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Teaching and quality of teaching: Conceptions of higher education professors in Sao Tome and Principe

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Higher education is a fundamental resource to achieve the 2030' Sustainable Development Goals (SDG) defined by the United Nations. Specifically, SDG4 advocates the access to quality education for all, including tertiary education. Besides, higher education is expected to be an important condition for achieving other SDGs. Developing countries face particularly important challenges to accomplish these higher education goals. Thus, it is crucial to understand how to promote quality in higher education in the specific context of each country. Among the most important factors influencing higher education quality are professors' conceptions of teaching. These conceptions influence teaching action and have a direct impact on students' own academic performance and learning outcomes. Teaching conceptions seems to be strongly influenced by cultural values and social norms and in African countries there is little research in this field. This study aims to characterize and understand both the conceptions of teaching and on facilitating factors and barriers to university teaching held by the University of Sao Tome and Principe (USTP) faculty. The data were obtained through semi-structured interviews to 19 university professors and analyzed through qualitative and quantitative methodologies. The results suggest the prevalence of teacher-centered/transmission-oriented and student-centered/learning-oriented conceptions of university teaching. In addition, other conceptions highlight professors' competences and the relationship between teaching and context variables. Organizational aspects of the education system, material resources and facilities, characteristics and training of the faculty, teaching action, and students' characteristics, are mentioned both as facilitators and barriers to university teaching. Some contributions emerged from the professors' conceptions that could inspire improvements at the USTP teaching, therefore contributing to facing changes and challenges of a society in development.

KEYWORDS

university professors, conceptions of teaching, quality of teaching, higher education, developing countries, sustainable development goals, qualitative studies

1. Introduction

Primary and secondary education has known a great expansion in African countries (Evans and Acosta, 2021) but the concern with university-level education is a relatively more recent topic (European University Association, 2010; McCowan, 2018; Amadhila and Guest, 2022). Improving access to and the quality of higher education is now among the sustainable development goals (SDG) proposed by the United Nations (2015) to be achieved by 2030. In addition, the improvement of higher education quality and enrolment seems to be a condition for making progress in the previous education levels and to achieve other SDGs (Zhou et al., 2020). Higher education can provide better training for teachers in both pedagogical and scientific domains, and contributes as well to eradicating poverty, promoting health and well-being, accessing to decent work and economic growth or building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering research and innovation, among others (United Nations, 2015; Africa Union, 2015a,b; Zhou et al., 2020; Pereira and Confraria, 2022; Pinto et al., 2022). African countries are therefore facing the challenges of massive schooling of younger generations at basic and secondary levels (Evans and Acosta, 2021) and getting a growing number of young people into higher education and ensuring quality education (Akalu, 2016). Considering that the improvement of higher education depends enormously on the contribution of some of its main actors, such as professors, this study examines the conceptions of teaching and quality teaching in higher education held by the faculty of the public university of Sao Tome and Principe.

The expression “quality teaching” has been used interchangeably with other terms, such as “good,” “effective,” or “excellent” teaching (Alhija, 2017). Frequently, the concept refers to both the procedures used by teachers and the teaching outcomes (i.e., student learning). Mainly based on teachers’ role, Alhija (2017) distinguished five components of quality of teaching, namely the goals to be achieved with the course, long-term student development, teaching methods, relations with students, and assessment. On the other hand, when the impact on students is the criterion, quality teaching goes beyond the mere acquisition of contents. It is related to truly transformative learning and in-depth knowledge and understanding of the subjects, and promotes personal, intellectual and civic development as well as a diversity of other skills (McCowan, 2018). For instance, the English universities studied by Su (2022) placed the student, and its learning and development at the core of their policy and management decisions. They conceptualized the quality of teaching as the extent to which (a) students are involved in teaching and learning processes; (b) curriculum design and implementation are rigorous and effectively lead students to develop their potential; (c) assessment and feedback practices lead students to progress; and (d) teaching and the excellent work of teachers is valued. However, it is expected that the conceptions of teaching quality vary according to historical and sociocultural contexts (Goldenberg, 2018; Keykha et al., 2021). For instance, in the context of higher education massification in Ethiopia, professors also emphasize the importance of selecting the most curious and committed students for quality teaching (Akalu, 2016).

Other studies have revealed similarities regarding the factors that affect the quality of higher education in countries from different continents and levels of human development. In a study carried out in Kenya by McCowan (2018), resources (human and infrastructure),

government (organizational structures and stakeholder participation), and pedagogical culture (social hierarchy, approaches to teaching, curricula, and assessment) were identified as barriers to the quality of higher education. Professors at an Iranian university identified several teaching quality factors, both facilitators and barriers, such as: (a) classroom teaching (e.g., teaching methods, mastery and application of content, collaborative learning, ability to communicate with students), the quality of teachers and students, curriculum, facilities and infrastructure; (b) academic aspects (management and executives, infrastructure, policies and regulations); (c) Post-academic (governance, planning in higher education and culture; Keykha et al., 2021). A recent report identifies several challenges to university teaching and research in Mozambique, Cape Vert, and Angola universities, namely “the lack of research facilities and equipment, lack of financial and material resources to keep up with the demand of students looking for training and to boost the quality and quantity of research and training, weak relationship with industry and governments, and limited levels of qualification in the faculty members (both in teaching and research)” (Pinto et al., 2022, p. 5).

Among the most important factors that influence the quality of higher education are professors’ conceptions of teaching, which consist of the different ways of conceiving, understanding, interpreting, and experiencing teaching. Such conceptions of teaching are reflected in the approaches that teachers have towards teaching and are the basis for their practices (e.g., Kember and Kwan, 2000; Prosser and Trigwell, 2000; Mladenovici et al., 2022). They influence the behavior and attitudes of teachers, the organization of pedagogical activities and practices in the classroom, the assessment of students, and have an impact on students’ conceptions and approaches to learning, academic performance, and learning outcomes (Entwistle, 2009; Shagrir, 2015; Jacobs et al., 2016).

Several studies (e.g., Kember, 1997; Swinkels et al., 2013; Degago and Kaino, 2015; Cheng et al., 2016; Jacobs et al., 2016) on university professors’ conceptions of teaching have highlighted two main descriptive categories: (a) transmissive, content-oriented, or teacher-centered conceptions; and (b) constructivist, learning-oriented and student-centered, which conceive teaching as facilitating student’s learning and understanding, changing students’ conceptions and encouraging critical thinking, motivation, and active participation. It has been argued that the exclusive existence of a teacher-centered and knowledge-transmission conception of teaching leads students to less sophisticated conceptions and approaches to learning, thus affecting learning quality (e.g., Trigwell and Prosser, 1996; Carnell, 2007). Several studies identified more differentiated categories within these main categories. González (2011) found four descriptive categories, namely teaching as transmitting the basic information, teaching as transmitting professor’s understanding, teaching as developing students’ understanding, and teaching as changing students’ understanding. Mimirinis and Ahlberg (2021) identified six categories: transmitting knowledge, presenting contrasting concepts, communicating and engaging with students, enabling students to apply knowledge and skills, enabling students to interpret and compare concepts, and promoting personal, professional, and societal development and change. Based on a study with university professors in Ethiopia, Degago and Kaino (2015) proposed four descriptive categories, namely meeting curriculum demands, presenting students with information in a structured way, helping students to learn what they want to learn, and helping students to expand their knowledge.

Some authors proposed that conceptions of teaching are independent from each other (see, for instance, [González, 2011](#)). However, the authors of the mentioned three studies proposed that the categories of conceptions of teaching are hierarchically related, so that the lower-level conceptions are less sophisticated and included in the higher-level. The links between the hierarchically organized categories involve variation in dimensions such as the role of the lecturer, the role of the students, the content's nature, and motivation ([González, 2011](#)), and entails a progression from teacher-centered to students-centered conceptions (e.g., [González, 2011](#); [Degago and Kaino, 2015](#); [Mimirinis and Ahlberg, 2021](#)). These models predict that the same teacher can present both broad types of conceptions and practices ([Konopka et al., 2015](#); [Almeida et al., 2022](#)), and can therefore make flexible use of them depending on the students' needs, time, and context ([Degago and Kaino, 2015](#); [Shagrir, 2015](#); [Ross, 2017](#)). For instance, Degago and Kaino suggested that in certain circumstances such as "class size, heavy workload, student characteristics and lack of institutional support" (p. 503), teachers may present less sophisticated pedagogical practices (for example, teaching-centered) even if their conceptions of teaching are student-centered. Conceptions of teaching can also be conceived as stable or relational construal, the later referring to variable responses to specific teaching and learning situations. Different contexts can influence teachers to activate different conceptions thus resulting in different teaching approaches and pedagogical practices ([Degago and Kaino, 2015](#); [Uiboleht et al., 2018](#); [Jensen et al., 2020](#)). Descriptive categories hierarchically related and relational arise mainly from the phenomenography perspective ([Åkerlind, 2003](#)).

Furthermore, it is argued that teachers can shift from one conception of teaching to another over time and that faculty development should be promoted through a critical self-analysis of their conceptions of teaching and learning to achieve lasting changes in their practices ([Prosser and Trigwell, 2000](#); [Jacobs et al., 2014](#); [Ross, 2017](#); [Almeida et al., 2022](#); [Mladenovici et al., 2022](#)). Other authors argue that teachers' conceptions and teaching approaches have an impact on students' own conceptions, approaches, quality of learning and performance (e.g., [Uiboleht et al., 2018](#)). Faculty conceptions of teaching and learning seem to be strongly influenced by cultural values and social norms, and pedagogical practices seem to vary across contexts ([Han et al., 2015](#); [Yeung, 2015](#); [Cao et al., 2019](#)).

1.1. Sao Tome and Principe and the present study

To the best of our knowledge, no study to date addressed the teaching and quality of teaching conceptions of the university professors of Sao Tome and Principe. Sao Tome and Principe is a small country with an area of 1,001 km² located on two islands on the western equatorial coast of Central Africa, which obtained its independence from Portuguese colonial power in 1975. Classified as a medium human development country by the [United Nations \(2022\)](#), in 2021 it had about 223,107 inhabitants ([World Bank, 2022](#)). This country has two private and one public higher education institution, the University of São Tomé and Príncipe (USTP). Created in 2014, the USTP had 1849 students in 2017 ([Ministério da Educação, Cultura e Ciências, 2018](#)). A considerable number of young people are pursuing their university studies in other countries (nowadays Portugal, Brazil,

Morocco, among others) with scholarships often included in cooperation programs ([Seibert, 2013](#)). The Legal Framework for Higher Education Institutions (Law 4/2017; [Governo de Sao Tome and Principe, 2017](#)) establishes that higher education institutions offer three academic degrees: Bachelor's, Master's, and PhD. However, the availability of these last two degrees depends on partnerships with higher education institutions in other countries, as there not yet sufficient critical mass to ensure them in the country, as in other African countries ([Pinto et al., 2022](#)). The USTP integrates three organic units: Faculty of Sciences and Technologies (FST), Higher Institute of Education and Communication (HIEC), and Higher Institute of Health Sciences Victor Sá Machado. None of these units has a systematic continuous training program that allows teachers to improve their skills and ensure the quality of teaching and learning. Despite the Portuguese influence in the legislative system, the university faculty was trained in several countries on different continents (Portugal, Brazil, France, USA, Italy, Spain, Bulgaria, China, Libya, Algeria, Congo, Cuba, Russia, German Democratic Republic) with the support of scholarships ([Pinto, 2018](#)). In this way, the current faculty of the USTP was influenced by different experiences, ideologies, and conceptions of teaching and learning in the countries where they studied. Moreover, in some cases, teachers graduated many years ago ([Aguiar, 2022](#)).

Higher education in Sao Tome and Principe faces increased challenges due to its socioeconomic weaknesses, lack of infrastructure and critical mass, professors teaching in different institutions simultaneously, incipience or absence of quality assurance systems, management and organization deficiencies, and increasing demand for higher education ([Aguiar, 2022](#)). Such problems are common to other countries with medium and low human development (e.g., [McCowan, 2018](#); [Hanh et al., 2020](#); [Rahnuma, 2020](#); [Pinto et al., 2022](#)).

In such a context, much remains to be done for the development of higher education in Sao Tome and Principe. It is very important to know the university professors' conceptions about university teaching as they are crucial agents for the development of higher education in the country. Therefore, this investigation aims to examine the conceptions of the professors at the University of Sao Tome and Principe, specifically identify and analyze their: (a) conceptions of teaching in higher education; (b) conceptions of facilitators and barriers to teaching in higher education.

2. Materials and methods

This study followed a qualitative, phenomenographic approach. The aim of phenomenography is to understand phenomena from the point of view of those who experience them, i.e., to explore different conceptions or structures of consciousness that people have about a phenomenon, based on the assumption that individuals have qualitatively different ways of experiencing it ([Marton, 1994](#); [Marton and Booth, 1997](#)). Considering the phenomenon as a whole, (in this case the conceptions of professors about university teaching and facilitators and barriers) we simultaneously distinguished its parts by focusing on the variation in the way individuals experience this same phenomenon (that is, identifying descriptive categories and detecting the underlying meaning). To the extent that phenomenography studies variations in lived experience, it also makes it possible to account for cultural differences ([Willis, 2018](#)).

Thus, the objective of the phenomenographic analysis carried out was to discern the variation in teaching conceptions (and its facilitators and barriers) of a group of university professors from the only public University of S. Tome and Principe (USTP) and to find the meaning of the group's experiences as a whole, not attributing it to the specific characteristics of individuals (gender, age, educational qualifications, years of experience or other) (Åkerlind, 2005; Harris, 2008).

2.1. Participants

Following the recommendations of Khan (2014) and Trigwell (2000) regarding the number and diversity of participants in a qualitative phenomenographic study, the participants were 19 USTP professors. The selection of participants sought to ensure the variation of experiences (Bowden, 2000), complying with the following cumulative criteria: (a) Willingness to participate in the study; (b) Minimum of 4 years teaching experience in Higher Education; (c) Be a faculty or have a contract with the USTP; and (d) be currently engaged in teaching duties at the time of the interview.

Participants were 12 (63%) male and seven (37%) female, aged between 32 and 64 years old ($M = 53$ years old). Most participants were between 40 and 49 years old ($N = 6$; 32%) or 60 years or older ($N = 6$; 32%), followed by those aged 50 and 59 years old ($N = 5$; 26%). The age group between 30 and 39 years old had less participants ($N = 2$; 11%). Regarding academic qualifications, most participants ($N = 16$; 84%) had a master's degree, two (11%) had a PhD, and one is in the process of obtaining his/her PhD. Most participants ($N = 12$; 63%) belong to the FST (USTP's largest organic unit) and seven (37%) belong to HIEC. The area of Exact Sciences is the most represented ($N = 10$; 53% of participants), followed by Arts and Humanities ($N = 8$; 42%), and Pedagogy (one participant). Twelve (63%) were tenured professors and seven (37%) had a full-time contract. Participants' experience in higher education teaching varied between 4 and 32 years ($M = 11$ years), with 32% ($N = 6$) indicating an experience of 20 or more years, 37% ($N = 7$) between 10 and 19 years, and 32% ($N = 6$) between four and 9 years.

2.2. Instrument

The data gathering method was a semi-structured interview (Knox and Burkard, 2009). Three exploratory interviews were carried out, mainly with open-ended questions, with the objective of checking the clarity of the questions, obtaining feedback from those involved to improve the interview guide, evaluating the degree to which the interview guide explored the phenomenon under study, and opening up the possibility of generating new information that could suggest a reconceptualization of the issues under study. The final interview guide included several blocks of questions: (a) Introduction; (b) Sociodemographic data; (c) Seven thematic sections, two of which were considered for this study, namely conceptions of teaching and facilitators and barriers to the quality of university teaching; and (e) Finalization. In the thematic block on conceptions of university teaching the main question was: "In your opinion, what is university teaching? Why?" There were two questions in the section about the quality of university teaching those were: "What aspects facilitate

teaching at university? Why?" (teaching facilitators) and "What aspects make teaching difficult at university? Why?" (barriers to teaching).

2.3. Data collection and analysis

The research project was approved by the Scientific Council of the University of Évora. An authorization and informed consent were obtained from the USTP Dean's Office for conducting the interviews with the professors, as well as the informed consent from each participant. The interviews (about 1 h each) were carried out individually, in person, and audio-recorded, between August and November 2018, according to the availability of each professor. One of the authors received training to administer the interview, considering the contents of the guide and its objectives, and a set of verbal and non-verbal techniques.

The interviews were fully transcribed. The analysis began with a general reading followed by a cyclical and repeated process between analysis and reading of the data, reading the excerpts as parts of entire interviews and as part of a collection of related excerpts. Content analysis was used to systematize the data and make emerge relevant categories to map and interpret the conceptual field under study (Bardin, 2016). In phenomenographic terms, description categories are used to characterize conceptions (Marton, 1994). In the process of defining the categories, semantic criteria were used to analyze participants' discourse, and the fragments that represented a complete idea or information content understandable by itself were considered as units of meaning. Due to the commonalities of the excerpts, categories were formed under a generic title. This was followed by the systematic codification of the units of meaning, their grouping and classification. We privileged the emergence of categories throughout this classification process without, however, neglecting their elaboration according to previous theory and research. As the data were analyzed, the categories were reorganized until the definitive categorization framework was achieved; the outcome was a thematic and categorical analysis grid explaining the categorization criteria.

The categorization was committed to several quality criteria proposed by Bardin (2016): (a) Mutual exclusion (each semantic unit was classified into one and only one category); (b) Homogeneity (the categories were created based on a single classification principle that guided their organization and complied with precise and explicit selection criteria); (c) Relevance (construction of categories adjusted to the material under analysis, the research objectives and the defined theoretical framework); (d) Objectivity and reliability (the same coding grid was applied to the different interviews by two coders who resolved disagreements by consensus together with the researcher; Khan, 2014); (e) Productivity (the analysis of the set of categories is considered productive if it provides fertile results in inference, new hypotheses and exact data).

The qualitative analysis and its interpretation were expanded with the quantitative treatment of the data. We used simple descriptive statistics, namely the count of frequencies (and percentages) of the units of meaning codified within each category and subcategory. The frequency counting criterion was based on the number of times each unit of meaning appeared in the participants'

discourse in each category or subcategory. When a participant repeated the same unit of meaning within the scope of a given question, only one was counted. Therefore, the frequencies refer to the number of different verbalizations enunciated by the participants and not to the number of participants who did so. This whole process made it possible to identify the most frequently referred conceptions in each topic.

3. Results

This section shows the conceptions of university teaching held by USTP professors, as well as the aspects they consider to be facilitators and barriers to university teaching. Descriptive categories and subcategories are presented from the most to the less frequently mentioned by the participants.

3.1. Conceptions about university teaching

The analysis of the interviews produced four different categories of description on the conceptions of university teaching, namely: student-centered and learning-oriented, teacher-centered and content-oriented, teacher competency-centered, and context related. Table 1 shows each category and its respective subcategories.

3.1.1. Student-centered and learning-oriented conceptions of university teaching

This category focuses on a pedagogical action that guides student's learning and is conceptualized in terms of the student's characteristics or objectives of student's transformation ($N=25$; 40%). Two major axes of meaning emerged. The first axis conceptualizes teaching as the facilitation of the student's learning process through:

- Guidance and help to improve student's understanding ($N=6$; 9.5%). For example, "The teacher basically serves as a guide for concepts, definitions, bibliographies that students should use, reference works" (P12) or "To help students understand" (P6).
- Teacher-student, student-student interaction, and participation ($N=4$; 6.3%). The conception of interactive teaching emphasizes a mutual relationship between teachers and students in the construction of knowledge (e.g., "View the class as if it were a scientific community, we share and collaborate to produce information and knowledge," P15) or between the students themselves (e.g., "The class must be interactive, bilateral, ... the student has knowledge, he teaches the other" P6).
- Differentiate teaching action regarding student's specificities ($N=2$; 3.2%):

I often say that being a teacher means being a teacher for the student you have (...) But being a teacher when the student has specific needs is different from being a teacher in an environment where the student has other needs. (...) they bring prior knowledge that needs to be considered (...) the question is to what extent this knowledge is consolidated or not, I suppose that teaching at the university should take this into account. (P8).

TABLE 1 Conceptions about teaching.

Category	Sub-category	N	%
1. Student centered and learning oriented		25	39.7
	1.1. Learning process facilitation	6	9.5
	1.2. Intellectual development and conceptual change	5	7.9
	1.3. Autonomous learning	5	7.9
	1.4. Interaction and participation	4	6.3
	1.5. Problem solving	2	3.2
	1.6. Differentiation	2	3.2
	1.7. Personality/citizenship construing	1	1.6
2. Teacher centered and content oriented		19	30.2
	2.1. Knowledge transmission	8	12.7
	2.2. Preparation to specific professions	6	9.5
	2.3. Intentional/planned action	4	6.3
	2.4. Application	1	1.6
3. Professor's competence		12	19.0
	3.1. Pedagogy and didactics	4	6.3
	3.2. Multiplicity of knowledge	3	4.8
	3.3. Relational aspects	2	3.2
	3.4. Position concerning knowledge and teaching	2	3.2
	3.5. Technical and scientific qualification	1	1.6
4. Relationship with the context		7	11.1
	4.1. Dependent	4	6.3
	4.2. Independent	3	4.8
Total		63	100

The second axis of student-centered and learning-oriented teaching refers to objectives and intentions focused on student's transformation and development:

- Building autonomy in learning to prepare students to be independent and autonomous learners ($N=5$; 7.9): "Students must carry out activities mainly in terms of research and data processing (...) being autonomous, and perform tasks by themselves, autonomous" (P5).
- Student's intellectual development and conceptual change ($N=5$; 7.9), guiding them "To position themselves in this world and help them have the ability to reflect, criticize, and analyze what surrounds them" (P17).
- Preparation for solving future problems ($N=2$; 3.2%). One professor says:

It is true that the university must go further, it must also function as a visionary, people who project the future and anticipate certain events, so that at certain times we have professionals prepared to intervene in areas where we did not intervene before (P8).

- Construction of social personality/citizenship, focusing on the development of personal and social skills, formation of values and citizenship that culminate in a useful and beneficial intervention of the individual in the real society ($N=1$; 1.6%):

It should focus on two fundamental aspects, one of which is the integral formation of mankind (...) so that man must have, that is, can serve him as an entity or citizen and serve his country, as such. It means that the individual grows up with a useful personality [to society] and transmits values to society... he is also a useful individual to society (P3).

3.1.2. Teacher-centered and content-oriented conceptions of university teaching

In this description category ($N=10$; 30.2%), the focus is on a transmissive action of factual knowledge by the professor, pointing to the acquisition and application of different knowledge or contents by the student:

- In general ($N=8$; 12.7%), as “Teaching at university means transmitting technical-scientific knowledge, taking into account various aspects depending on the subject I teach” (P7).
- Professional preparation of the student ($N=6$; 9.5%): “The university is where you will prepare future staff, future technicians, people capable of intervening in certain domains or professional areas” (P8).
- Teaching as intentional and planned by the teacher ($N=4$; 6.3%). As one participant clarifies, “Teaching at the university, from my perspective, is a properly process of planned contents” (P16).
- Application of what was taught ($N=1$; 1.6%), “And putting our knowledge into practice according to the need (...) The teacher, when teaches, should tell the student how to apply these contents” (P6).

3.1.3. Teacher competencies- centered conceptions of university teaching

This description category expresses the central idea that teaching is closely related to certain specific knowledge and skills that the professor possesses ($N=12$; 19%), such as:

- Pedagogical ($N=4$; 6.3%; “It must imply preparation to teach, we often face situations that people want to teach but are not prepared to teach,” P15) and diversified knowledge ($N=3$; 4.8%; “Being a teacher does not only mean having knowledge of a certain area,” P8), as well as having technical-scientific qualification ($N=1$; 1.6%); the latter case is verbalized by a participant as follows:

Higher education in Sao Tome is still very incipient, it is an experiment, insofar as the system itself lacks, in many senses, the basic necessary conditions for quality education. For example, it is necessary to have a qualified teaching staff that does not yet exist, despite the efforts that have been made, there is still no properly qualified teaching staff. (...) In some cases, teachers have good technical and scientific preparation (P11).

- Relational and social skills ($N=2$; 3.2%), “A teacher must realize that he must know what education is because he is here to educate. He must know how to be” (P6).

- Intellectual openness, willingness to updating and reflection on their-own teaching action ($N=2$; 3.2%), like the following professor says:

For me, teaching at the university is, above all, being willing to learn, because I see a university professor as a restless student; therefore, the professor must be someone with a great predisposition to do research, he must be someone with the capacity to do a systematic self-assessment of what he teaches (P9).

3.1.4. Context related conceptions of university teaching

This last category of description refers to ideas about the relationship between university teaching and the context and was the one with the lowest number of verbalizations ($N=7$; 11.1%). Professors conceptualize teaching at the university in relation to the context in two antagonistic ways:

- Dependent on the cultural and geographic context ($N=4$; 6.3%). A participant asserted:
He must be aware of the geographic location of his school, of the surrounding population, because the school cannot function in isolation from society, because we educate and instruct society. So, there must be an interaction between society and the school, including nowadays there is a lot of talk about education for citizenship (P6).
 - Independent of context ($N=3$; 4.8%), “Well, I think that teaching differs little from a technical institution, secondary or higher level” (P10).

3.2. Facilitating aspects of teaching at the university

The analysis of the interviews produced six different categories of description about facilitating aspects of university teaching: resources; management and organization; professor’s action; students; faculty training; and professor – student relationship. [Table 2](#) illustrates the descriptive categories and the corresponding subcategories.

3.2.1. Resources

Various material resources were understood as facilitators of teaching at the university; this category registered the largest volume of information ($N=17$; 40.5%). Three types of teaching-facilitating resources were mentioned and perceived to be sufficiently available in the USTP:

- Facilities and equipment ($N=8$; 19%),
The school and the classroom, although small, they are not full; I meant to say that we have many students, they have a reasonable number of students, all seated, we have equipped classrooms, we do not have power outages here, because we have a generator (P10).
 - Material and didactic resources ($N=6$; 14.3%):
As for the library, we have some books, and I think we cannot criticize the library too much, there are many pdf books available on the internet, so students have more than enough resources to follow the classes, concerning to books (P14).

TABLE 2 Facilitating aspects of teaching at the university.

Category	Sub-category	N	%
1. Resources		17	40.5
	1.1. Facilities and equipment	8	19
	1.2. Materials and didactics	6	14.3
	1.3. Financial	3	7.1
2. Management and organization		8	19
	1.1 Communication/flexibility	4	9.5
	2.2. Interinstitutional cooperation	2	4.8
	2.3. Students' participation	1	2.4
	2.4. Graduate students' follow-up	1	2.4
3. Professor's action		7	16.7
	3.1. Technological and extracurricular activities	2	4.8
	3.2. Learning facilitation	2	4.8
	3.3. Resources sharing with students	1	2.4
	3.4. Cooperation between professors	1	2.4
	3.5. Motivation	1	2.4
4. Students		6	14.6
	4.1 Motivation	4	9.5
	4.2. Availability/no overload	2	4.8
5. Faculty training		3	7.1
	5.1. Qualification	2	4.8
	5.2. Knowledge update	1	2.4
6. Professor – student relationship		1	2.4
Total		42	100

- Financial resources ($N=3$; 7.1%), “What makes it easier is having financial resources to solve the problems” (P18) or

I think what makes it easier is the value of the fees themselves, they complain that it is too high, but I think it is a facilitator, as the value is low, there is no elitism in the university, everyone can come, can study, can participate (P17).

3.2.2. Management and organization

Organizational, management, and institutional culture aspects of the university were understood as teaching facilitators and four different aspects emerged:

- Communication/flexibility ($N=4$; 9.5%), “Must have communication between management, teachers and students, this facilitates” (P15):

An administration that facilitates everyone's work. The administration must make equipment available, it must be open, it must be available on Saturdays, for example, allowing teachers to work with students, ..., and if a teacher asks for it, the administration must make rooms available to work; fortunately, our university has had this facility (P9).

- Inter-institutional cooperation and partnerships ($N=2$; 4.8%), “external and internal partnerships as I said, we have

our technological agronomic center, there are often cutting-edge technologies that the university cannot offer, but if we take our students to these places, they will have access” (P6).

- Participation of students in academic life in an organized way through the student association ($N=1$; 2.4%), “the existence of something that is very important in higher education is having a very strong student association, which, above all, can help students in the first phase of integration” (P12).
- Follow-up of students after graduation ($N=1$; 2.4%), “it would be, after the students leave school, we would have the possibility, in agreement with the schools, to follow-up students, at least a semester or a year to monitor their progress in practice and then release them” (P18).

3.2.3. Professor's action

University teaching was perceived as facilitated by five different aspects of professor's intervention:

- Extracurricular and technological activities ($N=2$; 4.8%), “there was a climate change fair and I attended with all the students (...) there we have the methodology, there is the part of the animals, insects that are pests (...) they went there to see” (P6); “Getting more involved in the technological process, internet, so that students have access to it, because today there is a quantity of knowledge and content spread out, students have to be guided on how to select knowledge, so if we manage to unite all these parts, we will certainly be improving other parts of higher education” (P4).
- Learning facilitation ($N=2$; 4.8%), “students are not autonomous when they come from secondary school, so we have this struggle for them to gain this autonomy; the knowledge is available, but deep down we want them to develop their own learning, progressively gain autonomy” (P14).
- Motivate students ($N=1$; 2.4%), “Motivation is important, and it is the role of the professor of each subject to motivate students, at least I try to do it, telling students what advantage they have studying mathematics, what they can do with their lives as mathematicians” (P9).
- Sharing resources with students ($N=1$; 2.4%), “in the biology department we have a small library, consisting of books that purchased by the professors, and these books are shared with the students” (P1).
- Cooperation between professors ($N=1$; 2.4%):

Then it also has to do with the core of the professors, I come from a department where we are very united, maybe because we have known each other for a long time, but it's that familiarity that exists, this spirit of mutual help that exists between us, communication makes it a lot easier (P19).

3.2.4. Students

In this category, the facilitating aspects of teaching relate to students in terms of their intrinsic or extrinsic motivation ($N=4$; 9.5%), there are others who came because they like mathematics, and there is also another fringe who came to take the course just for the sake of doing it; having motivated students who come with a desire to

learn, curious, critical, committed students, facilitates teaching (P9), and the availability/absence of work overload ($N=2$; 4.8%),

What makes teaching easier is having students available too and that does not always happen, we have many students who work, they are student teachers, student workers, student mothers, people who are overwhelmed with concerns, it does not favor the teaching-learning process (P11).

3.2.5. Faculty training

This category includes verbalizations about the training of the teaching staff as one of the facilitating aspects of teaching, referring to their qualification and technical-scientific preparation ($N=2$; 4.8%; “If we want quality, we will start with teaching and its qualifications, the level of academic preparation of teachers,” P15), and knowledge update ($N=1$; 2.4%; “Teachers who are concerned with the teaching process are concerned with buying books to keep up to date” P1).

3.2.6. Professor – Student relationship

The central idea of this residual category ($N=1$; 2.4%) highlights that relational aspects between professors and students facilitate teaching:

The teaching-learning process takes place fundamentally with teachers and students. The teacher is not the one who arrives in the classroom and transmits and expects the students to understand, he needs to interact with the students, it is this predisposition to interact with the students that I believe will greatly benefit and contribute to success (P8).

3.3. Barriers to university teaching

The analysis of the interviews produced seven different descriptive categories about aspects that make university teaching difficult: resources, students, faculty training, management and organization, quality of pre-university education, professor’s action, and professor-student relationship. Table 3 presents each category and respective subcategories.

3.3.1. Resources

This category highlights the lack of resources as an aspect that makes teaching difficult. This was the most mentioned obstacle ($N=24$; 40.7%) and was related to:

- Facilities and equipment ($N=11$; 18.6%):

There are several aspects that make teaching difficult, firstly the issue of adequate infrastructure for higher education, we need to evolve towards a university city, with cafeterias, with accommodation to make sure that students who come from other regions can accommodate, the laboratories for biology and chemistry students (P7).

- Teaching materials and resources ($N=8$; 13.6%), as for instance, “access to updated literature, (...) we have to have bibliographies, access to scientific teaching journals, (...) there is a lack of teaching materials” (P1).
- Financial Resources ($N=5$; 8.5%), “If we want to buy books, that’s another difficulty; we cannot buy books in Europe, our fee does not make it easy either, so there are people who do not even buy a book a year” (P18); “the problem that blocks us is the financial

TABLE 3 Barriers of teaching at the university.

Category	Sub-category	N	%
1. Resources		24	40.7
	1.1. Facilities and equipment	11	18.6
	1.2. Materials and didactics	8	13.6
	1.3. Financial	5	8.5
2. Students		11	18.6
	2.1. Previous knowledge	8	13.6
	2.2. Commitment/compliance with learning standards	2	3.4
	2.3. Extrinsic motivation	1	1.7
3. Faculty training		9	15.3
	3.2. Lack of continuous training	6	10.2
	3.1. Lack of pedagogical training	3	5.1
4. Management and organization		6	10.2
	4.1. Organization/management	3	5.1
	4.2. Student’s participation	1	1.7
	4.3. Interinstitutional cooperation	2	3.4
5. Pre-University education		4	6.8
6. Professor’s action		4	6.8
	6.1. Cooperation between professors	3	5.1
	6.2. Professor responsibility	1	1.7
7. Professor – student relationship		1	1.7
Total		59	100

problem. Because sometimes we have difficulties in acquiring teaching materials, inkwells, acquiring papers” (P10).

3.3.2. Students

Some aspects centered on the students were mentioned as aspects that hinder teaching ($N=11$; 18.6%). In particular, the low level of previous knowledge ($N=8$; 13.6; e.g., “The lack of prerequisites puts it right at the start, because it often forces us to have to lower the level a little, for them to follow,” P17), low commitment/compliance with learning norms ($N=2$; 3.4%; “they do not follow the rules of the regulation, that also makes it difficult, they do not arrive on time, they arrive tired, and then there is a learning load, and all these things contribute to that,” P5), and extrinsic motivation ($N=1$; 1.7%):

The biggest problem we have, I like to call it students’ carelessness, I say this because students come to the university to obtain a diploma, but they lack that culture of dedication and, above all, the willingness to learn something, and because they want the diploma more than the knowledge, they do not have this responsibility; and when there is no responsibility it is very difficult (P9).

3.3.3. Faculty training

This category ($N=9$; 15.3%), refers specifically to the lack of pedagogical training ($N=3$; 5.1%; “teachers are important, but they

have to have a pedagogical component,” P7) and the lack of continuous training ($N=6$; 10.2%):

We are talking about professors who have a master's, PhD and other knowledge, but spend 3, 4, 5 years without continuous training. We are saying that continuous training is important, it must be something that is always dynamic, and it is not worth if we are here teaching the same thing 10 years later, we need to have opportunities to improve that (P4).

3.3.4. Management and organization

Institutional management and organization were understood as a barrier to university teaching ($N=6$; 10.2%), referring specifically to three facets:

- Institutional organization/management ($N=3$; 5.1%), “with skills that allow us to understand better and better the work of management, school administration, and also the management of university institutions” (P8).
- Interinstitutional and international cooperation ($N=2$; 3.4%) as illustrated in the following excerpt,

Our university is new, and it was very good to have implemented this university, because it is an open door for national and international researchers, and not only that; what we must do is establish partnerships, open up to the world, bring the world to us and also search for more knowledge (P6).

- Student participation in the university ($N=1$; 1.7%):

I think the university was created because of the students and I think the students should be integrated into the university, not just as students, I do not know if the student's association works well here but establishing a partnership between the students' association and the university [would be important], because students must be informed about the university (P2).

3.3.5. Quality of pre-university education

In this category, the focus was placed on shortcomings in pre-university education with subsequent impact on university teaching, making it more difficult ($N=4$; 6.8%):

Because in secondary education there are many disruptions, the programs are not fulfilled 100%; so, often the content that begins in the seventh grade and must continue in the eighth grade, that is, this chronological sequence sometimes fails, in addition the quality of teachers in primary and secondary education must be improved (P15).

3.3.6. Professor's action

In this description category, the focus is placed on the teacher's action as a barrier to university teaching ($N=4$; 6.8%), and two aspects of this action were highlighted:

- Difficult cooperation between teachers ($N=3$; 5.1%):

I also think that this difficulty could be overcome, if we did not live in isolation; because there are professors who have easier communication with others, have other strategies, are easier to reach, a more collaborative work group is needed, (...) we [could] work on a common strategy in which each one's area was considered; but I think there are strategies that can be agreed, I think that would help too (P17).

- Professor's lack of responsibility ($N=1$; 1.7%):

Sometimes I observe a teacher who should start class at 7:20, he starts at 9:40, and half an hour later he is leaving, and the students said that this teacher is like this; this teacher should never be in the classroom teaching, because he is stealing the state and is not fulfilling the objectives for which he was called, so with these situations it is very difficult to achieve the objectives of teaching and learning (P15).

3.3.7. Professor – Student relationship

In this category, the focus is placed on the teacher-student relational proximity, seen as being able to weaken a fair evaluation of the student:

I see the interaction as a process that can also make it difficult, because when the teacher creates a relationship with the students and, if he is not rigorous, he can later assign a grade that the student does not deserve (P4).

4. Discussion

The current study aims to identify professors' conceptions on university teaching and facilitators and barriers to teaching in the public USTP. Four main conceptions of university teaching emerged, and multiple factors were considered as facilitators and barriers to teaching.

4.1. Conceptions about university teaching

Regarding the conceptions of university teaching by Sao Tome and Principe professors at the existing public university, two types of conceptions more frequently mentioned are consistent with the student-centered/learning-oriented and the professor-centered/transmission-oriented conceptions of teaching systematically found in previous studies (e.g., Kember, 1997; Åkerlind, 2004; Ashwin, 2006; González, 2011; Tigchelaar et al., 2012; Degago and Kaino, 2015; Cheng et al., 2016).

The most mentioned student-centered and learning-oriented conception of teaching can be grouped into: (a) teaching as the process to facilitate learning (help students to understand, two-way interaction between professor and student, relationship between peers and participation as a way of sharing and building knowledge, pedagogical differentiation); and (b) teaching objectives and intentions focused on student transformation and development (autonomy in learning, conceptual change, preparation for solving future problems, building personality and citizenship that contributes to society's development). However, important aspects of the student-centered conception of teaching, such as problem solving, intellectual development, and conceptual change, or critical thinking, have little expression. It seems that, despite the highest number of verbalizations, student-centered teaching conceptions are not fully developed by the USTP professors at the time, as found in other studies (e.g., Degago and Kaino, 2015).

The conceptions of teaching centered on the professor considers that students' learning depends exclusively on the professor's action, decision, and knowledge. These professor-centered conceptions of teaching and oriented towards the transmission of contents are related to an instructional paradigm. On the other hand, student-centered

and learning-oriented conceptions of teaching are consistent with the paradigm of learning advocated by important pedagogues (e.g., Freire, 1992) and international policies for higher education, and are a key element in the Bologna process established in Europe (UNESCO, 2010; OECD, 2018).

In this study, two other conceptions of university teaching emerge. First, the conception of teaching centered on teacher's competences which encompasses two types of competences. Some are related to professional qualities, such as scientific knowledge of the contents to be taught and pedagogical knowledge related to teaching methods. This is more related to an instructional paradigm and a role centered on the teacher. Another set of competences relates to higher-order personal characteristics or relational, communicative and cognitive personality traits of the professor (for instance, reflexivity, willingness to know, and openness to new ideas and knowledge). These last competencies are even more sparsely mentioned by professors and seem related to the student-centered learning paradigm. In their review of typologies of conceptions and approaches to teaching, Almeida et al. (2022) also identified these two aspects in the conception of the role and pedagogical orientation of university professors. Overall, the emergence of conceptions of teaching centered on professor competences can, in part, be explained by the reality of university education in Sao Tome and Principe. For instance, the lack of continuous training and of involvement in research also mentioned by the participants (to be discussed below) both limit their opportunities to update their knowledge and reflect on their role (Aguilar, 2022) and make professors competences a more salient subject.

Second, a contextual conception of university teaching emerges encompassing two distinct and antagonistic conceptions, namely as independent or dependent on the teaching context. The conception of context-independent teaching considers that teaching should be the same in any circumstance, academic degree or socio-cultural reality, and shares a traditional view of teaching in which students are all equal and learn the same way. This conception seems to be anchored at a macrosystem level. In turn, the conception that university teaching is related to the context clearly refers to the reality of Sao Tome and Principe and considers that teaching must consider the geographical and cultural aspects of the country, its population, and the national education system. Likewise, the student-centered conception of teaching included a few contextual aspects at the microsystem level (e.g., classroom), referring to pedagogical differentiation according to the needs or characteristics of the students. Thus, the context-dependent conception of teaching expands the attention to various contextual levels (Bronfenbrenner, 1979), possibly to perceive teaching as a procedure that articulates knowledge with the experience of the students and the local culture, therefore promoting a meaningful learning (Keykha et al., 2021).

4.2. Facilitators and barriers to university teaching

The same type of aspects has been seen as both facilitators and barriers to university teaching by the USTP professors: resources, university management and organization, training and action of teachers and students. In addition, the fragile quality of pre-university education is also referred to as an aspect that hinder university

education. Despite the commonalities in the categories, there are also specificities when the focus is placed on facilitating aspects or barriers.

Resources are the most mentioned aspect either as facilitators and sufficiently available, or as barrier and deficiencies in university teaching at the USTP. In both cases, facilities and equipment, materials to support teaching and learning, and financial resources were mentioned. The more frequent barriers refer to the purchase and access to updated literature, teaching materials, laboratories, and even basic resources such as paper or ink cartridges for printers. Regarding resources more directly focused on students, the amount of fees was perceived as a facilitator, while the lack of cafeterias and accommodation for those coming from other regions were seen as barriers. The focus on these last aspects is very important because they could contribute to reducing social inequalities, increasing access to higher education and qualified human resources, fundamental for the economic and social development of the country (Altbach et al., 2019) and the achievement of the SDGs by 2030 (United Nations, 2015). The widespread lack of resources is indeed an aspect that hinders teaching and its quality. To implement quality teaching, universities must guarantee a set of mechanisms, tools, facilities and equipment, funding, material, and human resources that respond to their needs and that, when coherently assembled, result in quality teaching (OECD, 2009; Greatbatch and Holland, 2016).

The university management and organization categories are slightly more frequent as facilitators than barriers to teaching. Institutional cooperation and student's participation are pointed out both as facilitating and as hindering aspects. The need for students' follow-up after graduation is mentioned only as a facilitating aspect. At the organizational level, the mentioned facilitators are administrative flexibility, internal and external partnerships, and sharing of resources and equipment. As barriers, the lack of training and competences in management and administration of the university system, and the incipience of collaborative partnerships between national and international institutions are mentioned. In addition, only one participant mentions the poor participation and involvement of students in the university, which may result from a more traditional university culture, non-participatory or collegial, in which students are not seen as elements with a relevant role in university organisms. Weaknesses in the organizational dimension, governance and leadership of universities have also emerged as difficult aspects in other African universities (Zhou, 2020). In the participants' discourse, the need for an institutionalized system of internal and external quality assessment of the university system still does not emerge, which is considered one of the essential points of quality teaching (Lagrosen et al., 2004; Seyfried and Pohlens, 2018).

The greater differences in the descriptive categories of the conceptions about facilitating and barrier aspects of university teaching concerns teacher's action. The more numerous and diversified descriptive categories emerge as teaching facilitators, namely: (a) professors' actions to promote technological and extracurricular activities; (b) learning facilitation through the support provided by the professor to build autonomy in learning and student motivation; (c) sharing resources with students; and (d) cooperation and mutual help between professors. Cooperation difficulties between teachers and their irresponsibility or lack of commitment to the teaching process are the aspects mentioned as difficulties. Nowadays, an education of quality requires professors' involvement and the assumption of a sustainable commitment with the quality of teaching and its outcomes

(OECD, 2009). Some of the important aspects of the teacher's action, such as facilitating learning or the pedagogical use of information technologies, are barely mentioned. Only one verbalization refers to the sharing of knowledge with colleagues, suggesting that professors do not usually discuss everyday adversities with each other and do not feel supported and included by the entire group. The teacher action to motivate students also appeared only once, which contrasts with its core role among student-centered/learning-oriented conceptions of teaching. On the other hand, the professors seem not aware of how important their own motivation is to facilitate students learning. Indeed, some studies on excellence in teaching, as perceived by students, indicate that they want to be taught by enthusiastic and competent, empathetic, accessible, helpful and patient professors able to encourage them to develop their full potential (Greatbatch and Holland, 2016).

Regarding university students, professors consider their intrinsic motivation (enjoyment, curiosity) and full availability (that is, absence of other occupations and excessive time occupation, as the jobs many students have) as teaching facilitators. The fragility of students' previous knowledge, non-compliance with norms and schedules, tiredness and a limited extrinsic motivation (e.g., merely obtaining a diploma) are considered barriers to teaching. This brings to the fore the relationships between contextual and personal aspects of students with an impact on their conceptions of learning, approaches, motives, and strategies, underlying different learning situations and leading to qualitatively different learning outcomes (Entwistle and Peterson, 2004).

The qualification, technical-scientific preparation and updating of university professors at the USTP are seen as teaching facilitators, but the absence of pedagogical training and continuous training are considered obstacles to the quality of university teaching.

According to the OECD (2009), the employment relationship and career progression of professors can influence the quality of teaching. In Sao Tome and Principe, some professors are teaching at the university as a secondary activity and have other professional activities. This is also the case in other African, Asian and Latin American countries, pressured by the growing demand for higher education and where professors and qualified professionals have low salaries (McCowan, 2018). This double job pattern impacts on the commitment and challenges that lead to the investment and development of the university as a whole and jeopardizes the quality of the new professionals educated by the universities. In the other hand, in the national context of Sao Tome and Principe, professors search on their own means to create conditions for their professional development, and the costs (compared to the income earned) are a major obstacle (Aguiar, 2022). These are fundamental aspects to consider, since the quality of the faculty (concerning scientific and pedagogical updating) greatly depends on their initial and on-going training. In this way, the definition of a permanent training policy by the USTP could contribute to increasing the quality of teaching.

The teacher-student relationship appears very residual, both at facilitating teaching and making it difficult. The interaction between professor and student is considered an overall facilitator, but it is mentioned that the proximity between professor and student can compromise evaluation's objectivity. This can be related to the simultaneous presence of student-centered and transmissive conception of teaching, respectively. Therefore, a dilemma seems to emerge in the faculty opening room to unclear ideas about the

preferred role and type of interaction between teacher/student in higher education. However, there is some consensus about the relevance of the student-centered conceptions of teaching for quality teaching, where student is active and stimulated through interaction and dialogue (González, 2011; Han et al., 2015).

A few USTP professors' verbalizations explore a broader dimension of the educational system, when they consider that the deficiencies of secondary education have repercussions in university teaching and learning, and that greater importance should be given to the quality of teaching and qualification of primary and secondary education teachers. In the same vein, Evans and Acosta (2021) consider that achieving high-quality education in Africa requires interventions at each of the previous levels of higher education, that is, preschool, primary and secondary education. The conceptions about the quality of teaching in terms of facilitators and barriers seem to be closely related to the context of university teaching in Sao Tome and Principe.

Although higher education rates in Africa remain among the lowest, as in Sao Tome and Principe, the number of students has been rising following the increase in primary and secondary education. At the same time, governments are increasingly aware of the importance of higher education for the economic development of countries (Mohamedbhai, 2014). In Mohamedbhai, 2008 studied the effects of massification in public universities in seven African countries (e.g., Senegal, Mozambique, Ghana, Kenya, Burkina Faso, and Zimbabwe), concluding that this had negative consequences for these universities. The decline in the quality of higher education as a result of its massification was also observed in Akalu's (2016) study at an Ethiopian university.

The economic development of countries has repercussions on the structures of universities, the teaching strategies of professors and the characteristics of student learning, which influences and conditions the quality of teaching (Greatbatch and Holland, 2016), as should be the case at Sao Tome and Principe. However, universities' mission goes beyond the building of knowledge and qualification of human capital. It also includes promoting the development of the country, participating in the social construction of the country, and a more inclusive and democratic society (Yarra et al., 2017). Therefore, it is necessary to overcome the traditional view of the university and teaching as a mere transmission of knowledge and qualification of people, redirecting it towards a teaching centered on the student and new learning skills (e.g., learning to learn, critical thinking), enabling students to deal with rapid and continuous social and labor market changes. The lack of equipment, financial and material resources for the training and research of professors and students, as well as the weaknesses in the qualification of the faculty reported by the USTP professors, are also challenges to universities in other African countries, such as Mozambique, Cape Verde and Angola (Pinto et al., 2022). In general, the quality of education in Africa presents weaknesses at the various education levels, which, in the specific case of university education in Sao Tome and Principe, challenges the preparation of the teaching staff, available resources, teaching conditions, its quality and the assurance mechanisms (e.g., McCowan, 2018; Hanh et al., 2020; Aguilar, 2022; Amadhila and Guest, 2022). The strengthening of international partnership and cooperation between African universities and universities in other countries (including other Portuguese-speaking countries), could contribute to overcoming, in the medium and long run, some of the difficulties

faced by the USTP, with a view to changing concepts about university teaching and its mission, improving professors' skills and the quality of their teaching, research, and innovation.

4.3. Limitations and contributions to research and practice

Despite the care taken to ensure maximum variation in the sample, the study presented some limitations regarding the participants. The voluntary character of participation may eventually have had the effect that the participants were those with greater openness in relation to the construction of knowledge and research. Other research is needed to extend this first study, including quantitative research and studies to focus conceptions of teaching (and of learning) of other agents (including policy makers and students) and conceptions on the factors affecting its quality. The possibility that professors from different scientific areas or from different organic units of the university present different conceptions of teaching and quality of teaching also deserves further investigation.

The current study suggests a certain mix between student-centered/learning-oriented and teacher-centered/knowledge transmission-oriented conceptions of university teaching. However, the conception of teaching centered on learning and on the student is still underdeveloped. We consider that the two types of conceptions are not mutually exclusive, being aligned in a continuous growth and development of the professor. The data obtained suggests the need for professors to become more aware of their conceptions of teaching and training that promote their reflection and development of more sophisticated conceptions (e.g., Trigwell et al., 2005; Leger and Young, 2014).

Qualitative studies about conceptions of university teaching and perceived facilitators and barriers are as scarce as needed in Africa. This is the first study on this topic carried out in Sao Tome and Principe and, in our view, it makes important contributions to the improvement of universities. By focusing on facilitators and barriers to university teaching, it contributes to a greater understanding of the challenges faced by university teaching in Sao Tome and Principe, from the standpoint of some of its most influential agents, its faculty. This awareness has implications to the achievement of the SDG proposed by the United Nations (2015) concerning access and quality of higher education in this medium-developed country. Contributions to improving higher education in Sao Tome and Principe emerge at different levels: (a) the qualification of the teaching staff in terms of initial and continuous training, highlighting the importance and role of their conceptions of teaching and helping to guide the design of continuous training aimed at helping teachers to change and develop their teaching conceptions, practices and pedagogical interventions; (b) political and university decisions, namely in the organization and programming of actions conducive to improving the quality of teaching and learning in university education, bearing in mind that the guidelines or impositions of policies for higher education are not enough for the change of professors' conceptions and practices of teaching (Almeida et al., 2022); (c) encouraging further research relevant to the specific context of university teaching in Sao Tome and Principe. Furthermore, higher education has pervasive,

beneficial effects towards other specific education subSDG and the society in general. Improving the quality of higher education also means improving the training of teachers, educators and other professionals who intervene at different levels of education (e.g., early development, pre-school, primary and secondary school, vocational training, lifelong learning, citizenship in general), more access to education of quality for all, and more educated and competent people (including the most vulnerable) for decent and creative jobs, to actively participate in the development of the country.

Data availability statement

The raw data associated with this article will be made available by the authors, upon request. Requests to access these datasets should be directed to LG, mlg@uevora.pt; HA, helgaaguair@hotmail.com.

Ethics statement

The research project was approved by the Scientific Council of the University of Évora. An authorization and informed consent were obtained from the USTP Dean's Office for conducting the interviews with the professors. The participants provided their written informed consent to participate in this study.

Author contributions

LG and HA: conceptualization, methodology, data curation, and project administration. HA, LG, MJC, and HP: formal analysis and writing – review and editing. HA: investigation. LG, MJC, and HA: writing – original draft and visualization. LG: supervision. LG and HP: funding acquisition. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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