




Curricular Vulnerability of Young Physical Education Teachers in Tunisia Through the Prism of Innovation

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Abstract

Background: Since gaining independence, Tunisia has faced challenges in providing quality education for its youth. One key area is the training of future teachers. Although efforts have been made to enhance teacher preparation, the programs at the "Superior Institutes of Physical Education and Sport" (ISSEPs) seem to be struggling. Graduates, who complete their Bachelor's degree under the License-Master-Doctorate (LMD) structure introduced in 2006, often wait over five years before becoming Physical Education (PE) teachers.

Objectives: The present study aimed to examine potential vulnerabilities in the PE training programs at ISSEPs, with the goal of suggesting possible innovative perspectives.

Methods: Twelve semi-structured interviews were conducted to obtain the reactions of participants regarding the training of PE teachers at ISSEPs. Seven semiotic cards related to the training at ISSEPs were distributed to the interviewees, who were asked to express their thoughts freely.

Results: A lexical analysis of the interview transcripts was performed, followed by a categorical analysis of the corresponding outputs. These analyses revealed categories of ideas that highlighted a series of problems, including: i) difficulties with professional integration, ii) the absence of a clear set of competencies to guide the initial training, iii) a lack of support for graduates in the years between completion of their studies and becoming PE teachers, iv) the content of academic courses, and v) a focus on high-level sports training in physical and sport activities.

Conclusion: These results highlight several vulnerabilities in the PE teacher training programs at ISSEPs. To address these issues, potential recommendations include developing a clearer set of competencies to guide the initial training curriculum, improving the integration of theoretical and practical elements, and providing greater support and mentorship for graduates in the transition period before they become practicing PE teachers. Additionally, updating the LMD structure to allow for more thorough development of professional teaching skills could help strengthen the preparedness of new PE teachers. Implementing such changes could enhance the effectiveness and relevance of PE teacher training in Tunisia, better equipping graduates to succeed in physical education courses.

Keywords: Education, Employment, Innovation in Education, Pedagogy, Professional Development, Skill Acquisition, Teacher Training, Tunisian Education

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1. Introduction

The present study aims to examine potential sources of vulnerability in the training of future Physical Education (PE) teachers in Tunisia, with the goal of identifying possible innovative perspectives to enhance their preparation. Tunisia has four distinct institutes, referred to

as ISSEPs (Institut Supérieur du Sport et de l'Éducation Physique, or High Institutes of Sport and Physical Education), responsible for the initial training of PE teachers. These ISSEPs are situated within universities across four governorates: El Kef, Gafsa, Manouba, and Sfax. The current curriculum for PE teaching at ISSEPs spans 6 semesters, totaling over 2000 hours of educational



workload, after which students can obtain a Bachelor's degree and become eligible to serve as fully certified PE teachers.

Since 2005, the education of Tunisian PE teachers has taken place within the context of a broader reform effort to develop a "License-Master-Doctorate" (LMD) structure. However, the implementation of this reform has been limited by the country's socioeconomic climate (1, 2). Like many young adults in Mediterranean nations, educated Tunisian youth, including those who have completed PE teacher training, face significant challenges in accessing employment (3). During the 1990s and 2000s, the number of university students in Tunisia grew substantially, from 100,000 in 1990 to 350,000 in 2009, with only a slight decrease thereafter (to 335,000 in 2014) (2). While the pool of graduates expanded, the Tunisian economy was unable to generate sufficient qualified positions to absorb this growing labor supply. In 2010, young people around 25 years old represented approximately 40% of the unemployed population in Tunisia, with an observed correlation between unemployment and educational attainment (4). For example, roughly 40% of students who obtained a Bachelor's degree in 2011 remained unemployed in 2015 (2).

In this context, the initial training of PE teachers at ISSEPs has been weakened by a lack of job opportunities. Additionally, concerns have been raised about the suitability of ISSEPs educational programs to adequately prepare students for the realities of teaching PE. While the official curriculum allocates equal emphasis to scientific disciplines and physical/sports activities, scholars have noted a disconnect between the theoretical (scientific) and practical (teaching) components of the training (5). This disconnect may be exacerbated by a strong focus on high-level sports coaching within the initial PE teacher preparation (5). Furthermore, the limited duration of the 3-year ISSEPs program, compared to the 5-year teacher training common in other countries (leading to a Master's degree), raises questions about the development of essential professional teaching skills (6-9).

In summary, the initial training of Tunisian PE teachers appears to face both internal and external challenges that may generate vulnerabilities in students. The present study, therefore, aims to examine these potential vulnerabilities within the ISSEPs training programs.

2. Materials and Methods

Semi-structured interviews were conducted to elicit participants' perspectives on PE teacher training at ISSEPs in Tunisia. Interviewees were interviewed separately by the same researcher. Participants were informed of the broad focus of the study but remained unaware of any expected outcomes. Each interviewee was asked to respond to a series of cards designed based on Peirce's principles (10). The interviews were transcribed to enable textual analysis using specialized software (Alceste2012Plus©). The potential weaknesses of the initial PE teacher training in Tunisia and the vulnerabilities it may generate in graduates were examined through interviews with 12 participants

2.1. Participants

This study builds upon a previous conference presentation (11). The participant sample included 12 individuals: 4 directors (D; 1 female, 3 male) of the 4 Tunisian ISSEPs, 4 instructors (I; male, 35-43 years old) from these institutes, and 4 ISSEPs graduates (G; 3 female, 1 male, 23-29 years old) who had not yet been hired as PE teachers. This diverse group was selected to obtain perspectives from the key stakeholders involved in Tunisian PE teacher preparation. All participants engaged fully during the interviews, which took place in Tunisia in early 2017.

2.2. Semi-structured interviews

Participants were interviewed separately by the same researcher. Each interviewee was unaware of any expected results. At the start of the interviews, participants were simply informed that they were expected to share their views on PE teacher training in Tunisia. The interviews were recorded using a voice recorder.

During the interviews, each participant sat at a table with a set of plastic cards face-down. Participants were instructed to choose and turn over the cards one by one, then respond freely to the content. In alignment with semi-structured interview principles (12), the researcher then posed follow-up questions based on an interview guide to further explore relevant lines of discussion. Interview durations ranged from 30 to 45 minutes.

The interviews were initiated using 7 "semiotic cards" developed from Peirce's theoretical framework (10). These cards were divided into two categories (C1 and C2). The C1 category included 4 cards designed to elicit discourse

on the aims and objectives of PE teacher training in Tunisia, as well as its effectiveness for professional integration. The C2 category contained 3 cards to prompt discussion on the design and content of the PE teacher training programs. C1 and C2 corresponded to the two

main indicators of quality in formal teacher training curricula (6). **Table 1** provides an overview of the C1 cards and the potential follow-up questions used to facilitate and expand the interviewees' responses.

Table 1. Tools to interview on the aims, objectives and efficiency of PE teachers training in ISSEPs

Semiotic cards		Themes to question: examples
1	<p>Aims, Objectives, Priorities</p>	Type of aimed teacher Importance of PE teaching in the curricula
2	<p>Trainers-Students Ratio</p>	Types of supervision of the students Influence of the trainers-students ratio on the Efficiency of the learning of the students
3	<p>Initial / Continuous Training Teachers / Trainers</p>	Follow-up of the graduated students not yet recruited as PE teachers Type(s) of teachers benefiting from a continuous training
4	<p>Initial training / Employability</p>	Suitability of the initial training to teach PE Access to employment

The C2 category included 3 cards designed to initiate discussions around the design and content of the PE teacher training programs at ISSEPs (**Table 2**). These cards aimed to elicit participants' perspectives on:


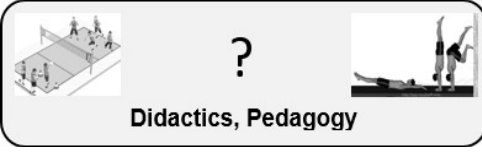

i) Contents of the Initial PE Teacher Training: Interviewees were prompted to describe and reflect on the overall curriculum and course offerings within the ISSEPs preparation programs.

ii) Didactics/Pedagogy of PE and Physical/Sport Activities: This card focused specifically on the components of the training related to teaching methods, strategies, and approaches for delivering physical education and sport-related instruction.

iii) Development of Skills for Teaching PE: Participants were asked to share their views on how the ISSEPs programs seek to cultivate the practical teaching competencies required for effective physical education delivery.

Similar to the C1 cards, the researcher used these C2 cards as a starting point and then followed up with additional questions to further elaborate on the participants' perspectives on the design and content of the PE teacher preparation curriculum. **Table 2** outlines the specific card contents and potential follow-up questions used to explore these dimensions of the ISSEP training programs.

Table 2. Tools to interview on the contents of the training of the PE teachers in ISSEPs.

Semiotic cards		Themes to question: examples
1	 <p>Training contents</p>	Importance of the scientific disciplines in the initial training Importance of sport in the initial training
2	 <p>Didactics, Pedagogy</p>	Type(s) of reference(s) for didactics of physical and sport activities Categories of pedagogical content knowledge in the training program
3	 <p>Actual PE teaching</p>	Construction of professional skills to teach PE Adaptation to the realities of PE teaching

2.3. *Lexical and categorial analysis*

The lexical analysis of the interview transcripts was conducted using the Alceste 2012Plus software. This analysis involves four main steps (13-15):

1. Transcription of the Interviews: The discourses of the 12 interviewees were transcribed into separate text files for the C1 and C2 categories. Within each file (referred to as the initial context units), the participant types (director, trainer, graduate) were encoded as external, or passive, variables.
2. Lemmatization: This step involves reducing the words to their base or lemmatized forms, allowing the software to group semantically related terms.
3. Hierarchical Descending Classification (HDC): The software performs statistical analyses to identify the most significant word associations and classify the text into distinct thematic categories.
4. Output: The analysis produces categories containing lists of lexemes (lemmatized words) that are statistically linked, as well as the associated elementary context units (ECUs, or text fragments) from which the calculations were derived. The influence of the external variables

(participant type) on the category formation is also assessed.

Following the lexical analysis, a categorial analysis was conducted to determine the meaning and implications of the identified thematic categories (16, 17).

3. Results

3.1. *Aims, objectives, and efficiency of PE teachers training in ISSEPs*

The lexical analysis of the interviews in the C1 category identified 5 thematic categories (Table 3). Category C1a, linked to the directors, suggests a weakly structured training program that fails to effectively prepare students for professional integration. The lexemes indicate a "gap" between theory and practice, with doubts about the ability of the training to develop the necessary "professional" knowledge and "skills" for the "PE profession." Category C1b, also associated with directors, indicates a lack of a clear framework for professional competencies and long-term teacher development. The discourse emphasizes the absence of a "reference table" to organize the training and the need for a stronger "strategy" to support PE teachers' ongoing skill improvement.

Table 3. Aims, objectives and efficiency of PE teachers training in ISSEPs: categories of lexemes.

Corpus (12 interviews)				
Categories (lexical analysis of the interviews)				
C ¹ _a	C ¹ _b	C ¹ _c	C ¹ _d	C ¹ _e
80ECUs (15%) 149lexems	66ECUs (11%) 112lexems	105ECUs (18%) 134lexems	126ECUs (22%) 142lexems	194ECUs (34%) 164lexems
D (54/46/33)		T (118/95/39)		G (52/74/40)
doubt (37 /6/100)	initial (76/15 /68)	laboratory (36 /8/100)	semester (61/21 /100)	Manouba (44/51 /71)
skill (37/13 /57)	training (51/72 /25)	sport (27/16 /55)	session (75/40 /70)	unemployment (42/27 /90)
knowledge (31/17 /100)	continuous (49/17 /50)	doctoral (26 /8/80)	pedagogy (53/39 /66)	state (32/35 /81)
relation (25 /4/100)	ISSEP (32/14 /40)	master (24/21 /60)	internship (40/38 /54)	salary (29/19 /90)
professional (20/10 /47)	difficult (21 /6/55)	department (22/13 /73)	practice (52/49 /52)	job (28/26 /79)
profession (18 /4/80)	inspector (19 /4/67)	scientific (20/12 /58)	theory (21/14 /67)	find (22/11 /100)
theory (18 /4/80)	integration (17 /7/41)	federation (19 /9/67)	didactical (13/13 /52)	dinar (21/16 /88)
gap (14 /8/67)	goal (9 /3/67)	train (18/11 /60)	pedagogical (13/28 /43)	club (14/11 /90)
practice (8 /20/24)	skill (7 /6/29)	thesis (13 /6/71)	insufficient (11 /7/64)	aerobics (14 /7/100)
scientific (5 /6/32)	professional (4 /10/20)	olympic (13 /5/80)	bad (10 /6/71)	unfortunate (14 /9/90)

Category C1c, linked to the trainers, emphasizes the importance placed on high-level sports and "scientific knowledge" in the training program, suggesting a focus on developing "BMD" (presumably a reference to fitness or athletic performance). Category C1d, associated with the graduate students, expresses the perceived lack of "relevance" in the initial training program, potentially due

to the disconnect between the content and the realities of teaching. Finally, category C1e, again linked to the graduates, highlights the absence of post-graduation support and "professional follow-up," suggesting a weakness in transitioning newly trained teachers into their careers. Examples of typical ECUs associated with each C1 category are shown in [Table 4](#).

Table 4. Aims, objectives and efficiency of PE teachers training in ISSEPs: examples of ECUs.

C ¹ _a	We lack a structured process of professional insertion from the initial training to the continuous training. It is time today to revise the current system which compromises the efforts of the students There is a gap between theory and practice, the students study scientific knowledge, and they will have to use other knowledge to teach PE.
C ¹ _b	Unlike the European countries, we are lacking a reference table of skills; what is the professional profile of a Tunisian PE teacher? We cannot answer. Besides the deficiencies of the initial training, the in-service training is not very developed.
C ¹ _c	You take champions in an Olympic academy where they are educated, you add researchers of the ISSEPs and research laboratories at their disposal. There are champions and maybe it is time to create in Tunisia an Olympic academy which would train these champions who have made a sporting career.

c1d	Moreover, 112 hours of internship on the whole... This is totally insufficient, 56 hours by semester, 2 hours a week, it is not enough.
	For example, we began the practical pedagogy courses during the second semester of the second year. I remember the session centered on handball: only 3 or 4 students have played the role of teacher.
c1e	It is catastrophic, after 3 years of studies in ISSEP, there is no support, no follow-up, and each graduated student tries to work in a sports club.
	My parents are worried for me, they told me to undergo another training in order to find a job; there is no continuous training of the PE teachers, only the best graduated students can make a Master's degree.

3.2. *Design and content of PE teachers training in ISSEPs*

The lexical analysis of the C2 category interviews identified 6 thematic categories (Table 5). Category C2a, associated with the directors, suggests the training

curriculum is overly "theoretical," potentially at the expense of practical, applied preparation. Category C2b, also linked to the directors, indicates an "abrupt transition" between the training program and the realities of PE teaching in schools.

Table 5. Design and content of PE teachers training in ISSEPs: categories of lexemes.

Corpus (12 interviews)					
Categories (lexical analysis of the interviews)					
c2a	c2b	c2c	c2d	c2e	c2f
84ECUs (20%) 117lexems	83ECUs (20%) 126 lexems	101ECUs (24%) 141 lexems	30ECUs (7%) 109lexems	32ECUs (11%) 98 lexems	76ECUs (18%) 104 lexems
D		T		G	
(6/25 /30)	(51/40/49)	(108/87/51)	(3/17 /10)	(41/29/19)	(63/59/38)
content (51/40 /56)	gap (20 /5/100)	sports-trainer (41/22/100)	psychological (77 /7/88)	ball (83/12 /89)	gymnastics (70/22/86)
sport (34/17 /74)	training (20/29 /43)	language (20/11 :82)	social (63 /5/100)	running (83/10 /89)	second (48/15 /92)
intervention (23/12/69)	reference (16 /7/100)	student (18/51 /41)	develop (55 /6/75)	pass (69/17 /58)	year (44/29 /59)
PE (21/23 /49)	didactics (14/21 /41)	french (14 /6/86)	perform (52 /9/57)	criteria (59 /5/100)	internship (42/19 /63)
science (19/15 /61)	pedagogical (12/23 /39)	player (11/10 /75)	physiological (51 /6/83)	specific (59 /6/86)	begin (34/11 /83)
volume (9 /6/63)	job (11 /4/80)	technique (5 /3/75)	taught (39 /4/80)	volleyball (48 /6/83)	introduction (26 /6/100)
schedule (9 /6/63)	create (11 /4/80)	sport-training (8 /5/71)	motor (37 /6:55)	leg (47 /4/100)	semester (25 /9/80)
theoretical (9 /12/44)	relationship (11 /4/80)	methods (8 /4/80)	age (18 /4/44)	arm (36 /4/80)	pedagogy (15/20 /43)
problem (8 /9/45)	skill (9 /6/63)	tactic (3 /3/60)	train (13/10 /22)	objective (30/11 :40)	beginning (12 /4/80)
unfortunately (8 /7/50)	alternate (7 /3/75)	arabic (3 /3/67)	athlete (8 /2/40)	technique (27 /7/41)	volleyball (12 /4/80)

Categories C2c and C2d, associated with the trainers, emphasize the focus on high-level sports and "scientific knowledge" in the training, consistent with the findings from the C1 analysis. Category C2e, linked to the graduate students, reveals a preoccupation with sport-specific "techniques," suggesting a gap in the development of

broader pedagogical competencies. Category C2f, also associated with the graduates, expresses concerns about the lack of "pedagogical" preparation during the training program. Table 6 shows examples of typical ECUs associated with each C2 category.

Table 6. Design and content of PE teachers training in ISSEPs: examples of typical ECUs.

C2a	The training content is too theoretical, the students tend to learn by rote to pass the examinations, especially in biological sciences or in anatomy; unfortunately, they are not used to solve complex problems.
	Unlike the science students, the PE students have difficulty to understand the lectures in ISSEPs which questions of the content of the training.
C2b	There is thus a difficulty to put into practice the content of the training, the didactics training, <i>i.e.</i> : to operate a successful transfer of learning.
	I have tried to create a Department of Educational Sciences to improve the design of the training and to favor a close linkage between theory and practice.
C2c	It is very important to teach the various roles of the basketball players; the trainer has to teach all these informations to the students.
	Although some people do not know how to manage the training of an athlete, they can manage a team during a match; we have to teach the different models of the sport trainer to the students.
C2d	The future PE teacher has to know the physiological demands of different physical exercises, the effect of a given physical exercise in teenagers and adults and how to develop physical abilities.
	The content of training should rather be centered on psychological, social, and pedagogical dimensions according to the age of the pupils and according to their stage of motor development.
C2e	The specific goal is to run as fast as possible by synchronizing arms and legs and without slowing down at the end of the race.
	For example, during a match of volleyball I observe the passes (directed upward vs. more horizontally); such observation helps me to organize my teaching.
C2f	Why not to train to teach from the beginning of the second year rather than during the second semester of the second year? It would give us more time to learn; during the first semester we practiced physical activities (handball, volleyball, gymnastics, athletics) like during the first year of training.
	Pedagogy courses begin during the second semester of the second year of training, it is too late because these courses begin almost at the end of the training, just before the internship of preparation for the professional life.

3.3. Summary

The analysis of the lexical categories and associated stakeholder perspectives suggests several key issues with the PE teacher training programs at the ISSEPs in Tunisia. These include: i) Weaknesses in the structure and relevance of the initial training program, as perceived by the directors and graduates; ii) Lack of a clear competency framework and professional development support, as indicated by the directors; iii) Overemphasis on theoretical, scientific, and

sport-specific content at the expense of pedagogical preparation, as expressed by the directors and graduates; and iv) Disconnect between the training program and the realities of teaching physical education in schools, as noted by the directors and graduates. The diverse stakeholder views highlighted the differing priorities and concerns regarding the design, implementation, and outcomes of the ISSEPs PE teacher preparation.

Table 7. Key-ideas by lexical category.

C1	a	D	Lack of structuration of the training/limited professional integration
	b		Absence of a clear goal of professional skills
	c	T	For a BMD structure centered on the high-level sport
	d	G	Lack of pertinence of the preparation to the teaching profession
	e		Lack of follow-up after graduation and towards a professional insertion
C2	a	D	Excessively theoretical content of the training
	b		Abrupt transition between training in ISSEPs and PE teaching
	c	T	High-level sport as a major reference for the education of the PE teachers
	d		Major importance of the scientific contents to train the PE teachers
	e	G	Understanding of the PE teacher as a sport technical trainer
	f		For a training program prematurely centered on the professional skills

Table 7 synthesizes the identified key-ideas in the discourses of the interviewees, as function of the determined lexical categories (Tables 3-5) and of the types of interviewees (D for Directors of ISSEPs; T for trainers, and G for graduated students).

Altogether, the D participants identified a weakness in the structuring of the initial training (C1a), the absence of a reference table of professional skills, and a lack of follow-up of the PE teachers along their career (C1b). They also considered that the content of the training is too theoretical (C2a) and that it induces an abrupt transition with PE teaching (C2b). The T participants expressed the importance they give to the high-level sport and to the scientific knowledge in the possible development of a BMD structure (C1c) and in the initial training of the PE teachers (C2c-d). Finally, the G participants regretted a lack of pertinence of their initial training (C1d) as well as the absence of a professional follow-up after graduation (C1e). As possible future PE teachers, they were also found centered on the sport techniques (C2e) while criticizing a lack of pedagogical training during their initial training (C2f).

4. Discussion

The present study was initialized from the observation of signs of weaknesses in the initial training of the PE teachers in ISSEPs and from the observation of a high rate of unemployment in the graduated students. This led to examine the possible curricular vulnerability of the young PE teachers in Tunisia from the interviews of the directors of the ISSEPs, of trainers of these institutes, and of graduated students not yet recruited as PE teachers.

The interviewees, and in particular the G participants, were found to be worried about the current problem of deficiency in employment (2) (C1a; Table 3 and Table 4). Some D and F participants also showed themselves pessimistic regarding this problem. One of them indicated for example: "We train future unemployed persons who will have to wait for a long time before possibly becoming PE teachers." Such idea was moreover quite recurrent in the discourses: "The recruitment by the Tunisian State cannot absorb all the graduated students. Goodbye the PE domain in Tunisia. [...] There will be no recruitment until 2019"... Our results are in agreement with the studies of Calmand, Kocoglu and Sgarzi(2). These authors emphasize the difficult entry on the job market for education graduates. Young people are affected by long-term

unemployment, which refers to a gap between the year of obtaining the diploma and the year of hiring.

To address this challenge, the ISSEPs and relevant government agencies should work to better align the supply of PE teachers with projected demand, through improved workforce planning and targeted enrolment management.

Despite the socio-economic situation of the country (2), two sectors of training exist in the ISSEPs since 1996, which are respectively dedicated to the PE teaching and to the sport coaching. The T participants showed however a particular interest for this second sector (C1c; Table 3, Table 4 and Table 7). They also tended to refer to the social field of the high-level sport to consider the education of the PE teachers (9) (C2c; Table 5, Table 6, and Table 7). Our results are in agreement with the studies of Chamseddine, Mekni (9). These studies have shown a sporting conception in the teaching of physical education. These studies have shown a sporting conception in the teaching of physical education. According to these studies, the only acquisitions in physical and sporting activities seem to be the primary objective in physical education courses.

To address this imbalance, the training programs should place greater emphasis on developing well-rounded PE teachers focused on providing quality instruction and fostering holistic student development, rather than simply training high-performance athletes.

In addition, the discourses of the T participants suggested the importance they give to the scientific knowledge in the initial training of the PE teachers (C2d; Table 5 and Table 6). This emphasis on the scientific knowledge is for example reflected by the following example: "We try to train a PE teacher who has an adequate knowledge of the physiology applied to the sport training [...]". Although the discourses of the interviewees did not specially focus on any problem of relation between theory and practice (5), the D participants considered the content of the training as too theoretical (C2a; Table 5 and Table 6). The D participants also indicated that the global structuring of the content of the training might be improved (C1a; Table 3 and Table 4). In this sense, Bali (5) showed the absence of functional articulation between the teaching and learning of gymnastics and that of biomechanics in initial training of physical education teachers in Tunisia. These findings make the training program very theoretical and very far from the training requirements.

To address these concerns, the training programs should strive to strike a better balance between theoretical knowledge and practical, applied preparation, ensuring that

PE teachers develop both the conceptual understanding, and the hands-on skills required for effective instruction. This allows future teachers to observe the aims of teaching physical education.

While the G participants regretted weaknesses in the construction of the professional skills required to teach PE (8) (C1e; Table 3 and Table 4 / C2f; Table 5 and Table 6), the D participants considered that the current training leads to an abrupt transition between the courses in ISSEPs and the teaching of PE (C2b; Table 5 and Table 6). At this level, the discourses of the interviewees emphasized two main possible problems. First, the absence of a reference table of professional skills to organize the training was noted by the D participants (C1b; Table 3 and Table 4). At this level Bali, Zayed (8) have shown the need for reflection on how the integration for physical education students in the preparatory training for working life allows to integrate into the professional environment. This is possible through the development of professional skills in teaching physical education and sports.

To address this, the ISSEPs should develop a clear, coherent framework of the core competencies required of PE teachers and use this to guide the design and sequencing of the training curriculum. Second, the lack of a general strategy for the development of the professional skills of the PE teachers throughout their career was also emphasized. The D participants and certain F participants (C1a; Table 3 and Table 4/ C2b; Table 5 and Table 6) noted the absence of a general process of development of the professional skills from the initial training to the continuous training (8). To remedy this, the ISSEPs and educational authorities should implement a comprehensive system of pre-service preparation, induction support, and ongoing professional development to foster the sustained growth of PE teachers' expertise.

5. Limitations

Since this study is pioneering in examining the curricular vulnerabilities of PE teacher training in Tunisia, it has certain limitations that need highlighting. The small sample size of 12 participants may not fully capture the diverse experiences of all stakeholders. Additionally, the reliance on semi-structured interviews introduces potential interviewer bias, as the single researcher's presence might have influenced responses. The cultural and educational context specific to Tunisia may limit the broader applicability of the findings. Furthermore, the qualitative

focus, while insightful, lacks quantitative data for a more comprehensive understanding. Future research should consider a mixed methods approach to address these limitations and validate the findings.

6. Conclusion

In conclusion, the analysis of the interviews revealed two main areas for improvement in the organization of PE teacher training in the ISSEPs in Tunisia: the overemphasis on the field of high-level sport, and the lack of a clear framework of professional competencies to guide the training curriculum. While these issues need to be further investigated, the study also found that those responsible for the training programs are aware of these problems and have begun taking steps to address them. A project is underway to develop a reference table of professional skills for PE teachers, and new Departments of Educational Sciences have been created within the ISSEPs to help regulate the training program. Additionally, there appears to be a growing dynamic of scientific research in the field of physical education, which may contribute to enhancing the relevance and quality of the training content. The initial training of Tunisian PE teachers is currently in a transitional period, having undergone a reform that reduced the overall training duration from 4 years to 3 years. The success of this transition will likely depend on the ability to develop a training system that is more centered on cultivating the professional competencies required of PE teachers. To further support this effort, considerations should be given to establishing a comprehensive competency framework, expanding the educational science components of the curriculum, and potentially introducing a dedicated Master's degree program focused on the didactics and teaching practices of physical education in the Tunisian context. Carefully monitoring the evolution of PE teacher training and maintaining a commitment to continuous improvement will be essential as the programs adapt to the evolving needs of schools and students.

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Ethical Approval and Consent to Participate

Ethical review and approval were waived for this study by the local ethical committee of ISSEPs Ksar Said

university, due to the fact that the research does not require recourse to an ethics committee in accordance with the legislation of the country of origin. The study also complied with the ethical and procedural requirements of the journal for the conduct of sports medicine and exercise science research.

Availability of Data and Materials

The datasets examined in this study can be obtained from the corresponding author upon a reasonable request.

Consent for Publication

Informed consent was obtained from all participants involved in the study.

Competing Interests

The authors declare that they have no conflict of interest to disclose.

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Authors' Contributions

Conceptualization, Ph.L., P.F., C.A., I.S.; methodology, P.F., I.S.; writing - original draft preparation, I.S., Ph.L., C.A., P.F.; data analysis, I.S., Ph.L., C.A., P.F.; writing - review and editing, I.S., Ph.L., C.A., P.F., TD. All authors have read and agreed to the published version of the manuscript.

Declaration

None.