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Teacher Professional Development in Higher Education: The Impact of Pedagogical Training Perceived by Teachers

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Abstract: This paper aims to analyze the impact of a pedagogical training program aimed to promote teacher professional development in a higher education institution in Portugal. Based on a mixed-methods approach, the study evaluates the satisfaction of 36 higher education teachers with the pedagogical training program offered and discusses its impact on teachers' perceptions of teaching practices, conceptions, and professional development. The results from the questionnaires applied to participants, including multiple choice questions and open-ended answers, indicate high satisfaction with the implemented training program. Based on this case study, the authors discuss the implications of findings for teacher professional development and identify key characteristics for the design of successful pedagogical training programs in higher education.

Keywords: higher education; pedagogical training; teacher professional development; university teachers; perceived impacts; teaching practices

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1. Introduction

What does creating a successful and impactful teacher development program for higher education teachers require? How long should it be? What are the underlying principles and features which it should entail? Who can/should be the trainer? In summary, what are the main elements for effective pedagogical training and how can pedagogical training contribute to the development of higher education teachers? These questions are at the heart of the discussion about the importance of teacher pedagogy for the quality of teaching and learning in higher education [1–7]. Fabriz et al. [2] argue that professional development programs for academic teaching staff should include activities contributing to positive experiences of teaching-related competencies and skills as well as to deeper reflection on academic roles in higher education. Muammar and Alkathiri [3] discuss the design and delivery of professional development programs based on what really concerns faculty members attending professional development programs in higher education. The study conducted by Yürekli [7] explores how pedagogical competencies of instructors affect the perceptions of students by focusing on three key dimensions of classroom pedagogy, namely delivery (provision of content and facilitation), communication, and assessment. The communication dimension was found to have the greatest differences in results. This idea is also aligned with Kalipci [8], who stresses the importance of communication and personal relationships as crucial qualities and skills for being a mentor in teacher professional development programs.

In this paper, we present a study that aims to analyze teachers' perceptions about a pedagogical training program implemented at a private higher education institution located in Portugal. The objective of the study is twofold: (i) to analyze teachers' satisfaction with the pedagogical training program, in terms of its organization and planning, the

methodologies used, and the trainer's overall performance; and (ii) to discuss the impact of the pedagogical training on teachers, namely in regard to their perceived teaching conceptions, practices, and experiences. Based on this case study, the authors seek to offer new recommendations for academic developers, educators, and other stakeholders in higher education concerned with the design of successful pedagogical training programs for higher education teachers.

1.1. Teacher Professional Development in Higher Education

According to Darling-Hammond, Hyler, and Gardner [9], effective professional development can be defined as structured professional learning that results in changes in a teacher's knowledge and practice. Desimone [10] argues that effective professional development possesses a strong content focus, features active learning, is collaborative and aligned with relevant curricula and policies, and provides sufficient learning time for participants. Pedagogical staff development at European higher education institutions presents many differences according to the systems, types of institutions, and disciplines [11]. This can take many different forms and may vary depending on the institution and its priorities but generally includes a mix of workshops, seminars, coaching, mentoring, and other forms of support. It may be mandatory or voluntary. However, the goal is always to provide instructors with the support they need to continually improve their teaching skills and stay current with the latest trends and practices in higher education.

A growing interest in this field can be found across European higher education institutions as more and more aim to promote pedagogical training programs to enhance the quality of teaching and learning and address the challenges of student-centered learning [12]. Reports from European organizations provide evidence of the importance of pedagogical staff development in higher education institutions. For example, the European Association for Quality Assurance in Higher Education (ENQA) has developed a set of Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) [13]. The ESG highlight the importance of providing support for the professional development of academic staff, including training in new pedagogies and teaching methods. The European University Association (EUA) also published a report on the state of teaching and learning in the European higher education area [12]. The report emphasizes the need for universities to prioritize staff development, arguing that training and support for academic staff in their teaching role is essential to ensuring that they can design and deliver high-quality teaching and learning experiences. In general, these reports provide strong evidence of the importance of pedagogical staff development in European higher education institutions and highlight the need for ongoing training and support for instructors to ensure high-quality teaching and learning experiences for students.

The literature has also addressed the reasons why professional development programs in higher education are needed [14]. These are critical to promote teaching quality, fostering a culture of continuous improvement, supporting faculty career development, meeting the needs of diverse student populations, and supporting institutional goals. Although academics enter the teaching profession with excellent knowledge of the content on their fields, most of them received very little preparation for teaching [15]. The literature on teachers' professional development has focused on several topics, including the support provided to teachers at their institutions [16,17], the impact of such programs on faculty members and students [18–20], and the different purposes underpinning professional development activities [3], among others. The literature on pedagogical training and professional development in higher education calls attention to the fact that pedagogical training, rather than aiming at the mere acquisition of techniques, should, above all, give priority to providing spaces for joint reflection of teachers on the curriculum and on pedagogical practices and decisions [21]. Tutoring and mentoring programs are also key issues to support pedagogic innovation and changes in teaching practices [22–25]. Evidence from the literature shows that tutoring or mentoring can be a valuable component of professional development for higher education teachers, helping them to improve their

teaching effectiveness, reflect on their teaching practices, develop new skills, and gain new insights into teaching and learning. Mentors' roles can be to guide the novice, give feedback on key aspects, encourage them in their work, and provide guidance [25].

1.2. Design of Professional Development Programs in Higher Education

Darling-Hammond, Hyler, and Gardner [9] studied the features of effective professional development programs based on a review of recent studies of successful professional development models and identified seven common design elements of these approaches, namely: (1) they are content focused; (2) they incorporate active learning strategies; (3) they engage teachers in collaboration; (4) they use models of effective practice; (5) they provide coaching and expert support; (6) they include time for feedback and reflection; and (7) they are of sustained duration. The authors provide a research-based description of the kinds of professional development that lead to powerful professional learning, instructional improvement, and deeper student learning and conclude that programs should be "linked to identified teacher needs, should ensure that teachers have a say in the type of learning they require to best support their students, and should be regularly evaluated so that quality can be continually improved" [9] (p. 23).

Other important issues explored in the literature include how these professional development programs are prepared and delivered and what really matters to faculty members attending professional development programs in higher education. Muammar and Alkathiri [3] suggest that teacher satisfaction with such programs involves a favorable rating of the following factors: (1) achievement of the program objectives; (2) appropriateness of the program topics; (3) appropriateness of the program activities; (4) duration of the program; (5) academic developers' teaching skills; (6) appropriateness of the program objectives; and (7) academic developers' skills in discussion management. Identifying these factors will make it easier to understand and conceptualize the tasks and activities that should receive more attention when designing a faculty development program [3].

A systematic review developed by Sanchez-Tarazaga and colleagues [25] provides and overview of the actions and programs developed at university institutions for the professional development of new academics. The results indicate key elements of university induction programs for early-career academics such as program design, program content, and program assessment. For program design, issues such as the voluntary nature [26], prior diagnosis, institutional incentives, and recognition are highlighted. In regard to the program content and assessment, the review points to a balance between theory-practice, the teaching identity [27] and also continuous improvement and institutional support as practical implications for program design and content.

1.3. The Impact of Teacher Professional Development Programs in Higher Education

Professional development in higher education has a positive impact on teaching quality and effectiveness, self-efficacy, beliefs about teaching, student outcomes, and overall job satisfaction [2,5,6,28–34]. Such programs also foster teachers' well-being [35] and employability [36]. Team-based interventions, particularly, have been shown to promote teacher's reflection on their teaching practice, a focus on student-centered teaching, and pedagogical knowledge [37]. When analyzing studies on the impact of pedagogical training or professional development initiatives involving higher education teachers, it is possible to verify that the majority of the studies are based on data collected from teaching staff and using pre- and post-test surveys [1,2,4–6,18]. However, qualitative studies [38–40], a systematic review [20], and mixed-methods approaches [4,29] can also be found. A recent example of such a thread in research is the work of Odalen et al. [5], who explored if pedagogical training courses for university teachers have the desirable effects on the participants. The study was based on the application of a pre- and post-survey to 183 university teachers from Sweden's six largest universities. Findings were surprising, as results showed changes in participants' approaches to teaching, both in the direction of more student-centeredness and more teacher-centeredness. The study by Fabriz et al. [2] also adopted a pre- and

post-test design, with a group of German university teachers who participated in a comprehensive training program on academic teaching. The findings showed improvements, regarding teaching-related self-efficacy, self-concept, and subjective knowledge about teaching and learning. Previous studies, such as the one by Postareff, Lindblom-Ylänne, and Nevgi [18], analyzed the impact of university teachers' pedagogical training on approaches to teaching and self-efficacy beliefs. The results indicated that pedagogical training had an impact on scores in scales measuring conceptual change/student-focused approach and self-efficacy beliefs. Even when the influence of teaching experience was held constant, in order to find out the unique effect of pedagogical training, the results remained significant. Vilppu et al. [6] explored whether university teachers' interpretations of teaching can be affected during a short online pedagogy course. Results showed that the training successfully changed participants' interpretations from a knowledge transmission perspective to a learning facilitation perspective of teaching. Short online training programs have the potential to influence participants' interpretations of teaching–learning situations, especially when participants are not very experienced in teaching. The authors conclude that pedagogical training should be offered at the early stages of teaching careers [6]. This finding is also supported by Odalen et al. [5], who refer the positive effects of pedagogical training mainly for participants with fewer years of teaching and discuss whether a policy of making these courses mandatory for all university teachers implies an overestimation of their impact. Additionally, a qualitative study carried out by Weurlander and Stenfors-Hayes [40] on the impact of a staff development course revealed that the course contributed to changes in the participants' approaches to teaching and learning as well as in their practice. The reported changes range from using new teaching techniques or tools to fundamentally transformed views on learning and, thereby, on being a teacher.

The evaluation of the impacts of such programs should also take into account that teachers participating in pedagogical training have specific motivations and needs and that their satisfaction with the quality of these programs is influenced not only by the quality of the contents but also by the relational environment that facilitates the discussion of their practices with the trainer and with other fellow teachers. Finally, the evaluation of the quality of pedagogical training in higher education should also include the impacts that teachers perceive in the ways they see themselves as teachers and the conceptions they have about learning and their students.

In Portugal, the standards and guidelines for pedagogical training in higher education are defined by the Portuguese Ministry of Science and Higher Education and the Portuguese Agency for Assessment and Accreditation of Higher Education (A3ES) [13,41,42]. Programs for teacher professional development in higher education in Portugal include, for example, pedagogical training courses, mentoring and coaching programs, and the development of institutional teaching and learning centers that provide support and resources for academic staff. These centers may offer workshops, seminars, and other professional development opportunities, as well as access to teaching resources and technology. In sum, by investing in teacher professional development, Portuguese higher education institutions demonstrate their commitment to continuous professional development of academic staff and improving the quality of teaching and learning.

This paper aims to analyze teachers' perceptions about a pedagogical training program implemented at a private higher education institution located in Portugal. Portugal has made significant progress, in recent years, in terms of pedagogical innovation policies and practices implemented in higher education institutions, leading to the adoption of new teaching methods and educational technologies to enhance the learning experience of students [42,43]. However, scientific evidence based on research on the impact of the implementation of these programs is still scarce and highly needed. Thus, this paper seeks to evaluate the satisfaction of teachers with the pedagogical training courses carried out and, furthermore, discuss the impact of the pedagogical training on teachers' conceptions, practices, and experiences.

2. Materials and Methods

The case study reported in this paper refers to a private higher education institution located in the north of Portugal. Concerned with the pedagogical challenges and demands faced by higher education institutions, the rectory of the university created, in 2017, the Center for Excellence in Teaching (CET). This center aims to support academic staff development, provide pedagogic training for teachers, create pedagogical resources, and enhance the dissemination of best practices and teaching quality at the university (Fernandes et al., 2018 [44]). It focuses on the development of pedagogical training for academic staff in diverse and active teaching-learning methodologies (e.g., team-based and project-based learning, flipped classroom).

The first pedagogical training program was organized and implemented in the academic year of 2017/2018. A short online survey was sent to all teaching staff to collect data about current teaching methods (Bonwell, 1991) and training needs. The information from this survey was essential to provide the context analysis and needs assessment to develop a training program aligned with the teaching needs of academic staff. The first training program was based on five different training modules (Project-based Learning; Scholarship of Teaching and Learning; Team-based Learning; Flipped Classroom; Curriculum Development for Course Coordinators), with a duration of 12 h each. Afterwards, in the academic year of 2018/2019, some changes were introduced in the format and duration of the modules, according to the suggestions provided as feedback by the participants in the previous first training program, resulting in a greater diversity of themes and number of training moments. In total, there were ten training modules available for teachers, with a duration that varied from 2 h to 9 h.

According to the objectives of our study, the following research questions were defined:

1. How do teachers evaluate their satisfaction with the pedagogical training program offered?
2. Did participation in the pedagogical training impact teachers' perceptions about teaching practices, conceptions, and professional development?
3. Based on this case study, what are the characteristics of successful higher education pedagogical training programs?

The participants in the study were 36 higher education teachers (80.6% women) from five different departments: Economics and Management; Law; Psychology and Education; Tourism, Inheritance, and Culture; and Science and Technology. Participants taught in bachelor's and master's degree programs, and their teaching experience ranged from 1 to more than 25 years. The collection of demographics and academic background was limited to essential information to prevent the participants' indirect identification and, therefore, guarantee anonymity and decrease social desirability when answering the questionnaires. Although this decision inhibited the possibility of further data analyses (e.g., compare answers based on departments or years of experience in teaching) the research team deemed it preferable to maximize participants' confidence to openly express their perceptions of the engagement in the training program.

Data collection included the administration of two questionnaires at two different moments. The first questionnaire (Questionnaire 1) aimed to evaluate the satisfaction of teachers with the pedagogical training courses. The questionnaire included four dimensions of teachers' perceptions of the training sessions, namely: organization of pedagogical training (3 items; e.g., "The topics/contents covered in the training were relevant"), methodologies used at the training courses (3 items; e.g., "The activities developed will be useful for my teaching practice"), trainer's performance (1 item; "The trainer's performance corresponded to my expectations"), and general satisfaction (1 item; "In general, I am satisfied with the final result"). All items were answered in a 5-point Likert scale (1 = "Strongly disagree", 5 = "Strongly agree"). Participants were also given the opportunity to share their opinion and make suggestions for future courses through three open-ended questions ("In my opinion, the most positive aspects of this experience were…"; "In my opinion, the least positive aspects of this experience were…"; "To improve the next sessions, I

suggest…"). The questionnaire was sent by email to participants shortly after they had finished each module.

The second questionnaire (Questionnaire 2), a follow-up survey, aimed to analyze the impact of the pedagogical training on teachers' conceptions, practices, and experiences and it took place 1 year after the training sessions were held. The questionnaire was based on participants' self-reported experiences and the perceived impacts of prior pedagogical training on four main dimensions: teaching experience, experienced challenges and difficulties, perceived changes in pedagogical practices and conceptions, and willingness to change in the future. The questionnaire also provided an open-ended question for participants' comments about these suggestions.

Participants were informed about the aims of the surveys. Anonymity and confidentiality were guaranteed. All participants provided appropriate authorization through an informed consent. No compensation was provided upon the completion of the surveys and participation was voluntary.

Data analyses included both quantitative and qualitative approaches. The quantitative responses to each item in the questionnaires were explored through descriptive analyses (percentages, means, and standard deviations) using IBM-SPSS 22.0. The qualitative answers to the open-ended questions of the questionnaires were subject to a content analysis of the principal and recurring topics identified by participants, following a thematic analysis as suggested by Bardin [45].

3. Results

In this section, we present the results from the quantitative and qualitative data analysis, organized in two parts.

3.1. Findings from Quantitative Data

3.1.1. Teachers' Satisfaction with the Pedagogical Training

Results from the survey applied at the end of the training sessions (2017/2018 and 2018/2019) to evaluating teachers' satisfaction with the pedagogical training sessions are detailed in Table 1.

Table 1. Teachers' Satisfaction with the Pedagogical Training.

	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	M	SD
Organization of the training							
1. The contents explored in the training were relevant.	0	2.0	6.1	32.7	59.2	4.49	0.71
5. The objectives of the training were accomplished.	0.7	2.7	13.0	34.2	49.3	4.29	0.85
6. The available resources in the training were adequate.	0.0	1.4	9.6	33.1	55.9	4.43	0.72
Methodologies used in training							
2. The activities developed during the training will be useful for my teaching practice.	0	5.5	11.6	41.1	41.8	4.19	0.85
3. I participated actively in the development of the activities.	0.7	0	9.7	37.9	51.7	4.40	0.72
4. The activities developed were adequate.	0.7	2.8	13.2	35.4	47.9	4.27	0.85
Trainer's performance							
7. The trainer's performance met my expectations.	0	0	9.0	24.1	66.9	4.58	0.65
General satisfaction							
8. In general, I am satisfied with the final result/output.	0.7	2.1	8.9	33.6	54.8	4.40	0.79

Overall, the organization of the training was very well evaluated by participants. More specifically, almost all participants agreed that the contents explored in the sessions were relevant (91.9%), that the established goals were accomplished (83.5%), and that the materials made available during training were appropriate (89%). In addition, data from the open-ended questions emphasized that participants highlighted the opportunity to acquire new knowledge on active learning strategies and explore different teaching

strategies. When asked about methodologies used during training, the vast majority of participants evaluated them very positively: 82.9% considered that those activities were useful or very useful for their teaching practice, 89.6% believed they had active or very active participation in the training activities, and 83.3% assessed training activities as adequate or very adequate. The trainer's performance was also very well evaluated, as 91% of participants considered that it had highly or very highly reached their expectations. The perceptions of success in training were reinforced by participants' evaluations of overall satisfaction. Indeed, 88.4% admitted being satisfied or very satisfied.

3.1.2. Impact of the Pedagogical Training Perceived by Teachers

In general, the perceived impacts of the pedagogical training were positive according to participants' self-reported experiences (Table 2). Teachers reported confidence in their competency to play their professional role and perceived the training program to have a positive impact in their teaching practice.

Table 2. Perceived Impacts of Training.

	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	M	SD
Teaching Experience							
I feel that I have the necessary pedagogical competencies to develop my role as a university teacher.	0	2.8	8.3	58.3	30.6	4.17	0.70
The training increased my confidence in my role as a university teacher.	0	19.4	16.7	27.8	36.1	3.81	1.14
The training was useful for the improvement of my teaching practice.	0	2.8	25.0	33.3	38.9	4.08	0.87
Participating in the training sessions contributed to my professional development as a teacher.	0	11.1	25.0	25.0	38.9	3.92	1.05
Challenges and Difficulties in the Implementation of Pedagogical Changes							
I experienced difficulties in the implementation of new pedagogical strategies in my curricular unit.	16.7	36.1	22.2	13.9	11.1	2.67	1.24
I needed more support in order to adequately implement new pedagogical strategies.	11.1	33.3	27.8	13.9	13.9	2.86	1.22
Perceived Changes in Pedagogical Practices and Conceptions							
I implemented new pedagogical strategies in my curricular unit as a result of participating in this training.	2.8	16.7	25.0	33.3	22.2	3.56	1.11
I am satisfied with the results I achieved in the implementation of new pedagogical strategies in my curricular unit.	8.3	5.6	30.6	30.6	25.0	3.58	1.18
Participating in this training helped me to question myself about traditional conceptions about teaching and learning.	5.6	11.1	16.7	47.2	19.4	3.64	1.10
Willingness to Change							
I am interested in participating/motivated to participate in pedagogical training.	0	5.6	5.6	27.8	61.1	4.44	0.84
Participating in this training allowed me to reflect about my practice as a teacher.	0	5.6	11.1	27.8	55.6	4.33	0.89
I aim to implement new pedagogical strategies in my curricular unit.	0	8.3	19.4	47.2	25.0	3.89	0.89

When asked whether teachers experienced difficulties in implementing the pedagogical strategies they learned throughout their training, more than half of the teachers reported they experienced very few or few difficulties. However, 13.9% and 11.1% agreed or totally agreed, respectively, they had such troubles. This finding supports the self-reported need for more support in the implementation of such principles and strategies. Regarding the experienced challenges and difficulties, 13.9% of the teachers agreed and 13.9% totally agreed that they needed additional support to implement innovation in their pedagogical practice.

3.1.3. Perceived Changes in Teaching Conceptions and Practices and Willingness to Change

When reporting whether they had implemented changes in their practices as a result of the training, 33.3% and 22.2% of the teachers agreed or completely agreed, respectively, they had introduced changes in their practices. It is important to mention that 25% of the teachers neither agreed nor disagreed with this affirmation, which may suggest that they may have troubles in pinpointing what can be considered changes. This finding supports the self-perceptions regarding satisfaction with the implementation of changes, as 30.6% of the teachers were neutral in this aspect. However, it seems that the training may have had a slighter larger impact on changing teachers' conceptions, rather than the perceptions about practices, as 47.2% and 19.4% agreed or completely agreed, respectively, that the training motivated how they reasoned about traditional pedagogical practices. Average scores in this question tend to be slightly higher in this item compared to the former.

Self-reported willingness to change seems to be the dimension on which the training had more impact as the average scores on these items tend to be higher than the ones obtained for professional identity, challenges and difficulties, and changes in pedagogical practices and conceptions. A total of 61.1% of the teachers reported to completely agree that they are motivated to learn more and participate in pedagogical training.

In addition, a total of 27.8% and 55.6% agreed or completely agreed that the training helped to think about their own pedagogical practices, and 47.2% agreed and 25.0% totally agreed that they aim to implement new pedagogical strategies in their classes.

3.2. Findings from Qualitative Data

The qualitative data from the open-ended questions of the questionnaires were subject to a content analysis of the principal and recurring topics identified by participants [45]. The emerging categories are presented in Table 3, which summarizes the positive aspects of the training program and suggestions for improvement according to the organization and delivery of the training program.

Table 3. Emerging categories from the qualitative data analysis of surveys.

Categories	Positive Aspects	Suggestions for Improvement
Organization of the training program	• Contents of the program (knowledge about active learning approaches, development of new skills, deepening learning)	• Duration of the program (longer sessions, more time to explore and practice, calendar of sessions during non-lecture periods) • Participant requirements (different levels of training, voluntary or mandatory participation, maximum number participants)
Delivery of the training program	• Sharing/discussion (experiences, ideas, interactions with colleagues, reflection, dynamics and relationships between peers) • Practical component (applicability of contents to the classroom context, examples) • Performance of external trainer (quality of performance, trainer/trainee relationship)	• Practical component (the need for more examples from different field areas, application in specific contexts)

3.2.1. Positive Aspects of the Training Program

In the open-ended questions, the most positive aspect concerning the methodologies used in the training was the applicability of the contents to the context of teaching practice, as mentioned by one of the participants: "the possibility of applying what we learned in a specific curricular unit in the next academic year". The opportunity for greater sharing, reflection, and discussion of ideas amongst peers and the adequacy of the proposed activities were also very evident from participants' qualitative feedback: "sharing ideas and experiences among participants", "joint reflection on teaching experiences", "exchange of ideas on the implementation of solutions and fostering critical thinking", "the strategies, activities and interaction implemented were adequate". The quality and performance of the trainer was also highlighted by participants as a positive aspect of the training program. The trainer's communication skills, availability and ability to adapt the sessions to the participants' needs were some of the topics noted.

3.2.2. Suggestions for Improvement in Future Programs

Participants were asked to provide suggestions for the improvement of future training. The majority of the answers related to this question focused on assets related to the organization of the training, such as the duration of the program ("the duration of the sessions should be shorter"), the number of trainees ("fix a maximum limit of participants (example: max.20)", and the establishment of different levels of training ("think about training by levels: basic, intermediate and advanced").

Feedback from participants regarding the training sessions was also useful and important to prepare and adjust the organization of the training sessions in the following academic year. The design of the training program followed an action-research cycle, where the planning, execution, and evaluation phases aimed at developing a continuous process of improvement and reflection [44].

In the follow up study, when participants were asked about the challenges and difficulties in the implementation of pedagogical changes, findings from teachers' comments suggest that these teachers need support for "making videos for classes", "simulation games", "developing pedagogical materials", as well as material resources such as "classrooms with good sound and video technical resources". Teachers referred the need of supervision, more direct contacts with the trainer, or even of collaborative work. In addition, one teacher wrote "The training has been very interesting, but generic and not adjusted to the different scientific domains, which have diverse pedagogical needs and opportunities". The analysis of this comment and the quantitative appreciation of challenges and difficulties in the implementation of pedagogical improvements may suggest that these teachers need some help to translate what they have learned in their training into practical strategies adjusted to their specific pedagogical realities. These teachers would benefit from participating in supervision or other types of individual coaching or mentoring.

Feedback from the external trainer of the program was also collected through a written narrative, which also pointed out the importance of rethinking certain issues in the organization of future training sessions:

- Invite faculty staff to organize some of the training sessions and share their expertise and experience.
- Provide support/coaching/mentoring to faculty who are implementing new pedagogical approaches.
- Evaluation of training sessions should take place immediately after the end of each session, either online or onsite.
- Organizing follow-up sessions for a deeper understanding of the impact of the implementation of the new approaches.

4. Discussion and Conclusions

This study aimed to analyze teacher satisfaction with two pedagogical training programs carried out at a Portuguese higher education institution in the academic years of

2017/2018 and 2018/2019 as well as the perceived impacts of the trainings regarding their conceptions, practices, and experiences.

The first research question, concerned with the satisfaction of participants with the pedagogical training program offered by the university, revealed positive results and a very high level of satisfaction considering the items evaluated, in particular those related to the trainer's performance and the relevance of the contents and the strategies used, which enhanced the active participation of teachers. These results confirm the importance of the dimensions pointed out by Darling-Hammond, Hyler, and Gardner [9] for an effective teacher professional development program. These features include, for instance, the use of active learning strategies, engaging teachers in collaboration, and providing time for feedback and reflection. Through the qualitative data collected, the participants in our study highlighted the interaction amongst peers and the opportunity to share experiences as one of the most positive aspects of the training program. However, when asked about the application of the activities developed during the training in their future teaching practice (item 2 of Table 1), teachers revealed a lower level of satisfaction. This finding could be understood as a result of the short duration of the training program, which could mean that the teachers did not have enough time to apply what they learned during the training. This calls attention to the importance of developing a sustainable teacher development program and the need to provide greater support and coaching to teachers after the training sessions [9]. Future editions of the training program should focus on providing teachers with supervision and mentoring facilitated by education experts or peer-based teacher mentoring groups [37,46,47].

In regard to the second research question, which aimed to analyze if the participation in the pedagogical training had impact on teachers' teaching practices, conceptions, and professional development, it is possible to conclude that the perceived impacts of the training program were not as positive when compared to the overall satisfaction of participants immediately after the conclusion of the sessions. The results are medium or medium-high. Even though teachers demonstrate high motivation to learn and reflect on their practices, the truth is that the response averages regarding the perceptions about effective implementation of change are lower. On the other hand, although perceptions are positive, changes in the perception of competence and self-confidence are also more modest. This fact can somehow be related to the short duration of the training sessions and absence of individual or peer support/mentoring for the implementation of new strategies in the classroom [9,46]. In fact, teachers seem to value the training and feel satisfied with it, but to transform it into effective change, something more is needed—a relationship of supervision with modeling, followed by reflection, as in initial teacher training [48]. Furthermore, it is important to note that this study focused exclusively on teachers' self-reported perceptions of the impacts of the training on their practice in the classroom. The study did not evaluate effective pedagogical transformation or other-informant information (e.g., peer observation, students' surveys), which would be valuable in future research.

The third and last research question focused on the characteristics of a successful pedagogical training program for higher education teachers and provided a set of recommendations for stakeholders and educators about the design of professional development programs. Thus, the main characteristics and principles underlying a successful pedagogical training program for higher education teachers, based on the experience and findings from the case study analyzed in this paper, can be summarized in three main points:

- The organization and planning of training should focus on relevant topics with clear objectives and adequate materials for participants.
- The methodologies used in the training should promote the active engagement of participants through a wide variety of strategies that engage participants in active learning with modeling.
- The impact of the pedagogical training on teachers' practices and conceptions should be supported by initiatives that strengthen the teachers' confidence, stimulate the

development of research on teaching practice, and build a community of practice that provides opportunities for individual coaching/mentoring.

It is crucial to identify the type of training that meets teachers' satisfaction and has the greatest impact on teachers' conceptions, practices, and willingness to change. Teacher professional development programs should take into account the previous knowledge and learning experiences of teachers, along with their specific needs for training [10]. Needs may vary depending on length of experience, self-confidence in the role of teacher, mastery of studies, etc. In addition to this, creating the conditions for effective professional development programs [9,48] is a challenging but necessary task for higher education institutions, as seen previously and explored in this paper.

Limitations in the collection of personal and academic background information about the participants inhibited further quantitative analyses, including the exploration of the influence of the participants' department, types of courses they taught, and teaching experience on their perceptions about the received training. This can be an important focus for future studies. Future work should also consider studies with self and peer evaluation (heads of departments, students, trainers), pre/post designs (this is a limitation of our study), and in-depth follow-up interviews to evaluate the effective impacts on practices, namely on professional identity and conceptions about the value of active involvement in learning. It is also important to go deeper in understanding and providing empirical evidence of the conceptual underpinnings of the training programs [49] and purposes and models of professional development programs developed by the centers for teaching and learning or academic structures in higher education institutions [50,51]. On the other hand, it should also include qualitative data from the observation of the dynamics established between the participants during the training sessions. An action research or change laboratory intervention methodology can be useful to monitor future moments of these teachers' professional development. Satisfaction results are always strongly contextualized either by organizational culture or by personality characteristics and other personal attributes such as values and motivations: this context must be evaluated in the future.

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