

ISSN: 2310-0036

Vol. 1 | Nº. 11 | Ano 2020

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Differentiated activities in higher education: teacher practices and challenges

Abstract

The allocation of differentiated activities to students is a didactic strategy that essentially aims to promote inclusive education in higher education and is an act that encourages pedagogical differentiation. Therefore, with this article we aim to reflect on the practices and challenges of promoting differentiated activities in higher education. For this study, we opted to work with teachers, students of the Degree in Teaching Chemistry and with the pedagogical management at the Niassa Faculty Extension of Rovuma University. Methodologically, we opted for the case study, with a qualitative approach, supported by a literature review. For data collection techniques, we used semi-structured and focus group interviews, and content analysis, which facilitated the action of analyzing and interpreting the results. For the theoretical foundation we cited authors such as Nhangumbe et al. (2017); Pacheco (2011); Tomlinson (2008) and Heacox (2006). The results show that the teachers of the Teaching Chemistry course do not diversify the exercises and assessments, according to the specific learning needs of each student, although they approach the contents using different strategies.

Keywords: pedagogical differentiation; differentiated activities; didactics.

Introduction

The classes of Higher Education Institutions (HEIs) are constituted of students who have different learning styles and academic preparation, hence the need for teachers who teach in these Institutions to promote pedagogical differentiation in order to, according to Nhangumbe et al. (2017, p.77), "making learning more effective in an inclusive context."

According to the European Agency for the Development of Special Education (2009, p.16), inclusion "is about improving the processes and environments to facilitate learning, both at the level of the student in his learning context, and at the level of system to support learning".

Further, Ainscow (2009, p. 20) says that the inclusion process involves: (a) the processes of increasing student participation and reducing their exclusion from curricula, cultures and local school communities; (b) restructuring cultures, policies and practices in schools in a way that corresponds to the diversity of students in their localities; (c) the presence, participation and achievement of all students vulnerable to exclusive pressure, not just those with disabilities or those categorized as "people with special educational needs."

The identification of the specific learning needs of each student and the consequent adoption of pedagogical differentiation is achieved through the use of diagnostic assessment. This type of evaluation makes it possible to:

"achieve the objectives defined in the program and prepare the student for new learning, checking if the knowledge he brings with him is a prerequisite for a new approach, that is, if the student is in possession of certain previous learning that serves as the basis for the unit that if it will start "(Ainscow, 2009, p.49).

The professors of the Degree in Teaching Chemistry at UniRovuma-Extension of Niassa, only infrequently employ pedagogical differentiation as a means of promoting the inclusion of all students in the teaching-learning process. This can cause poor academic performance. In view of this problem, we pose the following research problem: why do teachers of the Degree in Teaching Chemistry not employ pedagogical differentiation?

The general objective of our study is to analyze the practices and challenges of the teachers of the Degree in Teaching Chemistry (CLEQ) at UniRovuma-Extension of Niassa in relation to the promotion of pedagogical differentiation. Specifically we aim to: (a) characterize the meaning that teachers attribute to pedagogical differentiation; (b) identify the element that is differentiated by CLEQ teachers; and (c) to identify the challenge for the promotion of pedagogical differentiation at UniRovuma-Extension in Niassa.

1. Theoretical framework

1.1. Didactics in higher education: object of study

For the successful completion of the teaching-learning process it is essential that teachers master the tools provided by didactics. In the view of Libâneo (1990, p. 25), Didactics is the branch of pedagogy that investigates "the foundations, conditions and ways of carrying out instruction and teaching".

Didactics is responsible for converting socio-political and pedagogical objectives into teaching objectives, selecting content and methods according to those objectives, when establishing the links between teaching and learning, with a view to developing students' mental capacities (Libâneo, 1990).

The development of students' mental capacities is different and, therefore, their learning will also take place differently. In order to meet the challenge of this learning difference, it is essential that the teacher adopts pedagogical differentiation.

1.2. Concept of pedagogical differentiation

Before approaching the concept of pedagogical differentiation, we find it convenient to discuss the meaning of two concepts, namely: differentiate and differentiate in the educational area. For Roldão (1999, p. 52) differentiating means "defining different curricular paths and options for different situations, which can enhance, for each situation, the achievement of the desired learning." Regarding the same concept, this author also adds the following:

to differentiate is to establish different routes - but it can never be to establish different levels of arrival because of the conditions of departure. Differentiating also does not equate to prioritizing goals for students from different groups - but rather trying,

by all means, the most diverse, that everyone will come to better master the skills and knowledge that everyone needs in personal and social life (p. 53).

Therefore, the teacher, when trying to use different means to teach, will certainly be including all students in the teaching-learning process and, consequently, improving the quality of teaching.

Differentiation, on the other hand, means "leading the student to an equal mastery" (Cardinet, cit. In Pacheco, 2011, p. 90). According to Heacox (2006, p. 14), this process "helps teachers to develop plans for lessons and activities that can prevent students from being left behind, or having to wait, before proceeding to the next unit".

Differentiation can be done in two stages. In the first stage, the teacher analyzes the degree of stimulation and variety in his current teaching plans and, in the second, the teacher modifies, adapts, or elaborates, new teaching approaches, in response to the students' needs, interests and learning preferences. (Heacox, 2006, p. 12).

So, what is pedagogical differentiation? It is:

an education based on the differentiation of learning styles, taking as a starting point the identification and appreciation of the students' most evident skills. Therefore, teachers must resort to diversified strategies, materials and resources of different natures and different formats (Almeida, cit. In Clérigo et al., 2017, p. 100).

Nhangumbe et al. (2017) define pedagogical differentiation as being a "set of didactic measures that aim to adapt the teaching and learning process to the individual differences of the students, in order to allow each student to reach their maximum in achieving the didactic objectives" (p. 125). It aims, according to Machado and Formosinho (2017, p. 60), to "respond to the needs of each student, presupposes the diagnosis of their characteristics - their needs, their interests, their previous experiences and their learning preferences - and the modification, adaptation or elaboration of new teaching approaches". In this regard, Morgado (2004, p. 16) emphasizes that:

Thus, the adoption of pedagogical differentiation allows students to be included in the teaching-learning process because according to Heacox (2006, p. 14), "teachers develop lesson plans and activities that can prevent children from being left behind, or from having to wait, before proceeding to the next unit". In this sense:

In the inclusive school, the great diversity and difference between students must be matched by a great curricular flexibility, both with regard to the learning contents, the teaching and learning methods, and the materials used and assessment modalities. Different people in their language, culture, abilities, interests, have to find appropriate answers to their situations at school. The teacher must be very receptive to make decisions about each of the curricular components and the necessary contextualization to the students' concrete reality, which presupposes a thorough knowledge of their characteristics and needs (Baptista, 2011, p.86).

Following this line of thought, Cortesão and Torres (1983, p. 9) recommend that:

one cannot conceive of the school as an institution that chooses and promotes only those students who, for various reasons, have an easier time understanding the pedagogical proposals that are offered to them. On the contrary, the school must "promote each and every one", it must foster success through success, it must value the differences detected in its students, using them as a source of resources for richer, more open and more democratic teaching.

Therefore, pedagogical differentiation is a pedagogical practice that aims to respond to the learning needs of each student with a view to the objectives of the lesson, didactic unit or subject being achieved by all students; that is, this practice has a welcoming character that allows all students to achieve the same learning objectives.

1.2. Elements to differentiate in teaching

For the teaching-learning process to be inclusive, it is necessary for teachers to promote pedagogical differentiation in the following elements: content, process and product (Heacox, 2006, pp. 16-17).

a) The content: the teacher seeks to know from the students what they have learned in previous levels, or classes, through diagnostic evaluation.

According to Zabala (1988, cit. In Anastasiou, 2002, p. 70), differentiated contents can be factual, procedural and attitudinal.

- Factual knowledge: refers to the knowledge of facts, events, situations, concrete and singular phenomena, sometimes overlooked, but indispensable and whose learning is verified by literal reproduction.
- Procedural knowledge: includes rules, techniques, methods, skills, strategies and procedures, verified by carrying out the actions to be mastered by multiple exercises and being made aware of this knowledge by reflection on the activity itself.
- Attitudinal contents: they are grouped in values, attitudes and norms, verified by their internalization and acceptance, which implies knowledge, evaluation, analysis and elaboration.
- b) The process: the teacher adopts methodological strategies according to the styles and learning preferences of his students. To this end, it is essential that the teacher is able to use different ways of approaching the contents in order to allow that all students have the same opportunity to learn and, consequently, achieve the same learning objectives.
- c) The products: reflect what the students understand and are able to apply. (Heacox, 2006, p. 17). In other words, this is where each student is evaluated according to what he understood and can apply.

According to the above, we suggest that teachers are called to adopt the contents, methodological strategies and exercises that value the individual characteristics of each student. But, this does not mean, according to Baptista (2011, p. 86), of "introducing facilities much less facilitations that compromise the quality of education, rather, it is about providing each one with a serious and demanding job for which they have the preparation and means to accomplish (...). But the learning paths cannot be the same" because, in Perrenoud's opinion (2003, p. 118):

a weakly differentiated pedagogy, aimed at all the same content, the same exercises, the same homework, the same treatment, can only transform cultural differences into inequalities in school learning. When the proposed learning situations are identical, students, to whom they are adapted, learn; the more advanced ones get bored; those who do not have the required level or do not see the meaning of the activity also waste their time and gradually become convinced of their inability to learn.

From this perspective, in order to guarantee the promotion of pedagogical differentiation, it is necessary that Higher Education Institutions choose to teach content and assign different exercises/activities and assessments to their students, because Heacox (2006, p. 13) guarantees that:

when teaching and assessment are modified in response to the unique needs of each student, the chances of academic success on the part of all students increase, both for students with normal learning rhythms and for students with problems learning, or those who do not master the predominant language (in the case of students belonging to ethnic minorities or cultures).

That is why:

Currently, teachers are required to make an individualized and diversified assessment with a view to the success of all students; that assess the cognitive and affective domains; to establish support programs for students with difficulties, to work as a team and to modify their pedagogical and assessment practices (Barreira, Boavida and Araújo, 2006, p. 96).

Individualized assessment is required because "it respects the individuality of each student; adapts pedagogical help to the needs of each student; it defines criteria according to the starting point of each one and seeks to develop individual capacities" (Nova, 1997, p.16).

As for activities, Roldão (1999, p. 53) suggests that schools differentiate "activities to correspond to the different access routes and starting points of students, but so that all of them reach a higher level of learning". Therefore, it is necessary that the exercises/activities are designed taking into account the specific needs of each student in relation to academic objectives. The differentiation of exercises/activities must guarantee the improvement of the teaching-learning process. In this regard, Ferreira (2007, p. 87) argues that:

Since students have personal characteristics and learning resources of their own, the means by which they achieve terminal objectives may be different, which justifies the need to formulate different intermediate objectives for students, according to their characteristics, their needs,, their interests and successes achieved in specific learning.

According to Heacox (2006, p. 13), "in differentiated teaching, teachers develop activities that support students' learning preferences and strengths, while presenting them with tasks that encourage their development in the areas where they are most weak." And the use of different ways of approaching content can make "learning successful." (Tomlinson, 2008, p. 30). Heacox (2006, p. 13) concludes Tomlinson's reasoning by saying that:

The greater the number of ways the teacher uses to involve his students in learning - giving them more opportunities to use their favorite ways of thinking - the greater their ability to learn. When teaching and assessment are modified, in response to the unique needs of each student, the chances of all students achieving academic success are increased, both for students with normal learning rhythms and for students with problems learning, or those who do not master the predominant language (in the case of students belonging to ethnic or cultural minorities).

Still Heacox (2006, p. 76) emphasizes that, "the greater the variety that the teacher offers to students, with regard to the ways in which they are asked to learn and to demonstrate that they have learned, the greater the chances of him teaching with success for all students".

However, for pedagogical differentiation to be at the service of improving the teaching-learning process, it is essential that it is planned because, according to Ferraz et al. (1994, p. 3, cit. In Mouta, 2015, p. 38), planned pedagogical differentiation, guarantees: (a) the remediation of cognitive aspects; (b) the preparation of activities for more advanced students; (c) the integration of ill-adjusted students; (d) the resolution of disciplinary problems and; (e) support for individual or group projects. On the other hand, "spontaneous pedagogical differentiation is adopted by teachers who are concerned with supporting students at the same time, which only allows them to adjust their circumstances (Ferraz et al., 1994, cit. In Mouta, 2015, p. 38).

In short, the practice of pedagogical differentiation encompassing content, processes and products ensures that the teaching-learning process is conducted in an integrated and inclusive way. However, for this to happen, it is essential that it is planned in order to achieve the learning objectives.

2. Research methodology

In order to carry out this study, we opted for the case study, with a qualitative approach, based on a literature review. For the techniques of data collection, we chose semi-structured interviews and focus groups. The case study allowed us, during 2019, to study, in a deep and detailed way, the practices related to the differentiated activities in the Degree course in Teaching Chemistry, at Rovuma University.

The qualitative approach aims to describe the practices of the teachers of the Degree in Teaching Chemistry at the University Rovuma-Extension of Niassa. The literature review consisted of reading articles and books, deepening the theoretical foundations for approaching our theme.

Using semi-structured and focus group interviews, we obtained data related to the diversification of activities at the University Rovuma-Extension of Niassa. We conducted the semi-structured interview with three professors from the Chemistry course and the pedagogical management. We conducted the interview in a focus group of 36 students from the 1st, 2nd, 3rd and 4th years of the Degree in Teaching Chemistry at the University Rovuma-Extension of

Niassa. Class observation consisted of witnessing how the diversification of activities takes place in the classroom.

After the data collection process, we followed with the presentation, analysis and discussion of the results. We performed the analysis and interpretation of results using the content analysis technique accompanied by the definition of category and subcategory. The results were analyzed, interpreted and discussed in the light of the theoretical framework.

During the data analysis and interpretation, we compared the data obtained from interviews with teachers, students and pedagogical management, with the theoretical framework.

For the ensure participants' anonymity, we identified teachers, students and the pedagogical management through a code that allowed us to proceed to the stage of writing a text that translates the common features and the different features of the analyzed messages, and then advancing in interpretation and theorizing. In our analysis and interpretation the "P" indicates teacher; the "E" indicates student and "PM" indicates pedagogical management.

3. Results and Discussion

For the analysis and interpretation of results, we began with a single category called pedagogical differentiation. Drawing on the answers given by the participants of our research, the following subcategories emerged: (a) concept of pedagogical differentiation; (b) differentiated approach to content; (c) differentiated exercises/differentiated activities; (d) differentiated ed/individualized assessment; (e) obstacles to differentiated activities.

a) Concept of pedagogical differentiation

When interviewed about the concept of pedagogical differentiation, teachers presented a differences in understanding, as we can see from the statements below:

"It is a new term (...) for me, pedagogical differentiation is the disparity that exists in terms of students' knowledge; and the teacher may be able, given the differentiation of knowledge that each student brings, to attend [sic] in a specific way. For example, a student who knows more, I don't need to spend a lot of time explaining to this student" (P1).

"I don't have a complete concept, but I understand [that] it is linked to the teaching activity, but if it is linked to the teaching activity, it would be related to the students' level of learning, given that each student has his level of learning. So, the pedagogical differentiation could be, in this context, one in which each student would need a work perhaps a little more in-depth than the other using the same content. So, in my vague opinion, I would define pedagogical differentiation as using the same content with different activities according to the learning level of each student" (P2).

"(...) it is a basis that explains that teaching and learning is dynamic, it is innovative, that it does not have a fixed way of being followed, in this case" (P3).

The above testimonies reveal that the teachers do not have a full or uniform understanding of the concept of pedagogical differentiation. This may mean that teachers did not have the opportunity to hear about this concept during their training. Therefore, it is clear that investments should be made in the training/education of teachers with regards to pedagogical differentiation, so that these professionals know that, according to Nhangumbe et al. (2017, p. 125), the pedagogical differentiation "is the set of didactic measures that aim to adapt the teaching and learning process to the individual differences of the students, in order to allow each student to reach their maximum in achieving the didactic objectives. " Almeida (cit. In Clérigo et al, 2017, p. 100) sharing the idea of Nhangumbe et al. emphasizes that:

pedagogic differentiation is an education based on the differentiation of learning styles, having as a starting point the identification and appreciation of the students' most evident competences. Therefore, teachers must resort to diversified strategies, materials and resources of different nature and different format.

In general, pedagogical differentiation is an instrument that aims to respond to the specific learning needs of each student, with a view to improving the teaching-learning process.

b) Differentiated approach to content

There are several ways of approaching content in the classroom, as we can see in the following statement:

"(...) When I see that with a certain question there is a need for me to change the way I am approaching it, or how we are discussing it in the classroom, then I use the active teaching methodologies that help a lot with the question, to resolve a certain problem that I identified and for which, due to the way we were interacting, there was no solution. So, I am going to differentiate, I follow another path to check if they will understand it or not " (P3).

Looking at the testimony of the teacher "P3", we can see that the adoption of different ways of approaching a certain content can allow the student to easily assimilate the contents and improve the interaction between teacher and student and, consequently, include all students in the process of teaching-learning. In this regard, Heacox (2006, p. 76) emphasizes that, "the greater the variety that the teacher offers students, with regard to the ways in which they are asked to learn and to demonstrate that they have learned, the greater the possibilities of successfully teaching all students. "In other words, "the greater the number of ways that the teacher uses to involve his students in learning - giving them more opportunities to use their preferred ways of thinking - the greater their ability to learn" (p.13).

Like Heacox, Tomlinson (2008, p. 30) guarantees that the use of different ways of approaching content can make "learning successful."

However, for the teacher to feel the need to change the way of approaching a certain content, it is important that he has the ability to read the class environment and demonstrate skills in matters of higher education strategies, which aim to include the student in the teaching-learning process and, therefore, improve the quality of higher education.

c) Differentiated exercises

Differentiated exercises are activities that aim to meet the different learning styles of students. When students were asked if teachers assign them the same exercises or not, students were unanimous in saying that the teachers assign them equal exercises, as we can see in the statements below:

"Yes, teachers give equal exercises, yes" (FG3, E24).

"Usually the exercises are the same" (FG3, E26).

"Teachers usually give us exercises in the same way, in the same way" (GF4, E36).

"The exercises are the same for everyone" (FG2, E17).

From the responses above, it is clear that teachers do not attribute differentiated exercises to students. This can lead students who have mastered the subject of the contents contained in the exercises to become bored, because they think it is a waste of time; and those who do not understand it, to find themselves increasingly unable to solve them. For Perrenoud (2003, p. 118), "a weakly differentiated pedagogy, aimed at all the same content, the same exercises, the same homework, the same treatment, can only transform cultural differences into inequalities in school learning".

To avoid this, it is necessary that, according to Roldão (1999, p. 52), the university differentiates "the activities to correspond to the different access routes and starting points of the students, so that all of them reach a higher level high learning".

In summary, the assignment of different exercises to students must be associated with the teachers' awareness of their importance, the availability of time and methodological guidelines. However, these exercises should be designed taking into account the specific needs of each student, in relation to academic objectives, so that all students can learn and, consequently, obtain a good school performance.

d) Differentiated/individualized assessment

Pedagogical differentiation cannot only focus on the strategies used in the content approach, but must also focus on evaluation, since, according to Heacox (2006, p. 13):

When teaching and assessment are modified in response to the unique needs of each student, the chances of achieving academic success on the part of all students are increased, both for students with normal learning rates and for students with learning problems, or those who do not master the predominant language (in the case of students belonging to ethnic or cultural minorities).

Hence, Barreira, Boavida and Araújo (2006, p. 96) say that:

Currently, teachers are required to make an individualized and diversified assessment with a view to the success of all students; that assess the cognitive and affective domains; to establish support programs for students with difficulties, to work as a team and to modify their pedagogical and assessment practices.

Despite the advantages explained above, the teachers interviewed have adopted an equal assessment for all students, as we can see in the statements below:

"I never differentiated because students should have the same level of knowledge" (P1).

"No [...]. You can, but we rarely do that" (P2).

"In the first test I have made two variants for differentiation, you know [sic]; but of the same content. Why do I do this? [...] I think that at the beginning of every assessment there is a need for the student to take a position. So, I do it there to check to what extent he has basic understanding" (P3).

Looking at the above responses, we can see that teachers believe that students have the same cognitive ability. This conception can lead students to have a low academic performance be-

cause the assessment that teachers use does not take into account the cognitive characteristics of each student. Nevertheless, Nova (1997, p. 16) assures us that differentiated assessment "respects the individuality of each student; adapts pedagogical help to the needs of each student; it defines criteria according to the starting point of each one and seeks to develop individual capacities."

It is important to mention that, in order to make this kind of assessment feasible, teachers need to know the cognitive capacity of each student.

e) Obstacles to differentiated activities

Pedagogical differentiation is a practice that aims to improve the quality of teaching, but its adoption is difficult due to a factor identified in the statement below:

"It's really complicated, actually, to talk about pedagogical differentiation in a situation where we have a lot of students. We have teachers, for example, who have three classes in one room. Generally, this teacher cannot do this pedagogical differentiation. Even in classrooms that have more than 60, or 50 students, it is difficult to do this pedagogical differentiation "(DP).

Analyzing the responses, we perceive that the large number of students per class constitutes an obstacle to the adoption of differentiated assessment in higher education. This may be due to the implementation of the demassification policy of higher education. However, in order to promote or practice pedagogical differentiation in higher education institutions, it is necessary to reduce the teacher-student ratio, because through this process, "teachers monitor the correspondence between student and learning and make the necessary adjustments" (Tomlinson , 2008, p.20).

Therefore, the failure to adopt differentiated activities inhibits the development of the student's creativity and talent, simply making him/her a depository of knowledge. In this context, he can be seen as a "being of adaptation, of adjustment" (Freire, 1987, p. 34). And this hinders the progression of his learning and his "critical awareness that would result in his insertion in the world, as his transformer" (Freire, 1987, p. 34). However, in order for this not to happen, it

is important that the teacher creates conditions so that the objectives, teaching strategies, content and assessments are adapted and adjusted according to the learning needs of each student.

4. Conclusion

As evidenced throughout the text, teachers presented a concept of pedagogical differentiation that is not clear, probably due to the lack of training and/or training in matters related to the same subject. According to the data obtained, pedagogical differentiation does not involve exercises and evaluations, nevertheless, teachers try to approach the contents in a different way. That is, teachers assign to students the same exercises and submit them to the same evaluations, devaluing what students understood and know how to do it, which may be the reason for the weak adoption of pedagogical differentiation, aggravated by the high number of students in the classroom.

Thus, in order for pedagogical differentiation to be practiced in an integral way, it is necessary to reduce the teacher-student ratio and think about training teachers in matters of pedagogical differentiation.

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