



The engineering professors' teaching identity formation as university teachers: A process of sociocultural construction

María Luisa MADUEÑO SERRANO¹, Lorena MÁRQUEZ IBARRA², Agustín MANIG VALENZUELA³

¹ Prof. Dr., Instituto Tecnológico de Sonora, México, ORCID ID: 0000-0002-9571-3526

² Prof. Dr., Instituto Tecnológico de Sonora, México, ORCID ID: 0000-0002-7615-2241

³ Prof. Dr., Instituto Tecnológico de Sonora, México, ORCID ID: 0000-0003-2109-2920

Received: 04.07.2018

Revised: 16.01.2019

Accepted: 21.07.2020

The original language of article is English (v.17, n.4, December 2020, pp.504-519, doi: 10.36681/tused.2020.41)

Reference: Madueño Serrano, M. L., Márquez Ibarra, L. & Manig Valenzuela, A. (2020). The engineering professors' teaching identity formation as university teachers: A process of sociocultural construction. *Journal of Turkish Science Education*, 17 (4), 504-519.

ABSTRACT

The purpose of this study was to examine engineering university professors' teaching identity formation as a result of their experiences derived from their teaching practices. We used the position of cultural psychology and conception of identity in the practice of Wenger (2001). The stories of ten engineering professors from a Mexican university were retrieved through open-ended qualitative interviews. The results showed that the main coincidence in the process of being and identifying as a teacher was the interest in students and learning. We concluded the teacher identity construction developed through experiences of successful teaching practices and the commitment towards student training.

Keywords: Formation, identity, teachers, university, teaching practice.

INTRODUCTION

Background

Society attributes challenges to higher education institutions (HEIs), including faculty members. Specifying academic achievements to respond to the changing needs of the socio-historical context is considered a responsibility of teachers (Cuadra & Catalán, 2016; Salas & Murillo, 2007). International reports and research reports have been noted that the quality of education and students' learning depends on the quality of the teaching staff (Díaz, Alfageme, & Serrano, 2013).

The competency approach incorporated in HEIs requires great commitment for university professors to serve with a double identity, professional identity in their disciplinary field and teacher identity in teaching courses (Zabalza, 2007). Ideally, it is urgent to address



the professional identity of their disciplinary field, without neglecting the importance of assuming identities as teachers. In line with the previous idea, it is essential to mention that professional dedication to teaching can hardly stabilize their identity as teachers if they do not achieve their competences in their expertized fields (Lanèlle 2011, in Martínez and De Ibarrola, 2018). Thus, it is not enough to practice as disciplinary experts for university professors.

Galaz (2011), based on his research, reported that professionals who join university teaching with a different previous training are characterized by an intermediate or transitory identity, and this has an impact on their lack of commitment with their work because they look for other job opportunities. Therefore, it is not easy to act in congruence by considering the importance of assuming the teaching identity (Aristizábal & García, 2012; Monereo & Domínguez, 2014).

Some studies mention that in their first years, teachers face both uncertainties and inaccurate performances when teaching their classes (Bozu & Imbernón, 2016; Galadí, 2010). Galadí (2010) reported that this situation is more common when teachers do not assume the teaching identity. On the other hand, Bozu and Imbernón (2016) noted that it is necessary to improve initial teacher training programs to influence the quality of teaching in higher education. The novice university professors need to know how to plan and teach a class, prepare exams, general pedagogical knowledge, and methodological teaching tactics. It is also necessary to incorporate reflexivity in those who prepare to be teachers (Odabasi & Cimer, 2012).

Researchers (e.g., Bozu & Imbernón, 2016; Martín, Conde, & Mayor, 2014) support the idea of strengthening initial training because it has been reported that the teaching identity is developed precisely in the first years of the exercise in this profession. On the other hand, Zabalza, Cid, and Trillo (2014) reported that the foundations of teaching identity are strengthened in the context of relationships that the teachers develop in their first years of teaching. Thus, it is suggested to saturate teachers with meanings, generate efficiency expectations and satisfaction, in addition to reorienting their identity with the support of induction programs to the profession (Zabalza, Cid, & Trillo, 2014). On the contrary, when extrinsic motivations influence, the quality of teaching performance can be affected (Kilinc & Seymen, 2014). In light of these ideas, we considered that conducting a research study to observe successful practices and challenges regarding teacher identity is vital.

Researchers in the related literature (Brito, Subero, & Esteban-Guitar, 2019; Contreras & Villalobos, 2010; Díaz et al., 2013; López de Maturana, 2010; Marcelo, Mayor, & Murillo, 2009; Monereo & Domínguez, 2014; Valdés, 2017) investigated the identity of teaching staff, interested in incorporation or improvement of their teachings. In general, these studies link teaching complexity with the changes that emerge from curricular models or demands derived from educational policies in the social, cultural, and economic environments. Recognizing this complexity is critical because it helps to understand the need for teachers to assume a teaching identity, as indicated by the researchers mentioned above. They expressed that this identity affects the development of the faculty's work favoring reflection and improvement in their teaching practice.

López de Maturana (2010) indicated that teaching identity helps to assume the demands of a function according to the priorities of this era. However, as researchers pointed out, despite the importance of supporting the development and improvement of teacher teaching practices, sufficient mechanisms and spaces have not been developed to improve professional performance and strengthen the teaching staff's identity. However, Vaillant (2009) documented that the construction of identity is not fully acquired through initial training programs.

For teachers who join teaching without prior training, learning through practice is central in constructing their identity in the didactic-pedagogical aspect (Muñoz & Arvayo, 2015). In this sense, it is necessary to address an identity study and its formation, based on the condition of each situation, teachers with and without initial training.

Description of the problem

Identity refers to people's sense of self and, in turn, defines performance (Ávalos, Cavada, Pardo & Sotomayor, 2010; Remedí, 2008). The sense of self that a human being has and assumes is both a subjective limitation and an impulse for action (Ávalos, 2009; Ávalos et al., 2010). Aristizábal and García (2012) affirm that the identity of professional teaching represents a critical factor in teaching practice quality.

Faced with the changing demands of the educational world, especially in higher education, becoming a proficient teacher requires assuming different versions of his identity, adjusted to the contextual requirements (Monereo, & Domínguez, 2014). A professional, who works as a university teacher, has a double identity: his profession, which is related to subjects he teaches, and his teacher identity. However, at the beginning of his teaching responsibility as university professors, what prevails is usually the identity in the taught discipline. Zabalza (2013) mentioned that due to the diverse functions of full-time university professor positions, university professors report a lack of professional teacher identity definition due to their responsibilities as researchers, and they need to do management to spread the knowledge before participating in the necessary cultural extension.

In general, the HEIs' faculty of most Latin American countries lack teacher training at the beginning (Martínez y De Ibarrola, 2018). This is due to the belief that mastery and experience in a discipline are enough for teaching as a university professor downplaying the development of teacher training and identity. In opposition to this belief, it is argued that in order to prepare better professionals, both from the requirements of the competency-based approach and from the demands of the current socio-historical context, there is a need for teaching and disciplinary competences, in addition to assuming both identities: the teacher and the professional discipline identity (Zabalza, 2007). Teacher training is a necessary condition in the processes of teacher change and reconstruction of professional action (Zabalza et al., 2014).

On the other hand, Díaz-Barriga (2010) pointed out that teachers are considered constructive learners, indicating that teachers learn during the development of their practices. For this reason, it is essential to recognize their learning through practices, and this process requires acquiring new ways of learning and act accordingly. Zabalza (2007) and Díaz-Barriga (2010) agree that a university professor who lacks teacher training learns from his practices. Therefore, if during his teaching performance, the university professor acquires a repertoire of didactic-pedagogical tools to face with the complexity of educational work, conducting a research study addressing the university professor's construction of his identity as a teacher can help to understand how the university professor identifies himself as a teacher.

According to Imbernón (2007), to strengthen teacher training, it is necessary to improve support strategies directed towards university professors and conceive teachers as subjects that can contribute from their experience. This posture makes more sense if it is accepted that a university professor is formed through practice. Thus, it is valuable to understand, from the university professor's rapporteur, what has helped him to form and build his identity as a teacher, and in particular, in his early years of teaching work. In addition, in related literature, Bozu and Imbernón (2016) reported that there is a limited number of studies with beginning

university professors, which arises the research question of What characterizes of experiences that favor the construction of the identity of university professors in their beginnings?

Purpose

The purpose of this study was to identify the characteristics of experiences derived from teaching practice that drive the process of the identity construction of the university professors who did not have a didactic-pedagogical training during their first years of teaching work.

Theoretical posture

This research's theoretical position is based on a basic principle of cultural psychology, which supports that an individual and the culture of the individual mutually influence each other. The human being, by its social nature, when participating in a specific practice, is modified by its context, while he modifies it by belonging to his culture (Bruner, 1991; Cole, 2003; Wenger, 2001). The construction of identity is conceived as a product of a sociocultural nature, where the influence of socialization and interaction with others is highlighted, as well as the relevance of the meanings that guide the action.

Identity is built through participation in a social practice, which is why we begin from the concept of identity formation in action, from Wenger's (2001) perspective. According to Wenger (2001), identification and meaning through commitment, as well as imagination and alignment, are key references in the construction of identity from the notion of identity in action, the human being constructs or forms his identity in sociocultural contexts.

From its social nature, learning is a conceived process constructed from practice. In this way, identity is assumed as learning that starts from the experiences of practice in various modalities of participation in situated activities. In this sense, individuals' learning experiences within social environments enable the development and transformation of identities (Wenger, 2001). That is why Lave and Wenger (1991) emphasize that learning is becoming a different person.

When someone learns something new about a specific practice, the person and their work are transformed, that is why his identity suffers changes (Larreamendy, 2011). The foregoing is consistent with the notion of an identity that is not static but dynamic and changing, which is congruent with the position of the human being's social nature and learning capacity. From this position, the notion of the dynamic identity of Ricoeur (2006) constitutes an axis of analysis since the construction of identity is a process that is constantly refigured or reconstructed. Finally, it is appropriate to point out from Ricoeur's approaches (as cited in Fernández, 2016), indicating that it is important to understand a person from the actions as an ethical agent in understanding identity.

METHODS

Researchers in this study utilized a qualitative approach, based on the narrative biographical method from the modality of thematic life stories focused on practice (Bertaux, 1999, 2005).

a) The Study Group

Ten professors assigned to the Department of Industrial Engineering of the Technological Institute of Sonora participated. Researchers used selective sampling criteria (Ruíz, 2012). The first criterion was participants' referrals by their academic peers with

recognition of teaching practice. Based on the referred list of teachers, four other selection criteria were applied including (1) minimum experience of one year as a university professor, (2) not have teacher training in their beginnings, (3) identify themselves as teachers, and (4) agree to participate in the study. After the selection process, 10 participants (i.e., five male and five female) were identified to participate in the study. The participants' ages ranged from 28 to 48, with an average of 40. The average of their teaching experience was 12 years, ranging from 2 to 26 years

b) Data Collection Tools

The technique of collecting data was the interview, and for this, interview guides were prepared with three variants. The first instrument was a structured interview that was applied to university professors responsible for the administration of the graduate competencies in an educational program. These professors served as key informants to refer or nominate outstanding professors in their work. The instrument consisted of a section for identifying data, and another section to write the names of five distinguished professors by their teaching performance in their affiliated department, including a space to explain the reasons for their choice. Finally, a section was included to receive the contact information of referred professors.

The second instrument was a structured interview that was applied to retrieve identifying data from the professors referred by the key informants. The structured interview included the type of contract, age, teaching seniority, professional training, work experience, and pedagogical training before becoming a university professor. With this information, a list of professors was filtered, from those who had at least two years of university teaching experience and did not have prior teacher training, to contact and invite them to participate in the research. The last criterion was to accept their collaboration in the study.

The third instrument was a semi-structured interview guide with open-ended questions, including trigger questions that were used to provoke the participants' reflection to generate their stories. This interview was applied to the professors who were included in the final version of the study sample. The instrument's format was structured in two sections. The first section included recorded place, date, and beginning and ending time of the interview. The second part contained the following trigger questions: What or who helped you to identify yourself as a teacher at the beginning? How was that experience? Why? To which could be added more questions in order to gain depth and richness in the interviewee's story.

c) Obtaining the Story and Data Analysis

The study procedure was developed in two stages, obtaining the story and analyzing the information (Bertaux, 2005).

In the first place, the authorization and permission to enter the field were requested by means of an official letter signed by the institution's corresponding academic authorities for the development of the study. Then, potential participants who would provide information to the study were contacted. It should be noted that the information provided by key informants and interviewees was handled confidentially.

The interviews were conducted on the agreed day, place and time. Prior to its development, details of the study were announced, and informed consent was reviewed in writing. The consent form, then, was signed by accepting the conditions of participation and their rights. Interviews were audio-recorded with prior authorization. Before concluding the interviews, each participant received a space to express some additional information that would be considered relevant for the investigation. The interviews were finalized by thanking

participants for their collaboration. It is important to mention that due to the nature of the semi-structured interviews, subsidiary questions were generated to deepen the stories.

The analysis began with a faithful transcription of the interviews. Then, emerging pre-categories were identified, which were contrasted with the theoretical body of reference, and thus the final analysis categories emerged.

The process of analyzing the information consisted of (a) carefully reading each of the transcripts and, if necessary, checking them with the audio to ensure that the narrative was not distorted, (b) retrieving relevant evidence from the transcribed stories in order to reduce the information without losing the orientation of the study, (c) generating emerging categories based on the empirical evidence recovered, (d) organizing the information by participants from the categories generated by means of a summary table that included relevant fragments that were used as key vignettes to illustrate the stories by participants, and (e) a transversal analysis, which consisted in identifying recurrences and particularities of practice reports of all participants. Finally, the results were integrated from the dialogue between empirical data and theory.

It is worth mentioning that this research had methodological rigor through the agreement between its components including question, objective, method, technique and procedure for collecting and analyzing the information (Salgado, 2007). On the other hand, the criterion of credibility was taken care of fidelity of the discourse of participants in transcription and reporting findings (credibility). Likewise, the research was exposed to various researchers to ensure reliability and validity. As ethical criteria, the anonymity of informants was considered, their consent was given in writing, attention was paid to risk management, which ensured that participants or the university would not be prejudiced, and it was informed about the use of their data to generate the results (Galeano, 2009).

To illustrate the participants' voices, vignettes were used from excerpts from the interviews, and pseudonyms were used to refer to participants. P was used for *participant*, followed by a *consecutive number* as a differentiating element to ensure participants' anonymity.

FINDINGS

After analyzing the data, it was found that the practical experiences that drive the process of identity formation during the first years of university professors' work are related to two categories: satisfaction and commitment. For both categories, the characteristics of experiences derived from participants' mentioned practice had to show the interest that participants refer to student's learning when referring to their teaching practice.

a) Satisfaction for Teaching Practice

The satisfaction for the teaching practice arose from diverse experiences, emphasizing the following: (a) the teaching practice in the first classes with the students, (b) when they overcame their nervousness and found alternatives for improvement, (c) value teaching as a vocation that they had not discovered and considered it as an opportunity for professional development, (d) felt competent when integrating their experience as industrialists to the teaching work, and (e) imagined themselves as able to support the learning process of the students.

The experience in the delivery of the first course indicated the identification of teaching. For example, when the interviewees shared what helped them identify themselves and saw themselves as teachers, they told stories like the following. P1 narrated:

I can say that the moment I touched the classroom... I said: I want to be a teacher! The moment I opened my classroom and felt the butterflies in my stomach, I felt my students! And I said: this is I want to be! I do not know, that day I realized that. [P1]

Continuing the story, he insisted: *“Every day, every start of semester... butterflies in my stomach return despite my experience, even if it’s the same course, whatever it is, I still feel butterflies in my stomach.”* P1 closed his comments by saying: *“The day you don’t feel them, be careful!”*

It is appropriate to point out the warning expressed by P1 as *“be careful!”* was a reflection for himself in his story. He said that every teacher must feel the emotion of being sensitive to students. He mentioned that if this was not present in his act, it could cause problems of disposition and commitment towards teaching.

The first teaching experiences were also characterized by the nervousness of participants before a new activity. Overcoming this nervousness was part of the construction of identity. For the teachers, the nervousness represented *“feeling a new challenge”* as expressed by P2. In this respect, it is important to point out that the interviewees recognized the presence of insecurity in their first classes. Regarding this, P1 stated, *“like everyone, I think we started a little hesitantly.”* In addition, for P1, the nervousness that he felt from the first class sessions and when he started a course, was *“a challenge.”* It was identified that, with different stories, teachers related nervous situations as a challenge or experience that led them to look for alternatives to improve their teaching. The previous idea was a coincidence in the narrations of professors, including P1, P2, P3, P4, P6, P7, P8, and P9.

Some teachers thought teaching was a profession that they had not discovered, but somehow they already had. In this sense, P1, P2, P8 and P10 agreed. P2 described that *“to be a teacher is to feel like a fish in the water,”* in this context of the story, he mentioned that he felt like vocation since his first years in teaching practice. He mentioned that *“being stuck to books, acquiring knowledge and transmit them”* for him it was a pleasure, then shared the following:

I felt joy! I do not know if it’s what it feels like when you say: I have the vocation! Right now, I still do not see myself working if it's not in a university as a teacher I do not regret having chosen to be a teacher because it fills me with satisfaction every day. [P2]

On the other hand, another participant shared:

I think I always had the vocation [to be a teacher], as an industrialist I had the experience giving workshops in the company, and also since I was in high school had the responsibility to help my brothers in their tasks, I was in charge of them, and now that I think about it, I think there was always a joy in me for teaching. The truth is I am very proud to be able to help the boys here in the race because, in addition to them, you have to love them, yes [he insist] the student you have to love the student. [P8]

The joy and emotion originated from first classes, as well as disposition to overcome nerves assuming them as acting challenges, were parts of the beginnings of a built-in identity acting. The university professors began to identify themselves with teaching action as they overcome fears and insecurities. As the teaching of the classes was practiced, it took on a meaning that had not been thought, that was, from being a new function for them, was associated with a teaching vocation that had not been discovered. They imagined themselves differently as they advanced in their teaching experience. In this sense, the presence of three key referents of Wenger’s acting identity (2001) is noted: identification, meaning and imagination.

Some professors (e.g., P3, P5, P7, and P9) mentioned that in their early years, they were not teachers and saw themselves as engineers. They noted that they were aware that they were far from being teachers. One of them said:

Is just that I am not a teacher, I teach, I transfer my knowledge and experience as an engineer, but I still have a lot to be a teacher, and yes, I like what I do, although little by little I am forming myself. [P5]

Following the previous, Martínez and De Ibarrola (2018) noted that it is complex to assume an identity as a teacher without first acquiring the competencies of that function. When teachers recognize that they are not teachers or lack a lot for it, it is expressed as a need for training that they are willing to address (Martínez & De Ibarrola, 2018).

The authors mentioned earlier affirm that transition to a new identity is complex. However, it is also considered that institutional training mechanisms are part of identity construction; therefore, it is appropriate to promote both formative routes. The present results reaffirm the importance of emphasizing teacher training as an element of change that affects the transformation towards professional identity as a teacher (Zabalza et al., 2014).

The formation of a new teaching identity, in the beginnings of teaching, was strengthened by involvement in the teaching practice. In these cases, interaction with students in first semesters, and previous experiences related to teaching, as well as the experience of being instructors of courses in the industry, were precedents in the formation of their identity as teachers. Consistent by Lave and Wenger (1991), teaching-apprentice socialization from a joint work experience contributed to the development of human beings and teachers' training in this case.

Approaches to a teaching identity, which highlight the advantages of interaction with others (students), coincided with the assumption of human beings' social nature. These ideas are consistent with other studies reporting the context of relationships developed in the first years of the teaching takes on meaning in their identity (Zabalza et al., 2014).

For an industrial engineer, becoming a teacher created a new possibility of professional development that emerged during the teaching in the classroom. An almost total agreement was presented among the professors who shared their stories. Six of the interviewees assured that being a teacher was better than working in the industry. When they were asked about why they said teaching was better, one participant answered that *"the complexity of teaching is not exhausted [P2]."* Another participant said, *"Being a teacher keeps you always updated, in the search for new knowledge, forces you to be at the forefront, to find alternatives for students to learn [P3]."* In these cases, teachers experienced the satisfaction that led to personal growth, which drove them towards constant updating, not only in the field of industrial engineering but also in the search for preparation to performing as teachers.

For the participant P6, being a teacher *"is better than the maquila because, in the maquila, there is not the same need to make adjustments."* For his part, P4 reported that his entry into teaching meant access to a *"work activity with better opportunities for personal and professional development,* in addition to offering a flexible schedule of less physical wear. P3, P4, P5, and P7 expressed that being a teacher was better than work in the industry.

Describing the pleasure of teaching as part of the process of identity formation highlighted opportunities to see in teaching possibilities for the development of the profession of origin coupled with personal satisfaction. The reason for this was that the teaching experience allowed them to be updated in their disciplinary area, and felt that they helped others to learn.

The advantages about the process of constructing identity as teachers, based on empirical evidence from P1, P2, P3, P4, P5, and P6, were as following: (a) the constant opportunity to identify as teachers when developing teaching practice, (b) the need to stay updated in their disciplinary area, and (c) the satisfaction experienced in contributing to the training of their students. These advantages were motivation in their work.

When continuing with the description of what marks the satisfaction for teaching, P4 mentioned that she discovered the taste of being a teacher when performing as a teacher in her first course called Economics in Engineering. She stated, "*I liked to give classes precisely for that matter,*" was part of a narrative context. She mentioned that she gained experience at a company as a project evaluator, which helped her become familiar with the mentioned course. Regarding this, she stated:

The opportunity to work out there, in the day to day, in the industry, helps the teacher to bring concrete examples to the classroom, we can bring real cases when the subject you teach is related to what you do at work. [P6]

The possibility of teaching the course of Economics in Engineering, combined with work experience in the area of specialty in which she joined as a teacher, represented a fundamental advantage that helped her to integrate her knowledge from theory to practice. This experience allowed her to support students in applying their knowledge to the corresponding course. In this case, the teacher felt and imagined herself as competent and identified herself as someone capable of supporting her students in the learning process.

According to Wenger (2001), identity is presented in action, which is woven little by little at the beginning of a teacher's career. In particular, the identity is built when teachers discover in themselves teaching vocation and value satisfaction for what is done. Another aspect of that identity in action is teachers' noticing that teaching is an alternative development complementing their training and disciplinary development based on what they do in the classroom and what drives them to prepare during their practices.

For university professors, their discipline of origin is substantive to feel competent and satisfied as teachers. According to participants, the work experience gave them security and confidence when helping to teach their students what were related to their disciplinary areas. The participants argued that the experience gained in their field of work facilitated them to feel familiar with courses. This favored their theoretical and practical capacity. They said they experienced the satisfaction of recognizing themselves as competent and supported students in applying the knowledge contemplated in the course programs of the subjects they taught. The feeling of competence, which is part of its identity construction as a teacher, was not only achieved by teachers' mastery from theory but from the various situations experienced in the field of their profession to work in the company.

When the connection of learning originated in non-formal scenarios was enhanced, for example, what an industrial engineer learned from work experience incorporated into classrooms with students, teacher identity formation was influenced. This idea is sustained in Wenger's theory of cultural psychology (2001) to specify the relevance of learning from participation in situated contexts. In this sense, the idea of Ricoeur (2006) is also reaffirmed about the fact that identity can be constantly refigured. It was observed that one of the reasons for these changes or reconfigurations originates to the extent that knowledge or competences are strengthened in situated learning contexts (Brito et al., 2019; Díaz Barriga, 2010; Martínez y De Ibarrola, 2018).

A recurring coincidence among the participants was the taste or satisfaction towards teaching practices arose from moments in which they achieved experiences that, in some way, contributed to students' learning process. P10 mentioned:

When the student understands me, it's when I feel good, that's when it's worth it [and reiterates the expression with emotion], worth the effort! Otherwise, I feel that something is wrong and you have to look for it because that is why we are here [in the teaching function]. [P10]

Another participant also pointed out that:

The most important thing is when the student manages to apply what they have learned; otherwise, it is as if we are not doing our work. If the student does not learn, what are we here for? [the teacher questioned herself, and also adds], but that's not how everyone thinks. [P4]

For his part, P6 mentioned that it was pleasing to “*know that from the course [which he taught] the student is being trained.*” According to the results, one of the most significant experiences for the construction of identity in the practice of teachers, at least in its beginnings, was teachers' satisfaction when carrying out a work activity that allowed them to influence the academic training of their students.

From the results of this research, it was possible to notice that the teachings' beginnings were usually somewhat complex if one took into account that there was uncertainty about how to help the students. It was also identified that anxiety was felt in the beginning was seen to overcome the experience and security of what was done every day. Also, at other times, it can be seen that the lack of initial training was a limitation for teaching practice. However, it is worth noting that although at the beginning of the teaching, the presence of complications for teachers was common, the interesting thing was that precisely these experiences became an invitation to reflection and improvement around function (Bozu & Imbernón, 2016; Galadí, 2010) and that was what was part of the process towards the construction of a new identity.

In short, the satisfaction of being in contact with learners, and having opportunities to interact in the learning process, contributed to the process of teacher identity construction.

b) Commitment to Their Roles and Students

The commitment toward students and university professors' learning provided meaning to the formation of the teaching identity. Below are the results that refer to experiences that contributed to this formation.

The beginning teacher saw themselves as teachers when they were able to bring classroom real problematic situations that arose in the industry. By questioning the participants why commitment was valued, an emphasis was placed on the concern and commitment to the formation of students. All the participants narrated that since their admission as teachers to the university, they sought to contribute to students' professional preparation of the educational program from which they graduated as industrialists.

From the beginning, professors' interest in favoring conditions for the apprentice to integrate theory with the practice led them to prioritize the generation of examples, challenges, and problems that arose from real situations in the workplace. The commitment to prioritize the aforementioned actions made sense for the professors, and this practice was reflected as part of their training and identification as teachers, not just as engineers.

When the participants were asked what helped them to identify as a teacher at the beginning of their teaching (subsidiary question), the obtained answers were related to how they led students to learn. Regarding this question, P6's answer was “*the class session, when I use cases, practices, and concrete examples.*” To P1, what helped to identify as a teacher was “*to promote learning activities in which academic situations related to the future performance of the student are addressed.*”

The participants assured that the best way to favor the comprehension of information and learning by students was using a real context. For his part, P7 said that he was shaping up as a teacher: *“in trying to transfer the apprentice to different scenarios so that he can identify what can be useful and what will apply.”*

From these two examples, it was identified that when teachers prioritize these actions because these actions sought to prepare students better. These practices allowed the participants to identify as teachers.

As Wenger (2001) points out, the process of imagining oneself as a teacher favors his identity from acting when teaching a class. On the other hand, what drives them to act in this way is the commitment teachers feel for students and their learning. In this sense, it is understood that commitment represents the meaning that mobilizes teaching performance (Bruner, 1991).

It is appropriate to mention that practice experiences that gave satisfaction to teachers. However, it was identified that in the first courses taught by teachers, commitment and satisfaction were related to the desire to support students in their training as engineers. According to the narration of professors, this originated a concern to look for alternatives training as teachers. In this respect, P1 said:

When I started this adventure [as a teacher] in college, I was not a teacher, and I realized that I had a lot to learn, here in the institution those who know this are those of education, that is clear to me. But I have always known that I have to prepare, and since then I took advantage of all the courses that came out, I remember that since that time the institution had an area run by education experts [the teacher tries to remember the exact name of the area and makes a recount of the name changes. Currently, the area is called Coordination of Academic Development ... and continues saying ...], I remember that Dr. Ferreiro was an advisor (...); and also came professors from the UNAM, ITESO and uf, they were very good, [he said:] I took advantage of everything. And I read a lot, and consulted with my classmates who had experience teaching. [Later on, in relation to this story, he says:] One cannot do it alone! [he also mentioned], it is necessary to help each other as much as possible to help the students. [P1]

The opportunities for teacher training gestated from the university to support beginner teachers and participants valued their transition to their process of identity construction. In this order of ideas, we can see a coincidence with Zabalza (2013), who points out that the favorable effects of the experienced training can generate greater interest in professors' formation.

The teachers' concern for student learning arose from the reflection on the commitment to perform as best as possible in their roles as teachers. However, participants recognized that they experienced doubt and needed help from their academic peers in the beginning.

Teachers imagined themselves as professionals capable of contributing to the preparation of future industrial engineers by incorporating or transferring their work experience to classrooms. This way of imagining acted as an impulse for actions that led teachers to prepare for teaching. The participants in this study expressed *“if something must be done, the first time should be done well”* with different nuances by P5, P9, P2, P1, and P6, who described that during their practice as teachers identified the need to incorporate new knowledge, in addition to those referred to the discipline to develop as teachers in their narrations. However, when analyzing overall stories, it was noticed that the knowledge of the didactic-pedagogical area, in some cases, were considered as complementary. Also, a great extent to the advantage of discipline experience was put in

the foreground. In these cases, identity initially prevailed as engineers, and their teaching identity was being shaped.

Finally, according to the assumptions of cultural psychology and consistent with what Bruner (1991), Cole (2003), and Wenger (2001) indicated, participation in situated contexts, in which the human being develops, is inherent to the identity development constructed in practice. In this sense, the results led to the conclusion that teachers were involved in the training process of their students, indicating that the educational actor experiences a satisfactory process from which they identified themselves as teachers. The cultural environment, in which teachers' professional practice was developed, especially classroom settings, allowed them to build themselves as teachers from their own practice. At all times, what dynamizes the teaching action is the commitment to teaching itself and towards students; on the contrary, as Kilinc and Seymen (2014) pointed out, the lack of intrinsic motivations can affect the quality of their performance.

DISCUSSION and CONCLUSION

In the context of the daily activities of the teaching staff lies the idea of the main deficiencies that they lived as students can be solved. This perception is strong during the performance of the first classes. However, as they experience the difficulties and challenges of teaching, they gradually discover that disciplinary knowledge is not important, but not enough to successfully complete their teaching practice.

For the participants of this study, to become teachers and experience, this practice led them to value the meaning of being teachers, which in no case means that they stop identifying with their profession. It is necessary to take into account that the beginning teachers refer satisfaction for the teaching work itself, as well as for the advantages derived from it.

It was identified that in the beginnings as university professors, the meanings that gave significance to the construction of identity arose from commitment and satisfaction from the experience of contributing to students' formation. It should be noted that the commitment towards the apprentice lead teachers to strengthen their own professional development and, at the same time, led them to prepare themselves as teachers from the didactic-pedagogical perspective. That is why, from the universities, better insertion programs must be articulated for enhancing teaching and strengthening teachers' teaching identity.

During the first experiences in teaching, the construction of identity as a university professor occurred. The participants showed interest and commitment prevailed to a great extent in disciplinary competence as engineers. However, the participants also expressed interest in their training as teachers. That is why it was suggested to strengthen training routes focused on the needs of teachers and promote social and situated learning to strengthen the institutional offer efforts. For this reason, reflection processes around the practice can be considered as triggers for training and improving the practice of teachers.

In general, what drives engineering university professors to identify as teachers were the satisfaction they experienced in the classroom. The practice can be considered as training triggers for the improvement of teachers' practice. This coincides with proposals such as those cited by Odabasi and Cimer (2012), who suggest the incorporation of reflection skills as a training strategy before the teaching service.

Regarding the identity from performance, it was concluded that when the experience of participation as a teacher does not underlie the commitment and satisfaction, it can be difficult for the teacher's identity to be formed.

In short, what strengthens the teaching identity was the meaning that the teaching itself had for teachers. The satisfaction and commitment derived from the teaching function

is a path of identity construction and an invitation for institutions to continue promoting support for teachers to strengthen their practice, which requires creating conditions for teacher training for the benefits of students and university professors.

An important finding was that teachers assumed the demands of their teaching performance from the beginning, and these planned demands were what built their identities. An interesting finding was that not having a teacher training, rather than being seen as a limitation, was an engine that drove them to build or strengthen their teaching identity, enhancing the advantages of their professional identity. In these cases, the findings coincide with López de Maturana (2010), pointing out that spaces and mechanisms must be created to strengthen the teaching staff's identity. Similarly, Zabalza (2007, 2013) stated that in the context of higher education, it is necessary to ensure a double identity to favor a better teaching performance of teachers, since their identity is permeated with action (Bruner, 1991; Ricoeur, 2016), and that in this order of ideas must be strengthened from the initial teacher training.

Finally, it is necessary to mention that the results of this research were limited to the analysis of stories of teachers' experience without initial training to teach and depart only from the perspective of university professors. The above is considered relevant for the understanding of construction routes towards identity because it sought to recover experiences of teachers referred to as good teachers by their peers. However, given the qualitative nature of the study, it was recognized that it is necessary to reflect on the present results from the study context and keep in mind that what was reported is not for generalization purposes. The findings of this study can encourage researchers to deepen the understanding of the line of investigation around the formation and teaching identities of the professors who teach higher education.

Suggestions

Based on the findings of this study, it is recommended that the educational authorities recognize those teachers committed to their teaching function and establish conditions for their continuing education, both in the pedagogical and in the disciplinary. These teachers are mainly those who join the teaching being professionals or disciplinary experts of the classes that they teach but that do not have studies that have prepared them for the exercise of teaching.

According to the results of the present study, the commitment and satisfaction derived from the teaching exercise are a source that triggers the construction of the teaching identity. Having said this, it is recommended that the attitudinal dimension, as well as the entry and permanence requirements, be given more importance.

Thanks to

We thank the Program for the Promotion and Support of Institutional Research Projects (Programa de Fomento y Apoyo a Proyectos de Investigación Institucional, PROFAPI, for its acronym in Spanish), as well as the PFCE (Programa Fortalecimiento de la Calidad Educativa [Strengthening Educational Quality Program]) for the support for this publication.

REFERENCES

- Aristazábal, A. & García, A (2012). Construcción de la identidad profesional docente: ¿posibilidad o utopía? (Construction of the professional identity teacher: possibility or utopia?) *Revista EDUCyT*. Vol. Extraordinario. 126-138.
- Ávalos B., Cavada, P., Pardo, M., & Sotomayor, C. (2010). Profesión docente; temas y discusiones en la literatura internacional (Teaching Profession; topics and discussions in international literature). *Estudios pedagógicos*, 36(1), 235-263.
- Bertaux, D. (1999). El enfoque biográfico. Su validez metodológica, sus potencialidades (The biographical approach. Its methodological validity, its potentialities). *Proposiciones*, 29. Recuperado de http://www.sitiosur.cl/publicaciones/Revista_Proposiciones/PROP-29/14BERTAU.DOC
- Bertaux, D. (2005). *Los relatos de vida. Perspectiva etnosociológica (The stories of life. Ethnosociological perspective)*. Barcelona: Edicions Bellaterra.
- Brito, L. F., Subero, T., & Esteban-Guitart, M. (2018). Fondos de conocimiento e identidad: Una vía sociocultural de continuidad educativa (Knowledge and identity funds: A sociocultural way of educational continuity). *Revista Educación*. 24(1). Recuperado de <http://www.redalyc.org/articulo.oa?id=44051918005>. DOI: <http://dx.doi.org/10.15517/revedu.v42i1.23470>
- Bozu, Z., & Imbernón, F. (2016). La formación docente en momentos de cambios: ¿Qué nos dicen los profesores principiantes universitarios? (Teacher training in times of change: What do university beginning teachers tell us?) *Profesorado. Revista de curriculum y formación del profesorado*. 20(3), 467-492.
- Bruner, J. (1991). *Actos de significado (Acts of meaning)*. Madrid: Alianza.
- Cole, M. (2003). *Psicología Cultural (Cultural Psychology)*. España: Morata.
- Contreras, C., Monereo, M., & Badía, A. (2010). Explorando la identidad: ¿Cómo enfrentan los docentes universitarios los incidentes críticos que ocurren en las aulas de formación de futuros profesores? (Exploring identity: How do university teachers confront the critical incidents that occur in the training rooms of future teachers?) *Estudios Pedagógicos*, 34(2), 63-81.
- Contreras, G. & Villalobos, A., (2010). La formación de profesores en Chile: una mirada a la profesionalización docente (Teacher training in Chile: a look at teacher professionalization). *Educ.Educ.* 13(3), 397-414.
- Cuadra, D. J. & Catalán, J. R. (2016). Teorías subjetivas en profesores y su formación profesional (Subjective theories in teachers and their professional training). *Scientific Electronic Library Online*. Recuperado de: <http://www.scielo.br/pdf/rbedu/v21n65/1413-2478-rbedu-21-65-0299.pdf>.
- Díaz, J., Alfageme, M., B., & Serrano, F. J. (2013). Identidad profesional de los docentes en formación de Ciencias Sociales (Professional identity of teachers in Social Sciences training). *Enseñanza de las Ciencias Sociales: Revista de investigación*, 12, 77-89.
- Díaz-Barriga, F. (2010). Los profesores ante las innovaciones curriculares (Teachers in the face of curricular innovations). *Revista Iberoamericana de Educación Superior. RIES*, 1(1), 37-57.
- Galadí, J. (2010). Recuerdos de cómo llegué a ser profesor universitario. Profesorado (Memories of how I became a university professor. Faculty). *Revista de curriculum y formación de profesorado*, 14(3), 229-235.
- Galaz, A. (2011). El profesor y su identidad profesional ¿facilitadores u obstáculos del cambio educativo? (The teacher and his professional identity, facilitators or obstacles to educational change?). *Estudios Pedagógicos* 37(2), 89-107.

- Galeano, M. E. (2009). *Estrategias de investigación social cualitativa. El giro en la mirada (Qualitative social research strategies. The turn in the look)*. Medellín: La Carreta Editores.
- Imberón, F. (2007). *10 estrategias clave. La formación permanente del profesorado. Nuevas ideas para formar en la innovación y el cambio (10 key strategies. The permanent training of teachers. New ideas to form innovation and change)*. Barcelona: Graó.
- Kilinc, A., & Seymen, H. (2014). Preservice teachers' motivations for choosing science teaching as a career and their epistemological beliefs: Is there a relationship? *Journal of Turkish Science Education*, 11(1), 115-132.
- Larreamendy, J. (2011) Aprendizaje como reconfiguración de la agencia (Learning as reconfiguration of the agency). *Revista de Estudios Sociales*, (40), 33-43. Recuperado de <http://res.uniandes.edu.co/view.php/711/view.php>
- Lave J., & Wenger, E. (1991). *Participación periférica legítima (Situated Learning. Legitimate peripheral participation)*. New York: Cambridge University Press.
- López de Maturana, S. (2010). Las complejidades emergentes en las historias de vida de los "buenos profesores" (The emerging complexities in the life stories of the "good teachers"). *Polis. Revista de Universidad de Boliviana*, 9(25), 255-267
- Marcelo, C., Mayor, C., & Murillo, P. (abril, 2009). Profesorado principiante e inserción profesional a la docencia [Monografía]. Profesorado (Beginning teaching staff and professional insertion in teaching [Monograph]. Faculty). *Revista de currículum y formación de profesorado*, 13(1), 3-5.
- Martín, A, Conde, J, & Mayor, C. (2014). La identidad profesional docente del profesorado novel universitario (The teaching professional identity of the university novel teacher). *Revista de docencia universitaria*. 12(4), 141-160.
- Martínez M., & De Ibarrola, M. (2018). Conformación de una identidad docente entre profesionistas universitarios contratados por asignatura en el nivel medio superior (Conformation of a teaching identity among university professionals hired by subject at the high school level.). *Sinéctica*, (51),
- Monereo, C., & Domínguez, C. (2014). La identidad docente de los profesores universitarios competentes (The teaching identity of competent university professors). *Educación XXI*, 17(2), 83-104. DOI: 10.5944/educxx1.17.2.11480
- Muñoz, F. O. & Arvayo, K. L. (2015). Identidad profesional docente: ¿Qué significa ser profesor? (Professional teacher identity: What does it mean to be a teacher?) *European Scientific Journal*. 11(32).
- Odabasi, S., y Cimer, A. (2012). Issues around Incorporating Reflection in Teacher Education in Turkey. *Journal of Turkish Science Education*, 9(1), 17-30.
- Ricoeur, P. (2006). *Sí mismo como otro (Oneself as another)*. Siglo XXI Editores, S. A., de C. V.: México.
- Ruiz, J. I. (2012). *Metodología de la investigación cualitativa (Methodology of qualitative research)*. Universidad de Deusto Bilbao: España.
- Salgado, A. C. (2007). Investigación cualitativa: diseños, evaluación del rigor metodológico y retos [Versión electrónica] (Qualitative research: designs, evaluation of methodological rigor and challenges [Electronic version]), *Liberabit*, 13, 71-78.
- Vaillant, D. (2009). Políticas de inserción a la docencia en América Latina: deuda pendiente (Policies for teaching insertion in Latin America: pending debt). *Revista de Currículum y formación del profesorado*, 13 (1), 27-41.
- Wenger, E. (2001). *Comunidades de práctica. Aprendizaje, significado e identidad (Communities of practice: Learning, meaning and identity)*. Barcelona: Paidós.
- Zabalza, M.A (2007). *La enseñanza universitaria. El escenario y sus protagonistas (University education. The stage and its protagonists)* España: Narcea.

- Zabalza, M.A. (2013). La formación del profesorado universitario. Better teachers means better universities. *Revista de Docencia Universitaria*, 11(3), 11-14.
- Zabalza, M. A, Cid, A., & Trillo, A. (2014). Formación docente del profesorado universitario. El difícil tránsito a los enfoques institucionales (Teacher training for university teachers. The difficult transition to institutional approaches). *Revista Española de Pedagogía*, 257, 39-54.