

Perceptions of attendance tutors on early chemistry teacher training in DE offered by the IFMT

Percepções dos tutores presenciais sobre a formação inicial de professores de química em EaD ofertada pelo IFMT

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Abstract

Several are the players involved in a licentiate degree course in the Distance Education (DE) modality, among which are the attendance tutors, who take the spotlight in this text. The positions and responsibilities taken, as well as the attributions and functions performed, make them privileged observers. Thus, the objective of this study is to investigate perceptions of the DE Chemistry Licentiate Degree Course, offered by the IFMT, attendance tutors on the challenges faced along this trail, the gaps they identify in the course and the pieces of knowledge provided to the future teachers. This research took place during the first semester of 2018 and is characterized as descriptive and exploratory from a qualitative approach. From the 16 tutors who work in the course, 8 volunteered to take part in the research. For data collection, an electronic questionnaire was utilized that contained six open questions. The data collected were analyzed through the technique known as content analysis. The categories identified were: existing challenges in this training process; difficulties or gaps identified throughout the course; and pieces of knowledge provided to the future chemistry teachers. From those perceptions, it is possible to understand how the training process occurs at the IFMT, and that information may allow for planning actions to promote improvements to the course.

Keywords: Distance Education, Teacher Training, Tutorship.

Resumo

São muitos os atores envolvidos em um curso de licenciatura na modalidade da Educação a Distância (EaD), dentre os quais, nesse texto, destacam-se os tutores presenciais. As posições e responsabilidades assumidas, além das atribuições e funções desempenhadas, os tornam observadores privilegiados. Assim, o objetivo deste estudo foi investigar as percepções dos tutores presenciais do Curso de Licenciatura em Química em EaD, ofertado pelo IFMT, sobre os desafios que encontram nesse percurso, as lacunas que identificam no curso e os conhecimentos proporcionados aos futuros professores. Realizada durante o primeiro

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semestre de 2018, esta pesquisa caracteriza-se como descritiva e exploratória, com abordagem qualitativa. Dos 16 tutores atuantes no curso, 8 deles aceitaram participar voluntariamente da pesquisa. Para coletar dados foi utilizado um formulário eletrônico contendo seis questões abertas. Os dados coletados foram analisados por meio da técnica conhecida como análise de conteúdo. As categorias identificadas foram: desafios existentes neste processo formativo; dificuldades ou lacunas identificadas no decorrer do curso; e conhecimentos proporcionados aos futuros professores de química. Com estas percepções é possível compreender como está ocorrendo o processo formativo no IFMT, sendo que tais informações poderão possibilitar o planejamento de ações que promovam melhorias no curso.

Palavras-chave: Educação a distância, Formação de professores, Tutoria.

Introduction

Distance Education (DE) is a teaching modality that facilitates people's access to a Higher Education by breaking the limitations imposed by time and geographical space. It arose under the premise of democratizing access to and continuity in higher education institutions, consequently, an opportunity to promote the construction of knowledge (SILVA; NUNES, 2014). Furthermore, DE provides for new training spaces that are not limited solely to the support of new technologies or digital didactic materials, but it links the elements present in this education process, among which is tutoring that takes the spotlight in this text.

Regarding early chemistry teacher training through DE, Silva & Fireman (2013) point out that such courses should overcome the technical reasoning that separates the foundations for the construction of specific and pedagogical pieces of knowledge that are not mutually linked, providing few opportunities for reflection, that is, training that practically is not concerned with the existing needs in contemporary education. Based on theoretical presuppositions and legal documents, the authors advocate teacher training that is based on practical reasoning founded on reflection that would go beyond accumulating knowledge and allow for the establishment of relations between specific, pedagogical concepts and didactic transposition.

A study by Silva & Fireman (2013) observed the position adopted by the Chemistry Licentiate Degree course at the Rio Grande do Norte Federal University (UFRN) offered in the DE modality regarding whether the dominant reasoning was technical or practical. In other words, it intended to observe whether the course prioritizes the accumulation of knowledge or seeks means to promote reflective training. The results obtained point that the training provided by the course is highly influenced by the technical reasoning of the tutors working in the course.

In turn, Santos (2017) carried out his investigation under the perspective of comparative analysis with chemistry teachers working in schools of different social contexts, whose results point that many of their practices are influenced by the early training they received. This way, the author advocates that the training model adopted by the licentiate degree courses represents an important factor towards the non predominance of the uniform conception of pedagogical practices, i.e., the different social contexts must be considered and teaching must be guided so as to meet students' needs.

Another study involving tutors influence during early chemistry teacher training was developed by Oliveira et al. (2013), who investigated the role those professionals played in the DE Chemistry Licenciature Degree at the Minas Gerais Federal University (UFMG). That occasion considered the experiences that occurred throughout the course from the point of view of the course tutors themselves. The difficulties reported by the investigated tutors concern the training rather than the technical field, i.e., they pointed out that the support and didactic guidance they are required to provide to meet student needs is the action they perform more frequently and is most required throughout the training process of the future chemistry teachers.

To corroborate the findings in the above mentioned studies, Acosta et al. (2015) advocate the importance of attendance and performance of tutors to carry out DE courses. In their studies, the authors observed that tutorship in the Chemistry Licenciature Degree Course offered by the Mato Grosso Federal Institute for Education, Science and Technology (IFMT) in the DE modality takes on an outstanding, protagonist role, since they are the players who interact and establish more effective contact with the course students.

The objective of the above mentioned study was to analyze the devaluation process of the teaching activity by reducing the professor to a tutor. From the institutional documents and reports from the players involved, it was possible to investigate which attributions and what recognition tutors hold in this course. The study revealed that the course tutors are not recognized as being professors and that they do not receive appropriate training to work with early teacher training in the DE modality.

Such lack of recognition of the pedagogic role tutors develop in the DE Chemistry Licenciature Degree courses must be overcome. In addition to valuing those professionals, one other action that may contribute to early training is to provide spaces for tutors to express their observations and conceptions of how the course they are following develops. In this sense, the proposition for the development of this study is close to that developed by Caetano & Rezende Júnior (2009), through which they investigated the view of tutors in the Physics Licenciature Degree course at the Itajubá Federal University (UNIFEI) on the main elements present in DE: students, professors, contents and learning environment.

From the above exposed, this research aims to investigate, together with the attendance tutors of the IFMT DE Chemistry Licenciature Degree Course, what challenges they face when performing tutorship in this training process, what difficulties or gaps they identify in the course, and what pieces of knowledge are provided to the future chemistry teachers.

This investigation was motivated during the development of the doctorate research investigating the teachers' knowledge during this course, which shall be presented at the Stricto Sensu Post-Graduation Program in Sciences Education: Chemistry of Life and Health (PPGQVS) at the Rio Grande do Sul Federal University (UFRGS). This study relied on financial subsidy of Call Notice 069/2018 from PROPES/IFMT and on support from the IFMT concerning the scholarship for the first author's doctoring (Call Notice 079/2016).

DE and the democratization of access to Higher Education

DE is a teaching modality that is mediated by technologies that allow for learning and professional enhancement in different areas of knowledge. Thus, DE has increasingly become a feasible alternative for many persons in the last decades, since with it students are able to manage their own learning, that is, they have the autonomy to administrate their available time that they most likely would not have with attendance training (SILVA; NUNES, 2014).

As to the historical side of DE, Borges (2015) discusses the fact of, during the 1960s, there being in Brazil an official effort towards the implementation of projects by government bodies of this teaching modality, he further discusses of the lack of success in the first presentations of the project; however, it was possible to observe that from the onset those projects made feasible the interiorization of basic education through radio broadcasting as a way of helping the country fight the high levels of illiteracy that existed up to that time.

Officially, DE became considered and recognized as a teaching modality through Law nr. 9.394 from December 20, 1996, that established the guidelines and bases for national education (BRASIL, 2017). Mendonça et al. (2012) state that the advancement of DE may be visualized by the increase in offerings by public and private institutions, which represents the expansion of a new education that matches the new society that is experiencing the generation of the new technologies.

Faced with the expansion of Brazilian higher education and its interiorization promoted by government policies, the higher education institutions were encouraged to utilize the technological resources and started to adopt DE as a way of enhancing the means of generating and providing knowledge (CASSUNDÉ, MENDONÇA, 2014).

Silva & Nunes (2014) discuss the different opinions aimed at this type of teaching since, according to them, there is a group of enthusiasts that approves the use of information and communication technologies to update the teaching and learning processes; as a counterpart, there are those that advocate the impossibility of students receiving quality learning behind the screen of a multimedia apparatus. Despite opposing opinions, DE has shown to be efficient in the learning process, as it offers graduation, post-graduation, professionalizing and enhancement technical courses.

In general, prejudice against DE is reducing as surveys report on the seriousness of the professionals involved and student satisfaction (TEPERINO, 2006). Even though some people are still resistant, Silva & Nunes (2014) state that this teaching has become a strategic alternative intending to supply "education for everyone".

Furthermore, DE has provided innovative teaching models and is increasingly gaining space in graduation and post-graduation courses in the country. Borges (2015) states that the demand for on-line graduation courses has had a significant increase, enrollment rises all the time by students who face the challenge of learning through the experience of assessing and encouraging educational innovation.

Theoretical discourses on tutors' performance in DE

With the development of DE, the presence of professionals to guide and mediate students in this education process has become essential. Within this context, according to Caetano & Rezende Júnior (2009), the role of tutors in the courses is strengthened, since they are players who establish more effective contact with students.

To quote the above mentioned authors "Tutors perform both with the faculty, by directly participating in the pedagogical practice, and are in contact with students. Therefore, they have a broad view of the course and all its elements" (CAETANO; REZENDE JÚNIOR, 2009, p. 1).

According to Oliveira & Lima (2012), the attendance tutor is that agent who is present in the attendance support hub of the Open University of Brazil (UAB), being responsible for the exchange between students and the training institution, and to whom are attributed specific functions to make training through DE feasible.

The role played by tutors is fundamental for courses to develop satisfactorily. However, Segenreich (2009) considers the tutor figure as lacking recognition, since it exists in a precarious, informal fashion, with no employment links, which turns tutorship into a sort of "faculty sub-class".

At the institution of the course under investigation in this study, the attributions of the attendance tutors include carrying out basic instructions in the field of computing, that is, guide students through navigating the Virtual Learning Environment (VLE), as well as assisting in the execution of tasks and provide support for the course coordination operationally in the attendance activities that take place at the UAB hub, especially in following the query forums and applying the evaluations (IFMT, 2013).

Nevertheless, usually tutors need to take on, in addition to the bureaucratic and technical assistance functions, the pedagogical aspects that involve certain subjects (SEGENREICH, 2009). This happens with the intention of closing the gaps left by the training professors who are not always able to attend to the queries due to physical limitations. Furthermore, support for carrying out the subject tasks and following group studies leads to attendance tutors performing activities that are the duty of the professors.

When such tutor pedagogical intervention occurs, that player takes on the role of co-trainer, which characterizes a process of multi-teaching. To quote Oliveira & Lima (2012, p. 85), "the groups of workers who, despite having diverse functions, is responsible for the teaching-learning process in distance education (...) those who teach in distance education are multi-teachers".

In this sense, those tutors that take on the task of clarifying queries related to the contents covered in the subjects that comprise the course curriculum are exercising multi-teaching. Also, it is a complex activity, as it demands the linking of several knowledge areas, in an interdisciplinary perspective.

Moreover, usually tutors present a generalist training linked to the course area and not to one subject, which may result in hard work that may even lead to physical and mental exhaustion. For this reason, Acosta et al. (2015) advocate that tutors need to receive specific training and be more valued due to the importance of the role they play, since they are also responsible for training future chemistry teachers for basic education.

According to studies by Alonso (2010, p.1330) "professionally, tutors have no social/economic/employment recognition that is compatible with their attributions, although

they are also responsible for providing students with the closest attention". In other words, despite not being recognized, tutors are essential, as they participate in the training process made feasible by DE in such a way that they may interact not only with the students, but with all players involved, that is, these professionals exert a kind of link between the trainer professors, course coordinators and the UAB hub, and the students of the respective course.

According to Caetano & Rezende Júnior (2009), tutors play a central role in training via the DE modality by working together with the trainer professors to bridge the pedagogical practices with the students. In the authors' opinion, these professionals have a broad outlook of the course development, and therefore they advocate the need to listen to them to seek an understanding of the most accurate situation of the development of this DE training process, since such information may guide future actions to promote course improvement.

Methodological Procedures

This research is of a descriptive, exploratory nature from a qualitative approach. Creswell (2010) understands research from a qualitative approach as that when the researcher seeks to establish the significance of a certain phenomenon from the point of view of the participants involved in the investigation.

The study object chosen for investigation is the Chemistry Licentiate Degree Course offered through the DE modality by the IFMT Cuiabá - Bela Vista Campus. It was developed during the first semester of 2018. This text has been outlined within the perceptions attendance tutors have of the development of the training process.

The course is currently offered at eight UAB attendance support hubs located in eight different Mato Grosso municipalities, namely; Alto Araguaia, Barra do Bugres, Cuiabá, Diamantino, Juara, Pontes e Lacerda, Ribeirão Cascalheira, and Sorriso. The number of attendance tutors varies between one and five, according to the number of classes offered and students enrolled. The distribution of the number of tutors by hub is shown in Chart 1.

Chart 1: Number of attendance tutors per UAB hub.

UAB attendance support hub	Number of tutors	UAB attendance support hub	Number of tutors
Alto Araguaia	01	Juara	01
Barra do Bugres	02	Pontes e Lacerda	03
Cuiabá	05	Ribeirão Cascalheira	01
Diamantino	01	Sorriso	02

Source: Data collected from the research (2018).

Telephone contacts and electronic addresses of the attendance tutors who work at the course were supplied by the tutorship coordination with the authorization of the course coordinator. Initially, the 16 (sixteen) tutors were sent material containing general information about the purposes of the study, the procedures that would be carried out, the confidentiality and permanent clarification assurances.

They all also received the Term of Consent (ToC), for those who agreed to voluntarily take part in the research to sign and return it in a digital format. The invitation was sent to their electronic addresses more than twice, which was reinforced by the course coordinator.

Moreover, telephone contacts were attempted aimed at an expressive participation. To ensure that those involved remain anonymous, their names were substituted by alphanumeric characters as follows: Attendance Tutor 1 (AT1), Attendance Tutor 2 (AT2) and so forth.

A total of eight tutors took part in the research. Among them, three have Chemistry Licenciature training, one of which was trained at the course itself. Two others have Biological Sciences Licenciature training, other two in Physics and one tutor is a Business Administration Bachelor and, besides being a tutor, is an undergraduate at the investigated course since 2014, that is, is about to finish the licenciature degree in the area.

All the institutions that trained those tutors are from Mato Grosso, namely the Mato Grosso Federal University (UFMT) responsible for the academic training of three tutors, the Cuiabá University (UNIC), responsible for the training of two others, the Mato Grosso State University (UNEMAT) trained one tutor, the Várzea Grande University Center (UNIVAG) one other, as well as the IFMT that has trained one of the tutors in DE and is about to graduate one other who had no licenciature degree training.

Regarding the time period as tutors, two of them have been working at the course since 2009, one joined in 2010, one in 2014, two others in 2015, one in 2016 and one started the tutor activities in 2017. Among the participants, two already were experienced in DE course tutorship, one at the graduation level and the other at the Lato Sensu specialization level. It is worth registering that only one participant does not work in teaching as a Basic Education teacher and all others work as teachers in public schools in addition to the course tutorship.

In order to reach the established objective, an electronic form (Google Forms) was utilized to collect the data. The choice for this type of electronic instrument was made due to the virtual medium being widely used for communication among the DE players and also due to their geographical dispersion being considerable.

The form comprised six open questions, one of which served to characterize the participating public, and the others related to the perceptions they hold about the course. The following questions were answered: 1) Describe your academic training and professional background, mainly where related to the course tutorship activity. 2) Comment on the relations established among the DE players and how is communication established in the Chemistry Licenciature course. 3) List the main challenges faced to carry out the tutorship in a DE chemistry teacher training course. 4) List the main difficulties students have that you observe throughout the course. 5) From your perception, what are the existing gaps for faculty training in this Chemistry Licenciature Degree Course? 6) List and comment on which skills and pieces of knowledge this course provides for the future chemistry teachers.

The methodology employed to analyze the results was content analysis, as proposed by Bardin (2012). According to the author, this method makes it possible to extract from the wording provided by the investigated individuals the message related to the study subject. Categorization occurred in an emerging and frequency fashion, with similar messages being grouped up when tabulating the data. Results discussion took place based on the theoretical foundations that were utilized.

Results and Discussions

From the answers provided by the eight participants, three categories emerged: Existing challenges in this training process; Difficulties or gaps identified throughout the course; and Pieces of knowledge provided to the future chemistry teachers. Within each category, sub-categories emerged, as schematized in Chart 2.

The first category discourses about the existing challenges in the early chemistry teacher training in this DE course. This category emerged from the answers given to the second and third questions in the electronic form. Three sub-categories were identified as challenges: exchange among the players, course structural problems, and lack of student commitment.

The challenges related to the exchange among the involved became evident from the following answers provided by the course tutors: "There are other challenges in DE such as problems in the system, activity deadlines, communication between students and professors, but those are common to all courses offered in this modality" (AT3). "One is the communication among all segments that occurs more virtually. Professors need to be more efficient in answering queries about the contents or grades" (AT5).

Chart 2: Schematics of the results organization

Categories	Sub-categories	Sources/Questions
Existing challenges in this training process	Exchange among the players	2) Comment on the relations established among the DE players and how is communication established in the Chemistry Licentiate course. 3) List the main challenges faced to carry out the tutorship in a DE chemistry teacher training course.
	Structural problems in the course	
	Lack of student commitment	
Difficulties or gaps identified throughout the course	Unprepared students	4) List the main difficulties students have that you observe throughout the course. 5) From your perception, what are the existing gaps for faculty training in this Chemistry Licentiate Degree Course? 6) List and comment on which skills and pieces of knowledge this licentiate degree course provides for the future chemistry teachers.
	Communication problems	
	Lack of experimental activities	
Pieces of knowledge provided to the future chemistry teachers	Skills linked to DE training	
	Specific knowledge for the professional activity	

Source: Elaborated by the authors (2018).

The relation between students and trainer professors is timid. It is necessary to get to know the students, get close enough to gain their trust and supply the affective side that humans need. Summon them and have a conversation to check the causes for not participating or desisting at the ends of semesters to guide them in the best possible way (AT7).

"Students should use the platform in a more effective fashion, since they do over the telephone or e-mail, but for registering purposes they should use the platform more for diagnosing and to carry out future interventions" (AT4). "Sometimes, communication is troubled, especially between professors and students, since a lot of feedback is lacking, which

makes the course more difficult, as the learning process is driven from such exchange (AT6). Relations are almost always hierarchical" (AT8).

As can be observed, the sub-category that points to communication as being a challenge to be faced was the most recurrent among the tutors participating in the investigation. However, it is expected that this does not remain only in the field of findings, but that effective actions happen on the course attendance tutors side, since it is they who are the agents responsible for the exchange among the other players involved in the DE training process (CAETANO; REZENDE JÚNIOR, 2009; OLIVEIRA; LIMA, 2012).

The challenge of improving communication among the DE players is necessary for the courses provided by the modality to meet their objectives, i.e., for the policy of access to and continuity in Higher Education actually occur, it is necessary that the education process be favored through dialog (SILVA; NUNES, 2014; CASSUNDÉ, MENDONÇA, 2014; BORGES, 2015).

It is worth pointing out that the existing prejudice against courses offered through the DE modality, according to Teperino (2006), diminishes as those students undergoing the training process feel satisfied with the attention received and perceive the seriousness of all those involved in this training process. However, the exchange among the involved must be thorough, that is, this gap the tutors in the investigated course identified must be bridged.

Regarding the course structural problems, the tutors pointed that: "The challenges are more related to the course administration and to seeing to all that is proposed in DE, that is, caring that all steps are accomplished: laboratory classes, attendance forums, conference rooms, and other activities" (AT1). "Carrying out supporting functions is a challenge, also, the remuneration paid to exercise the function is low. We take on an important role in this process. Students trust and share with us many things, be them anguish, accomplishments, or even their perceptions of the course development" (AT2).

"I believe one of the main challenges to be the complexity itself of this science that requires abstraction, knowledge of calculations as well as concerning the experimental activities" (AT3). "Since my training is in Chemistry, more attention could be paid by providing qualification opportunities in the practical activities, as this would further strengthen the learning process, besides helping with the students' training costs" (AT5). "The challenges lie around the need for attendance classes that the chemistry training contents require" (AT8).

According to AT5's statement, it is possible to confirm the concern with the devaluation of the faculty work by reducing the professor to tutor, as pointed by Acosta et al. (2015), as it can be perceived that the tutors in this course end up performing attributions that are the duty of the trainer professors, characterizing the multi-teaching described by Oliveira & Lima (2012).

In the study by Oliveira et. al (2013) tutors also admitted to taking on, in certain situations, pedagogical mediation, even resorting to guidance originating from psychology. It is not to say that professionals who have knowledge in the course area should not contribute towards training, quite the opposite; but by taking on the responsibility for the training action as reported, it becomes evident that it is not clear what the tutorship functions are and that, according to the training institution itself, it does not attribute such competence to tutors (IFMT, 2013).

Regarding the lack of student commitment, below are some answers: "The greatest challenge of the course is contributing to student autonomy" (AT1). "Another challenge is the high rate of student evasion in this course, especially when they are faced with the difficulties of studying, be they technical or within the complexity of the subjects" (AT2). "The commitment

to studying, since the distance course requires self discipline, time management and an interest density from the learners to be successful in their journey, is extremely relevant" (AT7).

This finding that course students show more difficulties in the training rather than the technical field was also identified in the study by Oliveira et al. (2013). According to the authors, in the case of the DE Chemistry Licentiate Degree Course at UFMG, the main challenges pointed out in exercising tutorship is supporting and guiding students along the training process for them to be successful in their studies.

The second category includes the difficulties or gaps identified throughout the course. The data related to these important aspects were obtained from the fourth and fifth questions in the form, from which the following categories emerged: students' unpreparedness, communication problems, and lack of experimental activities.

About student unpreparedness, the tutors answers were: "The students learned how to use the platform, since many do not manage to send activities" (AT1). "The students need to maintain a study routine facing work and personal life and make better use of the platform tools: Forum, message, communication" (AT5).

Students in the first semesters have a lot of difficulties with the system, with posting the activities, meeting deadlines, in sum, difficulties in understanding how a distance course functions. As the semesters go by, the difficulties become more centered around the actual concepts, especially in the comprehension of those subjects that involve calculations (AT3).

"I consider that students are trained with plenty of scientific knowledge and little faculty learning; pragmatic, teaching activities are lacking to train them as proper teachers" (AT6). "A vast majority of students are totally unprepared or never had a qualified teacher in the area during their Intermediate Education. There is no reading, they want things easily, with little effort, few do good research and prepare for exams" (AT7).

A similar finding was obtained by Caetano & Rezende Júnior (2009), with the tutors investigated in that study at an early teacher training course by UNIFEI developed in the DE modality pointing out that most students they followed are uninterested, they carry previous training gaps, they watch passively the activities provided by the course and only a minority of them is actually committed to studying and actively participate in the proposed activities.

In the investigation made by Oliveira et al. (2013) of the Chemistry Licentiate Degree course at UFMG, the attendance tutors pointed out two major difficulties faced by students, which are their low or non-existent autonomy to study and the precarious training that preceded their joining the course. According to the UFMG tutors, there is a lack of basic chemistry knowledge, mathematical calculations, and reading comprehension, which makes the development of activities more difficult.

Regarding the communication problems identified in the course, the tutors stated that: "There is a lack of professor feedback, of correction date deadline compliance; pedagogical coordination, attendance forums for specific subjects are lacking" (AT1). "Structural problems such as professors dumping too much study matter in a single moment with no explanation thereof, delays at the start of each course semester. The academic calendar always changes from what was proposed" (AT2). "There is a lack of professor feedback and few attendance classes and video-conferences" (AT4). "The issue of supervised internships is complicated, no following up by an internship professor. The scholars are all lost" (AT8).

In the studies by Oliveira et al. (2013), based on their own experiences in Chemistry Licentiate Degree through DE, the tutors suggest that there must be improvements in communication and course arrangements, which, according to those investigated in that study, seems to be the highest barrier against the success and good development of the course. The factors that interfere with communication range from the Internet connection, through no or low student participation in the virtual environment, up to the mismatched schedules or unavailability of trainer professors at the moment of clearing doubts.

Those difficulties also confirm the findings by Acosta et al. (2015) in this course, that tutors end up taking on several responsibilities to bridge gaps, including training aspects and such an overload may result in more fragile teaching. The devaluation of faculty work by reducing the professor to tutor, which the authors fight against, may have a negative influence in training the future chemistry teachers.

Another gap pointed out by the tutors in this course is the issue of few experimental classes and activities. Some of the answers were: "One of the gaps in this training process is the experimental issue, I deem insufficient to have two or three practical classes throughout an entire chemistry course, which is an experimental science" (AT3). "Low execution of practical classes by the HEI that should have a higher commitment to offer and guarantee the quality of the course" (AT4). "Greater availability of more practical classes through workshops occurring at least monthly, more practical experiences through classroom experiments from the beginning of the course" (AT5). "In exact and experimentation subjects, students get lost in applying that knowledge in their daily lives because of the low contact" (AT6).

Chemistry is in fact a science of an experimental character, i.e., it is essential that experimentation be explored and developed in the early chemistry training courses. Such gap was not identified by Silva & Fireman (2013) in the UFRN Chemistry Licentiate Degree, because this course performs experimental activities regularly. However, in the referred study the concern was concentrated on the technical reasoning in performing experimental activities due to the influence of the course tutors.

The third and last category includes the pieces of knowledge provided to the future chemistry teachers. From the answers provided for the sixth question in the form, two sub-categories emerged: skills linked to the DE training and specific knowledge for the professional activity.

The participating tutors reported some skills linked to the DE training: "The Distance Education proposal is undoubtedly very good for training that qualifies in an autonomous fashion to make the pedagogue" (AT4). "Autonomy for those trained by the course, who really place an effort and utilize the possibilities of the platform, pertinent contents, professors who show they have the technical/training capacity" (AT5).

The fact that the course is through DE makes a lot of learning feasible, since students learn in practice to research, study, think critically, and develop problem solving mechanisms. Another important aspect is the issue of internships, since it is by experiencing the school floor that makes many teachings possible (AT2).

"The learning provided by the DE course prepares to deal with different situations, for example the collectivity created from the common needs throughout the course, which brings them closer to work in groups" (AT6).

The autonomy skill is one of the aspects pointed out by Oliveira et al. (2013) as extremely necessary for chemistry teachers trained through DE courses. The authors believe that this

important aspect develops through the course by means of planning and managing their own studies.

However, the development of this specific skill requires dedication, interest and commitment by the students under training. According to the training institution, these are some skills that are expected of students trained through DE, which when joined with intense motivation, a sense of responsibility, pro activity and self-discipline make possible the constitution of professionals who are prepared to perform their functions effectively (IFMT, 2013).

Regarding specific knowledge for the professional activity, the tutors pointed out that: "I deem to be the same skills and knowledge that may be acquired in attendance education" (AT1). "Scientific knowledge, which has greatly helped those schools that lack such professional in the sciences area, Chemistry subject" (AT7).

Knowledge in the reference area: I believe the course has provided for learning the scientific concepts that involve chemistry. Knowledge in the pedagogical area: how to perform the faculty function, from the posture, planning, teaching strategies, didactic transposition, and learning assessment (AT3).

These results reinforce the thinking of Silva & Fireman (2013) who advocate a chemistry licentiate degree that surpasses technical reasoning, but also provides the practical reasoning to train better prepared professionals to work in basic education.

In general, it can be perceived that the investigated course allows for specific training, but it needs some reflection about the training process and adjustments when required, since according to Silva & Fireman (2013, p. 72): "it is not possible to train good teachers from fragmentation and the pursuit for accumulating specific theoretical and pedagogical pieces of knowledge that are not mutually linked and far from the reality of the schools".

Final considerations

This text has presented the perspectives from attendance tutors who work in the IFMT Chemistry Licenciature Degree course offered in the DE modality on important aspects related to how this specific early training is being developed. The viewpoints shared by the tutors about the course comprise a valuable source of information that may serve as guidance for actions to promote improvements in this course and to understand how chemistry teacher training through DE is occurring.

About the existing challenges in this training process, the participants brought to evidence exchange among the players, course structural problems, and lack of student commitment. Those challenges must be overcome through jointly thought out actions from the course coordination, the trainer teachers, and the attendance tutors who follow the process more closely to the students. However, care needs to be taken so that tutorship does not take on attributions that are out of their competence.

Student unpreparedness, communication problems and a lack of experimental activities were the difficulties or gaps identified by the tutors throughout the referred course. Poor student training may be harnessed to the fact that they had previous teachers with no specific training in chemistry during their basic education, which requires that the trainer teachers think in ways to overcome conceptual difficulties. Regarding experimentation, it is at the discretion of the training institution to provide for it to happen in an effective fashion throughout this training process.

As to the pieces of knowledge provided to the future chemistry teachers, the tutors pointed out important skills linked to DE training, for example autonomy and discipline, in addition to specific pieces of knowledge to perform the function of chemistry teachers.

Further unfoldings are possible and suggestions for future research: investigate the perceptions of the training scholars, the trained graduates, as well as a survey of the resources and strategies available for the early training of chemistry teachers through DE. This training process is dynamic and fundamental, reason for which the issue is conducive to the development of constant research.

Training good chemistry teachers is a necessity in contemporary society, with the results even reflecting in Brazilian school classrooms. Therefore, to provide the opportunity for early chemistry teacher training through the DE modality is a way of contributing towards quality in education, but for that to happen all those involved must be in tune to such a point that students, trainer professors, attendance tutors, and course coordination hold dialogs and build together the knowledge that is necessary for exercising the faculty.

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