

UNIFACVEST EDUCATIONAL TECHNOLOGY AND ACTIVE LEARNING: A REPORT ON THE TRAINING PRACTICES OF THE COURSE FORMATIVE ACTIVITY VII IN THE 2025.2 SEMESTER

TECNOLOGIA EDUCACIONAL UNIFACVEST E APRENDIZAGEM ATIVA: RELATO DAS PRÁTICAS FORMATIVAS DA DISCIPLINA ATIVIDADE FORMATIVA VII NO SEMESTRE 2025.2

TECNOLOGÍA EDUCATIVA UNIFACVEST Y APRENDIZAJE ACTIVO: RELATO DE LAS PRÁCTICAS FORMATIVAS DE LA ASIGNATURA ACTIVIDAD FORMATIVA VII EN EL SEMESTRE 2025.2

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ABSTRACT

This article presents a systematized report of the activities developed in the course Educational Technology – Formative Activity VII, from the Centro Universitário UNIFACVEST, during the 2025.2 academic semester. The actions involved planning, execution and analysis of pedagogical practices integrating digital technologies, maker culture, active methodologies, computational thinking and theoretical foundations from Developmental Psychology, especially Piaget and Vygotsky. Among the activities carried out, the following stand out: construction of sensory panels, development of digital and physical games using Scratch, Micro:bit, laser cutting and 3D printing, field visits, pedagogical workshops, application of projects in public schools, and production of lesson plans in ENADE format. The practices demonstrated the transformative potential of educational technology in promoting autonomy, creativity, scientific investigation and meaningful learning. The results indicate that the course successfully articulated theory and practice in a critical and innovative manner.

Keywords: Educational Technology. Maker Culture. Scratch. Active Learning. Piaget.

RESUMO

O presente artigo tem como objetivo apresentar um relato sistematizado das atividades desenvolvidas na disciplina Atividade Formativa VII do Curso de Tecnologia Educacional do Centro Universitário UNIFACVEST, no semestre 2025.2. As ações envolveram planejamento, execução e análise de práticas pedagógicas integrando tecnologias digitais, cultura maker, metodologias ativas, pensamento computacional e referenciais teóricos da Psicologia do Desenvolvimento, especialmente Piaget e Vygotsky. Entre as atividades realizadas destacam-se: construção de painel sensorial, elaboração de jogos digitais e físicos utilizando Scratch, Micro:bit, corte a laser e impressão 3D, saídas de campo, oficinas

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pedagógicas, aplicação de projetos em escolas municipais e estaduais, além da produção de planos de aula no formato ENADE. As práticas evidenciaram o potencial transformador da tecnologia no contexto educacional, promovendo autonomia, criatividade, investigação científica e aprendizagem significativa. A disciplina cumpriu seu papel formativo ao articular teoria e prática de modo crítico e inovador.

Palavras-chave: Tecnologia Educacional. Cultura Maker. Scratch. Aprendizagem Ativa. Piaget.

RESUMEN

El presente artículo tiene como objetivo presentar un relato sistematizado de las actividades desarrolladas en la asignatura Actividad Formativa VII del Curso de Tecnología Educativa del Centro Universitario UNIFACVEST, en el semestre 2025.2. Las acciones involucraron la planificación, ejecución y análisis de prácticas pedagógicas que integraron tecnologías digitales, cultura maker, metodologías activas, pensamiento computacional y referentes teóricos de la Psicología del Desarrollo, especialmente Piaget y Vygotsky. Entre las actividades realizadas se destacan: la construcción de un panel sensorial; la elaboración de juegos digitales y físicos utilizando Scratch, Micro:bit, corte láser e impresión 3D; salidas de campo; talleres pedagógicos; la aplicación de proyectos en escuelas municipales y estatales; además de la elaboración de planes de clase en formato ENADE. Las prácticas evidenciaron el potencial transformador de la tecnología en el contexto educativo, promoviendo la autonomía, la creatividad, la investigación científica y el aprendizaje significativo. La asignatura cumplió su papel formativo al articular teoría y práctica de manera crítica e innovadora.

Palabras clave: Tecnología Educativa. Cultura Maker. Scratch. Aprendizaje Activo. Piaget.



1 INTRODUCTION

Teacher training in the digital age requires the integration between pedagogical foundations and the critical and creative use of technologies. In the Educational Technology Course at the UNIFACVEST University Center, the discipline Formative Activity VII plays a central role in the development of practical, critical, reflective and investigative skills necessary for contemporary professional performance.

In Freire's perspective, educational practice requires a critical positioning of the educator in the face of the world and the instruments that constitute it, including technologies. As Freire (1996, p. 31) states:

[...]Teaching is not transferring knowledge, but creating the possibilities for its own production or construction. Therefore, teaching practice requires curiosity, criticality, methodical rigor and openness to the new knowledge that emerges in social, scientific and technological life". In this way, the critical and creative use of technologies cannot be dissociated from pedagogical reflection, because, as the author adds, "it is in the problematization of reality, in dialogicity and in transformative action that the educator affirms himself as a subject who learns by teaching and teaches by learning. (Freire, 1996, p. 43).

The 2025.2 semester was marked by a significant set of training experiences, which included maker culture, programming, robotics, field trips, construction of pedagogical materials, application of projects in schools, and preparation of lesson plans aligned with the BNCC. All these experiences were based on classical and contemporary theoretical references, such as Piaget, Libâneo, Vygotsky, Wallon, Freire, Resnick and authors of Environmental Education and Active Learning.

The article presents a detailed account of these practices, highlighting their pedagogical, methodological and technological contributions to the training of academics in the context of democracy, inclusion and social justice.

For Libâneo, teaching requires much more than technical mastery; It requires a critical understanding of the educational reality and the ability to articulate knowledge, methods and resources in an intentional and reflective way. As the author states:

[...]Teaching practice is an intentional and systematic activity, guided by educational objectives and supported by theoretical foundations that enable the teacher to analyze, interpret and intervene consciously in the school reality. Teaching implies selecting methods, using instruments and resources – including technological ones – in a

critical, ethical and appropriate way to the students' training needs. (Libâneo, 2013, p. 28).

From the perspective presented, it is understood that teacher training in contemporary times cannot dissociate the theoretical domain from the ability to use technologies in a critical and intentional way. By integrating pedagogical foundations with innovative practices, the discipline Formative Activity VII reaffirms the role of the teacher as a reflective agent, capable of transforming the educational reality through conscious methodological choices aligned with the current demands of learning.

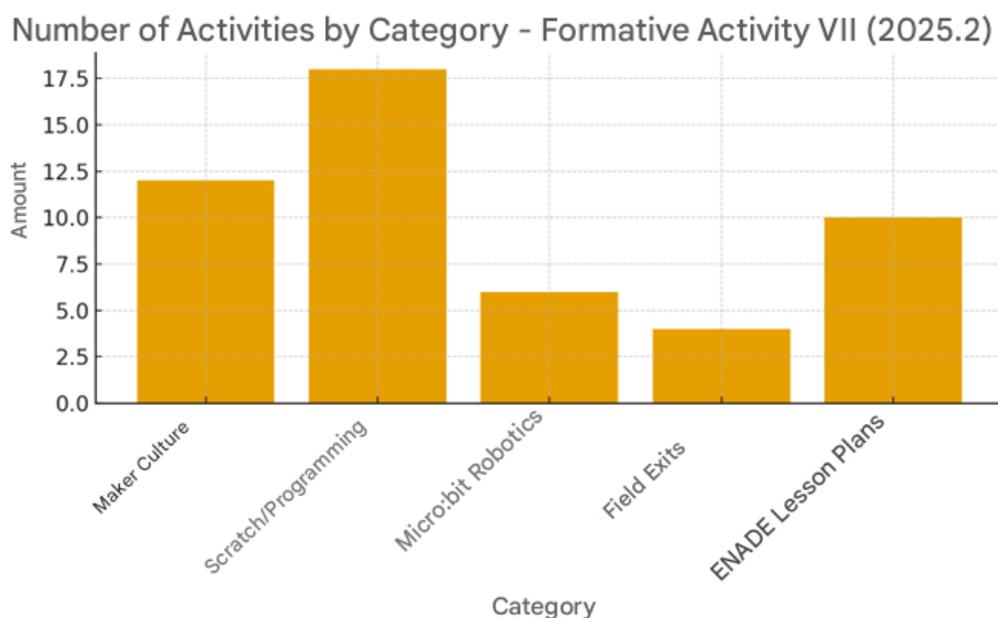
2 THEORETICAL FRAMEWORK AND REPORT OF ACTIVITIES

2.1 THEORETICAL FOUNDATIONS: PIAGET, CONSTRUCTIVISM AND MAKER CULTURE

The activities developed were guided by the constructivist theory of Jean Piaget, who understands learning as: "[...] active construction, occurring through assimilation, accommodation and balance". (Piaget, 1999; 2014). The proposals were structured respecting the cognitive stages: sensory-motor, preoperative, concrete operative and formal operative.

Figure 1

Number of activities by category - Training activities VII (2025.2)



Maker culture and computational thinking, according to Resnick (2017), were integrated as tools to favor project-based learning, autonomy, creativity, and problem-solving.

2.2 CONSTRUCTION OF SENSORY PANEL – SENSORIMOTOR STAGE

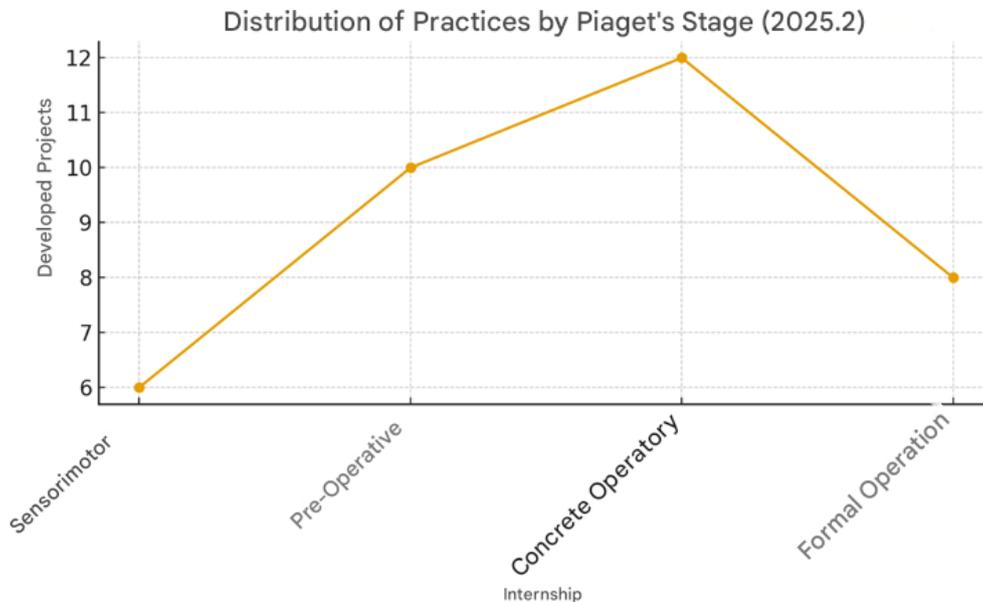
Based on the teaching plan provided, students built a sensory panel inspired by the sensorimotor stage (0–2 years). The activity involved:

- selection of objects with textures, sounds and colors;
- collaborative assembly with the support of the Maker Laboratory;
- understanding of cause and effect and motor coordination;
- theoretical foundation in Piaget's proposals and in the use of Scratch to stimulate sound and visual associations.

The panel demonstrated the relevance of sensory exploration for early cognitive development.

Figure 2

Distribution of practices by Piaget's stage (2025.2)



2.3 PROJECT "CONTATUDO 3000" – LOGICAL THINKING IN EARLY CHILDHOOD EDUCATION

The project applied with Maternal II used resources such as the Treasure Chest, flashlights with numerals and the Contatudo 3000 Machine. The children explored quantities,



colors and numerical relationships, experiencing playful, meaningful and investigative situations.

The activity dialogued directly with the preoperative stage, stimulating language, symbols and first logical-mathematical notions.

2.4 "RECICLAGAME" PROJECT – ENVIRONMENTAL EDUCATION, SUSTAINABILITY AND GAMES

Academics developed an ENADE lesson plan and a digital HTML game to teach recycling to Elementary School. The project involved:

- BNCC competencies such as EF03CI05 and General Competence 10;
- gamification, cooperation and decision-making;
- integration between Science, Technology, Languages and Mathematics;
- valuing environmental responsibility.

The practice exemplifies the use of technology as an interdisciplinary and engaging pedagogical resource.

2.5 MAKER CULTURE: LASER CUTTING, 3D PRINTING, AND PROTOTYPING

The Geometric Shapes Educational Game project involved:

- initial prototyping in MDF in Professor Alberto's laboratory;
- 3D modeling in Tinkercad and printing in the Maker Lab;
- digital version programming in OneCompiler;
- pedagogical application with 5th grade classes;
- observation of strategies, hypotheses, logical reasoning and cooperation.

It is a robust example of the integration between physical and digital materials, favoring computational thinking and socio-emotional skills.

2.6 EDUCATIONAL ROBOTICS WITH MICRO:BIT

Workshops held with guest professor Cristian allowed the students to understand the potential of robotics:

- hands-on experimentation with sensors and logic;
- intuitive programming for beginners;
- perception of the role of robotics in technological literacy.

2.7 PEDAGOGICAL VISITS AND OBSERVATION OF INNOVATIVE PRACTICES

The field trips to the institutions SESI, EEB Godolphin and EEB Vidal Ramos made it possible to:

- analysis of innovative educational environments;
- contact with active methodology practices;
- dialogue with former students who now work in the state network;
- articulation between academic theory and school practice.

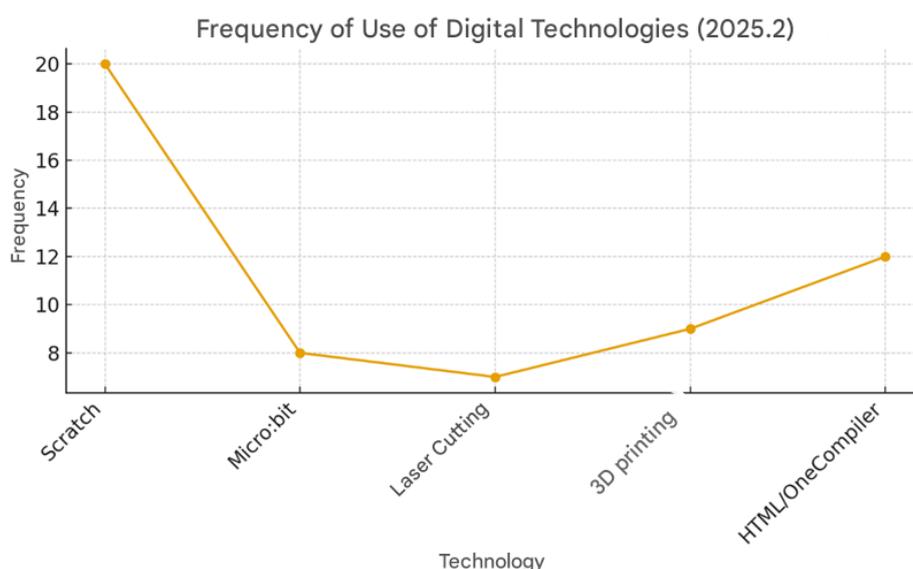
2.8 SCRATCH: PROGRAMMING, GAMIFICATION, AND DIGITAL STORYTELLING

The discipline produced projects in the different stages of Piaget:

- Sensorimotor: sound and visual responses in panels connected via Makey Makey;
- Preoperative: interactive stories, digital narratives and physical cards;
- Concrete operative: logical challenges, mazes and numerical sequences;
- Formal operative: games that require abstraction, hypotheses, and strategic reasoning.
- Scratch has proven to be an accessible and powerful tool, allowing creation, authorship and experimentation.

Figure 3

Frequency of use of digital technologies (2025.2)





3 SET OF ACTIVITIES

The set of activities described evidences a formative proposal based on Piagetian constructivism, in which learning is understood as an active process, resulting from the interactions between subject and environment. By respecting the stages of cognitive development — sensory-motor, preoperative, concrete operative and formal operative — pedagogical practices were organized to favor meaningful experiences, ensuring that each project was aligned with the capacities and ways of thinking characteristic of each age group. In this sense, the actions carried out in the discipline materialize concepts such as assimilation, accommodation and balance, promoting situations that challenge students and allow the construction of new mental schemes.

The integration between maker culture and computational thinking, inspired by authors such as Resnick, strengthened the perspective that learning involves creating, experimenting, testing hypotheses, and transforming ideas into concrete products. Projects such as the sensory panel, Contatudo 3000, ReciclaGame, and the game of geometric shapes illustrate this approach, as they articulate digital technologies, manipulable materials, and problem-solving in real contexts. Each activity was planned to stimulate autonomy, creativity and collaboration, core values of active methodologies.

The use of tools such as laser cutting, 3D printing, Micro:bit, and Scratch has broadened academics' understanding of the role of technology in contemporary education. Robotics and programming demonstrated their potential in technological literacy, while digital and hybrid projects enabled experiences that dialogue with the principles of the BNCC, especially with regard to digital skills, scientific thinking, and environmental responsibility.

The pedagogical visits reinforced the articulation between theory and practice, providing students with the observation of innovative environments and critical reflection on different teaching models. This movement between learning, observing, creating and applying reflects the essence of professional training in the area of educational technology: an education that integrates scientific knowledge, pedagogical sensitivity and technological mastery.

Freinet argues that learning is strengthened when it is born from concrete experience and reflective action on the school routine. According to the author:

[...]It is not possible to conceive of the education of the educator or the student apart from life. It is in direct observation, in contact with reality and in continuous experimentation that critical spirit, autonomy and the ability to create new solutions are developed. The school



must open itself to the environment, study it, transform it and allow itself to be transformed by it, because it is in the living relationship between practice and reflection that knowledge gains meaning and becomes truly formative. (Freinet, 1998, p. 42).

Field trips and interschool visits play an essential role in teacher training when seen from the perspective of Célestin Freinet. For the author, the school cannot remain isolated, because it is in the living relationship with the environment, with people and with social practices that knowledge gains meaning. By taking students to observe other educational environments, different methodologies and school realities, learning is promoted that is born from concrete experience — a fundamental principle of Freire's pedagogy. These moments allow the future educator to develop sensitivity, an investigative posture and the ability to critically analyze the daily school life, understanding that teaching is also studying the world, interacting with it and transforming it. Interschool visits broaden horizons, enrich pedagogical practice and strengthen the articulation between theory and life, as Freinet defended.

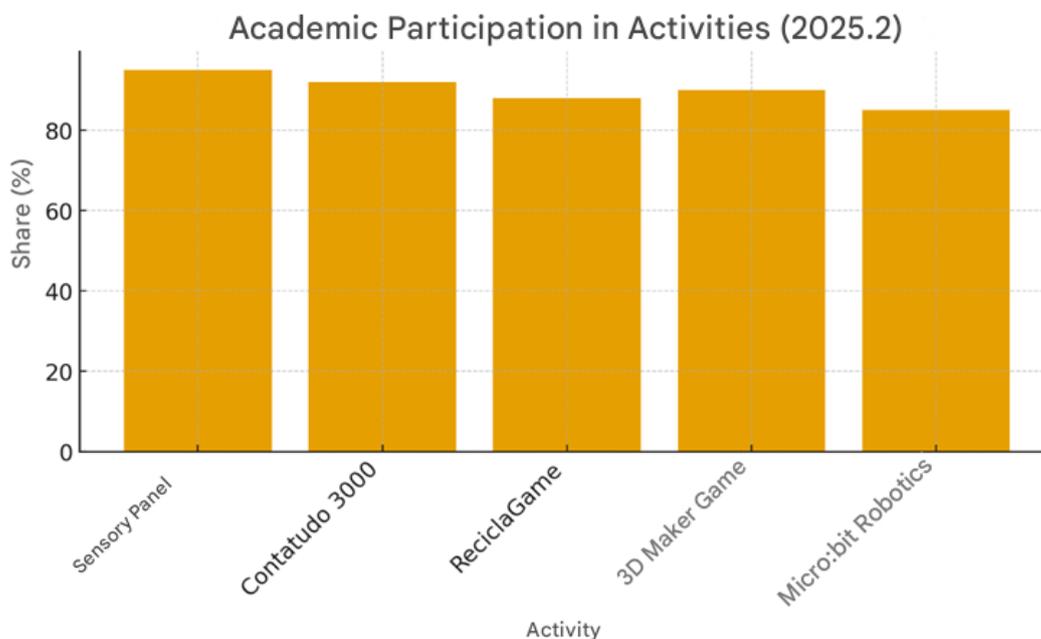
The set of activities shows a coherent curricular proposal, which understands learning as an active, interdisciplinary and creative process, while preparing future professionals to act with pedagogical intentionality and technical competence in different educational contexts.

4 FINAL CONSIDERATIONS

The 2025.2 semester of the Formative Activity VII discipline demonstrated the power of the integration between constructivist theory, digital technologies and maker culture in the training process of future educational technologists. The activities carried out enabled the students to experience active methodologies, develop creative, technological and socio-emotional skills, in addition to experiencing real pedagogical practices in different school contexts.

Figure 4

Academic participation in activities (2025.2)



The discipline fully fulfilled its objective of providing formative experiences that articulate innovation, criticality, authorship and social commitment, preparing professionals capable of transforming the contemporary educational scenario.

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