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A teaching strategy for education in health in Brazil: dialogic problematizing inquiry

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This paper presents a teaching strategy for education of health professionals called "Dialogic Problematizing Inquiry" (DPI), which was evaluated in the course "Teaching Methodology in Health Education", promoted by the Development of Higher Education in Health Center, at Federal University of Sao Paulo. It was designed in the framework of a bilateral project between Brazil and Argentina, and was developed in presencial and virtual format. The implementation of DPI generated a communication dynamic that was coherent with a constructivist perspective and enabled a change in teacher and students communication manners, which were guided by close-to-student-problematizing situations. The implementation of this teaching innovation was consistent with the curriculum changes stemming from current health policies in Brazil.
Keywords: Problematization. Higher education. Communication. Health education. Teaching.

Introduction

In recent years, higher education for health professionals in Brazil has undergone major curricular changes, influenced by the implementation of the Unified Health System (SUS)[1] and the National Curriculum Guidelines (DCN)[2]. Curricular and praxis changes arising from them have outgrown the old biomedical paradigm[3] and conception of health as "the absence of "disease"[4]. Their purpose regards the transformation of professional practices and work organization, their structuring based on the problematization of work processes, and the ability to face and care for various dimensions of people's health. However, Burg Ceccim and Macruz Feuerweker[5] say this field is characterized by a predominance of intuitive proposals, lacking theoretical and conceptual

formulations and a clear discussion of the characteristics of teaching-learning processes. Thus, the DCN is generally advisory. For all these reasons, outstripping the mechanistic and patronizing perspective in health[3,6] is promoted in health training. In particular, the DCN for courses in the area of health highlight communication skills as one of the core professional skills. Physicians for instance, should be able to communicate effectively with patients and families[7].

The Center for Development of Higher Education in Health (CEDESS) of the Federal University of São Paulo (UNIFESP) offers a course of "Teaching Skills Training in Health", which is taken by graduates of different professions (medicine, nursing, etc.) and incorporates said innovations. Its aim is to practice a teaching approach called Dialogic Problematizing Inquiry (DPI), which centers around communication and knowledge construction, with problematization at its heart. This strategy has been tested at pregraduate level[8] as well as primary and secondary schools in Argentina[9].

A teaching strategy that focuses on communication and problematization

A hospital, a medical practice, being on call, and a health service, as communicative spaces, can be viewed as learning scenarios that involve someone teaching, someone learning, and knowledge. The exchanges taking place in these scenarios are amenable to didactical analysis, since they promote interactions among people based on a certain knowledge. Such scenarios allow people to act either as teachers (health professionals from various areas) or students (usually patients or training health professionals) who exchange ideas or representations, discuss meanings, etc. Message contents intended to be understood by the subjects can regard for example symptoms, health policies, or safety rules.

This study responds to our perspective of promoting reflection and educational innovation, contextualized and adapted to the different realities, as opposed to prescriptive and normative training[6]. Furthermore, there is a need to consider educational facts with a holistic approach to those facts where the three dimensions of teaching are realized: human, technical and sociopolitical[10].

Working with the model of teaching situations involves linking the three vertices of the "educational triangle" (teacher, student, knowledge) and two processes (teaching and learning), concerning the transfer of knowledge, through some means of communication, in a given context. This requires not only subject matter knowledge and teaching skills, but also dialogicality[9]. The dynamic of this model to achieve innovation is constructivist, since it is considered that reconstruction of knowledge in the classroom requires a constant exchange between participants, as well as interactions between them and knowledge[11]. The pillars of DPI include an intended dialogicality in the social process of teaching, in accordance with Freire's theory of dialogical action[12] and Wells' dialogic inquiry[13]. The psychology of DPI lies in Vygotsky's proposal[14] regarding

the sociohistorical construction of knowledge, while DPI psycholinguistics lie in the consideration of language as a sociolinguistic mediator in education[11].

Thus, we depart from "traditional" teaching, where teachers just transmit structured messages, and turn to a role of encouraging and helping in the construction process, trying to achieve circular instead of one-way communication[15]. To succeed, it is crucial to plan activities for each stage of the class: (a) *beginning*, with recall of previous ideas; (b) *development*, with construction of shared meanings; and (c) *close*, or class contents *legitimation ending*. DPI produces *circular communication* through activities, whether face-to-face or not, supported by instances of narration, description, reflection, explanation, discussion, resoning, and grounding of ideas[15]. Lemke[16] holds that exchange of messages in a class allows the construction of three types of meaning: arising from the exchange itself; presented and staged by participants from their socioprofessional viewpoint; and interpreted by the teacher and rest of participants. Online teaching is challenging with regard to dialogicality, since communication becomes technology-mediated instead of face-to-face. Levin et al.[17] argue that, while asynchronous communication has proved to be beneficial bringing some schedule flexibility to students, it lacks real-time, synchronous interactivity, thus asking for a different format[18].

The DPI strategy rests on one more crucial pillar which is problematization. A "problem" refers to a situation involving difficulties without an obvious solution or immediate answer. Addressing problematic situations results in a thread allowing to address issues and to bring up new questions. However, "problematization" and "problem-based learning" (PBL) are different strategies. The former is a method that can be used to teach certain subjects, while the latter applies to complete curricula[19]. In this paper we limit ourselves to a problematizing approach, as an innovative response denaturing everyday matter and getting back to specific contexts. Problematization is where the political side of education lies, which must be committed to social change and awareness of the rights and duties of citizens[12].

Moreover, problematization helps students to improve comprehension and address increasingly complex levels of the subject matter. Moreover, it promotes, gives direction, and enriches the dialogue between the different actors of the class through discussion and debate, which involve changes of opinion, expression of different points of view, reasoning, and consensus building.

Development

Experimental context

This experience is part of a binational project between Argentina and Brazil involving a CEDESS team (Brazil) and two groups specialized in teacher training in experimental science

(Argentina). The innovation is implemented in the discipline of "Teaching Training in Health" offered to graduate students, in lectures either face-to-face or online (in bimodal format), using the Moodle[21] virtual learning environment (VLE). The DPI strategy was tested in two cases, to teach different contents: "evaluation" (Case 1) and "curriculum" (Case 2). The sequential implementation of DPI included the following steps:

i. Innovation planning: first the problematic situation was designed. To this end we identified issues, their associated questions, the openness degree of the problems to encourage the exchange of ideas, we recovered various benchmarks, and we introduced new knowledge. Furthermore, the student group was diagnosed so the problematization would relate to the social and institutional contexts in which participants work. In parallel we outlined the learning achievement goals and the activities arising from the initial problem approach. We devised the processing logic for each subject, i.e. its thematic route.

ii. Design implementation and monitoring: record keeping of classroom and distance learning actions (blackboard, virtual forums, notes, video and audio). We recorded Moodle interventions on the involvement of teachers and students in forums, frequency, quantity and quality of these messages, stories and narratives, and footage of classroom activities. The latter were transcribed and collated with the audio of classes and groups of pupils.

iii. Construction of data: data were constructed regarding the various stages of the class (opening, development, and close), contents legitimation interventions, teacher advice to encourage metacognitive thinking and decision-making, integration of prior knowledge, inclusion of new knowledge, and new problems posing.

iv. Analysis of data from three perspectives:

• procedures of knowledge construction on teaching and subject matters (conceptual, procedural, and attitudinal dimensions), to regain prior knowledge, of collective and collaborative construction, to problematize contents, to identify dilemmas and obstacles, to transfer knowledge to various situations, and to make grounded decisions.

• type of discourse interactions, teacher, tutor and student interventions, established model of discourse interaction (teacher/tutor-student, student-student), number, frequency, type and contents of messages, and trained cognitive-linguistic skills.

• manner and timing of metareflection on the training process experienced.

Study population

Innovation involved 31 graduate students (24 females and 7 males). These students were graduates in medicine, (9) nutrition (4), biomedicine (5), biology (3), psychology (2), pharmacy (2), physiotherapy (2), veterinary medicine (1), physical education (1), chemistry (1), and nursing (1). Regarding their provenance Higher Education Institution (HEI), 13 were public and 18 private. Most students came from Southeastern Brazil (25). At the time of implementation only five

participants (four physicians and a nurse) worked as teachers. The majority (18 students) had never taken distance education courses, while 12 students already knew and used the Moodle VLE in the role of students.

Results

The following exemplify some of the stages of DPI implementation in the selected discipline in each case.

(a) Stage of problem presentation to students

The problematic situations prepared revolved around everyday situations in the life of the students. These are presented in Chart 1 (Case 1) and Chart 2 (Case 2) with the topics to start the exchange between teachers and students.

Chart 1. Problem and instructions on how to treat the "evaluation" content (Case 1).

(Case 1) Topic: The panic room.

"The scene took place during the assessment of practices of Adult Health in the 3rd year of nursing studies in a Federal public university where the 3rd year curriculum had been recently redesigned to bring professional practice closer to the student, in line with the DCN. Students have a first contact with a patient admitted to hospital before taking any class of anamnesis and physical examination. It was around Easter and the teacher had asked students to prepare for an oral examination on Monday, after the holiday. The student said: "I swallowed the whole book, I mean, I memorized it entirely When the time came, they were all around the patient, and the poor guy, not understanding a word of our talking, just kept staring at us. The teacher asked: what are you hearing? I was so nervous that I could not answer. I had forgotten everything! A colleague answered instead of me: "bowel sounds". The teacher had the biggest tantrum and said if she wanted to call my colleague, she would have done so. . The teacher challenged us all in front of the patient and made me an even more difficult question that was not in the book. At the end, she said the group was very bad and noboby was passing."

Instructions:

- How would you label this scene?
- What are the teacher and student roles?
- What are the conceptions of teaching, learning and assessment in this case?
- If you were the teacher in the scene, how would you have played the role?
- What criteria would have been used to examine students and for what purpose?

Chart 2. Problem and instructions on how to treat the "curriculum" content (Case 2).

(Case 2) Topic: Who teaches? Who learns?

In a medical school in the Northeast region the curriculum is disciplinary, split in the basic and clinical cycles, with little integration of content and predominance of lectures. The preferred scenario is usually the classroom, with some labs sessions in secondary and tertiary level hospitals, with a preponderance of the physician's role in health teams.

In this medical school, the group responsible for the implementation of the new curriculum in the Pro-Health framework is composed by the course coordinator and the university rectorate. They decided to introduce undergraduate students at the family health unit in order to combine the teaching process of teaching-service process with underprivileged communities.

Shortly after the decision was announced, a series of emails were sent to the school Director . The communication sent by a student representative warned of the danger that medical students were in the hands of unprepared physicians of health services, claiming that "we are not in college to be forced to learn to deal with the poor ". A message from a head of department that had been visited by a group of students expressed his indignation about the university transferring the responsibility for training professionals to teachers that did not qualify academically. In turn, most of the course teachers showed resistance to the proposed changes. The situation became more serious after a phone call from a physicians representative announcing that the university should be prepared to face strong resistance from the broad majority of doctors in the Family Health Program -FHP, resenting their exploitative work and not being paid to train students which, therefore, can not be part of their duties.

Instructions:

- What are the different views on medical education present in the problem?
- What are the course curriculum structure and the proposed changes?
- What is your assessment of how the curriculum changes are being implemented?
- What was the curriculum like during your undergraduates course?

(b) Stage of student ideas activation and competition

This stage was to stimulate the recovery of students linguistic and mental benchmarks, encouraging brainstorming to express both agreements and disagreements regarding the problem posed, and the conflicts this situation causes. Multiple answers were recorded in the Moodle platform, e.g. for Case 1:

I also had an experience like this. My assessment is that this manifestation of the power of the teacher is totally inadequate, even for the traditional method [...]. (Student 1)

Records show thoughts on the power of teachers, traditional methods, learning, teacher-student-patient relationships, assessments, teacher preparation and professional ethics. Due to the virtual environment structure and intervention guidelines, exchanges among students were rather infrequent, which caused a "radial" structure of communication.

In Case 2, the teacher mentions the existence of a group responsible for the implementation of the new curriculum. Students reply that there is a need for change in the institution and reflect on how this path could be implemented in the academic community. They also stress the need for teachers and students to participate in the process of curriculum change, referring to their experiences. For example, one student expressed:

When you are going to implement any curriculum, help from teachers is always needed... because all participate in an integration ... all with a common curriculum at first, which has to be distributed as well as possible. Such decision-making though, was coordinated with faculty, with students [...] students also participate [...]. (Student 1)

(c) Stage of redirection of interventions and response to the problem

In this stage we assess whether student brainstorming is focusing well on the topic, and whether the teacher redirects the class with new questions or recontextualizes the problematic situation when necessary.

In Case 1, after a few students answered the initial questions, the teacher and moderator of the forum reoriented participant interventions. This helped student answers to focus on the problematic situation:

As made explicit in the messages, the scene provides multiple possibilities for analysis. We stress the importance of considering: i-How do you evaluate this scene? ii-What are the roles of teacher and student? iii-In your opinion, what are the conceptions of teaching, learning, and evaluation of students and the teacher in this case? iv-If you were the teacher in the scene described how would you have acted? v-What criteria would you apply to assess student performance and to what end? (Teacher)

After these and other exchanges the teacher returned to the problem, he made a summary of student conceptions and reoriented the discussion by asking new questions.

What are the characteristics of the medicine course curriculum analyzed? What are the aspects that need to change considering the present context? ...I think this analysis is on two levels. On a personal level it is the point of view of students, physicians, and course directors. The second level is institutional, [since we are] going through a curricular change, and the health service itself needs to be considered. How is this service organized to receive students? Now ... there is another level that does not appear explicitly in the text but you are mentioning, which is the political level ... that is, to what extent public policies bring about changes? (Teacher)

d) Stage where the teacher takes the interventions and performs partial closures

The virtual environment, compared to face-to-face class situations, facilitates the production of partial closures and the faithful reproduction of interesting interventions in order to preserve the thematic pattern[16]. In this case, after students express their ideas, the teacher performs some organization of answers that may require translations and categorizations. The introduction of some new knowledge may also be required to start meaning legitimation on a first level of complexity. For example (Case 1):

[...] In an attempt to summarize the thoughts shared, I explained: students agree on teacher conceptions of teaching, knowing, and assessing, related with passing, acquiring, verifying, respectively. The teaching function boils down to presenting knowledge, without joining theory to practice [...]. Contrary to Luckesi's proposal on the role of evaluation in decision-making so as to improve the decision-making process. The student has a passive role [...]. In this sense, the teacher applies the traditional teaching model. [Forum 2] (Teacher)

In Case 2, the teacher summarizes the comments from students and raises new conceptual relationships such as the DCN and their influence on everyday teacher practices. Thus, the teacher records the ideas in some previous curriculum that are generally associated with the notion of curriculum as a set of disciplines that make up the training, contents and strategies. On a first level of systematization the teacher said that students' prior knowledge reflects a fragmentary and disciplinary curriculum concept including the separation between a basic and a clinical cycle, and a dichotomy between theory and practice, deriving from an idea of curricular organization neutrality. Returning to the initial problematic situation, the teacher points out that these features of the medical course curriculum ask for changes in the current context of professional training according to the needs of society. In this case frequent literature references were brought up, which helped to enhance the discussion on DCN, HEIs and SUS.

e) Stage at which the teacher introduces new knowledge

The incorporation of new knowledge allows the contribution of new answers and analyses of the problematic situation. The teacher turns explicit a more complex level of subject approach that goes beyond common sense and opinion, providing new fundamentals. For example in Case 1:

Which are the evaluation assumptions and criteria? [...] emphasizes that the criterium should be used as a quality requisite, not as some kind of teaching authoritarianism. In this case, teacher authoritarianism has prevailed, in contrast with the failure of the criteria mentioned by Desprebíteres[22] regarding the possibility of providing student self-evaluation and constant stimulus for reflection and improvement. In addition to the authoritarian attitude of the teacher, what teaching assumptions will be applied in this assessment [the theoretical and practical part]? I suggest reading the mentioned DCN quote to think about the last question. (Teacher)

In Case 2, the new knowledge is presented with reading groups on the DCN. This involved organizing groups by profession to read the document and holding subsequently a roundtable on the desired new professional profile, especially with regard to teaching-service integration, referring to the problematic situation analyzed.

f) Stage of return to the original problem
and reviewing student initial answers to improve their arguments

After a classroom discussion and reading of suggested texts, students were asked to reread the problem and incorporate arguments stemming from introduced theoretical aspects.

g) Stage of metacognition

In this process of metacognitive thinking, the teacher brings back each student's manner and timing of integrating prior and new knowledge.

h) Stage of transfer and final synthesis

After bringing back the initial reports and legitimation of constructed knowledge, transfer is made to the new situations of daily teaching and the final synthesis is performed. For example, in Case 1, students reviewed the reports of assessment situations developed at the first meeting (face-to-face). Distributed in groups, they had to identify the original scene characteristics and describe an ideal scene in the light of the constructed knowledge.

i) Stage of posing new problems and process evaluation

The teacher compares initial and final answers, based on a class meta-analysis process.

Conclusions

Exchanges between students and teacher in the activation stage ("b") allowed to check ideas against each other and get back mental and linguistic benchmarks for the contents worked on. Many of the student contributions had to be guided by the teacher so as to reach an initial answer to the problem (stage "c"). This meant the teacher had to read thoroughly student interventions to guide them, if necessary, to the specific contents processing (thematic pattern). Then, performing partial closures based on student contributions (stage "d"), the teacher managed to improve on everyday benchmarks and prior knowledge of students, recapitulating the procedure of contents and new knowledge processing (stage "e "). These exchanges highlight a major effort to overcome the practices and concepts rooted in the reduccionist and hospital-centric biomedical model. The dynamic achieved through DPI implementation led to self-regulation of teaching-learning processes using Moodle, despite the lack of simultaneous interventions (or synchronous communication) (stages "f" and "g"). Stages "h" and "i" meant the synthesis of the teaching-learning process applied, as well as real transfer of learned knowledge to new situations, consistent with routine student contexts.

After recording and analyzing the implementation of innovation, we conclude that it was possible to adapt the DPI sequence of steps tested in the classroom to the VLE format in the health area. A communicative dynamic was generated, consistent with the constructivist standpoint, since it stimulated the participation of the majority of students, their mental and linguistic contexts were brought back in each Case, allowing their reinterpretation in light of the theoretical frameworks taught. This was aided by the generation of numerous speech turns and moments devoted to discursive student participation in the class thematic processing.

The teaching team in charge of implementations thus met the specifications for their actions mainly regarding when, how and what type of surgery to perform, time given to students, flexibility in the contents sequence, types, levels, and timing to perform the legitimation of contents and processes, student participation, and the consideration of one or more paths of contents analysis. This was achieved thanks to the team's prior training in those linguistic skills required to carry out the VLE strategy, as well as in the contents processsing and communicative processes for each case.

The activities developped, incorporating discussion, thinking, and learning forums, surpassed the teaching model consisting in the mere transmission and acquisition of knowledge. Moreover, the fact of working with adult, professional learners, motivated to learn, and

development bolsterd the DPI strategy development. Given all of the above, we consider it necessary to perform the teaching task of devising teaching problematic situations that mobilize knowledge, as well as giving it a functional character, and to plan and reflect on dialogic interactions with students arising from them. This is related to the communicative skills of whoever plays a teacher's role, which was helped by the implementation of the DPI.

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Contributors

Ana L. De Longhi was co-coordinator of innovation design and research on it. She gave advice continuously during the implementation of the proposal and reviewed it in the light of the initial strategy (DPI) in Argentina, in both virtual spaces and classrooms in Brazil. She developed the general outline of the article and took part in data construction,results and conclusions production. She took part in the manuscript writing and theroretical reviewal throughout the different stages. Gonzalo M. A. Bermudez reviewed the proposal design and assessment. He advised continuously during the implementation of the proposal and revised it in the light of the original proposal. He also took part in data construction, results and conclusions production. He took part as well in the writing and theoretical reviewal of the manuscript, and supervised its writing throughout its various stages. Lidia Ruiz Moreno was co-coordinator of the innovation design and research, and together with Patricia Dubeux Abensur, she took part in the writing and reviewal of the theoretical framework, especially the curricular aspects of the health context in Brazil. Both analyzed the DPI strategy transfer to the context of Brazil, implemented the proposal, participated in data construction, results and conclusions production.

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