

S. Querido[1], I. Freire Ribeiro[2], E. Mesquita[3]

[1]Instituto Politécnico de Bragança (PORTUGAL)
[2]Instituto Politécnico de Bragança, CI&DEI (PORTUGAL)
[3]Centro de Investigação em Educação Básica (CIEB), Instituto Politécnico de Bragança, (PORTUGAL)

Abstract

Experiential learning results from involvement, participation, exploration, experimentation, creation, discovery, relationships, and interaction with others and objects, in short, interaction with the world around us. In other words, everyone learns motivated by their purposes, i.e. they deliberately strive to achieve learning that makes sense to them. Motivation and learning are fundamental to the study of new school theories. It cannot, and should not, be seen only as an essential characteristic for the child, but must be mediated by the teacher, supported by various strategies to promote motivation for learning. The study presented here focused on experiential learning as a pedagogy and the teaching-learning strategies that correspond to it. The work was carried out with 24 children, aged 9 and 10, in the 4th year of primary school. The study is based on a qualitative, interpretive approach. Data was collected mainly through the technique of direct and participant observation, using field notes, photographic records, and observation grids. The objectives were: to understand whether experiential work is a motivating factor, and to study the role of the child in the development of experiential work. The results obtained in the study, which emerged from the application of various data collection instruments, revealed that the children were more active, autonomous, and participative, verifying that experiential learning, using diversified strategies, boosts children's involvement, and stimulates their curiosity and their love of learning. We were also able to see that experiential learning has a greater impact on children's motivation if the teacher presents him/herself to them as an example of a motivated person.

Keywords: Experiential learning, child motivation, supervised teaching practice.

1 INTRODUCTION

Experiential learning results from involvement, participation, exploration, experimentation, creation, discovery, relationships, and interaction with others and with objects, in other words, interaction with the world around us. We learn motivated by our purposes, that is, we deliberately strive to achieve learning that makes sense, and, in this regard, it is considered that "learning transforms experience in both its objective and subjective character. To understand learning, we need to understand the nature of development, and *vice versa*" [1, p.38].

Experiential learning takes place beyond the structure of the classroom. Children can learn naturally, and learning can take place in imaginative play and games; in moments of creative and artistic expression; or through exploring nature and the surrounding environment. In this sense, learning doesn't just take place on a cognitive level; it goes beyond that, and it's equally crucial to consider lived experiences, feelings, emotions, and intuitions. Constant, conscious reflection on experiences is therefore necessary, with the clear intention of transforming them into learning. As Alarcão [2] points out, experiential learning emphasizes "the interaction between the subject and the action and supports new learning through experience, while valuing context and reflection. But by also valuing the functional side of learning, its social externalization, it acquires a pragmatic dimension", which is considered fundamental, not only because it "promotes the resolution of problems by the actors involved", but also because it gives them "the power to solve them and the awareness that they hold that power" [2, p. 230].

Experiencing the world in an active, participatory, autonomous, and independent way helps children to think for themselves and, in doing so, they acquire a sense of achievement that increases their confidence, making learning more meaningful.

Kolb [1] characterized experiential learning taking into account the following assumptions: (i) learning is best conceived as a process, not as a product; (ii) learning is a continuous process based on experience; (iii) the learning process requires the resolution of conflicts between dialectically opposed ways of

adapting to the world; (iv) learning is a process of adapting to the world; (v) learning presupposes involvement between the person and the environment; and, (vi) learning is a process of constructing knowledge.

Experiential work can be developed through skills pedagogies, known as "learning to learn" pedagogies, i.e. those focused on skills and learning [3]. This learning to learn is also learning by doing, according to John Dewey's classic pedagogy.

In this sense, experiential learning is important because it is transversal, as Oliveira-Formosinho and Formosinho [4] argue that "the meaning of learning lies in the creation of attention within the reflected experience and in the rescue of the identity subject that develops relationships and creates", aiming to create "links between the child and the world (people and objects), making them a continuum". In this way, "the reflective way of living the experience also constitutes it in expression and meaning" [4, p.18].

In this context, educators and teachers need to create opportunities rich in experiential possibilities that do not reduce reality. The aforementioned authors consider that "the reality that children are entering into is, first and foremost, the reality of being, feeling, and living that is the root of learning" [4, p. 18]. In other words, lived experience and reflection on that experience enables meaningful learning. To create experiential situations, it is also essential to consider the role of the educator or teacher, and the role of the child and to have a broad knowledge of teaching strategies. The term teaching-learning strategy refers to a set of actions by the teacher or the child aimed at encouraging the development of certain learning competencies that are aimed at [5].

As experiential work is considered relevant for the holistic and full development of the child, this work aims to identify the advantages and disadvantages of experiential work, to understand whether experiential work is a motivating factor, and to study the role of the child in the development of experiential work.

2 METHODOLOGY

This study is part of a qualitative investigation. In qualitative research, the direct source of data is the natural environment, and the researcher is the main agent in collecting this data. A set of data collection techniques and instruments were selected: participant observation, an observation grid, and field notes. The observation grid used was constructed considering the well-being and involvement scale, adapted to different contexts, from early childhood education to adult education, and translated into Portuguese in the DQP manual - Developing Quality in Partnerships [6]. In each grid, 24 observations were made, corresponding to the number of children in the class, in two different teaching-learning experiences.

3 RESULTS

This section presents the observation of two teaching-learning experiences developed with experiential learning in mind. The experiments were carried out in the curricular areas of mathematics and social studies, in a class of 4th graders in the 1st cycle of basic education (1st CEB), with a total of 24 children aged 9 and 10.

In each observation, 11 items related to the children's involvement were analyzed, such as (i) concentration - this exists when nothing can distract the child; (ii) creativity - this exists when the child gives an individual touch to what they are doing; (iii) complexity - the child willingly mobilizes their cognitive abilities to engage in a more complex behavior than a mere routine; (iv) energy - the child invests a lot of effort in the activity; (v) persistence - children who are really involved do not easily abandon what they are doing [6].

A 4-point scale was used: the strong points, namely, *always* (4) in which the child demonstrates, through continued and intense activity that they are carrying out the task and have reached the highest degree of involvement; and *frequently* (3) in which the child experiences moments of great intensity, and in which other stimuli in the environment, however attractive, do not distract them; and the weak points, namely, *rarely* (2) in which the child is engaged in the activity, but at a routine level, easily distracted from what they are doing; and *never* (1) in which the child appears to be absent and shows no energy. The data that emerged from the 1st-grade observation grids gave rise to graphs, which we will now analyze.

3.1 Volumes in Liquids

This teaching-learning experience is part of the mathematics area and came about to follow up the study about volume. Its main objective was to recognize the correspondence between the cubic decimeter

and the liter and to relate the units of measurement of capacity to the units of measurement of volume, through learning activities, fostering the development of reflective skills. Five heterogeneous working groups were formed. An experimental protocol was distributed along with the material needed to answer the question: "What happens when we put objects in water?". This experimental protocol was designed as a "predict-observe-explain-reflect" activity [7].

Figure I reflect the observations made of the children during the development of this mathematical task.

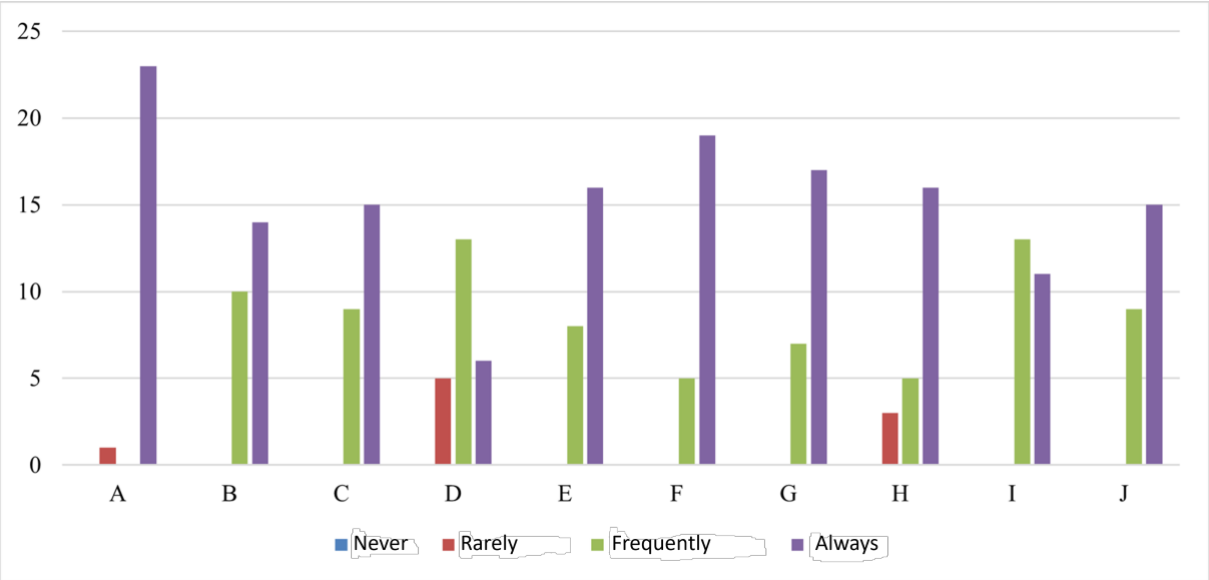

Chart Legend: A. Utilizes spaces and materials; B. Looks in an intentional and focused way (concentration and facial expression); C. Shows special care for her work, is meticulous and attentive to details; D. Produces comments/descriptions about what you have done or what you are doing, what you have discovered (verbal expression); E. Appreciates his/her work/activity or accomplishment and is satisfied; F. Invests effort and enthusiasm in the activity (energy); G. Persists in tasks; H. Makes discoveries in interaction with others; I. It is creative; J. Has curiosity and a taste for learning.

Figure 1. Observation results in the math task.

From the analysis of the graph, it should be noted that 23 of the children always used the spaces and materials provided, and only one of them rarely used them. As far as interactions are concerned, 16 of the children always made discoveries in interaction with others, five frequently, and three rarely. Most of the children in the class always made discoveries in interaction with their classmates, i.e. they were children who always worked as a group, showed team spirit, and shared what they discovered with their classmates. About comments, 13 of the children expressed themselves verbally frequently, six always did and five rarely made any comments. Having seen that most of the children in the class made discoveries, one would expect that the majority would also make comments about what they discovered or what they were doing. But this was not the case. Only 6 children always expressed themselves verbally. One last item of analysis stands out, which concerns the children's assessment of this work. Most of the children in the class (16 children) appreciated their work and were always satisfied, while the rest (8 children) were often satisfied.

In general, it can be said that this activity had very positive results since most of the children in the class understood the content about volumes in liquids. These are abstract mathematical ideas that were associated with everyday experiences, making the children attach meaning to them and understand the usefulness of mathematics in their daily lives. Situations were created that facilitate children's learning through experimentation, which was a motivating factor for the children, as it was different from more traditional work.

3.2 Peddy paper: visit to the Castle

As part of the environmental studies area, the Peddy Paper's main objectives were to get to know monuments, characters, and exhibitions that have been important in the city's history. We divided the class into 4 heterogeneous groups of 6 children. Different colored necklaces were distributed to identify

the different groups. Each group was also given a letter of proof. The taster card not only guided the children, giving them the necessary directions to get to know the Castle well but also contained questions about the surrounding area. This Peddy Paper would not be evaluated by the time it took each group to complete it, but rather by the score obtained in the answers to the questions posed. The aim was for the activities on the card to be diversified and motivating, which is why a photographic record of the place they most enjoyed visiting was also included, inviting them to write a photo report.

The attitudes that lead to a better understanding of the children's involvement in this activity can be observed through an observation grid that gave rise to Figure 2.

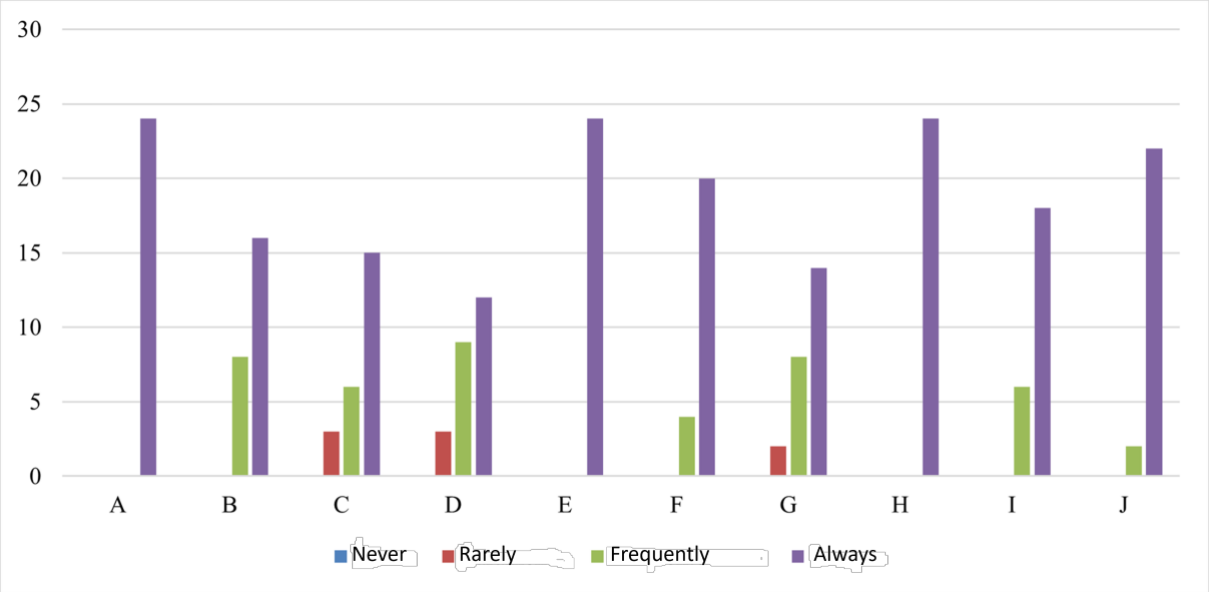

Chart Legend: A. Utilizes spaces and materials; B. Looks in an intentional and focused way (concentration and facial expression); C. Shows special care for her work, is meticulous and attentive to details; D. Produces comments/descriptions about what you have done or what you are doing, what you have discovered (verbal expression); E. Appreciates his/her work/activity or accomplishment and is satisfied; F. Invests effort and enthusiasm in the activity (energy); G. Persists in tasks; H. Makes discoveries in interaction with others; I. It is creative; J. Has curiosity and a taste for learning.

Figure 2. Results of observation in the social environment task.

This activity had extremely positive results. It is thought that this result is mainly because the Peddy Paper took place in a different space to the traditional classroom environment. We found that all the children used the spaces and materials provided, that they were motivated, curious, and willing to learn, eager to get to know all the positions listed on the test card. Most of the children were always attentive to details and were very participative. About verbal expression, half the children in the class always made comments about what they had discovered.

In general, the children were completely absorbed and focused on their goal of finding the correct answers to win the Peddy Paper, investing effort and enthusiasm in the activity. It's also worth mentioning that eight children were graded with the maximum scale in all the analysis items, which is very positive.

4 CONCLUSIONS

Experiential learning involves learning through hands-on experience and active participation in real-world activities. The learning process is reinforced by reflection on experiences, allowing for a deeper and more lasting understanding. This approach has a strong correlation with children's motivation. Motivation is an essential factor for children to be predisposed to learning, as is the space where activities take place, which can favorably condition learning and contribute to being a motivating factor and, of course, to greater educational success.

It is therefore important to create learning environments that support authentic, engaging, and reflective experiences, seeking to provide children with meaningful opportunities to apply theoretical knowledge in practice.

Experimentation activities, because they encourage participation, they are collaborative, because they stimulate activity and spontaneity, boost involvement in the proposed tasks, making children the builders of their own knowledge. This learning allows children to participate in learning that allows them to develop "attention to the world, a memory of experiences, the imagination of possibilities, reflective understanding, meaningful narration" [4, p.25].

ACKNOWLEDGEMENTS

This work is funded by National Funds through the FCT - Foundation for Science and Technology, I.P., within the scope of the project Ref.ª UIDB/05507/2020. Furthermore, we would like to thank the Centre for Studies in Education and Innovation (CI&DEI) for their support.

REFERENCES

[1] D. Kolb, Experiential learning: experience as the source of learning and development. Englewood Cliffs: Prentice Hall, 1984.

[2] I. Alarcão, Escola reflexiva e desenvolvimento institucional. Que novas funções supervisivas? In A supervisão na formação de professores (J. Oliveira-Formosinho, org.), Porto: Porto Editora, pp. 217-238, 2002.

[3] P. Perrenoud, Construir as competências desde a escola. Porto Alegre: Artmed, 1999.

[4] J. Oliveira-Formosinho and J. Formosinho, Pedagogia-em-participação – a perspetiva educativa da associação criança. Porto: Porto Editora, 2013.

[5] R. M. Vieira and C. Tenreiro-Vieira, Estratégias de ensino/aprendizagem: o questionamento promotor do pensamento crítico. Lisboa: Editorial do Instituto Piaget, 2005.

[6] T. Bertram and C. Pascal, Desenvolvendo a qualidade em parcerias. Lisboa: Ministério da Educação – DGIDC, 2009.

[7] L. Leite, Contributos para uma utilização mais fundamentada do trabalho laboratorial no ensino das ciências, in Cadernos didáticos de ciências 1 (H. V. Caetano and M. G. Santos, orgs.), Lisboa: Ministério da Educação, pp. 79-97, 2001.