

Future Brazilian teachers' imaginaries about physics teaching in adults' education



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Abstract

Although the school modality of Adults Education occurs for decades in Brazil, this field of education still shows many problems that can be exemplified in the following aspects: little investment from the government, inadequate public policies, shortage of materials produced specifically for this modality, the lack of a curriculum that meets the needs of the area and, especially, lack of teacher trainings to work in these classes. Taking these considerations into account, this research aims to investigate the performance of future physics teachers in the preparation and teaching practice for Adults Education classes. For that, we are monitoring a sample of future teachers taking their initial education program in a Brazilian public university, in the discipline "Supervised Teaching Practice III" where happens the training of activities to be carried out in real school situation in the next semester. The proposal is that some groups of future teachers prepare a didactic sequence taking into account the profile, needs and interests of adult students. The first step of this research was to investigate the future teachers' imaginaries about adults' education; for that, it was designed two questionnaires. The first sought to investigate whether the future teachers would bring important considerations for the Adults Education or even if they mention this school modality in their answers. The second questionnaire addressed directly the views of the research subjects about adults' education. Initial data analysis indicates that future teachers propose a teaching approach based on conceptual physics and involving facing everyday physics. These proposals agree with what researches suggest for the Adults Education.

Keywords: Adult Education, Physics Teaching, Teachers' Initial Education.

Resumen

Apesar de que el área de Educación de Jóvenes y Adultos (EDJA) fue creada hace décadas en el Brasil todavía presenta múltiples deficiencias, tales como: Poca inversión por parte del gobierno, políticas públicas insuficientes, escasos de materiales producidos especialmente para esta modalidad, falta de un currículo que atienda las necesidades del área y principalmente la falta de preparación del profesor para actuar en este campo. Con estas consideraciones, la investigación tiene como objetivo investigar las especificidades consideradas por los futuros profesores de Física en la preparación y en la práctica pedagógica de las clases para los cursos de EDJA. Para esto, estamos acompañando un grupo de licenciados de último año de un curso de Licenciatura en Física de una universidad pública, durante la disciplina "Práctica supervisada III", donde se realiza la preparación de actividades a ser aplicadas en la práctica docente que se desarrollará en el semestre siguiente. La propuesta es que algunos grupos preparen una secuencia didáctica llevando en cuenta el perfil, las necesidades y los intereses de los alumnos jóvenes y adultos. La primera etapa de la investigación fue indagar el imaginario de los licenciados al respecto de los cursos de EDJA, para esto fueron elaborados dos cuestionarios. El primero buscó averiguar si los licenciados en sus respuestas abordarían consideraciones importantes sobre la EDJA. Ya el segundo cuestionario a bordo de forma directa la opinión de los sujetos foco de la investigación. Un análisis inicial de las respuestas apunta que los licenciados proponen para la EDJA una Enseñanza de la Física abordando cuestiones cotidianas. Estas propuestas son coherentes con lo que la investigación sugiere para la EDJA.

Palabras clave: Educación de Jóvenes y Adultos; Enseñanza de la Física; Formación inicial del profesorado.

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I. INTRODUCTION

The Adults Education is designed for those who did not have access or permanence in studies in elementary and high school in convenient age [1]. According to data published by the OECD [2] half of the Brazilian population between 25 and 34 years has not completed high school in Brazil. This statistics rises to two third of the population when the age limit is extended up to 64 years. Although these values are decreasing compared to previous years, this data is still alarming and become a challenge for government and society.

We can understand the field of adult's education as an area that, despite having a long history in Brazil, it is not yet properly considered. Attempts to set specificities for this field have been a main feature of the Adults Education which has been seen as an education marked by "uncertainties, voluntary, emergency campaigns, occasional solutions" [3].

The problems in this field can be exemplified in the following aspects: little investment from the government, inadequate public policies, shortage of materials produced specifically for this school modality, lack of a curriculum that meets the needs of the field and, especially, lack of teachers training programs to work in these classes.

Many teachers do not have expertise to work in Adults Education and what has been seen in these classes is improvisation and kind of "sense of charity". Teachers themselves say there is prejudice in this field which is considered as a "second line" teaching activity [3]. There seems to be a strong idea that any teacher is automatically an adults' teacher [4].

According to Ribeiro [5], the lack of specific training of adults' teachers may result, even if only intuitively, the use of an improper transposition, made from the model used in the school for children and adolescents, disregarding the interests and abilities specific of adults and collaborating with children's representations that can populate both, the imagination of educators and the students. In this sense, it is proposed to set up a group of theoretical and practical knowledge already accumulated, from the history of adults' education in the country, as well as other studies in this area. This knowledge can contribute to educate teachers that will work in Adults Education [5].

In turn, the teaching of physics has historically been approached in a way out of context, with emphasis on memorization, hindering their understanding by students. Researches show that practically do not exist studies that investigate physics teaching for Adults Education. Thus, the field of Adults Education in the area of Physics Teaching has its specific characteristics and, to think on the combination of these areas, these characteristics will be added, requiring some precautions taken by physics teachers to act in these classes.

Taking into account these considerations, the following question guides this research: *What meanings future physics teachers ascribe to Adults Education teaching?* With the intention to answer this question this research aims to investigate the performance of pre-service physics teachers

when still in the preparation and teaching practice for adults education classes.

II. THE RESEARCH

This research is being developed with 17 pre-service physics teachers, aged between 21 and 29 years, taking their initial teachers' education undergraduate program in a Brazilian public university. The investigation has been taking place in the curriculum subject "Supervised Teaching Practice III" where happens the training of activities to be carried out in real school situation in the next semester. The proposal is that some groups of students, future teachers, prepare a didactic sequence taking into account the profile, needs and interests of adult students.

The first step of this research was to investigate the future teachers' imaginaries about adults' education; for that, it was designed two questionnaires which were applied on their first class. The questionnaire, which we denominate "Exploratory Questionnaire" (see Appendix) sought to investigate them about some important issues to prepare a didactic sequence that take into account specific characteristics of adults' education, such as: criteria for selecting physics content to be worked in classes, the teaching methodology to be used in classes, considerations about adult students' profile and their opinion about school dropout. The aim was to investigate whether the investigation could address important considerations for the Adults Education or even to mention this subject in their answers.

The second questionnaire addressed directly their views about Adults Education issues.

For the analysis of answers given in questionnaires, we used as referential the French Discourse Analysis (AD). According to the AD, future teachers' imaginary can influence their positions according to the school reality in which they will work. [6]

To Orlandi [7], the AD allows us to cross the individual imaginary conditions, and explain how the senses are being produced, which make us to better understand what is being said.

More than an instrument of analysis, the AD also permeated the construction of the questionnaire. We took care in the first questionnaire, for not mentioning the term "Adults Education" or other related terms, because the idea was to investigate whether future teachers would bring in their answers relevant considerations to the work in adults' education, and at some point they would cite some knowledge about this school modality. This concern is based on the concept of *anticipation*, which is the individual ability to put himself in place of the listener, to imagine what the effects of his words on the listener. This *anticipation* will influence the individuals' choice in his speaking manner [6]. From this concept, we seek to prevent future teachers anticipation before the term "adults' education" and also in designing the answers that we would like to investigate.

In this paper will be presented some of the analysis made on the future teachers' answers to the "Exploratory Questionnaire". We seek to analyze at what moments the future teaches' discourses are approaching of the researches' discourses in Adults Education.

III. SOME RESULTS AND DISCUSSION

The aim of the first and second questions was, respectively, to investigate whether future teachers already contacted adult education, either as a teacher or student. If any of the future teachers had worked in adult education, either as teacher or student, he could have a different imaginary from other colleagues, but it was not what happened.

The third question aimed to investigate the criteria suggested by future teachers to select physics contents to be worked in classes, and if these criteria are appropriate to the reality of Adult Education. This discussion is important for this school modality, given the profile of the students and the reduced working hours of the curriculum, which is much lower if compared to the called "regular education". Therefore, it is extremely necessary that teachers who work at this modality make a selection of physics contents to be worked in the classes considering Adults Education specific demands.

A first discourse often presents in future teachers answers was about the development of a conceptual physics curriculum based, involving also the "everyday physics". Here are some examples these discourses:

I would emphasize the contents more related with the everyday physics. [T₂]¹

I would develop the curriculum focusing on concepts such a conceptual physics, working the daily students' routine, so they will identify themselves with these concepts. [T₃]

[...] working more concepts than mathematical equations. [T₈]

The discourses reveal the future teachers concern to disconnect the Physics teaching from the traditional approach, with emphases, in general, mainly memorization and mathematical tools. The future teachers suggest bringing elements of students' everyday life to be related to physics concepts. This concern may be the result of the physics teaching research movement, initiated in the country in the 70's, with the emergence of researches groups in this academic area. The *Physics Teaching Reworking Group* (GREF), for example, has a proposal for physics teaching well known in Brazil, and tries to offer "conditions of access to a consistent and formal conceptual understanding" [8]. The activities proposed by this group are based on elements of everyday life, and this proposal is widely accessible to most students. This selection criterion indicated by future teachers is quite appropriate to the context of Adults Education, because the students of this modality have school trajectories marked by exclusion and

school failure, there may be difficulties in students' understanding of the formalisms that school requires.

Another criterion pointed out in the future teachers' discourses was the selection based on the *vestibular examination* topics. The *vestibular examination* is the assessment process to the Brazilian universities (after concluding the high school) through written tests. Below are some discourses pieces:

Leave out some concepts and worry about the most important for the vestibular examination. [T₁₃]

If it was for the second year of high school, I would approach more dynamic physics, because it is the most is required for the vestibular examination. [T₁₀]

This selection criterion should be viewed with precaution in the preparation for Adults Education classes because, in most cases, the assessment to the university is not part of the main goals of the students of this modality. Moreover, is preoccupant the excessive concern of teachers about teaching *vestibular examination* exercises in the classroom just leaving aside important physics concepts that contribute to an education based on human, social and ethical aspects [9].

One reason for the *vestibular examination* to be so present in these future teachers imaginaries can be the fact that they are speaking from a public university and have this institution as a reference. Thus, the *vestibular examination* becomes a main reference criterion for choosing the physics contents they intend to teach. Another comprehension to that is the young profile of the future teachers, who already are in the last year of the teachers' initial education program. Thus, we can realize that the assessment to the university was one of the goals of these future teachers when they were in the high school, a fact that can now influence their behavior as a teacher. We also found two other factors that may have influenced future teachers' choice to this criterion: the growth in the country of preparatory schools for the assessment to the university level studies and the fact that many schools, particularly those of private institutions, parents and students, all require and pressing them to take this preparation.

Still on the third question, there was a great concern in the future teachers' discourse showing that they expressed difficulties or disagreement about the selection of physics' contents.

It would be difficult to choose the content because we could leave out some important content to the student. [T₁₄]

I would not take anything, I would require the student to missing part of the task and run with the content because I think all topics are important. [T₁₆]

In these cases they suggested abstracts and home works as a way to finalize all physics contents demanded for the curriculum. However, not always the adult students, mostly workers or individuals looking for a better job, have extra classes time to accomplish the school's demands. Schools and teachers must take care to avoid distancing themselves from the real adult students living conditions [3], fact that may cause, once more, the exclusion from the school system, resulting in students' dropout.

¹ The speeches transcribed in this research are numbered according to future teachers names' alphabetical order.
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The fourth questionnaire's question sought to investigate whether the future teachers would suggest changes in the teaching methodology approaches.

The answers to this question again reinforced the importance of a conceptual physics approach. Another discourse often present, that matches with what the research in Adults Education suggests, is the necessity to adequate the teaching methodology approaches according to the students characteristics and the reality experienced by them. The discussions aim to define that the specificity of the field of adult education are guided by the importance of considering the profile of the students, their learning needs, the various contexts experienced and the knowledge built up through their experiences. The discourse following exemplifies this idea:

I think that the teaching methodology approach and content development should follow the class learning level; different students live different realities... we cannot teach all physics contents in the same way in different classes. [T₉]

This idea is related to the fifth question, that investigates the characteristics they consider relevant to future teachers prepare their lessons. Among the various characteristics listed we highlight the following: the students' interest and disciplinary issues, the reality experienced by students, their pre or misconceptions and the difficulties they have regarding the contents learning.

Disciplinary issues are not usually discussed in adult education, since they are adults who, in general, take responsibility, whether at work or in home duties. Thus, interest and motivation issues are considered important elements in adult learning. The Adults Education classes are constituted mostly by students-workers and they find difficult to conciliate school schedule with working hours, and none of these institutions modify their organization taking into consideration personal problems and difficulties of people like them, who meet at least two parallel tasks every day: Working and schooling [10]. In this sense, Knowles [11] emphasizes the importance of the motivational factors in Adults Education. According to this author, adults are motivated to learn from personal issues such as, self-worth, quality of life, personal development.

Other characteristics identified in future teachers' answers are the concerns about the student profile. It is necessary that students profile be a reference in the training of future professionals; it is the young people and adults knowledge that will define the teacher performance in the teaching process [5].

The sixth question approaches was related to the school dropout. The vast majority of students attending adult education left school by the need to insert early in the labor market. However, recent researches have pointed out the lack of interest as the main reason for dropping out of school [12]. The future teachers imaginary approach these issues because the talks more present in their answers are related to the need of the student worker, disinterest in school, and family issues. The speech below exemplifies the discourses mentioned:

It [the scholar dropout] happens for social reasons, such as the need to start early in the labor market, care for the

family, etc. But often it happens by the lack of interest generated on the students and it seems useless since it could turn their time to other activities. [T₇]

Returning to the question of adult students' motivation, it can be seen in the future teachers representations the presence of two discourses. In the first one, the interest in classes seems to be intrinsic to the student, that is, it is obligation only of the students to be motivated to attend and participate in the physics classes; by other hand there is the discourse of those who understand the teacher as responsible to awaken students' interest through more dynamic and attractive lessons. Thus, we emphasize the importance of such discussions to be present in the teachers' initial training.

Finally, the last question sought to approach the maximum of Adults Education with the aim to verify whether the future teachers would bring this modality in its imaginary. And what happened we see in these examples:

Well, I think the government, in a way, is already helping, offering adult education, the 'suppletive' education, among others. [T₁]

I think what the government can do, it is already doing: to have a program that is appropriate for cases such as Adult Education. [T₁₂]

The future teachers mention the Adults Education in their responses, and also the "suppletive" education as they former designated adult education courses in Brazil before 1996 [1]. At that time, "suppletive" education had a conception of quick studies, a form of compensation the government offered to people who abandoned their studies and there is little debate about the quality of those programs. This negative conception of "suppletive" education seems to be present in the future teachers minds as we can see below:

The government provides "suppletive" education for people who do not have access to basic education in a appropriate time, but this is a kind of teaching more discouraging than formal education because the physics contents is taught very quickly... [T₄]

Create education programs, so they [adults students] could finish their studies, but would have to be quality and not this shamble "suppletive" education which exists today. [T₁₆]

Currently, Adults Education brings a conception of *education for all*, allied to other population human rights. In this sense, the following discourse approaches to this discussion:

One way to recover the lost time is to offer education to these people; but, above all, also to give conditions for them to participate in schools close to their homes, public transportation, a school with condition to receive students in safety and dignity. [T₁]

IV. CONCLUSIONS

We could observe that there are some matching points between the future teachers' education and Adults Education researches' discourses. We highlight in particular

the proposals of a teaching approach based on conceptual physics and involving students' everyday physics. This discourses permeated most of the responses analyzed. Research in the area of Adults Education suggest this approach as a way to contextualize the contents and bring them closer to the reality experienced by students and to the knowledge adults acquire throughout their life experiences.

Another coincidence is the discourse about the necessity of adequacy of the physics contents according to the students' profile. It is important that teachers working in Adults Education respect the different characteristics of adult learners, which may contribute to increase motivation in these students.

The disagreements points are the discourses about the *vestibular examination* as assessment criterion to the university and the difficulty that some future teachers expressed to realize a selection of contents.

Finally one can note the presence of Adults Education in the imaginary of future teachers, but also a negative image linked to this school modality, seen as a poor school.

We understand that these are still first conclusions, just in order to understand future teachers imaginary about Adult Education. Next research steps will consider the analysis of the future teachers' teaching proposal and their implementation in real classroom situations.

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APPENDIX

EXPLORATORY QUESTIONNAIRE

1. How was your secondary education? Which institution and what year you graduated?
2. Do you work or have worked as a teacher? If yes, how long do you teach? In which level? If not, do you work with another subject? What? Do you intend to work as a teacher?
3. Assuming you are acting as physics' teacher in high school and, for some reason, you have only half of the time to work content that would normally be worked over a school year, how would you prepare your physics plan? What contents would you select? Why?
4. Regarding to the situation described in the previous question. Would you change your teaching methodology? Explain that.
5. What are the main students' characteristics which should be taken into account when preparing a lesson?
6. What is your opinion about school dropout? Why do you think that happens?
7. What the government could offer to the people who do not have access or have not completed basic education at the age considered appropriate?