

Brazilian teachers' beliefs about technologies in a training program in Portugal

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ABSTRACT

Teachers' beliefs regarding technologies are configured as a decisive component within the school context since they interfere directly in the adoption or rejection of devices. This way, the objective was to identify the main beliefs held by Chemistry teachers who take part in continuous training in an international cooperation between Brazil and Portugal regarding the insertion of technologies in the school daily routine. The aim was the Teacher Professional Development Program that took place in Portugal. The individuals are Chemistry teachers (n=25) from all Brazilian macroregions, including immersion follow-up at the schools (n=5). The methodological procedures employed for data gathering were questionnaires, interviews, and observations in both stages of training in Portugal and Brazilian schools. Data analysis was carried out through the use of content analysis assisted by the Nvivo software. The results point towards Chemistry teacher beliefs regarding the benefits and inconveniences from the use of technologies within their daily schooling contexts. The Chemistry teachers point out the benefits from the use of technologies in the classroom, but the inconveniences appear as decisive hurdles for them not to be used. Thus, the understanding of teacher's beliefs regarding government actions is essential for the application or financial resources and the didactic-pedagogical advancements in the use of technologies.

Keywords: Teacher training. Teaching practice. Cooperation Brazil-Portugal.

Crenças dos professores brasileiros em relação às tecnologias em um programa de formação em Portugal

RESUMO

Os professores precisam adquirir competências tecnológicas que permitam gerar oportunidades de aprender com as tecnologias. As crenças dos professores frente às tecnologias se configuram em um componente decisivo no contexto escolar, uma vez que interferem diretamente nas adoções ou rejeições dos aparatos. Assim, o objetivo foi identificar as principais crenças dos professores de Química, participantes da formação continuada em cooperação internacional entre Brasil e Portugal frente à inserção das tecnologias no cotidiano escolar. O alvo foi o Programa de Desenvolvimento Profissional para Professores, ocorrida na Universidade de Aveiro, em Portugal. Os sujeitos são professores de Química (n=25) de todas as macrorregiões do Brasil, inclusive com acompanhamentos imersivos nas escolas (n=5). Os procedimentos metodológicos empregados na coleta de dados foram questionários, entrevistas e observações tanto na formação em Portugal

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quanto nas escolas brasileiras. Para a análise dos dados, utilizou-se a análise de conteúdo auxiliado pelo software Nvivo. Os resultados apontam para as crenças dos professores de Química frente aos benefícios e inconvenientes da utilização das tecnologias em seus contextos escolares diários. Os professores de Química apontam os benefícios da utilização das tecnologias nas aulas, porém os inconvenientes apresentam-se como entraves decisivos para a sua não utilização. Assim, entender as crenças dos professores diante de ações governamentais é fundamental para a aplicação de recursos financeiros e para os avanços didático-pedagógicos na utilização das tecnologias na educação.

Palavras-chave: Formação de professores. Prática docente. Cooperação Brasil-Portugal.

INTRODUCTION

Teachers need to acquire technological competencies that would allow for the generation of opportunities to learn using the new technologies (UNESCO, 2009; COSTA, VOSGERAU, 2010). The integration of technologies in teachers' school routines appears as a challenge (CHAI; KOH; TSAI, 2013), whereas the use among students is a growing reality with no foreseen way back and that opens up teaching possibilities that have no historical precedents (ARIAS-ORTIZ; CRISTIA, 2014). Thus, "to analyze the role technologies and information/images have played in social lives implies not only to explore the technical features of the media but to understand the social, cultural and educational conditions in their contexts" (PORTO, 2006, p.44).

Teachers' deeds present demands that are not always absorbed by those who are responsible for them. "Lecture classes tend to be the means available for a large part of teachers when covering contents, with the technological devices providing the interaction/integration in a broad sense between knowledge-reality-world-citizenship" (AMARAL ROSA; EICHLER; CATELLI, 2015, p.86). The technologies allow for ways of learning that are based on interaction and both autonomous and collective constructions, which may favor both teachers and students (GARCÍA-VALCÁRCEL; BASILOTTA; LÓPEZ, 2014).

This way, in the pursuit to learn about the reasons for employing (or not) the technologies within the school context, the leaning over teachers' beliefs is inevitable since they are strong indicators of decisions by individuals (BEJARANO; CARVALHO, 2003). "The beliefs result from the individuals' relations with their profession, personal values, [...], interests, [...], in sum, [...], they result from their analysis of what is real, [...] considering what individuals think they are or should be" (SOARES; BEJARANO, 2008, p.61).

Regarding the use of technologies in teaching, there is no doubt that there are several discourses that are divided between "enlightenment and darkness" (MAMA; HENNESSY, 2013). In this way, teachers' beliefs regarding technologies are configured as a crucial component within the school context, since they interfere directly in actions of those who are responsible for the adoption or rejection of devices (COSTA; VOSGERAU, 2010).

The teachers shape their beliefs about technologies as teaching tools (or not) based on their own (un)successful experiences, often informally, through trial and error. The "personal beliefs" clash with "pedagogical beliefs," thus forming confrontations

or confirmations, both of which carry implications on the way ICTs are to be used (or not) in the classroom (PRESTRIDGE, 2012). In this way, the most influent beliefs are considered rather than the knowledge itself of something (BEJARANO; CARVALHO, 2003; MAMA; HENNESSY, 2013; NESPOR, 1987; SOARES; BEJARANO, 2008).

This paper investigates teachers' beliefs under continuous teacher training offered by means of an international cooperation between Brazil and Portugal that took place in mid-2014 at the University of Aveiro (BRASIL, 2013). Among the objectives of the referred teacher training was the encouragement to use technologies in didactic-pedagogical strategies within the school context (BRASIL, 2013).

The focus of interest is basic education teachers in the area of Chemistry. From the above exposition, the guiding question for this text is the following: what are the central beliefs held by the Brazilian Chemistry teachers who took part in the Professional Development Program for Teachers (Programa de Desenvolvimento Profissional para Professores – PDPP) in Portugal regarding the presence of technologies in didactic-pedagogical processes? Thus, the objective was to identify the main beliefs held by Chemistry teachers who take part in continuous training in an international cooperation between Brazil and Portugal regarding the insertion of technologies in the school daily routine.

MATERIAL AND METHODS

Object of Study

The aim of the study is the training offered by the Professional Development Program for Teachers (Programa de Desenvolvimento Profissional para Professores – PDPP) that took place in Portugal at the University of Aveiro. The guiding document was document nr. 074/2013 (BRASIL, 2013). The implementation of the program is based on the cooperation agreement between Brazil and Portugal (BRASIL, 2001). This article focuses on the beliefs held by teachers in the area of Chemistry who took part in the program regarding the aspects relative to the presence of technologies in schools.

General Characteristics of the Object of Study

The training at the University of Aveiro offered 25 places. The training took place in February 2014. The selected teachers had their expenses covered by the Brazilian government (BRASIL, 2013). At the University of Aveiro, the training featured activities that were aimed at technologies in pedagogical deeds in consonance with what the guiding document proposed. Among the general objectives, the highlight was to bring to evidence the potentialities of digital technological resources in Chemistry teaching (BRASIL, 2013). Given the particular circumstances of the research context, approval by any Brazilian Ethics Committee does not apply, since it was developed under an international cooperation agreement between Brazil and Portugal in a regime of exclusivity, specificity,

and unity in Portuguese soil. Anyway, the Chemistry teachers agreed to participate voluntarily by signing consent forms, and the individuals' anonymity was respected.

The selected teachers are required to either “be supervising scholarship holder of the Institutional Scholarship Teacher Initiation Program (Programa Institucional de Bolsa de Iniciação à Docência – Pibid) or a regularly enrolled student at a National Teacher Formation Plan (Plano Nacional de Formação de Professores – Parfor) and duly registered at the Freire Platform” (BRASIL, 2013, p.1). “Pibid is a program for encouraging and valuing mastership and enhancing the teacher training process for basic education” (BRASIL, 2014a, p.63). The objectives are to “promote the link between theory and practice and the integration of schools and HEI [Higher Education Institutions] for training; encourage the acknowledgment of the social relevance of the teaching career; and contribute towards the training of educators [...]” (CLÍMACO; NEVES; LIMA, 2012, p.192). In turn, Parfor is an action by the Ministry of Education in Brazil through the Capes that in general terms is a collaboration strategy by the Federal Government with the states and municipalities to improve the teaching system (CLÍMACO; NEVES; LIMA, 2012). As its objective, it encourages the offering of a free higher education with high quality for active teachers from basic education public schools so that those professionals may obtain adequate training in the activity they already practice (BRASIL, 2014a; BRASIL, 2014b).

Participants and procedures

The research participants were 25 teachers who attended the Teacher Professional Development Program at the University of Aveiro. The individuals were from 11 states – Amazonas (1), Acre (1), Goiás (2), Distrito Federal (1), Piauí (2), Bahia (3), Rio Grande do Norte (1), Ceará (1), Minas Gerais (3), Rio de Janeiro (2), Paraná (5) and Rio Grande do Sul (3) – covering all the macroregions in Brazil.

There were two separate data collection stages: the international stage on Portuguese soil at the University of Aveiro and the domestic stage on Brazilian soil at four schools. During the international stage a semi-structured questionnaire was applied to the PDPP attendees from the Chemistry area (n=25) in addition to participative observation (GRAY, 2012) during the training period (February 03 to 19, 2014). The domestic stage was to seek to deepen the comprehension of the issue through follow-up immersions (25 hours each) with Chemistry teachers from three Brazilian states (n=5). During this stage, interviews and non-participative observations were carried out at the school spaces (GRAY, 2012).

Open interviews were carried out to incite the individuals to expatiate naturally about the guiding issue of *Chemistry Teaching Mediated by Technologies* (AMARAL ROSA; EICHLER; CATELLI, 2015). This strategy allows for the approximation between interviewer and interviewee, and also reducing the formality of the dialog, easing the intrinsic discomfort from formal interviews. The immersion took place in June 2015 and between March and May 2016. The interviews were carried out in the grounds of

the schools and recorded as audio. Each one lasted for approximately 45 minutes due to the time available for teachers between classes. It should be pointed out that the schools agreed with the investigation proposal and opened their doors; additionally, the Chemistry teachers agreed to participate voluntarily by signing consent forms, and all the individuals' anonymity was respected.

Lastly, content analysis of the interviews and observation notes was performed with the previous adoption of categories under mixed encoding (BARDIN, 2011; MAYRING, 2014; SUÁREZ-GUERRERO; LLORET-CATALÁ; MENGUAL-ANDRÉS, 2016) for the questionnaire data. Once the initial encoding was performed, the reorganization and approximation by issue aimed at beliefs concerning the benefits and inconveniences from the use of technologies (LABRA, 2016). The focus was placed on the statements and direct situations directed at Chemistry teachers' beliefs regarding technologies within the school context, considering that such standings determine largely the educational practices that are effectuated or rejected (GARCÍA-VALCÁRCEL; BASILOTTA; LÓPEZ, 2014).

Data collection and analysis

The data were gathered in two stages: international stage and domestic stage. The first one took place between February 02 and 19 at the University of Aveiro in Portugal. The second happened at four schools in three Brazilian states in June 2015 and between March and April 2016. On Portuguese soil, 75 hours were dedicated to following up the Chemistry teachers, whereas on Brazilian soil it was 125 hours on-site, inside the school grounds. During the field work of the Brazilian stage around 10.000 km were traveled. Regarding distances, that is equivalent to about $\frac{1}{4}$ around our planet. Until now, there are no reports in the Brazilian literature of any study covering such distances to cover this issue. The period in the empiric field provided a saturation of the data to enable the creation of the categories regarding teachers' beliefs (CRESWELL; MILLER, 2000).

Data collection is qualitative and approaches the precepts of the Grounded Theory (CORBIN; STRAUSS, 1990). That is due to the search to understand a given situation and the reasons that lead the individuals to act – or not act – in the face of the situations that appear within their contexts. The analyses focused on the benefits and inconveniences that the individuals perceived in the relation between teaching Chemistry through technologies, considering that in most cases, within the actual context of acting, it is such conceptions that determine whether the technologies are inserted or rejected from pedagogical activities.

The gathering procedures adopted – questionnaires, observations, and interviews – produced a range of data and information that allowed crossing different sources of information (CRESWELL; MILLER, 2000). Organization and analysis of the material were carried out with the assistance of the Nvivo software (JOHNSTON, 2006) in an exploratory fashion, which allowed to work with the audio recordings without the need for previous transcriptions, speeding up the analysis process (GARCÍA-VALCÁRCEL;

BASILOTTA, LÓPEZ, 2014; MAYRING, 2014). The narratives were confirmed by the individuals being researched (CRESWELL; MILLER, 2000).

ANALYSES AND RESULTS

The results from analyzing the questionnaires, interviews, and observations regarding the Chemistry teachers' beliefs related to the technologies within the school context are presented. The population comprised 68% females and 32% males, and their average age was of 42.

Before the data related to teachers' beliefs regarding the benefits and inconveniences in using technologies within their professional contexts, there is a brief presentation of the beliefs related to those individuals' perceptions of their competence in computer use: 48% consider they find handling the technologies *very easy*; 35% consider that *moderately easy*. Furthermore, 57% of teachers believe their level of technical competence to enjoy the possibilities provided by the World Wide Web as being *intermediate*. Also, 78% believe it is possible to make use of technologies in their pedagogical practices after training in Portugal.

The on-site observations during training together with the 25h immersions at the Brazilian schools allowed contesting the conceptions presented by the teachers. Regarding the ease, skill and knowledge of electronic devices, handling difficulties was found to be above expectations by around 50% of the group of teachers (n=25). During the immersions, that observation was confirmed by the teachers: "It is absurd that a person cannot even turn on the computer" (Interview 4) and "There were people there [PDPP] who did not know how to use a computer" (Interview 2).

The data from both the international stage at the University of Aveiro and the domestic stage that took place in Brazilian schools are presented as a set within each category that was adopted – benefits and inconveniences – with the aim of sustaining each composition.

Benefits from the use of Technologies in Chemistry Teaching

The main benefits listed by teachers in the relation of Chemistry teaching and technologies during the training period at the University of Aveiro, were the following: the possibility of *providing dynamic, interesting classes to students*; the possibility of increasing *student-teacher interactions with new methods*; and the increased *student autonomy during activities*. Table 1 shows all the benefits teachers believe in and their respective frequency. It is worth pointing out that the teachers were allowed to list three advantages in the use of technology for teaching Chemistry contents and three reasons to use technologies in the classroom. This way, the main beliefs were constructed regarding the benefits from the use of technologies in Chemistry teaching.

TABLE 1 – Benefits from the use of Technologies in Chemistry Teaching.

Categories	Frequency
Dynamic, interesting classes for students	39
Increased teacher-student interactions with new methods	28
Increased student autonomy during activities	23
Facilitates teaching	16
Reduces abstraction from the contents	13
Technology is a part of daily life	06
Optimization of activity times	04

Source: This research.

From the three most mentioned units by the teachers, it can be perceived that the understanding that technologies provide more dynamic activities, greater interactions and are of essential importance in the schools. Since the fieldwork was done in separate stages and was stretched in time, it can be perceived that the beliefs regarding the benefits provided by technologies in Chemistry teaching featured a mix of excitement and environmental shock resulting from the training having taken place in Portugal.

Most teachers had never made any travels of similar distances and purposes. It is understood that this fact naturally affects people's feelings: "The training [PDPP] was great, I enjoyed everything very much. I learned a lot of things that I intend to develop further. It overcame my expectations. It was very good" (Interview 1). Hence, it can be deemed that the benefits listed by the teachers could have a direct interference from the entire training context.

It was therefore sought to confront their standing on Brazilian soil. Through the immersions it was possible to compare the first beliefs with those in the work environment. It was perceived that the teachers actually believe that technologies play an important role in student preparation and that they actually make Chemistry classes more pleasant for everyone. "Technologies are important and students enjoyed when I developed activities in which they were allowed to use computers, mobile phones, the Internet and all that" (Interview 1); "I see the technologies as something that is integrated with Chemistry, the ideal would be to keep the machines running and that I could work with the students" (Interview 1); "Computers, mobile phones, the Internet have changed the world. Nowadays, they even teach things we (teachers) are not able to" (Interview 2); "[Technology] would encourage another way of teaching and learning" (Interview 4); "Today, the technologies are essential and, as teachers, we must learn to use them with students" (Interview 3); "Technologies for students can help to understand the lessons in a better way" (Interview 5).

There is the notable trend of technologies providing interactions and work dynamics that, until the advent of those in the daily routine would only be possible on a face-to-face basis. The encoded units in Table 1 emphasize such conditions. It is worth highlighting that the teachers' discourse in their work environments remained in harmony with their first positions. Thus, it is understood that teachers believe that the presence of technologies

within the classroom context cannot be denied. However, some factors are decisive for their adoption or rejection.

Inconveniences from the use of Technologies in Chemistry Teaching

The main difficulties listed by teachers in the relation between Chemistry teaching and technologies during the training period at the University of Aveiro were the following: the *lack of teacher preparation* itself; the conditions of *school infrastructure* and the *lack of student preparation*. Table 2 shows the units relative to the inconveniences that teachers believe in and their respective frequency. It is worth pointing out that the teachers were allowed to list three disadvantages in the use of technology for teaching Chemistry contents and three reasons not to use technologies in the classroom. This way, the main beliefs were constructed regarding the inconveniences from the use of technologies in Chemistry teaching.

TABLE 2 – Inconveniences from the use of Technologies in Chemistry Teaching.

Categories	Frequency
Lack of teacher preparation	46
School infrastructure	25
Lack of student preparation	21
Curricular framework and scarce time	06
It is hard work for the teachers	03

Source: This research.

As to the inconveniences from the use of technologies in Chemistry classes, it can be perceived from the encoded units that there is a feeling of impotence in the face of the routine shortcomings in Brazilian schools, whether personal or structural. Some positions from the teachers are highlighted: “The teachers who use the technologies are those who know how to do so, but there are students who also do not know how to use and make the most of the opportunities” (Interview 1); “The space is unsuitable and we have no Internet connection. It is very costly. We always have to be in pursuit [of resources]” (Interview 1); “The problem is that training in the use of technologies is non-existent. At times, teachers may even want to learn to use in the classroom, by they are always tired and overloaded, so they just do the basics in the end” (Interview 3); “If teachers are not able to control the tool, how can they expect students to have control” (Interview 4); “Students use [technologies], they love what is most technological... they enjoy it, even though they do not know how to use it” (Interview 4); “I know how to use [technologies] in a shallow mode” (Interview 5).

The inconveniences teachers pointed out are fewer than the encoding and frequency than the benefits. However, they take on a decision-making character. The absence or lack of resources in public schools lead Chemistry teachers to lose their motivation regarding the use in classroom, even though they believe that the control of technologies is not a hindrance factor: “I believe I can use technologies well, but in the classroom it is not possible to use them... there are no rooms, no computers, no Internet access. How can I use them?” (Interview 2). If the hurdles regarding the infrastructure are not enough, the teachers point out pedagogical aspects as being the greater of the issues: “The impression is that there are still persons... the teachers excuse me, but they do not how to use [technology]. A basic notion is a must” (Interview 4).

Those Chemistry teachers that were visited on site (n=5) understand the needs of using technologies, but whenever there is an intention or attempt of their application they face obstacles, sometimes the lack of resources, others training itself, that for most of them are not possible to overcome, resulting in the neglect of technologies in their pedagogical practices.

DISCUSSION AND CONCLUSIONS

The core of the investigation is the central beliefs Chemistry teachers (n=25) hold regarding the use of technologies within the context of pedagogical actions. They attended the Teacher Professional Development Program that took place in Portugal at the University of Aveiro (BRASIL, 2013). The beliefs dislocate the figure of technologies themselves as being central (SUÁREZ-GUERRERO; LLORET-CATALÁ; MENGUAL-ANDRÉS, 2016) towards the figure of the professional, since the digital resources are only capable of assisting in learning when they are in harmony with the didactic strategies (SANTIBÁÑEZ; GIL, 2003). This way, priority is laid on the aspects that could make technologies actually be employed or rejected by teachers in their activities (BEJARANO; CARVALHO, 2003; COSTA; VOSGERAU, 2010; ERTMET, 2005; MAMA; HENNESSY, 2013; NESPOR, 1987; SOARES; BEJARANO, 2008).

It is worth pointing out that this study was carried out in two distinct stages: one international stage and one, domestic. During the first one, the technological conditions may be deemed ideal thanks to the conditions offered by the University of Aveiro for the training provided to the teachers. In turn, during the second stage, the teachers' technological conditions at their respective schools (n=5) are adjusted to their actual conditions. Thus, it is stressed that this study was concerned with the real-life conditions teachers experience within their professional context and not only with the single and extraordinary training framework for the use of technologies. Brazilian education faces several restraints and challenges. Starting from the level of infrastructure and resources, passing through the conditions to perform teaching practice and reaching the social, professional issues. In this particular detail, continuous enhancement of the teaching staff constitutes a line of action capable of producing regenerative effects for the pedagogical praxis.

It is a known fact that just adding technologies into schools is not enough (JOHNSON et al., 2012). The Chemistry teacher beliefs in the face of the inconveniences listed while on Portuguese soil goes to corroborate such statement. Furthermore, the immersions confirmed that the beliefs regarding the inconvenient aspects are hurdles that actually lead Chemistry teachers (n=5) to reject the use of technologies in the daily routine of their practices (COLL; MAURI; ONRUBIA, 2008), even with 75% of them stating that they were interested in using the resources once the training offered by the Brazilian government in Portugal was over.

The beliefs are historical constructions that overlap the individuals and their professions, ingraining and solidifying some conceptions regarding didactic-pedagogical actions (SOARES; BEJARANO, 2008). In what is configured as a contradiction, the same Chemistry teachers believe that technologies are capable of transforming classes into more exciting scientific gatherings for students when compared with traditional classes based on the one-sided teacher explanations and registry by students (POZO; CRESPO, 2009). The beliefs listed by the group of Chemistry teachers regarding the benefits from the use of technologies have been highlighted in other research (AMARAL ROSA; EICHLER; CATELLI, 2015; GARCÍA-VALCÁRCEL; BASILOTTA; LÓPEZ, 2014; GARCÍA-VALCÁRCEL; TEJEDOR, 2010) as potential factors to raise the educational dynamics and activities in classroom interactions.

Incentives by the Brazilian government for the use of technologies meets what is advocated about digital technologies in education: “it is not only the teaching technique that changes by incorporating a piece of technology. It is the conception of teaching itself that needs to rethink its path” (DOWBOR, 2001, p.11). Namely in Chemistry, it has been revealed as being fundamental to promote the systematic, intentional use of digital spaces and resources. Effectively, it is not only acknowledging the particulars of the contents in the pedagogical action but also the specificity of the contents in the pedagogical action supported by technology (DONNELLY; McGARR; O’REILLY, 2011; MISHRA; KOEHLER, 2006; SHULMAN, 1986).

The results make clear that teachers recognize that technology applied to teaching has the power to leverage it in pursuit of satisfactory results and pleasant practices, improving the learning environment (SUÁREZ-GUERREIRO; LLORET-CATALÁ; MENGUAL-ANDRÉS, 2016). The generalized belief is that digital technologies are the backbone of society and the catalyst to produce the required educational reforms for the students’ world (PELGRUM, 2001). The Ministry of Education in Brazil ordered a study (WAISELFISZ, 2007) that revealed the benefits regarding the inclusion of technologies in the schools’ teaching and learning strategies. According to that study, teachers stated that the competencies of students in calculation, reading, and writing improved with the use of technologies. Moreover, they present positive effects in motivation, attention, and collaboration.

However, what was registered from the Brazilian schools that were visited on site is that the times for the subject, the spaces available, the overload in teachers’ routines, together with the training difficulties and structural shortcomings prevail in the

performance of teaching activities in general, especially in the use of technologies. The hurdles make the use of technologies scarce in schools, confined to sporadic instances and complementary activities of second importance regarding the curricular contents, thus having a limited impact (MAMA; HENNESSY, 2013), and echoing the category of “There are no conditions here” (AMARAL ROSA; EICHLER; CATELLI, 2015).

Technologies may play several roles, i.e., supporting the organization of information, assist in the comprehension of relations and improve the interpretation of information (COLL, MAURI, ONRUBIA, 2008). However, it is even surprising that the non-use or negligible use of technologies in schools, even following teacher training, does not produce any result or is something that is overlooked in schools. It is essential that teachers and policy-makers understand the benefits from technology-assisted practices within specific modes of teaching for certain phases of education and student groups within certain social, cultural and political contexts, and for certain educational ends (MAMA; HENNESSY, 2013).

Negative teacher beliefs have been identified as a secondary barrier (ERTMER, 2005) for the integration of technologies in teaching. The primary barriers are extrinsic to teachers and include the lack of resources, access times and technical support (PRESTRINDGE, 2012). This way, based on the results, it can be perceived that pertaining to Chemistry teaching mediated by technologies those primary barriers must be brought down. Nevertheless, there have been attempts to improve the scenario. This article has pored over one of those attempts. The understanding of teachers’ beliefs regarding government actions about the situations that (do not) exist between teachers from the public basic education schools and digital technologies are trending in the marketplace, are fundamental for the quality in applying resources and for pedagogical-didactic advancements in the use of the possibilities provided by technologies for education.

Technologies in education is an area that is undergoing a crisis and depends on several players – government, teachers, managers, students, parents – having defined roles. Those forces that operate in schools and classrooms may bring to the surface the changes that are beyond the direct control of government ministries. Therefore, for education in general, it is important to make constant analyses of real situations of technologies in educational practices (PELGRUM, 2001).

The Chemistry teachers’ beliefs are the sore point in this study. However, it must be highlighted, albeit without getting too deep, one secondary aspect in the Teacher Professional Development Program: the motivational renewal of teachers. That branches out from the training proposal in the tight measure that does not correspond just to one perception of enhancement of expectations that befall basic education teachers, but that firstly contribute towards the political legitimization of their actions, being themselves signposts of the valuing of the teaching profession. Towards that sense, it is expected, for example, the even an isolated investment in a selected group of teachers may convert them into speakers for the social, professional development of their peers and the renewal of pedagogical practices within their contexts of action.

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