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Social representations of undergraduates about Practice as a Curriculum Component in teacher education

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Abstract

The text investigates the social representations of academics from the Biological Sciences Degree course about integrative activities developed in subjects that include practice as a curricular component. The theoretical framework is in the Theory of Social Representations by Moscovici (2012, 2015) and collaborators. Data collection was performed by applying a questionnaire to 99 students regularly enrolled in the course. The information was analyzed based on the frequency and percentage of responses, using the EVOC software and the assumptions of content analysis. The results point to a social representation that recognizes the importance of integrative activities for their training and professional development, at the same time that expresses negative attitudes and images regarding the way they are constructed and organized during the course, in a predominantly expository and demonstrative way.

Keywords

Science teaching; teacher training; teaching practice.

Representações sociais de licenciandos acerca da Prática como Componente Curricular na formação docente

Resumo

O texto tem por objetivo investigar as representações sociais de licenciandos em Ciências Biológicas acerca das atividades integradoras desenvolvidas em disciplinas de Prática como Componente Curricular. O referencial teórico é a Teoria das Representações Sociais de Moscovici (2012, 2015) e colaboradores. A coleta de dados foi realizada mediante a aplicação de um questionário para 99 licenciandos. As informações foram analisadas com o auxílio do *software* EVOC e com os pressupostos da análise de conteúdo. Os resultados apontam uma representação social que reconhece a importância das atividades integradoras para a sua formação e aperfeiçoamento profissional, ao mesmo tempo que expressam atitudes e imagens negativas frente à forma como elas são construídas e organizadas durante o curso, de forma predominantemente expositiva e demonstrativa.

Palavras-chave

ensino de Ciências; formação de professores; prática docente.

Representaciones sociales de estudiantes universitarios sobre la Práctica como Componente Curricular en la formación docente

Resumen

El texto tiene como objetivo investigar las representaciones sociales de estudiantes de licenciatura en Ciencias Biológicas sobre las actividades integradoras, desarrolladas en disciplinas que incluyen la Práctica como Componente Curricular. El marco teórico está en la Teoría de las Representaciones Sociales de Moscovici (2012, 2015) y colaboradores. La recogida de datos se realizó mediante la aplicación de un cuestionario a 99 alumnos matriculados habitualmente en el curso. La información se analizó en base a la frecuencia y porcentaje de respuestas, utilizando el *software* EVOC y los supuestos del análisis de contenido. Los resultados apuntan a una representación social que reconoce la importancia de las actividades integradoras para su formación y desarrollo profesional, al mismo tiempo que expresan actitudes e imágenes negativas respecto a la forma en que se construyen y organizan durante el curso, de forma predominantemente expositiva y demostrativa.

Palabras clave

enseñanza de la Ciencia; formación de profesores; práctica docente.

1 Introduction

Practice as a Curricular Component (PCC) is included in the curriculum of undergraduate courses in compliance with the Guidelines for Initial Teacher Training, published in 2002 (BRASIL, 2002) and 2015 (BRASIL, 2015). They establish a minimum of 2,800 hours, of which 400 would be practical activities starting at the beginning of the course.

However, even after this regulation, the understanding and how the PCC was organized in each course depended on the interpretations, context, and culture within the university. According to Gatti (2010) and Gatti, Barretto and André (2012), teacher training courses in Brazil have fragmented curricula, with excessively generic content and with a dissociation between theory and practice. For Gatti (2010), practical activities showcase a major problem because sometimes they are within other disciplines, without a clear specification, sometimes they appear in separate, with vague syllabus, which causes a dispersion of this knowledge in the students' training and an unsteady preparation for teaching in basic education. Not to mention the difficulty of the courses themselves in understanding the meaning of the practice (BARBOSA; CASSIANI, 2017).

This weakened training is worrying when considering that contemporary society requires a new educational paradigm, which, as Tedesco (2010) said, requires a fair school, attentive to heterogeneities, that respects students in their specificities and leads them to learn. A school where students learn and are prepared for life equitably. This new paradigm asks teachers to be prepared to work in a contextualized, interdisciplinary educational practice, attentive to the particularities of the moment, the local culture and diversity of life trajectories, and their students' expectations about schooling. Therefore, it's required that the teaching practice isn't reduced to the merely technical and linear transmission of previously defined contents but is an activity influenced by the social and cultural contingencies in which it takes place (BRANDALISE; TROBIA, 2011).

In the realm of the present research, the degree course in Biological Sciences of Universidade Estadual de Ponta Grossa (UEPG), the PCC is organized in articulated disciplines separated from the other areas of knowledge. These disciplines are mandatory and took place in person. However, during the pandemic, they were taught remotely, and with the return of regular activities, they gradually moved to a hybrid format and are now face-to-face again. The disciplines of Teaching Laboratory in Sciences and Biology I, II, III, and IV are in the course curriculum for the first four years. Each one of them has a workload of 102 hours/year, which includes activities articulated with other areas of knowledge of Biology. These activities planning occurs at the university, while the development and practice take place in schools, both public and private. In this way, they favor experiences in different situations and with different publics. In the syllabus, there is a reference to the contextualization of knowledge of the subjects in each grade, the development of skills and competencies related to teachers' work, and action-reflection-action activities in educational practice through integrative activities (IA).

The IAs, which are this research purpose, aim to establish the interrelationship between the specific and pedagogical contents of the different areas of knowledge that make up the curriculum of the course. From this perspective, they provide undergraduate students with contact with different segments of basic education and are “[...] understood as praxis - reflected action” (SOUZA NETO; SILVA, 2014, p. 904) insofar as they enable contact with the practice in basic education and reflection on these moments. According

to Góes and Chamma (2014), these activities bring university students closer to the teachers' reality, start them in teaching in elementary and high schools, in addition, to articulate the contents of the different subjects that make up the course.

Biological Sciences students are faced with situations in which they need to develop these IA and thus construct and share in group perceptions, manifest attitudes, and images about them, which are circulating and make up their routine (JODELET, 2007; JOVCHELOVITCH, 1999). These students base their experiences and build Social Representations (SR), which are spontaneous theories, truly reconstructions full of knowledge, attitudes, and images, which become circulating and shared in the course, and, therefore, they are social.

With this in view, the following question arises: what are the SR of the undergraduates in Biological Sciences at UEPG about IA? The objective is to present the SR of academics about IA. The justification lies in understanding how these SRs are produced and operate to accompany the actions proposed in PCC in undergraduate courses in compliance with the National Curriculum Guidelines for the Training of Basic Education Teachers (BRASIL, 2002, 2015). This follow-up must necessarily consider the SR of the undergraduates so that the strengths and weaknesses can be addressed in this context.

2 The SR

SRs are a set of explanations, concepts, and statements present in interpersonal communications. Studying them requires understanding how individuals understand the objects that circulate and how they make efforts to think, produce and communicate representations (MOSCOVICI, 2012). "Representing a thing doesn't consist simply in unfolding it, repeating it or reproducing it; is to reconstitute it, retouch it, modify its text" (MOSCOVICI, 2012, p. 54). In this sense, "[...] a representation speaks as much as it shows, communicates as much as it expresses, being able to produce and determine behaviors" (MOSCOVICI, 2012, p. 27).

When faced with an object such as IA, the subject brings it closer to their universe, to the knowledge they have, and thus they establish a particular language based on values and concepts (MOSCOVICI, 2012). Therefore, the social

representations of IA are not just “opinions about” or “images of”, but are “[...] collective theories aimed at the interpretation and elaboration of the real” (MOSCOVICI, 2012, p. 47). Therefore, they have a logic and a particular language that “[...] determine the field of possible communications, values or ideas present in the visions shared by the groups” (MOSCOVICI, 2012, p. 47). Each subject “[...] has its own categories and rules of reasoning that correspond to different representations” (MOSCOVICI, 2015, p. 186), therefore:

[...] they are fluid, pragmatic, susceptible to hits and misses, and, therefore, allow a certain freedom to language, experience, and even to the criticism of individuals [...]. They present themselves as a network of ideas, metaphors, and images more or less freely interconnected and, consequently, more mobile and fluid than other theories. (MOSCOVICI, 2015, p. 189; 210).

When studying the structure of SRs, Moscovici (2012) highlights knowledge or information, attitude, and the field or image of representation (SÁ, 1996). The first corresponds to the knowledge that subjects have about the social object, for example, the knowledge that academics have about IA (MOSCOVICI, 2012). The attitude is characterized as the most frequent and possibly the first to appear, which, according to the author, it is possible “[...] to conclude that we inform ourselves and represent something only after we have taken a position and according to of this positioning” (MOSCOVICI, 2012, p. 69). It can explain the favorable or unfavorable orientation of the subject concerning the object of social representation and is still considered a formula valued by society to which the individual adheres when taking a position in the face of a problem discussed socially (MOSCOVICI, 2012).

The image or field of representation refers to the concrete content of a precise aspect of the object. (ALVES-MAZZOTTI, 2008). It can be understood as a faithful reproduction within the spirit of what is located outside. Thus, each undergraduate takes in their memory a collection of images about IA that can be considered as mental sensations, and impressions left by people in their brain, which is analogous to visual experiences (MOSCOVICI, 2012). They perform a function similar to a selection panel, whose function is to receive new messages and control the perception and interpretation of messages (MOSCOVICI, 2012).

The structural dimension of SRs, also known as Central Core Theory, states that SRs elements are hierarchical and organized around a central core (CC), composed of one or more stable elements, which are resistant to change, and a peripheral system.

The CC is related to the collective, to the properly social common base that defines a group's homogeneity. Thus, it is characterized as the fundamental element of an SR, since it determines, at the same time, its meaning and its organization. As it's shared by the subjects of the same group, it's a point difficult to change, as it concentrates a common value attributed by the subjects to a certain object (ABRIC, 2003).

The peripheral system (PS), in turn, establishes “[...] the interface between the concrete reality and the central system” (SÁ, 1996, p. 73); it's the operative part of the representation and is related to the dynamics and functioning of the SR, so, it's more accessible and flexible (ABRIC, 2003). It works as a script for decoding situations, serving as a buffer for the CC, which can't change with the continuous transformation of reality (ABRIC, 2003).

3 Methodology

Data collection was carried out in December 2019. Students regularly enrolled in Biological Sciences from the 1st to 4th year at UEPG - Paraná answered the survey questionnaires. The Ethics Committee approved the research on August 28, 2019, under No. 4,243,220, and ethical care was followed, such as the protection against abusive power relationships and anonymity.

The questionnaire used to collect the information consisted of questions that initially aimed at characterizing the participants. Next, there were questions aimed at highlighting the social representations of IA, including the question on free association of words (FAW). In addition to being quite widespread among studies that use the theoretical contribution of SR, FAW is the most suitable when it comes to collecting the elements that constitute an SR (SÁ, 1996). In it, the students were asked to list five words or expressions based on the prompt: “The integrative activities developed in the teaching laboratory disciplines are...”. The use of a prompt allows demonstrating the semantic universes relevant to the object in question. According to Abric (1994, p. 66), it

allows “[...] to collect the constitutive elements of the content of a social representation spontaneously”. After listing the words, they assigned them numbers according to their importance and justified the one indicated first. Finally, there were questions aimed at highlighting the characteristics of IA.

After collection, the questionnaires were organized in an Excel database for further analysis. The open questions, those that allowed the subjects to answer descriptively, were transcribed. For that, the name of the participants and the institutions, conversational markers, slangs were removed, as well as grammatical and spelling errors were corrected. These questions were analyzed by the assumptions of content analysis (BARDIN, 2004). Initially, a pre-analysis was carried out, which corresponded to a floating reading of the answers. After selecting the excerpts that have evidence of attitudes and images, a reading was carried out to know the main themes that raised them. Subsequently, attitudes and images were organized according to the themes they referred to in the text, grouping them by similarity. To separate the categories of attitudes, it was necessary to identify the adjectives and their favorable or unfavorable inclinations and, to list the images, the comparisons made by the students were observed.

The multiple-choice questions, which had a pre-established list of options for the participants to indicate the one that best corresponded to their answer (GHIGLIONE; MATALON, 1993), were analyzed based on the frequency and percentage. In the question of FAW, the software *Ensemble de programs permettant l'analyse des evocations* (EVOC) was used, which combines the frequency of words with their average order of evocation, seeking to establish the degree of prominence of the elements that make up the social representation, identifying the likely elements that make up the four quadrants (VERGÈS, 2005).

The first quadrant, the probable central core, is composed of the elements with the highest frequency and evoked in the first positions by the subjects. In the second quadrant, first intermediate nucleus, are the elements that obtained high frequency, but were cited in the last positions. In the third quadrant are the elements that were mentioned with a low frequency, but evoked first. Finally, in the fourth quadrant are the elements that correspond to the periphery, those cited with a low frequency and among the last positions (VERGÈS, 2005).

4 Results and discussion

At the end of data collection, the total of 99 students authorized the use of the questionnaire. Table 1 shows the characterization of these participants.

Table 1 – Characterization of the participants

	Variables	Frequency	%
Grade / Students	1st year	20	20.20
	2nd year	4	4.04
	3rd year	43	43.43
	4th year	32	32.32
Period	Evening	24	24.24
	Night	75	75.75
Admission year	2014	2	2.02
	2015	7	7.07
	2016	28	28.28
	2017	37	37.37
	2018	7	6.06
	2019	18	18.18
Participation in other projects	Pibid	20	20.20
	Pibic	25	25.25
	Projeto de extensão	53	53.53
	No participation	34	34.34
Gender	Male	27	27.27
	Female	72	72.72
Age	18 – 24 years	86	86.86
	25 – 30 years	6	6.06
	+ 30 years	5	5.05
	Did not answer	2	1.98
Employment	Study only	32	32.32
	Study and work	22	21.21
	Study and internship	45	45.45

Source: Authors' own (2021).

Note: In the participation variable, in other projects the sum of frequencies is higher, as they could select more than one option.

In the analysis of the FAW question, words that had the same meanings were grouped. After processing by the EVOC software, a list was obtained containing 477 words, of which 166 were different.

For the composition of the four quadrants, evocations whose minimum frequency was equal to or less than five (25% of the total) were discarded. In addition, the intermediate frequency nine and the average order of evocation (OOE) 2.9 were considered, both extracted from the RANGMOT report. The minimum frequency defines that only words with five or more evocations are pointed out and the intermediate frequency that only words with a frequency above nine are part of the upper quadrants,

as shown in table 2. The OOE, in turn, determines how the words will be positioned relative to the vertical axis (PAREDES, 2007).

Table 2 – Possible elements that make up the CC and SP of the SRs of the IA

Words	F≥9	OOE<2.9	Words	F≥9	OOE≥2.9
challenging	11	2.182	learning	12	3.000
stressful	10	2.200	tiring	27	3.111
important	41	2.488	creativity	9	3.111
interdisciplinary	17	1.529	experience	15	3.667
			interesting	30	3.300
			cool	16	4.125
			group_work	9	3.000
Words	F<9	OOE <2.9	Words	F<9	OOE ≥2.9
constructive	8	2.125	professional_improvement	6	3.500
didactic	8	1.875	good	6	3.833
essencial	5	1.600	dynamic	5	3.600
poorly_designed	7	2.857	fun	5	4.400
			inclusive	5	3.200
			interactive	5	3.600
			necessary	8	3.500

Source: Authors' own (2021).

Note: "F" corresponds to the frequency in which the words were cited and "OOE" to the position in which the word was cited.

In the first quadrant are the probable elements that make up the central core; on the one hand, *important*, which was mentioned 41 times, and *interdisciplinary*, 17 times, evidence adjectives that express, respectively, the favorable attitude and knowledge of academics about the interdisciplinary aspect of IA. In the justifications, they reference the contributions of IA to teaching, corroborating studies carried out (BRANDALISE; TROBIA, 2011; BRANDT; HOBOLD, 2019; ORLANDI, 2015):

Integrating activities are extremely important for training because in them we use the knowledge of pedagogical practice together with specific subjects. It isn't enough to learn the subject, it's necessary to know how to teach it. (A47).

The integrative activities are important for our knowledge, as they make us use different methodologies which positively influence how students learning. (A54).

In these justifications, the academics express interdisciplinarity, the exchange with other disciplines, and the construction of knowledge related to teaching. However, it isn't clear in the justifications how the reflection about these experiences occurs.

Still, in the first quadrant, the words challenging and stressful appear, which express negative attitudes. "Challenging" is related to the fact that these activities integrate different subjects, as highlighted by participant 3: "Challenging because they generally demand creativity to integrate the disciplines and even in a playful way. It's

always necessary to think beyond what already exists, which isn't easy". Stressful is related to student experiences, deadlines, and pressure to deliver these activities. Therefore, there is an ambiguity in the central core of the SRs about the IAs, as they recognize the IAs' importance and their characteristics regarding interdisciplinarity, while highlighting negative attitudes related to stress and the challenge of their elaboration. This ambiguity is related to how the SRs are constituted, "[...] through reciprocal influences, through implicit negotiations in the course of conversations" (MOSCOVICI, 2015, p. 208), in which the undergraduates are guided and build models, images, and values about IAs, motivated not by the search for an agreement between their ideas and reality, but in the attempt to build a bridge between the strange and the familiar.

In the second quadrant, with a great tendency towards centrality, the words *interesting* and *tiring* appear, cited 30 and 27 times, respectively. These words again express an ambiguity, because, while the participants point out the IAs' positive aspects, such as *learning*, *experience*, *creativity*, and *group_work*, they point out that this makes them tired, as it requires the production of teaching and -pedagogical materials, for which there is no use or application. This may indicate an insufficient articulation of these activities with the education systems, from which the participants are unable to perceive the use and/or usefulness of the materials produced, as can be seen in the justification: *"Integrating activities are tiring, as they involve several things; the development of these activities is tiring. Often, we have to put aside tests and assignments to develop games, and parodies, which, most of the time, are not properly used"* (A43).

In the third quadrant, the words constructive, didactic, and essential and the poorly_designed attitude appear, evidencing again the fluidity expressed by the duality of SR. Finally, in the fourth quadrant, where is the periphery - the most flexible elements -, the words good, dynamic, fun, inclusive, interactive, and necessary are present. At the same time, the word professional_improvement appears, pointing out that the students recognize the importance of IAs for their professional training. In their justification: *"Experimentation happens in integrative activities; aims at academic growth, to enable our knowledge and training in the face of classroom challenges, thus helping to train teachers"* (A32).

When asking the participants about what they compare to the AIs, to highlight the images, the answers were separated into categories, with the most cited being: classes at school, teaching activities and/or seminars, extension projects, workshops and science fairs, and teacher training. Among the answers, the one from student 35 draws attention when comparing the AIs “[...] to TV shows where the students put on a show and the professors are the judges”. Student 51 highlighted group work, “[...] comparing them with a building site, where several people work and perform different functions to build something”. Student 65, on the other hand, pointed to AI as “[...] those boring commitments that everyone hates, but is forced to do because they need to”.

Some compared the AIs with classes, such as student 93 – “[...] to demotivating classes, because the teacher does his best, but the students’ judgment cannot be considered constructive” – and student 95 – “[...] a class with a teacher who has never taught”. According to student 96, AIs can be compared “[...] to disarming a bomb without training”. So again, in attitudes, ambivalence can be seen. Academics have favorable images and attitudes towards AIs related to their professional training while expressing unfavorable images and attitudes related to their experiences and the way they are constructed, guided, and evaluated during the course.

To understand more deeply how the AIs were organized, there was a question where they could check more than one option indicating the modalities in which the AI fits. The answers were organized in table 3, which contains the frequency with which each modality was chosen.

Table 3 – IAs didactic modalities

Didactic modalities	Frequency
Lectures	68
Demonstration	71
Practical class	50
Field trip	10
Discussion	30
Group work	79
Dynamics	59
Others	7

Source: Authors’ own (2021).

The most frequent modalities were in descending order: group work (79), demonstration (71) and lecture (68). Seven participants choose others, citing restorative circles, educational games, ICTs (information and communication technology), and

theater. The didactic modalities most present in the AIs were the lecture and the demonstration, which, in general, are done in groups and, thus, are very close to how Science and Biology is taught in schools. Thus, the question is: "What practice is this?". A practice that is supported by lectures and students' memorization skills. Aspects widely condemned in Science teaching (CARRAHER, D.; CARRAHER, T.; SCHLIEMANN, 1984).

It's worth highlighting the contradiction present in this data, since teaching science solely based on content, based on exposition, and demonstrations, often with the indiscriminate use of the textbook, in which the teacher is the holder of knowledge and the students are those who copy and memorize the content, evidences the mismatch of this teacher training in face of the emerging movements of contemporary society. However, it demonstrates the misunderstanding of the meaning of practice as a curricular component, as already evidenced in other research (GATTI, 2010; SOUZA NETO; SILVA, 2014). The practice "loses" its original dimension of "reflection on and of teaching" (BORGES, 2008; SCHÖN, 1992) and, in this specific case, assumes technical and pragmatic characteristics.

When evaluating the AIs, most participants (N=49) said that they helped a lot: "With the execution of these activities, I was able to achieve several goals, including greater integration between contents; I learned how to integrate them, and that helps the teacher in the classroom" (A34). The participants who said that the AIs helped referred to the following: "The way we are instructed and how the activity is organized could be better structured; as a result, our practice could bring more positive outcomes" (A21). Participants who said they were indifferent: "Sometimes they overloaded more than they added" (A10). The option hinder was chosen by only three participants, and the justifications were: "Lack of assistance and help from professors during the preparation" (A93) and "The lack of time to carry out activities due to work" (A19). The option was very harmful was not indicated by any academic.

Regarding the AIs' characteristics, the students were questioned whether the methodologies used in the AIs are the most appropriate for the course, to which 44 students responded that they are in most activities, and 27 participants responded that they are in all activities. This data, taking into account the didactic modalities discussed in table 3, demonstrates an interesting aspect. Even though there are many complaints

about pragmatic science teaching, based on the uncritical use of textbooks, and copying and memorization, which often disregards the cognitive development of students in their different stages (CARRAHER, D.; CARRAHER, T.; SCHLIEMANN, 1984), which, after decades, with the evolution in cognitive theories, remain in Science teaching (SBPC, 2003) and results in the evasion of students and teachers from classrooms, and high rates of scientific illiteracy (MATTHEWS, 1995), as well as the low proficiency and lack of basic knowledge and skills required in Science in most Brazilian students compared to students from other countries (INEP, 2019), even so, the undergraduates, when evaluating the methodologies used in the AIs, responded that they are suitable for science teaching.

It's worth noting that "[...] practice as a curricular component is the series of training activities that provide experiences of applying knowledge or developing procedures specific to the teaching profession" (BRASIL, 2005, s.p.) and as such contribute to the formation of the teacher's identity. In this sense, we ask: which teacher are we training in courses in which PCC mostly takes place through expository and demonstrative classes? What practice is this?

Talking about teacher training and, in particular, about the IAs that make up the PCC is about rethinking how the work of reflection on teaching is taking place in the face of the evolution of education. "Training is not built by accumulation [...], but through a work of critical reflection on the practice and permanent (re)construction of a professional identity" (NÓVOA, 1992, p. 25). It's noteworthy that the participating students positively evaluate the methodologies used in the IA as being suitable for their training when the didactic modalities mentioned by them are outdated for an interdisciplinary, equal, reflective science teaching, capable of contextually re-signifying the theory in practice (CUNHA, 2013).

5 Final considerations

In the present research, the objective was to present the SR of academics of the degree course in Biological Sciences about the AI developed in PCC classes. The social representations developed by undergraduate students about IAs recognize their importance for their training and professional development and are aware of their

interdisciplinary characteristics, at the same time expressing negative attitudes and images regarding the way they are organized, guided, and evaluated during their course, which is predominantly expository and demonstrative.

Regarding the methodologies used in the AIs, the participants' responses indicate that they're very close to the teaching the way commonly practiced in schools, widely denounced in research and publications in the area of Science Teaching since the most referenced didactic modalities are the lectures and demonstration. This data again reveals a misunderstanding of the meaning of the PCC; it also manifests a view of practice as a mere exposition/demonstration of Science, theory and contents, without an in-depth reflection on the methodology used (CANDAU; LELIS, 1999; DUTRA, 2010). We hypothesize that the practice, sometimes, is disconnected from the theory that underlies it in the teaching of Science and Biology.

However, the complexity involved in science teaching and learning demands the study, research, and deepening of the pedagogical, epistemological, cognitive, and social foundations involved in teaching and learning Science (GATTI, 2016). Therefore, it's necessary to think about several aspects that are indispensable to the construction of knowledge, as students, their interaction, the object of knowledge, the experiences resulting from this process, as well as in the conceptual conflicts and contradictions, among others.

Finally, we highlight the need to develop more research on the subject, since there are issues that still need to be explored, such as the social and cultural perspectives present in the IAs, the choice of the contents worked, among other aspects. However, we emphasize the need to consider the social representations of those involved, whether they are students or teachers since every transformation in practice necessarily involves a change in the social representations.

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