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Physical Education Preservice Teachers Adaptations to Lesson Plans in an Introductory Methods Class

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Abstract: The purpose of this study was to investigate the adaptations made to core practices in lesson plans (LPs) during the first methods class in a physical education teacher education program. In addition, it was assessed whether the adaptations to core practices were classified as modifications or refinements. Trained coders assessed preservice teachers' (PSTs) (n=71) adaptations to LPs following their teaching episode in frisbee and parkour during an introductory methods class. They also classified the adaptation as either a modification (i.e., substantial change) or a refinement (i.e., finetuning). Overall, 156 adaptations were coded in frisbee and 342 in parkour, with an average of 7 adaptations per lesson plan for both frisbee and parkour. Respectively task presentation (36% of all adaptations for frisbee and 32% for parkour), active supervision and monitoring (20% for frisbee and 25% for parkour), management (20% for frisbee and 15% for parkour), and content development (16% for frisbee and 23% for parkour) were adapted the most by PSTs. In contrast, adaptations for goals and assessment (5% for frisbee and 2% for parkour), and rules and routines (3% for both frisbee and parkour) were rarely made. Most adaptations were modifications instead of refinements, except for active supervision and monitoring. This research deepens our understanding of how preservice physical education teachers develop adaptive competence in a first methods class.

Keywords: *Core Practices, reflection-on-action, practice-based teacher education, supervisor feedback, teacher development*

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INTRODUCTION

Teaching is a complex process where the teacher acts as a decision-maker (Ward et al., 2022). The interactions between the teacher and individual students is often unpredictable (Doyle, 1986). Teachers must therefore be able to assess teaching situations, the planned lesson content, the specific teaching context, and adapt accordingly (Xie et al., 2021). The competence of teachers to adapt to the teaching context and to the individual learning needs of students is called adaptive competence (Brühwiler & Blatchford, 2011). For example, during the first lesson learning to throw

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the frisbee, the teacher might notice that students frequently drop the frisbee because they have problems catching it correctly. In planning the lesson, the teacher had not anticipated this could be a problem. The teacher calls the class together and explains the two-handed catch and uses the metaphor of a "crocodile bite" to strengthen students' understanding of how to catch the frisbee. During the practice that follows the teacher immediately notices an improvement in the students' successful catches and decides to integrate the crocodile metaphor into the task presentation for the next class. This metaphor is now generalized from one class to another, and has become part of the teachers' instructional task repertoire when teaching frisbee. This vignette illustrates adaptive competence of a teacher. The development of adaptive teaching skills is considered a key competence in teacher education and professional development (Anthony et al., 2015).

Adaptive competence aligns with Shulman's (1986) concept of Pedagogical Content Knowledge (PCK), which he described as the way teachers organize, represent, and adapt instruction to the diverse interests and abilities of learners (Shulman, 1986). This includes adapting their teaching representations and instructional tasks based on the teaching context, student progress, and unforeseen situations that may arise. Adaptive competence can be considered an element of PCK and represents the ability to combine and apply theoretical knowledge and teaching experiences to optimize the learning process for students (Cho et al., 2024; Xie et al., 2021). Research has demonstrated a solid relationship between content knowledge and PCK (Kim et al., 2018). Content knowledge in physical education has been operationalized by Ward (2009) into two distinct domains: common content knowledge (CCK) and specialized content knowledge (SCK). The former contains knowledge about rules, etiquette, technique, and tactics. The latter refers to knowledge about instructional task progressions, and knowledge about common errors that students are likely to make and how to correct these. Researchers have consistently found that when teachers' content knowledge increases, their PCK improves (Ward et al., 2020). A teacher with strong PCK achieves better learning outcomes for students through a stronger and more appropriate selection of tasks, higher-quality task presentations, and task adaptations for individual students (Iserbyt et al., 2019; Kim et al., 2018). In the studies by Iserbyt et al. (2019, 2024) and of Kim et al. (2018), significant learning outcomes in excess of one standard deviation compared to a comparison group were achieved by teachers who had improved their PCK after specific training on content knowledge.

Practice-Based Teacher Education Movement

The challenge for teacher education programs is to find a balance between theoretical knowledge and practical experience (Ward et al., 2022). The theory-practice gap is a common criticism and refers to the curricular dominance of theory that is not useful for the everyday practice of teachers (Darling-Hammond, 2021). There is little agreement on the best ways to support teachers in learning to implement practices and develop flexibility in applying appropriate teaching strategies (Von Esch & Kavanagh, 2017). Practice-based teacher education (PBTE) considers a good balance to bridge the gap between theory and practice, thereby reducing the reality shock for novice teachers (Forzani, 2014, Standal et al., 2014). PBTE focuses more on what a teacher needs to know and do to teach effectively (Ball & Forzani, 2009, Ward et al., 2020). Ward et al. (2022) defined the elements of PBTE and compared PETE programs in the US, Türkiye and Belgium. Ward et al. (2022) reported how all participating PETE programs reformed their curriculum to strengthen the connection between theory and practice. Therefore, most programs added Specialized Content Knowledge (SCK) to their content classes. In doing so these programs which aimed to increase future teachers' knowledge of task progressions as well as the correction of common errors, so they would be better prepared to teach students with a wide range of skill levels and prior knowledge. Most PETE programs also focused on lesson planning and repeatedly adapting it. Lesson plans typically start with writing a script, which is then revised and edited. (Ward et al. 2022).

Practice-Based Pedagogical Strategies

Pedagogical strategies derived from PBTE that are often used in PETE are teaching rehearsals and repeated teaching (Bosmans et al., 2024; Dehandschutter et al. 2024, Xie et al., 2021). Teaching rehearsals mainly occur in teaching situations with peers, where PSTs were frequent switching between the role of teacher and the role of student (Ward et al., 2018). During teaching rehearsals, PSTs can practice core teaching skills (i.e., core practice) in a safe and less complex context within methods classes accompanied by supervisor feedback (Lampert et al., 2013; Ward et al, 2018). For example, Ward et al. (2018) described teaching rehearsals as part of a design cycle for methods classes. First there was an observation of lessons with PSTs, afterwards an analysis made by PSTs. Next, there was a preparation for teaching rehearsal of teaching, followed by actual student teaching. Finally there was a collective analysis of the given instructions. Repeated teaching is an interesting strategy for teaching the same lesson content to different classes during internships.

When reteaching the same lesson content, PSTs can practice core pedagogical practices in slightly modified contexts and begin to understand the nuances of their teaching.

Core practices refer to research-based fundamental teaching strategies and actions that are central to effective teaching and learning across various contexts and subject areas (Ball & Forzani, 2009; Mc Donald et al., 2013). Mastering core practices helps PSTs to build a strong foundation for successful teaching and thus impact student learning directly (Ball & Forzani, 2009). Examples of core practices include instructional skills like managing classroom interactions, providing clear instructions, and assessing student understanding. (Ball & Forzani, 2009, Grossman et al., 2009). Ward (2020) identified 16 core practices based on a consensus from 22 PETE researchers. For this study, six core practices were addressed as they were the focus of the PETE program, namely developing goals and assessment, establishing rules and routines, managerial competencies, content development, task presentation, and active supervision and monitoring.

Practice-Based Design Cycle for Methods Classes

To develop adaptive competence in teaching, pedagogical reasoning cycles are used (Bransford & Schwartz, 1999). The duration and content of these cycles vary across different studies (Bosmans et al., 2024; Bransford et al., 2005; Cho et al., 2023; Cho et al., 2024; Xie et al., 2021). This design cycle helps PSTs to gain more depth in their role as a teacher. Despite the differences in methods classes and during internships in the number of steps taken, deliberate practice and reflection consistently reappear. Deliberate practice is intended to improve the teaching quality of PSTs by utilizing clear goals, where multiple teaching trials are implemented and frequent feedback from supervisors is given (Ericsson et al., 1993; Ward et al., 2018). With this feedback, the PST works on reflecting on what can be improved based on the previous teaching experience. This is called "reflection on-action" (Schön, 2017). Xie et al. (2021) showed that reflection-on-action positively impacted the development of adaptive competence in PSTs. Most adaptations in LPs were made for the core practices providing precise and clear instruction and establishing rules and routines (Cho et al., 2022; Xie et al., 2021). Bosmans et al. (2024). reported that most adaptations were made to the core practices task presentation and management.

During methods classes, PSTs usually receive feedback on their teaching from the PETE instructor. In a study by Bosmans et al. (2024), feedback meetings were organized with multiple PSTs after teaching in a methods class. This was still labor-intensive because the supervisor had a

lot of preparatory work, as they had to analyze the recorded lesson and determine which core practices needed adaptations. In this study, the PSTs received class-wide feedback immediately after teaching. It remains unclear what PSTs can adapt after receiving group feedback. Finding a method to effectively guide PSTs in acquiring adaptive competence while remaining feasible in terms of supervisor labor and time remains a challenge.

Study Purpose and Research Questions

The purpose of this study was to analyze the adaptations that PSTs made to core practices in LPs following their teaching rehearsals in an introductory methods class as part of the PETE program. We also investigated whether those adaptations were modifications (i.e., substantial changes such as adding or deleting a task) or refinements (i.e., finetuning of core practices, such as adding a critical element to a task presentation). Our research questions were (a) What adaptations do PSTs make to core practices in their LPs after teaching within an introductory methods class? (b) How do adaptations made by PSTs classify as modifications or refinements?

METHODS

Participants and Setting

The participants in this study were 71 PSTs (33 females and 38 males) enrolled in one PETE program in a Western European university. The PSTs enrolled in an introductory methods class as part of an 80 credit-hour undergraduate program consisting of 53-credit hours content courses in different sports, like dance, gymnastics, swimming, athletics, invasion games, and net and court games. These courses are primarily focused on improving motor performance rather than enhancing teaching skills. Ethical approval for this study was obtained from the first author's university's institutional review board.

The Methods Class

In the introductory secondary methods course (6-credit hours) all PSTs were involved in peer teaching sessions as a student or as a teacher. The methods course included 24 lessons, consisting of 12 frisbee-focused lessons and 12 parkour-focused lessons. All lessons were 60 minutes. The PSTs were divided into three groups (group 1: 27 PSTs, group 2: 26 PSTs, and group 2: 23 PSTs). Each PST taught an episode of the learning progression to a range of 8 to 12 peers for 20 minutes in both frisbee and parkour. Each PST taught two frisbee and two parkour lessons. A LP for each

lesson was provided by the supervisors of this class. The LP included lesson goals, a learning progression starting with a warm-up, management information and organizational outlines. The supervisors are teacher-educators at the university and experts in the content of frisbee and parkour. They supervised all teaching episodes and assessed PSTs performance on the six core practices of teaching, namely, goals and assessment, rules and routines, management, content development, task presentation, and active supervision and monitoring (see Table 1).

Table 1. Core Practices Used for Observing Internships

Core Practices	**Definition**	**Modification Example**	**Refinement Example**
Goals and Assessment (GA)	Adaptations made to the lesson goals, the formative/summative assessment of this goals, and the repetition of this goals at the end of the lesson.	The PST missed doing the formative assessment, opting to continue with direct instruction without checking for student-understanding mid-lesson.	The PST did the formative assessment mid-lesson, but could fine-tune this by adding more focused questions.
Establishing Rules and Routines (RR)	The adaptations made to enhance the realization of classroom behavior and general routines in class.	The PST forgot to introduce the rule that students have to stop their activity and look at the PST after the sound of a whistle.	The PST added 1 minute for changing clothes since 4 minutes is not enough.
Management (MA)	The adaptations made to organization of the gymnasium in general, proactive/reactive behavior management and building positive relationships with students.	The PST awaits students at the entrance to welcome them personally.	The PST changes the time-out to 2 minutes instead of 5.
Content Development (CD)	The ability to select, sequence and implement instructional tasks to meet a specific instructional outcome.	The PST decided to skip part of the progression to allow for a longer time to play the final game.	The PST added an extra intra-task adaptation to two students who were not successful yet.
Task Presentation (TP)	The instructions and demonstrations that a teacher provides to the students "what they are to do and how they are to do it." Including the check for understanding and accountability of the teacher.	The PST explained a task only verbally without giving a demonstration.	The instruction of a PST explained the task, but it needed more detailed information on the starting position of the student.

Active Supervision and Monitoring (AM)	The supervision pattern and feedback a teacher uses during the lesson.	The PST only encouraged students and forgot to provide content-related feedback as well.	The PST added specific whole class-feedback since this was missing.

The supervisors conducted a guided reflection activity on the teaching episodes they observed. The main questions started rather generic to check if the teacher was able to discriminate the different parts of the teaching that went well or needed improvement. A starting question was for example: "Did everything go as you had planned?" or "What would you change if you would teach this lesson again?" The supervisor added depth to the feedback by delving deeper into the core practices where improvement was deemed necessary. The supervisor then asked additional questions to the teacher and the students to get to the core of a problem. Each feedback session took 10 minutes and afterwards the teacher made adaptations to the LP based on the provided feedback. All teachers received a feedback form of the supervisor after the teaching course where more feedback was provided than discussed during the feedback session. No training was provided on how to make adaptations on the LP as this study was aimed at providing a description on how PST's adapted their LP after teaching.

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Coding Procedure

The coding procedure used to track adaptations consisted of five steps. The first step involved the study of the coding manual and a meeting with the researchers where all variables were defined

and explained. The coding manual contained definitions of the different core practices and the necessary information on how to use the coding template. To practice the coding of adaptations, a LP was collectively coded and discussed during the first meeting. In the next phase, each researcher had to code the adaptations made in three LPs. Phase three consisted of a follow-up meeting where agreements and disagreements were discussed. In the fourth phase the full dataset was coded by the researchers. In the last phase, an expert checked the adaptations made and disagreements were cleared until 100% agreement was reached. Two of the researchers reached 100% of agreement of a sample of 35% of the total dataset for determining which core practice an adaptation belonged to and whether the adaptation was a modification or a refinement.

Data Collection

After teaching, the PSTs uploaded the adapted LP on the online learning platform used by the university. The PSTs made adaptations to core practices on the LP by adding remarks with the track-changes function in MS Word. Those adaptations were investigated in this study. All adaptations were collected from the LPs and were copied into an Excel datasheet and coded by the researcher. Some vague track changes that were not adaptations and could not be categorized under the core practices were removed. Every adaptation was determined to which core practice the adaptation was referring. Next, the adaptation was scored as a modification or a refinement. An adaptation was coded as a modification in case a critical part of a core practice was removed or added. For example, the PST explained a task only verbally without giving a demonstration. .A refinement was coded when the adaptation gave more concise and detailed information to a core practice, or was finetuned to reduce ambiguity. For example, the instruction of a PST explained the task, but it needed more detailed information on the starting position of the student.

Data Analysis

In this study the guided feedback session lead by the supervisor is the independent variable. All adaptations in all lesson plans were divided within the different core practices to answer the first research question. Next, a comparison is made between the number of modified and refined adaptations within each core practice. The study's data were analyzed descriptively and reported in means, totals, and percentages (Anderson, 1971).

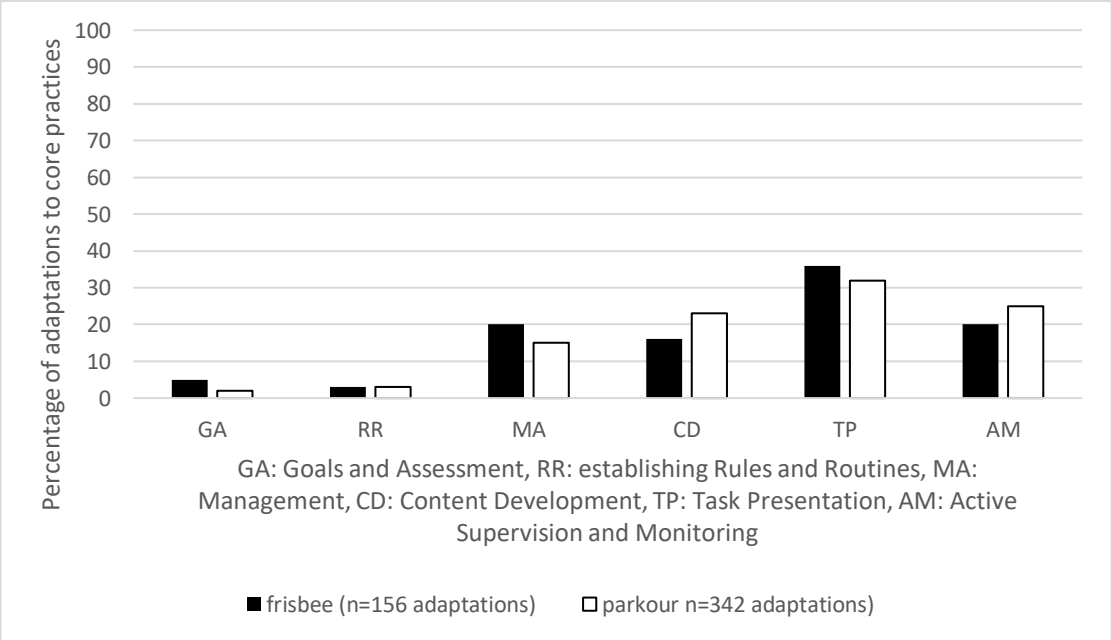
RESULTS

A total of 23 LPs for frisbee and 48 Lps for parkour were coded and analyzed. The 71 LPs were from 33 female and 38 male PSTs, respectively.

Adaptations made to core practices

A total of 498 adaptations to core practices in LPs were made (156 adaptations for frisbee and 342 for parkour). This resulted in a mean of 7 adaptations per LP (range 1-16). This variance cannot simply be explained or linked to the feedback provided by the supervisors because that feedback was not precisely recorded in the dataset. Figure 1 presents an overview of the number of adaptations per core practice in the LPs of frisbee and parkour. Almost no adaptations were made to the core practices of 'Goals and Assessments' (5% of all adaptations for frisbee, 2% for parkour) and 'Establishing Rules and Routines' (3% for both frisbee and parkour). The core practice 'Management' was adapted for 20% of all adaptations for frisbee and 15% for parkour. The core practice 'Content Development' was adapted for 16% and 23%, respectively for frisbee and parkour. Next, 20% and 25% of all adaptations were coded for 'Active Supervision and Monitoring'. The most adaptations occurred for the core practice 'Task Presentation', namely 36% for frisbee and 32% for parkour.

Figure 1. Adaptations to Core Practices in Frisbee and Parkour



Modified or refined adaptations made to core practices (RQ2)

Table 2 includes the core practice adaptations separated into modifications and refinements for respectively frisbee and parkour. Modifications represent fundamental changes or additions to a core practice, while refinements are smaller enhancements to a core practice. An example of a modification is an adaptation within a task presentation because a demonstration that seemed necessary to the supervisor was not given. A refinement could be that the demonstration had to be shown twice because the rotation system of players was unclear after one demonstration. Overall, the core practices Goals and Assessment, Rules and Routines, Management, Content Development, and Task Presentation have a higher frequency of modifications in proportion to refinements for both frisbee and parkour. In contrary, Active Supervision and Monitoring has a high proportion of refinements. For frisbee, 18% of the adaptations for Active Supervision and Monitoring are coded as refinements, and 21% of the adaptations for parkour for Active Supervision and Monitoring are coded as refinements.

Table 2. Modifications and Refinements per Core Practice for Frisbee and Parkour

	Modifications		**Refinements**	
	Frisbee	Parkour	Frisbee	Parkour
Goals and Assessments	1%	2%	1%	1%
Rules and Routines	4%	2%	0%	1%
Management	12%	10%	10%	4%
Content Development	11%	16%	5%	7%
Task Presentation	18%	20%	18%	11%
Active Supervision and Monitoring	2%	5%	18%	21%

DISCUSSION

The purpose of this study was to identify the adaptations PSTs made to core practices in LPs during the initial methods. Subsequently, it was assessed whether the adaptations were modifications or refinements. Most adaptations to core practices in this study were made for task presentation, followed by active supervision and monitoring, content development, and management. Almost no adaptations occurred for the core practices goals and assessment and rules and routines. Most adaptations were modifications compared to refinements for almost all core practices. Only for active supervision and monitoring more refinements were made. To be precise, 2% and 5% of the

adaptations for frisbee and parkour were modifications, while 18% and 21% were refinements, respectively.

Dehandschutter et al. (2024) reported that during school placements, PSTs made the most adaptations to the core practice of task presentation, although the adaptations decreased throughout a six-lesson unit. Conversely, in this study, the number of adaptations to active supervision and monitoring was much lower than reported by Dehandschutter et al. (2024). During the post-lesson reflection sessions in this study, emphasis was often placed on the need to provide frequent content-specific feedback to enhance student learning. The lower number of adaptations for management in the current study may be due to the peer teaching situation compared to a school placement (Dehandschutter et al., 2024). During peer teaching in methods classes, the PSTs in the role of students are more knowledgeable than students in physical education classes. This might compensate for a lack of clarity in the PSTs' task presentation or managerial system, and as a consequence lead to less adaptations by the PST.

Adaptations to content development were frequently made, even though large parts of the LPs were provided by the course instructors. This suggests that PSTs still want to adapt the selection of tasks and the content progressions afterwards, based on observations of the students. Only 3% of adaptations were made for rules and routines. In a study by Xie et al. (2021) during a methods class, opposite results were obtained for adapting rules and routines (24% of all adaptations). This may be explained by the fact that the definition of rules and routines also included managerial items in the study by Xie et al. (2021). Also, in the behavior of PSTs who act as students in a peer teaching setting might substantially differ from the behavior of students in schools. Consequently, PSTs during peer teaching might not necessarily see the need to focus on the development of rules and routines and thus make less adaptations to create a positive and effective learning environment. The low number of adaptations made for goals and assessment is likely due to the scripted LPs provided by the course instructor, where the lesson learning objectives were always provided by the supervisor. In addition, recent work from Iserbyt et al. (2024) suggested that PSTs struggle to write appropriate lesson learning outcomes, which might explain their limited adaptations in this domain.

The low number of adaptations for goals and assessment are comparable to the ones in the study of Dehandschutter et al. (2024). Vilaça et al. (2024) reported that there was a lack of holding PSTs

accountability for making adaptations after teaching. In their study, two PSTs made only 27 and 13 adaptations respectively in 48 lesson plans during school placement (Vilaça et al., 2024). Without holding PSTs accountable for adapting their lesson plans (i.e., reflection-on-action), PSTs efforts might be limited.

During methods classes, Bosmans et al. (2024) found that feedback meetings with content experts resulted in more adaptations. They found that most adaptations were made to the core practices task presentation, active supervision and monitoring, content development and management. There appeared to be a substantial need for improvement in the core practice of task presentation.

Not everything goes as planned during teaching. That is why teaching in a real classroom setting is rehearsed beforehand in methods classes in this PETE program. In these methods classes, the teaching context is simplified by having students teach their peers in small groups with fewer management issues, the teaching time is shortened to 20 minutes, and the LP is almost completely provided by the supervisor. Delivering a concise instruction with key points followed by a clear demonstration proves to be challenging for PSTs. Many PSTs have not sufficiently prepared their instruction, resulting in explanations that often include too much information. Demonstrating with multiple students is also a complex task that frequently requires adaptations to give students a clear understanding of the task.

Limited SCK can impact the ability to make adaptations in LPs. Teachers with low SCK may struggle to adapt content to different student performance levels and learning situations. They may be less flexible in responding to students' needs and the unpredictability of a class setting. A strong SCK, helps teachers differentiate better and make appropriate adaptations in lesson planning. There is substantial evidence that PSTs lack knowledge of the content they will be teaching in schools (Dervent et al., 2020; Iserbyt & Coolkens, 2019). In a case study by Iserbyt et al. (2024), the improved SCK of an experienced physical education teacher increased the number of task adaptations in front crawl swimming. The teacher had a larger repertoire of tasks to select and was better able to adapt the content for children with different levels of performance.

To conclude, this study contributes to the existing literature on adaptive competence by (a) supporting the findings in other studies mentioned before in the discussion, (b) supports the use of teaching rehearsals in methods classes, and (c) demonstrates that PSTs can make substantial adaptations in lesson planning to improve their teaching.

Strengths and Limitations

A strength of this study is that it contributed to the conceptualization of 'adaptive competence', more specifically to make adaptive competence measurable and observable linked to core practices. Second, the setting of this study is ecologically valid, because all data were collected in a first methods course with PSTs.

A first limitation is that the data in this study come only from one PETE program. PETE programs often vary in philosophical and curricular focus. The external validity of findings is therefore limited. Second, this study only examined reflection-on-action. Future research could find ways to analyze reflection-in-action, for example by comparing planned versus enacted PST actions. This could help our understanding of the development of adaptive competence of PSTs. Finally, this study does not provide an answer on how PSTs concluded there was a need to adapt a certain core practice. It is also unclear who initiates the adaptation, whether it is the PST or the supervisor during the feedback meeting or the feedback form. This is an area future research in adaptive competence could focus on.

CONCLUSION

The development of adaptive competence seems a crucial variable for PSTs to optimize student learning by adapting the LP to the lesson context. The aim of this study was to analyze the adaptations to core practices made in the first methods class in a PETE program. High frequencies of adaptations for the core practices task presentation, active supervision and monitoring, management, and content development were observed. Adaptations to the core practices goals and assessment and rules and routines were less frequent. Most of the core practices were coded as modifications or major changes to the original LP. Further research could focus on the teaching of PSTs during school placements and on adaptations PSTs make while teaching (reflection-in-action).

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