



ORIGINAL

## The flipped classroom in the training of technology education teacher

### El aula invertida en la formación del profesorado de educación tecnológica

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#### ABSTRACT

The present work is the result of classroom-based research, aiming to carry out a process of applying the flipped classroom model in teacher education, fostering autonomy, research, and reflection. For the development of the experience, a qualitative approach was considered, specifically action research, considering the organization of the conceptualization stage, the definition of an action plan, and intervention, establishing a contrast between theory and practice. It is highlighted that student-organized teaching seeks to enhance both individual and cooperative work, using one main strategy as a foundation and others as complementary. Therefore, the role of the student in organizing activities should be considered as it lays the groundwork for promoting the construction and reflection on their role as a teacher in training.

**Keywords:** Flipped Classroom; Curriculum; Action Research.

#### RESUMEN

El presente trabajo es producto de una investigación de aula, que tiene como objetivo realizar un proceso de aplicación del aula invertida en la formación del profesorado, fomentar la autonomía, la investigación y la reflexión. Para el desarrollo de la experiencia se ha considerado un enfoque cualitativo, específicamente la investigación acción, tomando en cuenta en la organización de la etapa de conceptualización, definición de plan de acción e intervención, realizando un contraste entre la teoría y la práctica. se resalta que la enseñanza está dirigida por el profesor y el trabajo del estudiante es seguir las indicaciones del docente en cada una de las practicas que se proponen. Con ello se debe de considerar el papel del estudiante en la organización de las actividades sustenta las bases para promover la construcción y reflexión sobre su rol como profesor en formación.

**Palabras clave:** Aula Invertida; Currículo; Investigación Acción.

#### INTRODUCTION

Teacher training requires the formation of critical thinking and implementation of the classroom model with a constructivist approach that allows student participation in the organization and planning of training spaces. Teachers must also rethink the theoretical models with which they teach and how they learn in terms of the changes that are provided in the curriculum.

Teacher training should be considered as enabling the development of competencies through different curriculum activities, which encourage reflection and student participation in the teacher training process.

To the above González et al.<sup>(1)</sup> the development and organization of a curriculum according to the existing demands in the contexts where it is proposed that allow emphasizing the practice Hernández<sup>(2)</sup> considers the training that helps the emphasis or simulation of the improves the understanding of the training. Thus, García<sup>(3)</sup> believes that the study programs must respond to identified needs and institutional characteristics.

### How to learn to teach in technical education

A logical order is established Bunk<sup>(4)</sup>; Hernández<sup>(2)</sup>. This is not a task that always seeks an interpretation and understanding of the previously organized programs from which the classroom teacher generates an itinerary from the competencies and contents together with the different methodologies that integrate it to achieve a good development of the curriculum in the classroom level with this Freire<sup>(5)</sup> mentions that.

Passion and practice are not opposing ideas; good planning and design are as important as concern and spontaneity in bringing out the best in learners. Although it is not everything, passion, however uncomfortable the word may be, is at the heart of what teaching is or should be, as cited in Day.<sup>(6)</sup>

It is right to think about the possibility of allowing student participation as part of training in teaching practice, which is why “the fundamental moment in the ongoing training of teachers is critical training on practice” Freire<sup>(5)</sup> as a methodology the inverted classroom allows the integration of a variety of strategies such as bibliographical research, reading, summarising, discussion, organisation of ideas and essay among others, Arroyo et al.<sup>(7)</sup>, Beltran Agudelo et al.<sup>(8)</sup> and Fiallos et al.<sup>(9)</sup>, is a phase of integration of pedagogical and scientific training of the teaching profession, which has little or no experience in the work of planning is why “it seems that the experience has played a key role in their continued development and in their ability to maintain the desire to make changes and to be effective teachers” (Day<sup>(6)</sup>, p.45), which allows novice teachers to consider the importance of participating in the planning of training spaces as a cycle of continuous improvement.

In teacher training González et al.<sup>(1)</sup> they take into consideration that trainee teachers must have a broad knowledge of the technical contents, as well as of the theoretical, pedagogical, and psychological competencies that underpin teaching, which allow the selection of the most appropriate ones according to the needs of the students and available resources, and which are aligned with practical, personalized and cooperative strategies. This is why Arteaga-Martínez et al.<sup>(10)</sup>, de la Torre et al.<sup>(11)</sup> and Parra-González<sup>(12)</sup> mention strategies such as exposure, didactic questioning, student-centered strategies, all of which are directed by the teacher as he/she works in the classroom.

### The training process

The ability to learn is not simply adaptation; it is to generate a change in reality in order to recreate it, to build, reconstruct, and verify the change that the world is not; the world is being Barato<sup>(13)</sup>, Freire<sup>(5)</sup> and Sepúlveda et al.<sup>(14)</sup>

The classroom allows us to deepen our knowledge of the methodological processes aimed at teaching in the workshop classroom and curriculum development, which is why we have considered the use of the inverted classroom as the basis for planning the training space, which is complemented by the competency-based approach and the constructivist curriculum model, This is complemented by the competency-based approach and the constructivist curricular model, which seeks to identify the methods and strategies used in the teaching exercise, so that trainee teachers can establish a perspective on the dynamics that develop in university classrooms, and how they can be replicated in the workplace.

Table 1. Teachers' perspective		
Teachers' perspective on the classroom	Vision of the learner's identity	Student response perspective
It is based on survival and control (shouts at pupils).	Adversary	Oppositional behavior and reluctant learning.
It relies heavily on the transmission of knowledge (talk to learners).	Receiver of truth and knowledge	Passive learner, sometimes boring
It is based on negotiation (talking to students)	Co-sharing in the success of learning	The active and collaborative learner takes responsibility for their learning success.

## METHOD

The study has been conducted under a qualitative approach Nocado de León et al.<sup>(15)</sup> they have their basis of functionality is the closest relationship between the researcher and the object of study; the methodology has been considered Action Research Cutipa & Tapia<sup>(16)</sup>, Risco<sup>(17)</sup> considers it “as a spiral of development that broadens and deepens as it advances in the process of construction of the activity and the investigative reflection”(p.67). With the above, a working route has been established, taking into consideration a hypothesis

of action, which marks the starting point as stated by Risco<sup>(17)</sup>: “It is called the hypothesis of action because it is precisely about possible actions that generate the change or transformation of the problem, which are proposed in a reasonable way to achieve a viable solution”:

The flipped classroom enables the integration of research, exposure, teamwork and expository strategies for understanding and applying teaching methodologies in teacher education.

Table 2. Categories of analysis	
Action hypotheses	Basic foundation
The flipped classroom allows the integration of research strategies, exposure, teamwork, and exposure to understand and apply teaching methodologies in teacher training.	
“The flipped classroom is an interactive method of information gathering that requires student involvement”. <sup>(18)</sup>	

### Subjects involved

The participants are the Design and Curricular Development of Technological Education students from the Universidad Pedagógica Nacional Francisco Morazán, with six students, one woman and five men. From the second and third years of teacher training.

### Information production process

Table 3. Relationship of competences and indicators of achievement		
Competences	Indicator of achievement	To be used
Theoretical and practical mastery of the concept, epistemology, and paradigms of curriculum design.	Demonstrates in practice theoretical mastery of the characteristics of learning theories and curriculum models.	Discussion from the research Construction of its concept
Differentiate the basic concepts and interrelationships between the various theoretical foundations of curriculum design		
Analyze the incidence of curriculum models in a teaching and learning proposal.	Demonstrates mastery of the theoretical concepts of curriculum design.	Comparing the concepts from different authors and the relationship between them.
Organize a micro-curriculum model.	Organizes and explains the stages of micro-curriculum organization	Explanation of the stages of the organisation of the micro-curriculum
Select the methodology relevant to the pedagogical areas of their professional training.	Proposes innovative alternatives for reorganizing the teaching planning process.	
Apply the theoretical and methodological foundations by the nature of their discipline.	Applies different didactic strategies	Development of the micro curriculum proposal

Once the strategy was defined to identify an activity that would allow the student to demonstrate mastery of the concepts and organization of the curriculum and thus enable the student to make a micro-curriculum proposal from their discipline of study, which would integrate and explain the concepts of curriculum and how its organization is influenced by the different curricular models and approaches, together with the student's participation in its planning.

### Intervention phase

It was developed in three moments; in the first part, the program and work proposal were shared, and the student contributed to the improvement of the products to be delivered, the products that allow the approach and theoretical development concerning the curriculum, concepts, models, approaches, evaluation, and organization in a study plan, together with the methodologies, paradigms, and models that support it, from the proposed models, in the second moment the base strategy was indicated and how this allows the use of other strategies that complement the teacher training using the inverted classroom.

## RESULTS

The results are divided into different moments: During the diagnostic phase, in which the working hypothesis was defined, the importance of implementing the methodology and the student's participation in planning the training spaces were identified to contrast the concepts underpinning their training.

In this phase, the organization of planning has been considered Rogel-Salazar<sup>(19)</sup>, which allows for the optimization of competencies based on the concepts and how these are applied in the teaching exercise.

The intervention process has been developed in two phases, which I consider to be a systematic process of using different teaching and learning strategies. I consider the inverted classroom as a starting point and its application and interactions, systematizing the experiences, organizing the times, and reflecting on effectiveness.

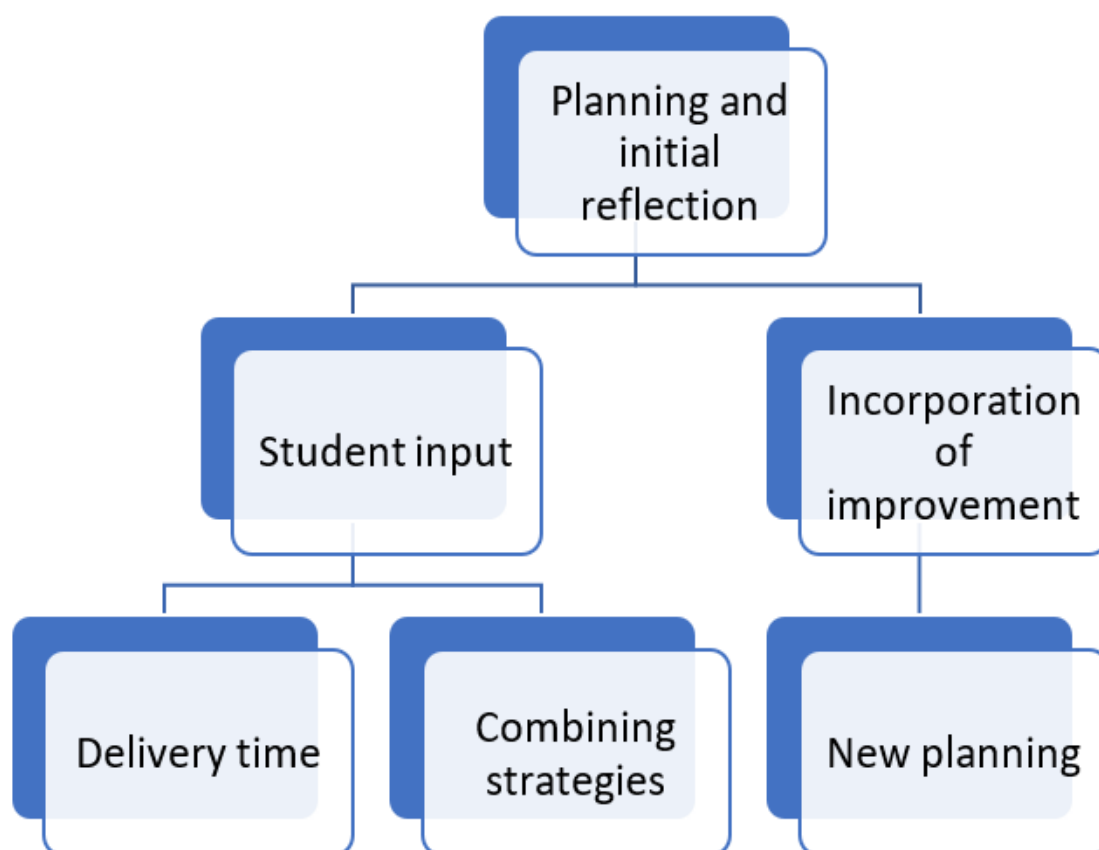


Figure 1. Organizing planning with students

In the planning process with the students, different teaching and learning methodologies have been identified, which have been common in the different pedagogical spaces; figure 2 shows strategies such as exposure, workshop, and laboratory practices, all directed by the teacher, learning strategies such as teamwork, individual work, workshop practices, and research assignments to strengthen concepts López Cubino<sup>(20)</sup>, Sabugal et al.<sup>(21)</sup>, take into account the activities led by the teacher Zabala & Arnau<sup>(22)</sup>, which is made up of different situations, such as the context, the characteristics of the students and the resources.<sup>(23)</sup>

The above has allowed the student to understand that teaching is conditioned by the characteristics of the students and the educational center, conceptualizations, and paradigms. figure 3 shows how the students follow the instructions provided by the tutor, the organization of individual work, and the development of the different practices, learning by participating in the planning in terms of the organization of the classroom, the importance of giving their opinion on what they want to do together with the distribution of the different strategies, observation, and monitoring of the assigned tasks, together with the reinforcement strategy in general, the pedagogical space, the number of students, the experience of the teachers in the area of specialization, the number of students, and the experience of the teachers in the area of specialization.

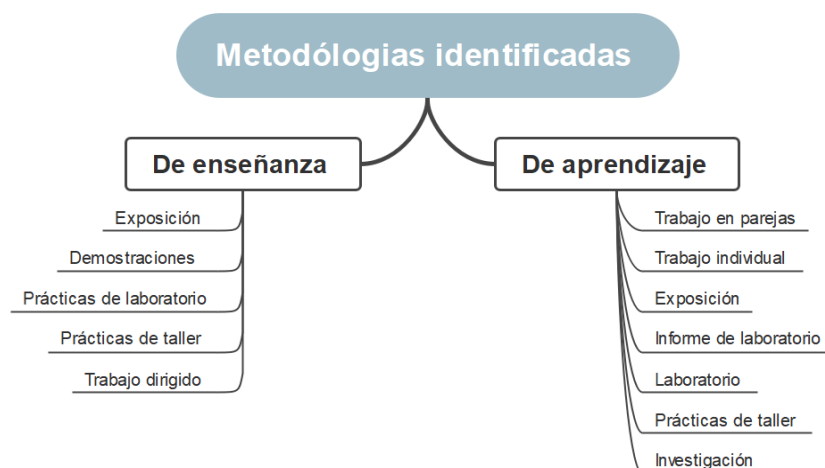


Figure 2. Methodologies used by teachers

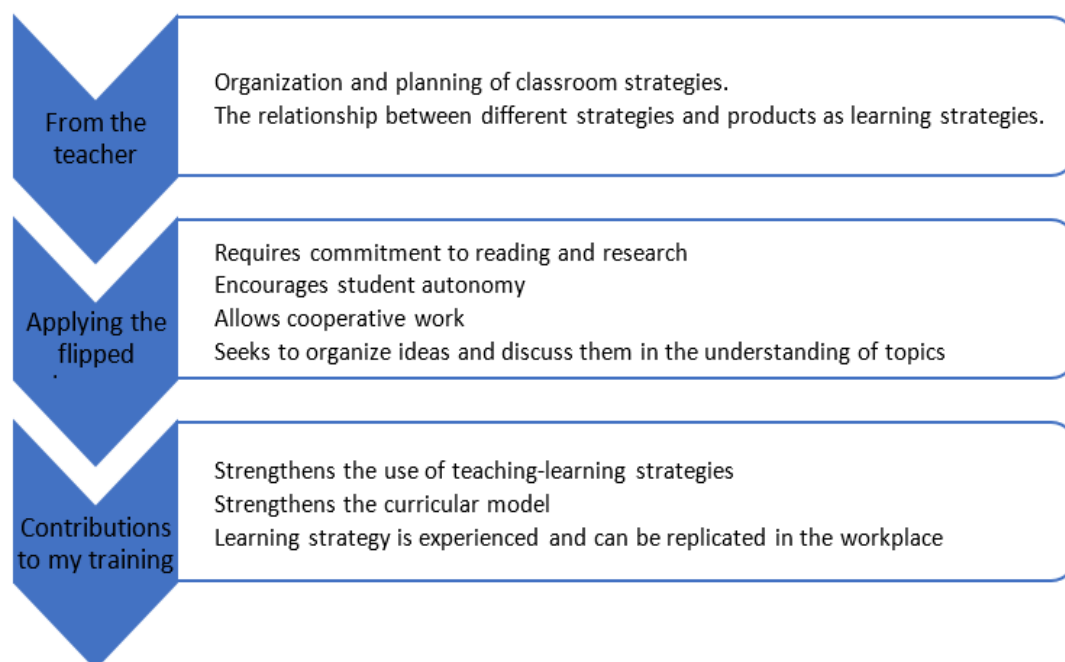


Figure 3. Lessons learned in planning and implementing the flipped classroom

## CONCLUSION

With the students' organization and participation in planning the observation for the implementation of the inverted classroom, the students have been able to connect the concepts with reality. The strategies selected have been chosen to strengthen the autonomy and development of critical thinking, considering the characteristics of the students and the available resources.

We consider that the student's role in organizing the activities supports the basis for promoting the construction and reflection on their role as teachers in training.

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#### **CONFLICT OF INTEREST**

The authors declare that there is no conflict of interest.

#### **AUTHOR CONTRIBUTION**

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