How University Teachers and Students Understand the ‘Learning to Learn’ Competence: An Exploratory Study Through Text Mining Techniques

CÓMO ENTIENDEN LOS PROFESORES Y ESTUDIANTES UNIVERSITARIOS LA COMPETENCIA ‘APRENDER A APRENDER’: UN ESTUDIO EXPLORATORIO A TRAVÉS DE MINERÍA DE TEXTOS

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Resumen: Este estudio tuvo como objetivo examinar cómo los profesores y estudiantes universitarios entienden la competencia ‘aprender a aprender’ mediante minería de textos. Se examinaron los corpus de texto de los profesores (16,317 palabras clave de 160 intervenciones) y estudiantes (15,394 palabras clave de 243 intervenciones). Los estudiantes enfatizaban la mentoría y las habilidades adaptativas, mientras que los profesores se centraban en la autonomía y el aprendizaje significativo. Los estudiantes también resaltaron el papel de los profesores para facilitar un aprendizaje exitoso, mientras que los profesores hicieron hincapié en la gestión de la información y el trabajo en equipo con los compañeros. Se discutieron diversas implicaciones para la práctica educativa, teniendo en cuenta los supuestos teóricos involucrados.

Palabras clave: Aprender a aprender, Profesor universitario, Estudiante universitario, Minería de textos.

Abstract: This study aimed to investigate how university teachers and students in Education, Health Sciences, and Engineering understand the ‘learning to learn’ competence, using text mining. Analyses covered 160 interventions from teachers (16,317 token-words) and 243 interventions from students (15,394 token-words). Students emphasized mentoring and adaptive skills, while teachers focused on autonomy and significant learning. Students highlighted the role of teachers in facilitating successful learning, while teachers prioritised information management and teamwork with classmates. Implications for educational practice were discussed, considering the theoretical assumptions.

Keywords: Learning to learn, University teacher, University student, Text mining.


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INTRODUCTION

In the last two decades, universities have sought to replace the time-based curriculum (Kelly & Columbus, 2016) with competency-based programs (Echols et al., 2018), where students demonstrate their skills and knowledge. The European Commission (2018) drafted a roadmap for the member states’ education systems to move towards the acquisition of generic competencies. Competency-based education is a priority in Higher Education institutions since the Bologna Process. In this respect, the European roadmap has considered the ‘learning to learn’ competence that involves the acquisition of all knowledge and skills.

‘Learning to learn’ competence has been widely conceptualised to be the ability to organize and regulate personal learning in an increasingly efficient and autonomous way according to personal objectives, context, and needs (Caena & Punie, 2019; Gargallo López, Pérez-Pérez et al., 2020). However, the scientific community has been unable to agree on either the conceptualization or the dimensions of this competence (Caena & Stringher, 2020; Deakin Crick et al., 2014). The disagreement on conceptualisation may be due to a misconception of the notion of competence. While some of the research literature situates ‘learning to learn’ as a single competence (Hoskins & Fredriksson, 2008; Sala et al., 2020), other studies suggest that it entails diverse skills and knowledge, which are more than the sum of their parts (Caena & Redecker, 2019; García-García, Moctezuma-Ramírez et al., 2021). If it were a single competence, such as reading comprehension or arithmetic calculation, the person would achieve short-term goals rather than ends or purposes. Instead, a meta-competence would allow an individual to activate each skill and knowledge when appropriate, customising the performance and tracking the purposes. In this sense, two people might desire to learn for differing reasons. That implies that individuals decide why they want to know how to learn, and the difference lies in the person’s decision regarding the applicability of the meta-competence.

The conceptualisation of ‘learning to learn’ is inconclusive, and therefore so are its dimensions, affecting the assessment of this competence. Several studies have made efforts to define categories and standards. Hautamäki et al. (2002), for instance, provided an assessment framework based on three chief dimensions: learning competencies, self-related beliefs, and context-related beliefs. Shortly afterward, the Centre for Research in Lifelong Learning (CRLL) of the European Commission set out to achieve common standards by considering four previous instruments (Hoskins & Fredriksson, 2008). One of them was Hautamäki’s et al. (2002), and the others were the Effective Lifelong Learning Inventory (Deakin
Crick et al., 2004), the Dutch Development of Tests for Cross-Curricular Skills (Elshout-Mohr et al., 2004; Meijer, 2007; Meijer et al., 2001), and the Metacognition Test (Moreno Hernández, 2002). Despite testing in several countries, they concluded that it was not feasible to extract common European standards from the available instruments (Kupianen et al., 2008). Though subsequent tools have attempted to assess ‘learning to learn’ (Muñoz San Roque et al., 2016; Villardón-Gallego et al., 2013) some dimensions are still not covered, such as motivation to accomplish mastery levels in specific fields (Boekaerts & Niemivirta, 2000) or social regulation of learning (Hadwin et al., 2018).

The need for a comprehensive model to define operationally the dimensions of ‘learning to learn’ remained evident (Jornet Meliá et al., 2012), and such a model should contemplate a practical approach for teaching in the classroom (Caena & Stringher, 2020). A recent investigation inquired university students and teachers to evaluate the dimensions of a theoretical model on ‘learning to learn’ (García-García, López Francés et al., 2021). Students and teachers granted different relevance to its dimensions, emerging two perspectives. The authors discussed the difficulty of teaching and assessing how to learn when teachers and students conceive it differently. That seems beyond the theoretical disagreement on the contents among the members of the academic community. The study suggested that this is reaching rather on-the-ground practice. When teachers’ and students’ expectations of how to learn at university do not match each other, there is a possibility that these students may believe that they are wrong in learning and find it challenging to learn how to do so (Murphy & Gash, 2020). Furthermore, a student’s learning process may not be suitable to succeed in the teacher’s expected results.

Given this background, the present study aimed to explore how university students and teachers understand the ‘learning to learn’ competence to identify the dimensions through an innovative strategy of text mining analysis. Thus, our specific objectives were to identify, through their speeches, those knowledge and skills associated with meta-learning. A better understanding of this issue may be beneficial for improving teaching practice and students’ academic success. Following that aims, we explored the following research questions (RQs).

RQ1. How do university students understand the knowledge and skills associated with ‘learning to learn’?

RQ2. How do university teachers understand the knowledge and skills associated with ‘learning to learn’?
Method

We explored teachers’ and students’ perspectives about ‘learning to learn’ competence at university through discussion groups, and we analysed them using text mining techniques. Text mining is a set of software-assisted processes and methods for extracting meaningful information from unstructured natural language (Gottfried et al., 2021). The unstructured nature of discussion group data poses a challenge in terms of systematically extracting valuable insights. Text mining, with its computational capabilities, allows for the conversion of unstructured textual data into structured information, facilitating a more systematic analysis. Since traditional content analysis methods may struggle with large volumes of unstructured data, text mining is a practical alternative to reveal patterns, themes, and ultimately an objectively comprehension (Bruun et al., 2019; Sakiyama et al., 2020; Verberne et al., 2019). We employed hermeneutics, as conceptualized by Gadamer (1977), wherein we delineated three key components: self-reflective examination, attentive listening, and dialogue. Through this approach, hermeneutics facilitates the juxtaposition of diverse perspectives, thereby enabling the interpretation of quantitative data with the aim of achieving deeper understanding.

Participants and procedure

An incidental ensemble of 19 university teachers and 16 students participated in this study. All of them came from Educational Sciences (5 teachers and 4 students), Health Sciences (6 teachers and 6 students), and Engineering (8 teachers and 6 students). We hold three discussion groups with teachers and another three with students, according to the area of knowledge.

The participants fulfilled some inclusion criteria required for their incorporation into the study. The students’ academic performance was notable as they were in their final year of studies. Similarly, the teachers exhibited a keen awareness of the researched subject, coupled with an extensive professional tenure exceeding two decades. Given the nature of the sample size, which comprised token words generated in the focus groups, and the number of participants in the study, we found it unnecessary to consider economic, social, or cultural backgrounds.

As participation in the study was voluntary, it led to variations in the gender distribution of participants. Nonetheless, we endeavoured to balance gender representation, considering the specific areas of knowledge and participant roles (i.e., teachers and students). Education Sciences comprised 5 female teachers, Health Sciences had 3 males and 3 females each, and Engineering included 4
males and 4 females as teachers. Regarding students, there were 1 male and 3 females in Education Sciences, and 4 males and 2 females in both Health Sciences and Engineering.

In the discussion groups, participants answered the question: ‘what knowledge and skills must an undergraduate student acquire to know how to learn?’ A theoretical model on ‘learning to learn’ (Gargallo López, García-García et al., 2020; Gargallo López, Pérez Pérez et al., 2020) helped to guide the discussion groups and to produce interventions on the topic of discussion. This model included cognitive, metacognitive, affective, social, and ethical dimensions, and its content is validated (García-García et al., 2022).

Participants attended a meeting where we informed them about the purpose of the discussion groups. At that time, we asked for their consent to use the information, safeguarding their privacy and anonymity. At least two researchers led each discussion group. They only intervened when necessary, and this was usually when there was doubt or when participants specifically requested it, or when participation was low.

The discussion sessions were conducted in a neutral environment, deliberately devoid of external influences or social pressures. The setting maintained a low-noise level and seclusion from external disturbances to encourage an intimate atmosphere. That was facilitated using a round table and comfortable chairs, ensuring an open yet internally focused ambiance. The duration of the discussions varied, spanning between 60 to 90 minutes for in-depth debate.

Text-corpus and pre-processing data

The teachers’ and students’ text-corpuses comprised an analytical sample of total of 16,317 token-words (from 160 interventions) and 15,394 token-words (from 243 interventions), respectively. The text pre-processing began with normalising the discussion content by correcting obvious typographical errors, setting all text in lower case, converting abbreviations and acronyms into their canonical forms, adapting numbers into textual representations, and establishing stopwords. Appendices A and B show the list of stopwords and the canonical forms of acronyms and abbreviations. We also removed special characters, digits, and text segments that might interfere with text analysis (e.g., %). Lastly, we executed an automatic pre-processing analysis of the KH Coder 3 Program. The pre-processing determined a loss of less than 10% of the corpus of token-words for both groups.
Analysis

The discussion group intervention corpora of both teachers and students were analysed separately, using the text analytics software package KH Coder 3. We plotted centrality co-occurrence networks and multidimensional scaling to explore clusters and relationships. We use the Kruskal distance scaling method to perform non-metric multidimensional scaling. This method allowed us to evaluate the relationship between the construct dimensions and keywords using dimensionality reduction analysis, similar to principal component analysis. Co-occurrence networks used a minimum standardised correlation coefficient of .20 and were drawn with the minimum spanning tree only formula. We computed the Jaccard coefficient distance (fi) to explore similarities between pairs of terms in multidimensional scaling and co-occurrence networks (Romesburg, 1984; Xu et al., 2019). The nodes in the bubble plots showed the variables according to their term frequency, and we coloured them to indicate clusters and centrality. We represented the strength of the correlation numerically and with the thickness of lines connecting the bubbles. The proximity between bubbles was demonstrative of the proximity between terms within-corpus. The discussion head of this paper contains the triangulation of the findings in contrast to previous research.

Results

RQ1. How the students defined ‘learning to learn’

Term frequency (TF) provided information about the main ideas in the students’ view. Students cited the teacher (fi=64), the person (fi=59), and the thing (fi=57) above all other nouns. Knowing how to obtain counselling to achieve learning goals was relevant for them, rather than learning with classmates (fi=29). They gave importance to problem-solving (fi=23) skills (fi=22) in professional practice (fi=23), but also in everyday life. Although the terms subject, career, exam, or university were frequent (fi rank=26-37), they talked about life (fi=17) too, and that made a contrast with the institutional environment of the college and even with labour (fi=12).

Students identified creativity (fi=10), responsibility (fi=9), and motivation (fi=8) to know how to learn, but these personal attributes were unusual compared to learning with other people. Unlike teachers, students did not mention ‘learning to learn’ (fi=12) so often, which correlated lower with learning in a general sense (fi=102, fi=.16).

Multidimensional scaling (Figure 1) revealed that learning with the teacher how to know, make, and have (Cluster 5) was at the core of the students’
understanding of how ‘learning to learn’ at university. Students sought the teacher to provide them with dispositions to action for becoming individuals who reach learning outcomes. It seems they take the undergraduate studies in the sense of acquiring practical skills for this purpose (Cluster 1).

Fewer central macro-ideas were searching for information to exceed work objectives on time (Cluster 6), the pleasure of learning something useful with classmates (Cluster 2), and skills to deal with real-life problems beyond a disciplinary scope (Cluster 3). Cognition was noteworthy from this perspective, for students highlighted the exploration of data and not retrieving it, or selection, classification, and categorisation. The learning process was predominant for them compared to learning outcomes like concept maps or V-diagrams. They imagined themselves ‘learning to learn’ while keeping motivation and relationships with pairs instead of producing results, which would depend on teachers.

Students stated that knowing how to pass exams (Cluster 4) is part of knowing how to learn, and linked it to practical skills, real-life scenarios, and relevant things. Diametrically opposed, they associated classwork and learning how to reason (Cluster 7) with searching for information.

The bridge conception to define ‘learning to learn’ in the students’ co-occurrence network were people and their duties (Figure 2). When students have a teacher ($f_i = .27$), who monitors them throughout the learning process ($have-learn; f_i = .27$), they are supposed to become proficient learners and offer what they learnt to assist others ($make-give; f_i = .27$). The knowledge they gained would increase their chances of success ($know-power; f_i = .33$). They would improve and study for passing exams ($study-exam; f_i = .25$) and care for their work at college, occasionally thinking about their future labour.
Figure 1. The similarity of concepts from the students’ dataset

Figure 2. Betweenness centrality in the students’ concept network
RQ2. How the teachers defined ‘learning to learn’

Teachers mainly cited the students (fi=114), recognizing them as a working team (fi=81) who learn things (fi=65) with the teacher’s (fi=52) mentoring. The leading role of students during the learning process was evident. They stated that not all learning (fi=95) comes from teaching (fi=22), nor does it have to lead to solutions (fi=9) or passing (fi=8) exams. Teachers saw ‘learning to learn’ at university (fi=33) as useful for life (fi=31), besides exams and qualifications, giving relevance to the process (fi=13) over results (fi=8) and products (fi=3). They stressed the need for students to know how to search (fi=38) information (fi=39) to address a practical (fi=18) problem (fi=37), regardless of its solution.

The semantic analysis of verbs reflected a different conception of ‘learning to learn’. The most relevant aspect for teachers was to be able (fi=89) to learn, and to a lesser extent, students should enjoy (fi=14) learning, and want (fi=36) and be motivated (fi=8) to learn.

According to multidimensional scaling (Figure 3), teachers gave weight to the students’ desire to know how to produce work on time that addresses a problem (Cluster 3). They were focused on practical and motivational learning as data management skills to generate a professional contribution to their workgroup (Cluster 1).

Figure 3. The similarity of concepts from the teachers’ dataset
On the second level of importance, teachers stated that proficient learners show empathy and effort during teamwork (Cluster 7). Their intention to improve themselves is related to the pleasure of knowledge and knowing how to learn (Cluster 2). They execute reasoning skills on professional issues from a critical and responsible approach to offer help to others (Cluster 4). Social and cognitive factors of learning were relevantly present in the teachers’ definition and were diametrically opposed to each other (i.e., Clusters 2 and 4).

Minor ideas were studying with curiosity (Cluster 5) and striving in the classroom (Cluster 6). Curiosity leads to engender original ideas and practical and process-based training to the progress of students.

In the teachers’ co-occurrence network, the bridge conception to define ‘learning to learn’ were students and their skills (Figure 4). Teachers remarked on the study of the subjects (study-subject; $fi = .33$) and the students’ ability to act on problems (make-problem; $fi = .34$) and acquaintance with data (make-know; $fi = .36$; and know-information; $fi = .35$). That was related to the mastery of learning skills (make-have; $fi = .43$; and have-learning; $fi = .38$). Despite this, ‘learning to learn’ was not exactly a central idea in the concept network. It was associated with knowledge ($fi = .36$), the academic year ($fi = .36$), and with passive teachers (‘learning to learn’-passive; $fi = .31$; and passive-teacher; $fi = .25$), which reinforce the active role of students to learn.

Figure 4. Betweenness cetrality in the teachers’s concept network
Effective information management was the key to understand this standpoint, although it was not a bridging idea in the network. Teachers pointed out the need to seek information \((f_i = .38)\) to achieve the knowledge and understanding that will enable students to learn effectively and self-determinedly.

**Discussion**

Students and teachers assumed the content of the ‘learning to learn’ competence differently. The findings provided evidence of misunderstandings about this competence beyond the theoretical disagreement among the academic community. This study reinforced the research problem pointed out in previous research, referring to the need for solving misunderstandings between students and teachers. Text mining allowed specific details to emerge, and we discuss them below, along with the limitations of the study and the implications for educational practice.

**Conclusion and contribution of the study**

All in all, there was a notable disparity in how university students and teachers perceive the ‘learning to learn’ competence. Through text mining, we identified distinct elements that each group emphasized (RQs 1 and 2). For instance, while students underscored mentoring and adaptive skills, teachers prioritised autonomy and significant learning. That discrepancies between student and teacher on the facilitation of learning revealed the importance of aligning expectations in educational practice.

Unlike previous research, which often focused on conceptualization, this study sheds light on the practical implications of divergent views. The emphasis on aligning expectations and understanding the nuanced dimensions of this competence adds a valuable layer to the ongoing discourse on meta-learning in Higher Education. Moreover, this study contributes novel insights by employing text mining techniques where they had not been used before.

**Students pointed out mentoring and adaptive skills**

Students understood ‘learning to learn’ as a set of competencies (Caena & Redecker, 2019), although they mentioned only a few of them (Gargallo López, Pérez Pérez *et al.*, 2020). Assimilating non-metacognitive practical learning skills was more prominent for students than theoretical knowledge and metacognition (e.g., time management and tracking objectives).
The students’ conception of the attributes for learning to learn at university laid close to Bandura’s (1986) social-cognitive approach. The teacher and help-seeking were recurrent ideas from this view, and they considered imitation more relevant in learning than cooperation with classmates. Results showed they preferred to learn how to learn directly from teachers rather than with peers. After all, it would be reasonable to think that students who effort to obtain high grades may be reluctant to work with others if they perceive lower attempts and performance that could affect their average academic record.

Mere imitation and looking for assistance are insufficient to harness the full social learning potential. It is striking that students overlooked the advantages of co-regulated learning (Hadwin et al., 2018; Panadero et al., 2019). Collaborating with other people to regulate the learning process is productive and requires less effort to maintain motivation or remember goals, among other benefits. Perhaps students were not skilful in selecting co-workers who matched their expectations and shared their aspirations for qualifications.

In an earlier exploration of the research problem, students felt it was important to make creative proposals and be responsible because they sought to learn in their way and were more focused on customising the learning process (García-García et al., 2021). In contrast, the content analysis with text mining showed lower relevance in creativity and responsibility. In the previous study, the authors ignored the teacher’s role, and now it consolidated as a reference in learning to learn.

Co-occurrence analysis revealed the weight of duty, which contrasted with placing responsibility out of the foreground. That led us to suspect the student’s outcome may be contingent on the demands of teachers. It would certainly make sense to gauge the expectation of who will decide whether an exam passes or not. Students appraised adaptive skills related to Piaget’s equilibration theory, which affirms that active and intentional learning is necessary for personal development (Inhelder & Piaget, 1958; Mintzes & Walter, 2020). Unfortunately, we were unclear concerning their beliefs about the influence on the own training process as a characteristic of someone who knows how to learn during undergraduate studies.

**Teachers laid emphasis on autonomy and significant learning**

From the teachers’ perspective, proficient learners are who become the leaders of their learning process and demonstrate autonomy to overcome academic aims. That contrasted with the students’ argument. While they thought about searching for information, teachers surpassed it and discussed educational aspects related to information management. Moreover, they found management insufficient.
For them, learning to learn implies motivation, perseverance, and the pleasure of knowing more and more.

Previous findings of the research problem remained unclear regarding the position towards significant learning (García-García et al., 2021). Now we found that teachers privileged sense-making over succeeding learning outcomes. Rote learning is necessary but also secondary. Sometimes passing a test involves recognition or comprehension and not higher-order reasoning, nor inquiring how to improve the process of acquisition (Abril-López et al., 2021), which they considered essential.

Therefore, our interpretation was that passing exams and meeting learning objectives would not be enough to learn how to learn at university. However, students suffer distress due to fear of failing, especially during the first year at college (Hassel & Ridout, 2018), and teachers probably ignored this is harmful to academic achievement (Pegalajar-Palomino, 2020). When students achieve the intended learning goals, they feel good and reinforce their sense of self-efficacy (Fernandez-Río et al., 2017; Murphy & Gash, 2020). Their motivation seems to be usually linked to success and should be easier to maintain when passing final examinations in subjects.

Decades ago, research assumed that the meaning given to the learning process generates positive or negative emotion, and it puts on the line the acquisition of new learning content (Ausubel et al., 1968; Boekaerts & Niemivirta, 2000). When identifying the process as a threat, it is rare to reach mastery in domain-general cognitive performance. That even explains the decline of high-performing educational systems (Vainikainen & Hautamäki, 2020) besides individual outcomes.

Another possible interpretation of the findings is that teachers dismissed the possibility of assessing whether students ‘learn to learn’. A comparative study found that half of the pre-university teachers in six different countries did not associate assessment with the ‘learning to learn’ competence (Stringher et al., 2021). Something similar may have happened with the teachers who participated in our study.

Although students should manage information properly before completing the last year of undergraduate studies (López Vicent et al., 2017), it was hardly possible to determine what the teachers meant by this. They did dispense with any comment on metacognitive strategies for self-regulation of learning based on data management (Winne, 2018). We are not sure whether they skipped talking on this issue because they found it irrelevant or because they were unfamiliar with these strategies. If the latter, there is a risk that experienced teachers demand something that they know how to do and ignore how to teach.
Moreover, the broad teaching experience of those who participated in our study meant that they studied their university degrees some time ago, with an educational model where other results were required to pass the subjects. Many of them were not trained in competency-based education at the Bologna reform time, which would explain why teaching programmes often incorporate many competencies to be developed in a single semester and no proposal to assess them. Teachers seemed aware of the need for teamwork, but students claimed the participation of all team members. In our study, teachers emphasised collaborative learning, but not as much as students did. Despite this, they both found part of the sense of ‘learning to learn’ in becoming able to help others later.

Limitations and emerging research

This study has some limitations, which arise mainly from both the data gathering strategy and the data analysis. We worked with a convenience sample from very specific university degrees, which may not necessarily represent a complete picture of Higher Education teachers and students’ beliefs on the ‘learning to learn’ competence. Additionally, this study only focused on the participants’ perspectives based on its knowledge, abilities, and personal experience. Future studies based on extended and more diverse samples together with a more detailed consideration of participants’ attributes (e.g., sex, age, college degree, educational pathways) could perhaps lead to broader conclusions.

Other statistical analyses could have provided more information about the participants’ perspectives on ‘learning to learn’. Although the text mining method allows researchers to access a large amount of data, it was improbable to detect some words that appeared with low frequency and could be qualitatively relevant (Hasegawa et al., 2018). The complexity of the natural language pre-processing and the lack of a standardised pre-processing and segmentation process means that many existing models have shortcomings in final applications (e.g., cleaning of punctuation marks).

Future research should train models aimed at the robust disambiguation and labelling of Spanish and other languages. For this reason, we decided to manually pre-review the entire dataset. Another limitation is that community classification algorithms from KH Coder do not allow researchers to identify overlapping communities. We allocated those words associated with multiple clusters to one specific cluster. The scale we found in the study was small due to the sample size and the descriptive-relational nature of text mining. Nevertheless, we could extract relevant information with significant educational implications.
The double focus on the ‘learning to learn’ competence underscores the need to design practical solutions for the classroom. Otherwise, misunderstanding between teachers and students may occur and affect the quality of teaching and learning. We need to investigate in the future the efficiency of different strategies to solve this problem.

**Implications for educational theory and practice**

For both teachers and students, ‘learning to learn’ involved a set of skills. One by one, the assessment of skills may be a simple task, but assessing a combination of them employed differently in several scenarios is more complex. The difficulty arises from the theoretical basis for defining standards.

In respect of a single competence, the teacher can consider whether the student achieves clear-cut learning objectives, such as comprehending a text or obtaining a magnitude (see the examples given in the introductory head). However, when it comes to ‘learning to learn’, the learner is implementing a set of competencies, the combination of which is more than the sum of its parts (Caena & Redecker, 2019; García-García *et al.*, 2021). There is not just one assessable objective but several articulated aims to pursue an end, which may be dissimilar and equally worthy, in one student and another.

The assessment of purposes belongs to a realm of educational research that has yet to be explored and is related to the measurement of attitudes and other non-cognitive factors (Wijaya *et al.*, 2020). Even so, we would encourage teachers to verify combinations of standards to assess different learning goals.

Similarly, curriculum designers can expect students to ‘learn how to learn’ throughout semesters, setting simpler achievable objectives at the beginning and more complicated ones at the end. Generally, some learning objectives derive from others, and this is how a student learns how to learn at university. Not all knowledge and skills, however, cannot be acquired at once.

We would also recommend that teachers clarify their expectations of student learning at the beginning of the course. There are value clarification techniques that can help avoid misunderstandings and negative emotions (Nisa’ *et al.*, 2020; Puspita *et al.*, 2020) and should lead to reach an agreement on the minimum requirements for passing a subject. Avoiding negative feelings is relevant for the students’ significant learning (Boekaerts & Niemivirta, 2000), and adjusting their expectations prevents effects similar to Pygmalion’s (Murphy & Gash, 2020).

Teaching clearly and openly can contribute to improving students’ readiness for formative assessment. We believe it is essential for teachers to monitor
individual learning processes and for students to strive to achieve the expected outcomes.

CONCLUSION

The students and teachers who participated in this study had different conceptions of the learning to learn competence. The findings confirmed the possibility of misunderstanding in the classroom, which could endanger students’ performance and learning during undergraduate studies. The main implication for educational practice is the need to design and implement teaching strategies to clarify the teachers’ and students’ expectations about learning at the beginning of training.

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