IOSR Journal Of Humanities And Social Science (IOSR-JHSS)
Volume 28, Issue 3, Series 8 (March, 2023) 04-08
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

Monitoring in Descriptive Inorganic Chemistry as Facilitator on Teaching-Learning Process in Covid-19 Period

Andrew Diego Medeiros Macedo[1], Álida Samara Gomes da Silva[1], Leandro Soares Malaquias[1], Higor Henrique Farias[1], José Carlos Oliveira Santos[1]
[1](*Laboratory of Biofuels and Environmental Chemistry, Academic Department of Biology and Chemistry, Education and Health Center, Federal University of Campina Grande, Brazil)*

Abstract:
According to a monitoring report, carried out by the United Nations Educational, Scientific and Cultural Organization, 192 countries suspended school activities as a preventive measure against the spread of the pandemic caused by the new coronavirus (Covid-19). With the interruption, approximately 1.5 billion students were left without face-to-face classes. The monitoring activities aim to help learners in the search for solutions to existing difficulties in the course of their learning process of Descriptive Inorganic Chemistry, through the discussion of the contents addressed during classes. The teacher, together with the monitors, defined how the teaching process would be outlined, aiming at the satisfactory development of the classes. Among the activities there was a presentation to the class, where the monitors met the students of the night class, mentioned the opening hours and provided their e-mails and contact telephone numbers; creation of a WhatsApp group: students enrolled in the course created a group so that we could maintain a dialogue about possible doubts regarding the course, as a way of facilitating communication by everyone; pedagogical activities: Doubts related to the content taught using the Google Meet platform; resolution of lists of proposed exercises, which served as the basis for learning verification exercises. Students' performance was analyzed during four school periods, analyzing the contribution of monitors in improving the teaching-learning process. In this way, monitoring allowed: the possibility of developing and innovating didactic-pedagogical methodologies and experiences; the promotion of inclusion and didactic-pedagogical accessibility; the promotion of improvements in the efficiency indicators of undergraduate courses; the promotion of academic cooperation between students and professors, in addition to providing undergraduate students with the possibility of improving their didactic-pedagogical and academic potential.

Key Word: Pandemic, Teaching Chemistry, Education, Inclusion.

Date of Submission: 15-03-2023 Date of Acceptance: 31-03-2023

I. Introduction

According to a monitoring report, carried out by the United Nations Educational, Scientific and Cultural Organization, 192 countries suspended school activities as a preventive measure against the spread of the pandemic caused by the new Coronavirus (COVID-19). With the interruption, approximately 1.5 billion students were left without face-to-face classes [1,2].

The coronavirus pandemic marked higher education and highlighted its fragility, as well as bringing changes in relation to teaching and learning, which needed to take into account social distancing and the need for greater interaction through virtual environments. , the context and the demand reflected directly on the pedagogical actions and made explicit, once again, the need to invest in the training of teachers who, in turn, left their comfort zone to face the challenges that were posed to them [3]. The adaptations to the use of the media, with the purpose of teaching-learning and the frequent use of technologies within the classroom, catalyzed an important process for contemporaneity and imputed responsibilities to schools at all levels, causing a development in training of its professionals, who started to use videos, recorded classes, online classes and platforms that change the student/teacher relationship, creating new expectations in relation to the traditional pedagogical posture [4].

In the pandemic period, there is a higher incidence of evasion in university courses, mainly in the area of exact sciences and engineering. Dropout in this area is a complex problem, marked by numerous economic, didactic-pedagogical and personal causes [5]. It should also be noted the difficulty of reconciling studies with the

need for work, the immaturity of recent high school graduates with regard to the habit of reading and text interpretation, distortions in the learning process inserted by the preparatory courses for the National Examination of Brazilian High School, lack of rapprochement between the basic and practical courses, flaws in the didactics used by the teacher, who does not introduce a historical context or relate to everyday life, when addressing subjects in the classroom [6, 7].

The lived context of pandemic and social isolation affected society far beyond the economic scenario. This pandemic situation also affected the school environment, which sought to reinvent itself in order to continue with formal teaching practices and make the most of its proposed content. Barriers between educators and students ranged from lack of access to the technologies necessary for remote study to the fine line between maintaining student engagement and interest [4]. As a solution, monitoring activities can be used with simpler language, and a non-formal and creative approach through social networks to encourage participation in remote classes [8], facilitating communication, disseminating scientific thinking and igniting students' interest in the area of Chemistry.

The monitoring activities aim to help learners in the search for solutions to existing difficulties in the course of their learning process of Descriptive Inorganic Chemistry, through the discussion of the contents addressed during classes. The professor, together with the monitors, defines how the teaching process will be traced, aiming at the satisfactory development of the students. The course aims to provide a descriptive approach to the physical and chemical properties of the elements in the *s*, *p*, *d* and *f* blocks of the periodic table, to work on the knowledge acquired in an interdisciplinary manner and to provide a critical analysis of doing science and of the models presented. The number of students who have difficulties in their learning, leading to dropouts or failures, due to gaps in their chemical knowledge. In this context, the monitoring activities aim to help these students in the search for solutions to the existing difficulties in the course of their process of learning the contents of the discipline.

Monitoring is a teaching and learning modality that contributes to the integrated training of higher education students in the teaching, research and extension activities of their training courses. The monitoring work intends to contribute to the development of pedagogical competence and help academics in the apprehension and production of knowledge [9]. Despite being an activity offered by the university, it is the student who chooses to participate. Monitoring is understood as an instrument for improving undergraduate teaching, through the establishment of new practices and pedagogical experiences aimed at strengthening the articulation between theory and practice and curricular integration in its different aspects.

One of the purposes of monitoring is to establish a work plan for the discipline that facilitates the students' learning process, because based on the difficulties that the monitor encountered when taking the course and the difficulties of current students observed by the monitor, it provides the teacher to approach, in a different or easier way, the subjects that the students understand to be more complex. Brazilian Federal Law number 5,540, of November 28, 1968, proposes that universities should create monitor functions for undergraduate students who submit to a specific test, in which they demonstrate development capacity in technical-didactic activities of a given discipline. The Law of the Guidelines and Bases of Brazilian National Education (Law number 9.394/96) corroborates the importance of monitoring activity in the training of higher education students when it predicts that higher education students will be able to be used in teaching and research tasks by the respective institutions, exercising monitoring functions, according to their performance and study plan [10].

According to Benigno[11], monitoring allows the possibility of developing and innovating didactic-pedagogical methodologies and experiences; the promotion of inclusion and didactic-pedagogical accessibility; the promotion of improvements in the efficiency indicators of undergraduate courses; the promotion of academic cooperation between students and professors, in addition to providing undergraduate students with the possibility of optimizing their didactic-pedagogical and academic potential. In this way, this work aimed to analyze the importance of monitoring in Descriptive Inorganic Chemistry in times of pandemic.

II. Material And Methods

The Descriptive Inorganic Chemistry course has 04 credits (60 hours) and a class is offered in the night shift and another in the day shift in alternating periods with about 30 students enrolled. The discipline is offered for the third period of the day shift and the fourth period of the night course.

The monitoring activities aimed to help the learners in the search for solutions to the existing difficulties in the course of their learning process of Descriptive Inorganic Chemistry, through the discussion of the contents covered during the classes. The teacher, together with the monitors, defined how the teaching process would be outlined, aiming at the satisfactory development of the classes.

Among the activities there was a presentation to the class, where the monitors met the students of the night class, mentioned the opening hours and provided their e-mails and contact telephone numbers; creation of a WhatsApp group: students enrolled in the course created a group so that we could maintain a dialogue about

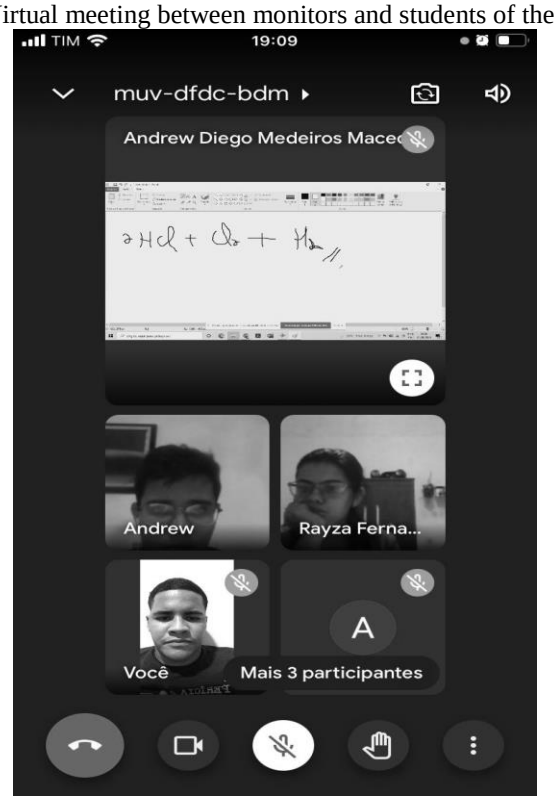
possible doubts regarding the course, as a way of facilitating communication by everyone; pedagogical activities: Doubts related to the content taught using the Google Meet platform; resolution of lists of proposed exercises, which served as the basis for learning verification exercises. Students' performance was analyzed during four school periods, analyzing the contribution of monitors in improving the teaching-learning process.

The work was developed within the framework of the UFCG Education and Health Center, involving professors, laboratory technicians, students and outsourced workers, where the proposed activities were developed in a methodology that provided an interdisciplinary, educational and scientific process that promoted the transforming interaction between the Federal University of Campina Grande and other sectors of society.

III. Results And Discussion

In general, it can be said that the role of the monitor, guided by the instructions of the mentoring professor, is relevant in the various activities of the Descriptive Inorganic Chemistry discipline, as monitoring contributes to reducing doubts regarding the content worked in the classroom. Class and guides the students in carrying out the experiments in the practical classes, generating motivation and helping learning.
During the pandemic period, monitoring activities were carried out using digital media (Figure 1).

Figure 1. Virtual meeting between monitors and students of the discipline.



It can be noticed in some students the gap in theoretical contents and, also, in contents that needed algebraic manipulation, when working the content of oxidation number, as well as in the assembly of chemical equations. However, it is believed that this comes from an outdated teaching, so it is necessary to review elementary mathematics and chemistry in advance. In this way, in the monitoring, it was possible to see the step-by-step, much more detailed, of the algebraic equations, as there was enough time for this type of doubt. However, it was also noted that the desire to understand the content stood out in relation to their phases, giving them more incentive to try to understand and master the content. Table 1 below shows the evolution of students during the analyzed periods.

Table 1. Evolution of students' academic performance.

School semester 2019.2		
Students	**Total**	%
Approved	18	78.4
Disapproved by grade	01	4.3
Disapproved for absences	03	13.0

Locks	01	4.3
Total = enrolled	23	100
School semester 2020.1		
Students	**Total**	**%**
Approved	12	48
Disapproved by grade	04	16
Disapproved for absences	05	20
Locks	04	16
Total = enrolled	25	100
School semester 2020.2		
Students	**Total**	**%**
Approved	7	100
Disapproved by grade	0	0
Disapproved for absences	0	0
Locks	0	0
Total = enrolled	7	100
School semester 2021.1		
Students	**Total**	**%**
Approved	6	75
Disapproved by grade	1	12.5
Disapproved for absences	1	12.5
Locks	0	0
Total = enrolled	8	100

The Descriptive Inorganic Chemistry curricular component is composed of several relevant contents of Chemistry (physical and chemical properties, methods of obtaining and applying the main elements of the s, p, d and f blocks of the periodic table) and is present in the curricular structure of the Chemistry courses (daytime and night), within the Federal University of Campina Grande. Knowledge of the discipline, which is part of the Exact Sciences area, is essential for student training. However, there is a large number of students who have learning difficulties, leading to evasion and/or failure, due to the lack of knowledge of Chemistry necessary for progression in the discipline and belonging to the level of education prior to university.

The deficiencies brought from basic education are due to the fact that Chemistry is perceived as a difficult science to understand, always associated with memorization, dissociated from the student's daily life. Understanding this reality and seeking to reduce the rate of failure/dropout observed in Descriptive Inorganic Chemistry, academic monitoring is offered. Carrying out this activity requires the undergraduate monitor to master the contents covered by the curricular component, as well as the development of the ability to retransmit these and of skills and didactic procedures that help the monitored students in the learning process of the subjects covered by the discipline. In this way, this extracurricular activity favors the psychosocial and cognitive development, contributes to the academic development and to the adjustment of the student within the University[12].

Monitoring, for fellow monitors, is a big step in their academic careers, as they can realize how rewarding and pleasurable it is to be able to mediate a little of what is learned for their course colleagues, as well as acquire much more knowledge through through the review of contents and through the dialogue exchange relationship, because when you teach, you learn more. The guiding teacher was always helpful whenever the scholarship holders needed help or suggestions for carrying out an exercise. In short, monitoring is a great form of self-assessment, as it was necessary to review existing content in the discipline, so that it would then be possible to resolve students' doubts in relation to it.

IV. Conclusion

In this pandemic period, Descriptive Inorganic Chemistry monitoring classes allowed greater contact with the subjects worked on by the professor, enabling a better theoretical and experimental skill in the discipline. It was found that monitoring is a teaching tool that favors the student, by making the learning process more dynamic and facilitating the construction of chemical knowledge. The pandemic time, as it helps to reduce doubts regarding the content worked in the classroom.

Monitoring encourages and reinforces the importance of scientific research, in addition to encouraging the teaching-learning process. It is the student's first contact with the world of teaching, and also serves as a space for the emergence of new professional perspectives.

Acknowledgment

The authors would like to thank the University Monitoring Programs of the Federal University of Campina Grande for financial support.

References

[1]. Pedroso PR, Gisi ML. A pandemia-Covid 19 e os impactos na juventude: educação e trabalho. Revista Práxis. 2020; 12(1) : 185-194.
[2]. Malaquias LS, Oliveira CRS, Gomes LS, Santos JCR, Santos JCO. Covid-19 Pandemic and Safety in Teaching and Learning in Experimental Chemistry Classrooms. IOSR Journal of Humanities and Social Science. 2023; 28 (3) : 17-23.
[3]. Prado L, Carvalho I, Amorim V, Izidoro E. A química na formação inicial de pedagogas: um relato acerca de produção audiovisual. In.: Congresso Internacional de Movimentos Docentes. Caderno Especial SEPAD–PRATIC, 2021.
[4]. Crocce GD, Paiva RMD, Nogueira I, Amorim V, Cinezi GRR, Marques R. Ensino de Ciências em tempos de pandemia: Desafios e possibilidades do ensino remoto. In: BORGES, R. C. (Org.) Educação a Distância e Ensino Remoto: Multifacetas e realidades das práticas docentes. Diadema: V&V Editora, p. 75-92, 2021.
[5]. Silva Filho R, Motejunas PR, Hipólito O, Lobo MBDCM. A evasão no ensino superior brasileiro. Cadernos de Pesquisa. 2007; 37 (132): 641-659.
[6]. Fiorani LA, Lopes MP, Nakao OS. Evasão na Engenharia Civil da escola politécnica da USP: o que pensam alunos e professores. In.:Congresso Brasileiro de Educação em Engenharia; XXXIX COBENGE. Anais... Blumenau, SC: ABENGE, 2011.
[7]. Gontijo GM, Stopa IS, Pereira CA. A Evasão no Curso de Engenharia de Minas. In.: Congresso Brasileiro de Educação em Engenharia, XL COBENGE, Anais... Belém: ABENGE, 2012.
[8]. Amorim TB, Paixão MFM, Silva AGC. A Importância da Monitoria para o Aprendizado de Química. Revista de Ensino de Engenharia. 2018; 36(2): 27-34.
[9]. Schneider MSPS. Monitoria: instrumento para trabalhar com a diversidade de conhecimento em sala de aula. Revista Eletrônica Espaço Acadêmico. 2006; 6 (65): 1-10.
[10]. Vicenzi C. B.; Conto F, Flores ME, Rovani G, Ferraz SCC, Marostega MG. A monitoria e seu papel no desenvolvimento da formação acadêmica. Revista Ciência em Extensão. 2016; 12(3) ; 88-94.
[11]. Benigno APA, Lima ACS, Oliveira EC, Oliveira PCC. A atividade de monitoria no ensino de Química: estudo de caso do IFAL Campus Murici. In.:XVI Encontro Nacional de Ensino de Química e X Encontro de Educação Química da Bahia. Salvador. Anais eletrônicos... Salvador: UFBA, 2012.
[12]. Santos JCO. Aulas experimentais e o covid-19: segurança e biossegurança nos laboratórios de ensino de química do CES/UFCG. Anais da XV Encontro de Extensão Universitária da UFCG. Campina Grande: UFCG, 2022.

Andrew Diego Medeiros Macedo, et. al. "Monitoring in Descriptive Inorganic Chemistry as Facilitator on Teaching-Learning Process in Covid-19 Period." *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 28(3), 2023, pp. 04-08.