Articulating dance knowledge
– a study investigating aspects of knowing when performing a parallel pirouette

Abstract
In this article, we describe the results from the dance section of a ULF project. ULF is an abbreviation for Development, Learning, Research (Swedish: Utveckling, Lärande, Forskning). Dance is a school subject at upper secondary level in Sweden with its own curriculum and grading criteria. Previous research has problematised teachers’ difficulties in verbalising and articulating their grounds for assessment. The research model used, a learning study, with its methodological and theoretical implications, is introduced. The model is collaborative and iterative and is combined with teaching practice. The results, presented as three categories of description in an outcome space with critical aspects, answer the research question: How can qualitative aspects of delimited subject-specific dance knowledge, namely, to perform a parallel pirouette, be articulated? We discuss the project’s results, gains and challenges and argue that the model used can be a way to gain knowledge about knowing expressed in a physical form, knowledge which is described as partly tacit. Considering the notion of tacit knowledge can be a way to understand the formation of dance knowledge and how it can be researched, in order to develop a subject-specific language.

Keywords: dance, upper secondary school, learning study, phenomenography

Artikulerad danskunskap
– en studie som undersöker aspekter av kunnande vid utförandet av en parallell piruett

Sammanfattning
I den här artikeln beskriver vi resultaten från dansdelen av ett utvecklings-, lärande- och, forskningsprojekt (ULF-projekt). Dans är ett skolämne på gymnasienivå i Sverige med egna kursplaner och kunskapskrav. Tidigare forskning har problematiserat lärarens svårigheter att verbalisera och artikulera sina bedömningsgrunder. Den valda forskningsmodellen learning study introduceras med dess metodologiska och teoretiska
implications. The model is collaborative and iterative and combines instructional practice. The results, presented as three descriptions in a data field with critical aspects, answer the research question:

How can qualitative aspects of defined subject-specific knowledge be described, in a parallel pirouette, articulated?

We discuss the project’s results, advantages and challenges and argue that the results can be a way to develop knowledge that is visible in a physical form, knowledge that is partly described as silent. To consider the concept of silent knowledge can be a way to understand the development of dance as a knowledge area and how it can be studied in order to develop a subject-specific language.

Keywords: dance, gymnasium, learning study, phenomenography

Introduction

In Sweden, dance is an arts subject at upper secondary school level. It is one of the specialisations of the national arts programme, which also includes art and design, aesthetics and media, and theatre, as well as music. It is a preparatory programme, preparing students to continue with either artistic or academic studies in higher education. Dance has been a school subject in the upper secondary school’s national arts programme in Sweden since 1994. Students generally start upper secondary school when they are 16, and the national programmes are three years long. This article introduces the theoretical and methodological choices of the research model learning study and discusses the results of the dance section of a ULF project (ULF project is further described under ‘Context, method and material’).

A broadened concept of knowledge

Since 2011, subject-specific capabilities have been emphasised in the Swedish curriculum, where developing students’ particular ways of knowing is underlined. Developing ways of knowing brings with it special demands on teachers to formulate knowledge in different subjects. In the curriculum, there is a clear emphasis on broadening the concept of knowledge (Skolverket, 2011). This opens the possibility for teachers to recognise and value practical knowledge, for example and as in this case, in dance. Dance knowledge, being part of a practical knowledge field, is not always easy to verbalise (cf. Andersson, 2016a; Carlgren, 2015; Carlgren et al., 2015).

Practical knowledge can be expressed in the form of an object (in arts and crafts for example) or as a physical expression, which is the case here. Therefore, we conceptualise practical knowledge in this study as physical knowledge. It is physical, both in the sense expressed in the students’ bodies as well as in the teachers’ understanding, based on their former experience and knowledge of their own bodies. To meet the schools’ requirements for planning teaching activities (sometimes with colleagues), as well as for assessing and giving feedback to
students, dance knowledge needs to be articulated. Previous research has problematised teachers’ difficulties in verbalising and articulating their grounds for assessment (cf. Ahlstrand, 2014, 2015, 2018, 2020; Andersson, 2016a, 2016b; Carlgren et al., 2015; Zandén, 2010; Zandén & Ferm Thorgersen, 2015; Zandén, 2016). If teachers are supposed to plan teaching situations that can develop subject-specific capabilities, as the curriculum emphasises, there is a need for more research helping teachers to articulate what such capabilities consist of. In this project, physical knowledge is recognised and studied, and is described as different ways of knowing (Carlgren et al., 2015).

Theory and Problem area – how to articulate dance knowledge

A starting point for this study is an interest in studying dance knowledge in students’ physical expressions. Knowledge can be represented in different ways, and students learn in different ways according to their previous experience (cf. Eisner, 1996, 2007). This does not mean that all knowledge is easy to verbalise or even recognise, since there is also the question of tacit knowledge to be considered (Polanyi, [1958] 1998, [1967] 2009; Schön, 1983; Wittgenstein, [1953] 1992). Practical knowledge generally is distinguished by its tacit dimensions, which can be captured by the sentence “we know more than we can tell” (Polanyi, [1967] 2009, p. 4). It is only by engaging with the tacit dimension of knowledge that we can better develop our understanding of what practical knowledge, in this case physical knowledge, consists of (cf. Ahlstrand, 2014; Carlgren, 2020; Carlgren et al., 2015; Carlgren & Nyberg, 2015). Considering the notion of tacit knowledge can be a way to understand the formation of dance knowledge and how it can be researched, in order to develop a subject-specific language. This is the problem area that the ULF project, and this article, address.

Aims and research question

In this article, we present the results from the dance section of a ULF project. The aim of this part of the project is to articulate physical knowledge, where a specific movement is chosen as the object of learning. The aim is brought into focus by the following research question: How can qualitative aspects of delimited subject-specific dance knowledge, namely, to perform a parallel pirouette, be articulated? In addition, we want to discuss how learning study as a model can be supportive for teachers in developing a subject-specific language for teaching and assessment.

Object of learning

A learning study (introduced further under the heading ‘Learning study’) starts by defining a problem that the teachers in the team have encountered in their teaching practice. It is formulated as something that either the teacher team finds difficult to teach or as something that the students have difficulties understanding or, in this case, performing. The teachers and researchers together chose an object of
learning, which is a defined area of the subject, in this case, the parallel pirouette. Parallel pirouettes can be performed in different ways. In this study, the teachers have defined this as a turn with one pointed foot aligned by the knee of the straight supporting leg. The arms are shaping a circle where the fingers are aligned by the belly bottom. The direction of the turn is *en dehors*, which means outwards from the supporting leg. The legs are parallel from the hips.

**Previous research on parallel pirouette**

Unlike research conducted in the field of biomechanics and physics, and in relation to professional, skilled dancers (cf. Kim, 2018; Laws & Lott, 2013), this study aims at articulating qualitative aspects of knowledge performed as a physical expression. Examples of research interests in the field of biomechanics and physics are muscle force and joint loading, which are measured in the parallel pirouette (cf. Blazkiewicz, 2021), or the mechanics of toppling and control of toppling during a pirouette (Lott & Laws, 2012). Our study investigates different ways of knowing the object of learning, the parallel pirouette, where the focus is on articulating different ways of knowing. Sugano and Laws (2002) discuss certain aspects of the pirouette preparation position. They write:

> Long hours of experimentation with little self-correction are common in learning pirouette technique, and guidance is usually based primarily on appearance rather than physical principles. Such extended repetitive practice of a particular dance movement can lead to injury. (Sugano & Laws, 2002, p. 29)

Their results point to the importance of preparation in a parallel pirouette:

> The results show that pirouettes are generally improved when the width of the fourth position preparation is increased, so long as the initial proportion of weight on each foot is carefully controlled. (Sugano & Laws, 2002, p. 29)

Even though their study mainly concerns dancers/students at university level, the conclusions drawn by Sugano and Laws will be discussed in relation to the results of this study and how it could have been delimited concerning the object of learning (see Discussion part).

**Context, method and material**

**Context – ULF project**

In 2017, the Swedish government decided to allocate extra funding to practice-based research on teaching and learning. The argument was that too little of the research produced at universities reached and made a difference to the actual classrooms and the teaching situation. The funding is intended to support research

---

1 There is an emphasis on collaboration between the universities and the municipalities to make the projects long-lasting. The first funding was described as experimentation, but the aim is to make it permanent and to spread the different interaction models that were tried out.
prompted by the questions and challenges that teachers encounter daily, i.e., research emerging from teaching activities. The overall aim of the ULF project we conducted is the verbalisation of physical knowledge. This can contribute to the development of a subject-specific and didactic language and serve as support for teachers in the planning of teaching and assessment of students’ physical expressions. The ULF project involved two different upper secondary schools within the area of Gothenburg, Sweden\(^2\). One team of theatre teachers and one team of dance teachers were involved. The teams work at the only schools in the area having dance and theatre as school subjects. The project started in the autumn of 2019 and ended in the spring of 2021. As mentioned before, in this article we focus on selected results from the dance part of the ULF project. For a description of the the design of the research lessons, see Andersson & Ahlstrand (2022).

**Learning study**

In this research project, a learning study (Pang & Marton, 2003; Marton & Pang, 2006) was used as the research approach. In a learning study, a group of teachers and researchers work in collaboration. “This research is for, not on, teachers, i.e. research into problems and challenges faced by teachers in their professional practice” (Carlgren, 2019, p. 18). The teachers expressed the view that although the parallel pirouette is a central movement in dance, it is difficult for the students to perform during their three years of practice. The parallel pirouette is used in different genres but in this study, we focused only on its use in jazz dance. The teachers had previously found it difficult to teach a parallel pirouette since the movement is so complex. One reason for choosing this object of learning was to try to specify what it consists of. In this part of the project, three dance teachers and two researchers were involved\(^3\). These individuals are referred to as the research team since the teachers were co-researchers mainly in planning and conducting the research lessons and were all involved in the analysis process.

The team developed research lessons using a cyclical planning process. This meant that the lessons were tried out, filmed, analysed and then revised. In the team, we planned three research lessons, which were implemented and filmed from September 2020 to February 2021. To be able to figure out the level of pre-knowledge the students already had about the content, a pre-test was designed by the teachers, in the form of a short choreography highlighting the parallel pirouette. The pre-test was filmed and analysed. The findings from the pre-test were used as a starting point for designing the research lessons, with the help of variation theory (Lo & Marton, 2012; Marton, 2018). Variation theory is used in planning and implementing teaching situations. Variation, for example contrast, is used with the aim of making it possible for the students to discern and

---

\(^2\) The theatre part of the project and the background for the project are described in Ahlstrand & Andersson (2021a, 2021b, 2022).

\(^3\) The researchers – and authors of this article – have backgrounds as dance or theatre teachers at upper secondary school level.
experience the object of learning in a structured way. The research lessons were then applied, tried out, and revised (as mentioned before and described in another article, see Andersson & Ahlstrand, 2022). Eighteen students at upper secondary school level (17–18 years of age) were involved in the project.

**Phenomenography**

Phenomenography looks for the meaning of something rather than trying to explain what something is. In the classroom, there are a limited number of ways of experiencing a phenomenon, which in turn means that it is possible to separate one way of experiencing from another. Phenomenography investigates how a phenomenon is experienced by people in a variety of ways. Phenomenography emerged from empirical studies of learning in the early 1970s and was mainly carried out using interviews. In phenomenography, qualitatively different ways of experiencing a phenomenon are analysed, and the results of this analysis form categories of description (Marton, 1981, 1994, 2014; Marton & Pong, 2005). It is important to stress that analysis using phenomenography does not give results that describe how people think in a certain way. Phenomenography does not explain the reasons for the variation or describe one particular way of experiencing things in detail; instead, the idea is to describe the variation in how members of a certain population discern something.

The result of a phenomenographic analysis consists of a set of different conceptions, or, in this case, different ways of experiencing the phenomenon studied. The phenomenon in this study was different ways of knowing a parallel pirouette. The phenomenon was studied in the variation of physical expressions. The conceptions, or ways of experiencing, form the categories of description. The categories represent, as described by Marton in the citation beneath, a second-order perspective; that is, how the object of learning is experienced by others in different ways.

In the first and by far the most commonly adopted perspective we orient ourselves towards the world and make statements about it. In the second perspective, we orient ourselves towards people’s ideas about the world (or their experience of it) and we make statements about people’s ideas about the world (or about their experience of it). (Marton, 1981, p. 178)

Ways of experiencing are considered as correlating with ways of knowing (Carlsgren et al., 2015). More complex ways of knowing are characterised by the simultaneous discernment of increasingly differentiated aspects of a phenomenon (Lo, 2012; Marton & Lo, 2007) and it is in this way that one can approach the meaning of knowing the object of learning (Carlsgren, 2012). The phenomenon in this study is formulated as different ways of knowing the parallel pirouette, where the parallel pirouette is the object of learning. The unit of analysis is formulated as physical expressions of ways of knowing the object of learning. In this study the process of analysing the object of learning led to the specification and articulation of aspects of the parallel pirouette. This is a way of unpacking the
object of learning (cf. Björkholm, 2015). During the project, we discussed the relation between the intended object of learning, the enacted object of learning and the lived object of learning. Briefly, the intended object of learning can be described as the teachers’ assertions and actions concerning the object of learning. The enacted object of learning can be described as a relationship between the possibilities that are offered by the teacher and the possibilities that are utilised by the learners in a given situation (Holmqvist et al., 2011; Marton, 2018). The lived object of learning is described as the students’ initial mastery of the object of learning (Marton & Pang, 2006). We used material (filmed and audio) which provided knowledge about the object of learning on all these three levels.

Material and procedure

The material consists of filmed material from one lesson where the pre-test was conducted, three filmed research lessons and audio material from three occasions where the pre-test and the research lessons were planned by the research team together. Additionally, there is one occasion where the final categories and results were discussed in the research team. The teachers were involved in conducting the analysis while revising the research lessons. Working on the analysis in the team while revising the lesson are central parts in the learning study model (Carlgren, 2019).

The researchers carried out the pre-analysis work on the filmed material of the pre-test, the research lessons, and the audio material of the lesson planning. In the periods between the research lessons, the filmed material was analysed and the lessons revised, which generated audio material. The research team met on Zoom, a video platform. The researchers presented the pre-analysis to the teacher team and we discussed the pre-analysis together on Zoom. Additionally, the research team analysed and categorised the filmed material by paying attention to different ways of physically expressing the object of learning. We recorded and saved the discussions of the analyses of filmed material. The excerpts in the result section are included to give insight into how the research team analysed physical expressions and articulated different ways of knowing. It does not give access to how the research lessons were conducted (due to space limitations, the design of the research lessons is published elsewhere: Andersson & Ahlstrand, 2022). Students’ knowledge about dance could also be studied for example by interviewing students and/or teachers, but that would mean investigating a different object of learning.

The outcome space and critical aspects

As described previously, both filmed material and audio material were used when analysing and categorising. Excerpts from both materials are used as examples of the categories that emerged. Excerpts from the filmed material were selected from
the pre-test and the three research lessons. When we use excerpts from the audio material in the results section, they are used to exemplify how the teachers and/or the researchers articulate physical knowledge. Based on the analyses of differences between these ways of experiencing, we constructed categories of description that are described and related to each other in what is known as an outcome space (see Figure 1). The aspects of knowing that these categories of description consist of are described using examples from the audio and filmed material (cf. Ahlstrand, 2021). In the results section this is exemplified by how teachers talk about the physical knowledge they see expressed in the students’ bodies, in filmed material. Physical expressions of knowledge were recognised and studied and described as different ways of knowing. The phenomenon in this study is different ways of physically and verbally expressing the object of learning, that is the parallel pirouette. By comparing the differences between the ways a certain phenomenon is expressed, qualitatively different ways of experiencing the phenomenon can be distinguished. The ways of experiencing cover linguistic as well as non-linguistic aspects.

The differences between the categories of description are formulated as critical aspects (see Figure 6). They are critical in the sense of what is crucial for the students’ learning opportunities in the teaching situations to develop the object of learning. “Now, such aspects that the learner has to discern but has not yet discerned are exactly ‘what is to be learnt’. This is why we call them ‘critical aspects’.” (Björklund et al., 2021, p. 264). The critical aspects, together with the categories of description, form the meaning of knowing as well as being powerful tools to use when planning the research lessons (see Andersson & Ahlstrand, 2022).

**Ethical considerations**

The project has taken into consideration the Swedish Research Council’s four ethical principles of humanistic social scientific research (Vetenskapsrådet, 2002). This means giving correct information to the participants about the research project’s purpose. It also means that the participants have the right to decide if they will participate or not, the consent requirement. The confidentiality obligations were considered in the sense that the filmed material was kept in such a way that no person other than the researchers had access to it. Finally, the utilisation requirement was considered in the sense that the material will only be used for research purposes. The students and teachers are anonymised in the excerpts, and we have anonymised the pictures used from the filmed material in the figures. One student did not agree to be filmed. We resolved this by giving her an alternative task, which was to observe the research lessons and provide us with her reflections on some specific questions. This gave the student the opportunity to be involved in another kind of teaching/learning situation instead of the physical dance class. Another possibility would have been for the student to attend but to stay out of view of the camera or for the material to be processed so that
she could be left out of the analysis. In this case, the choice was made after a
dialogue with the student, who chose to observe.

Results

The results are presented in two parts, first as three categories of description of
the object of learning, in an outcome space (Figure 1) and then as critical aspects
of the object of learning in the same outcome space (Figure 6). The categories
describe different ways of knowing the object of learning; in this case, different
ways of knowing the parallel pirouette. By analysing differences between ways
of knowing, the categories of description can be constructed, described, and
related to each other in what is known as an outcome space. These ways of
knowing form the hierarchy in the outcome space, where more complex ways of
knowing are characterised by the simultaneous discernment of increasingly differ-
entiated aspects of an object of learning. The most complex way of knowing is
presented as the highest category (corresponding to the third category, here
‘spinning’). These aspects of this precise object of learning form the answer to the
research question: How can qualitative aspects of delimited subject-specific dance
knowledge, namely, to perform a parallel pirouette, be articulated? In the
excerpts, the teachers are labelled T1, T2 and T3 and the researchers are labelled
R1 and R2.

Figure 1. Outcome space: describing the hierarchy of the categories of description including
the qualitative aspects

To perform a parallel pirouette as…

... SPINNING
• bidirectional energy
• the vertical
• glued foot to knee
• dynamic preparation

... WOBBLING
• shape & position of arms
• deep knees
• focused gaze and direction
• balance

... FLINGING
• form of arms
• bent knees
• speed
FLINGING

The first category, which in metaphorical terms describes how to perform a parallel pirouette as *Flinging*, includes physical expressions characterised as being carelessly performed. The movements signal that the most important thing is to spin around, regardless of how this is done. However, there are aspects that are central to being able to perform the parallel pirouette, and in this category, three different qualitative aspects of the object of learning are formulated, namely: ‘the form of the arms’, ‘bent knees’ and ‘speed’.

In Figure 2, the two students in white T-shirts exemplify the qualitative aspect ‘the form of arms’. The aspect of ‘bent knees’ is shown in Figure 3, exemplified by the two students in white T-shirts. The aspect of ‘speed’ is harder to visualise but is a basic prerequisite for being able to perform a parallel pirouette. Speed is used to get around in the movement (the turn).

**Figure 2.** The student in black shows both the shape and position of the arms (part of the next/upcoming category: *Wobbling*). The arms are raised and in line with the shoulders. The students in white T-shirts exemplify the form of the arms (category: *Flinging*). The arms have a rounded form, but they are not raised.

**Figure 3.** The student in black demonstrates deep knees (part of the next/upcoming category: *Wobbling*), while the students in white T-shirts show bent knees (category: *Flinging*).
WOBBLING
The second category, which in metaphorical terms describes how to perform a parallel pirouette as *Wobbling*, includes physical expressions characterised as being unstable. It gives an impression of someone wobbling but still managing to demonstrate some important aspects of the object of learning. Four different qualitative aspects of the object of learning are formulated, namely: ‘the shape and position of the arms’, ‘deep knees’, ‘focused gaze and direction’, and ‘balance’. ‘The shape and position of the arms’ and ‘deep knees’ are aspects that are demonstrated in Figures 2 and 3. Focused gaze and a clear direction of the gaze are prerequisite to avoid dizziness while spinning. It also contributes towards achieving a steady landing.

**Figure 4.** Expressions performed by students 2 and 3 are examples of focused gaze and direction (category: *Wobbling*). For students 2 and 3, the eye and head movement follow the movement/direction of the pirouette, while students 1 and 4 have the head and face to the front.

Finally, the qualitative aspect of ‘balance’ is placed in the category *Wobbling* and should be understood as an important aspect that distinguishes the category *Flinging* from *Wobbling*. Balance is important, even if the movements may still be unstable. As with a rope-dancer, even if balance is central to avoiding a fall, the movements can still have a wobbling, unstable character.

SPINNING
The third category, which in metaphorical terms describes how to perform a parallel pirouette as *Spinning*, includes physical expressions characterised as being smooth, consistent movements. Four different qualitative aspects of the object of learning are formulated, namely: ‘bidirectional energy’, ‘the vertical’, ‘the foot glued to the knee’, and ‘dynamic preparation’.

‘Bidirectional energy’ is discussed as a quality by the teacher team when one of the researchers (R2) asks:
Excerpt 1:
R2: And if we then go into what it is you know when you can do a pirouette like a table spinner. Do you have comments on what is written here, then? [Refers to a preliminary version of the outcome space where table spinner, later changed to Spinning, is one of the names of the categories of description]
T1: Yes … keep the weight down … I think the weight goes in two directions at the same time. It’s not just down, it goes … the power goes both up and down, you push down into the floor to be able to lift yourself up and find the pirouette. So, it is also in some way a two-way energy, as well as both an up arrow and a down arrow. At the same time.
T2: I think [name of teacher] that it’s true what you say, but I think that why it is there [refers to adapt force from the floor (speed)] is also because we saw that some, when they take off, it becomes almost as if they have nothing down at all.
T1: No, exactly …

In the excerpt above, teacher 1 is articulating how ‘bidirectional energy’ goes in two directions, both up and down at the same time. This is difficult to catch in a still picture of the filmed material. The teacher’s articulation of what they see in the physical expressions is essential to exemplify how the qualitative aspects can be studied and analysed. What teacher 2 is pointing at gives us further clues to what is critical for developing the movement (see critical aspect, energy, Figure 6).

The qualitative aspect ‘the vertical’ is visually described in Figure 5, where the three students are all standing in an upright position when they do the turn as part of the pirouette. In the same figure, the aspect ‘the foot glued to the knee’ is shown. This was also discussed in the material (The teacher refers to the student with white socks (W) and the student with black socks (B) in Figure 5):

Excerpt 2:
R2: But here, you still see examples of when you glue the foot to the knee? Now I look at her [the student] here with white socks a bit but … it looks like she has also glued here …
T1, T2, T3: Yes.
T2: Yes, because she [the student] with black socks has a stretched foot as well, and she [the student] with white socks has not stretched her foot so that it is not glued there.
R1: And not parallel either?
T3: No.
R2: Are you talking about that foot or that?
T2: We’re talking about the raised foot.
R2: It should be stretched?
T2: Yes.
R2: And where does she have it? She has the foot behind the knee?
T2: No, but she has her foot, her foot is stretched but if you compare her with the student with the white socks, her foot is not in place because it is also not even … the foot is sickled and not stretched.
T1: It’s probably hard to see for [name of researcher] back there in the white but that, yes …
T2: ... but you look at the ankle.
T1: … twists it out like, ends up behind the knee instead of next to the knee a bit.
Figure 5. The vertical and foot glued to the knee are demonstrated.

The excerpt is an example of how the teachers can, on a detailed level, identify what matters when performing a parallel pirouette. One of the researchers (R2) was not as familiar with dance as the teachers and the other researcher (R1), which gives possibilities for the questions (like: “And where does she have it? She has the foot behind the knee?”) to let the teacher elaborate even further on the qualitative aspects.

The qualitative aspect of ‘dynamic preparation’ is contrasted with static preparation:

**Excerpt 3:**
R2: The rubber band, then? Last thing here.
T2: I see the rubber band as, I think it came out then, when we talked about the preparation, not to be static in our preparation, but it is ongoing work *[makes noise]* and so on …

Originally, this quality was named rubber band and was then changed to ‘dynamic preparation’. This is an example of how the aspects were named and renamed during the discussions in the analysis process. There is also a reference to what happened during the last research lesson when one of the teachers made a point of contrasting dynamic with parking (static movement like in parking a car, in relation to making the preparation). The preparation, even if it is motionless, needs to have a ‘ready to go’ energy, the dancer can not relax which can give a static energy in the body.

The three categories of description, *Flinging*, *Wobbling* and *Spinning*, presented in the outcome space (Figure 1) have been described and exemplified with filmed and audio material above. We now continue with the second part of the results, the critical aspects (Figure 6).
Critical aspects
As mentioned earlier, through phenomenographic analysis, one can describe different ways of knowing. More complex ways of knowing are characterised by the simultaneous identification of increasingly differentiated aspects of a phenomenon (Marton & Lo, 2007; Lo, 2012) and it is in this way that one can approach the meaning of knowing the object of learning. The differences between the categories of description in the outcome space also reveal what is critical for learning:

[...] teachers should identify the critical features of an object of learning and structure appropriate patterns of variation in order to allow students to discern the critical features to be acquired. (Ko, 2014, p. 275)

The critical features mentioned in the citation above, labelled critical aspects in the learning study model, represented the starting point for planning the research lessons (see Andersson & Ahlstrand, 2022). The two critical aspects, mentioned beneath, are expressed as the differences between the categories of description (see Figure 6):

Figure 6. Outcome space: describing the hierarchy of the categories of description with the critical aspects.

To perform a parallel pirouette as...

... SPINNING

→ Critical aspect: ENERGY
→ hold the package together (suction)
→ obtain force from the floor (speed)
→ pick up power in preparation

... WOBBLING

→ Critical aspect: PLACEMENT
→ the squares (arms, shoulder blades, hips and shoulders)
→ conscious gaze
→ nail in the floor

... FLINGING

Critical aspect: PLACEMENT
The first sub-aspect ‘the squares’ in the critical aspect Placement is explained by the teacher team as two squares – one involving the arms and shoulder blades and the other involving hips and shoulders. This is shown in Figure 7, where square 1 is marked as something placed in between the arms. Square 2 is placed so that it involves hips and shoulders.
Figure 7. Square 1 is placed in between the arms. Square 2 involves hips and shoulders.

The second sub-aspect, ‘conscious gaze’, is called *spott* in Swedish. The qualitative (and critical) aspect involves being able to find a spot to focus on (for example a spot on the wall) while making the turn. It is critical in the sense that when one can find a conscious gaze, one can develop a quality-focused gaze and direction (category: *Wobbling*).

The aspect ‘nail in the floor’ is the third sub-aspect in the critical aspect *Placement*. This was, as with the other critical aspect, a starting point for planning the research lessons. During research lesson number two (conducted 20/11/2020), the teacher T2 instructed the students in the following way:

**Excerpt 4:**
T2: Inhale and exhale and think about pushing the foot down to eh, get up in position, so now push down, think of that nail in the floor as well as the foot and leg, stretch through. Press down that foot and at the same time, also press down the shoulder blades in the back, as if you have a table in front of you that you, as mmm *(shows)* press down. Rest your arms here on a … a table. Perhaps it is easiest to think that the arms are a short distance from the body and … exactly as at chest height, so they do not end up too close and too far up so that you can feel this in the shoulder blades in the back.

The ‘nail in the floor’ aspect is demonstrated in Figure 8.
Figure 8. Examples of the sub-aspect nail in the floor. As indicated by the arrows, the two students’ feet are stretched, unlike the student in black trousers, shirt and socks, whose foot is bent.

Critical aspect: ENERGY
The first sub-aspect in the critical aspect Energy is ‘hold the package together (suction)’. ‘Hold the package together’ is an example of how the teacher uses metaphors for something which is not immediately easy to articulate in words but can be related to when analysing the filmed material. In the planning of research lesson 3 (10/12/2020), the package is formulated as critical in Excerpt 5:

Excerpt 5:
R1: It is very critical for … just this thing with holding the package together, it becomes very visible if you try to do a double or triple pirouette, if you do not have … if you do not hold the package together it will not work, it might work to just get around, but then when you have to take a little more speed you cannot, like, then you have to have more … just enough muscle tension in …
T1: Yes …
T2: … torso and arms and all, or?
T1: Mmmm.

Holding the package together (suction) refers to what the teachers mean when they say “being able to collect your package with the help of sucking the package together”. This can be explained as when someone pulls the belly button towards the spine. In excerpt 6 (from the final analysis with the teacher team 15/04/2021), there was a discussion about how to articulate something that is known in one’s own body and which was, during both the research lessons and the discussions, exemplified by making a noise (like sucking in air through the mouth).

Excerpt 6:
T3: Maybe we can have it, that it is the same as the package, yes, hold the package together, suck together …
T1: Suck together the package … yes, hold it together … yes, it would be … yes … to collect your package with the help of sucking the package together [laughs].
R1: That’s where that sound comes in, after all.
T1: Yes [makes noise].

The second qualitative sub-aspect in the critical aspect Energy, ‘obtain force from the floor (speed)’, was one of the aspects that was an object for teaching during research lesson 3 (25/02/2021). In the planning of research lesson 34, we discussed a way to let the students experience the difference between what we mean when talking about power and what we mean when talking about energy:

**Excerpt 7:**
R1: That’s when you would like to have a volume button that they get like this: now we pull up a little, a little, a little all the time, to see …
T1: Yes, and that’s what I think, then maybe it’s better with one or two turns, that we like, we have quite a low volume on the first turn and then we pull up a little volume to the second turn to feel like the difference in dynamics … so how the power is put up a little at a time …

During the last discussion (in the last meeting, 15/04/2021, with the teacher team, when the last analysis and the outcome space were discussed), the following conversation occurred in relation to how to express the difference between energy, power and speed:

**Excerpt 8:**
T3: Get the power in the preparation where … yes, mmm.
R2: And adjust the energy. I do not know? I think I’ve figured it out. It sounds like everything we’re talking about now is about energy, so maybe it’s just … maybe it’s energy that should be here instead?
T3: But it’s good, I think, that the obtained energy is this volume that you get just enough power and speed. So that’s probably … I think … is correct.
R2: Uhm, okay? OK, good …

Picking up the power in preparation was articulated in the last discussion (at the last meeting, 15/04/2021) with the teacher team, where the last analysis and the outcome space were discussed:

**Excerpt 9:**
R2: Yes, but good! Excuse me for being so involved, but this was something you also talked about, [name of researcher R1], when you and I watched the material together. This is exactly where the power comes from, and then you talked about, as I understood it, in a similar way, that there was something with the back leg there too …
R1: You take off from the floor to get …
T3: Yes! It’s something we can maybe use … and push down, one sturdy leg, because it was also, we have not talked about it today but it was … in that they shoot off but that the leg that they should spin, is not really…
T2: Stretched.

---

4 See Andersson & Ahlstrand (2022).
T3: … stretches or has enough package feeling for it to … package feeling, but like stretched and use the muscles.
T1: Yes, exactly [T1 shows], it is very difficult if you do not have … you must have weight on the back foot as well, something in between.
T2: Because if they do not stretch fast enough there, then it is like the body on its way, instead of up, they have to pick it up because it is on its way somewhere else.
R1: And it was this student who reacted to this with force, I think, that it is also, so how they use the force when taking off?
T3: Yes, exactly!

Excerpt 9 is an example of when two of the teachers and one of the researchers try the movements with their bodies as a way to feel what the students are doing in their own bodies. This is an example of a way of putting oneself in the second-order perspective to experience the quality that has been identified and talked about.

Discussion

In this article, we have described a model of practice-based research, and have presented results that articulate aspects of a specific dance knowledge, namely different ways of knowing a parallel pirouette. We now discuss the results and the model learning study as a research approach.

One delimited object of learning (or two?)

The research team chose to work on a delimited movement, the parallel pirouette. Even so, questions about the delimitation arose during the research process. The teacher team talked about how it became obvious during the process that some aspects that are critical to the success of the pirouette are part of the preparation for it rather than its execution. This led to the question of whether we were dealing with one or two objects of learning. Preparation before performing the parallel pirouette can be seen as one object of learning and the turn in performing the movement can be seen as another. As seen in the study of Sugano and Laws (2002), preparation is of great importance and could very well be investigated in itself. In addition, the landing after doing the turn is also important and the teachers stressed this as a possible third object of learning. In this study, we decided to treat the object of learning as consisting of both preparation and the turn, but it is possible we might have gained even deeper knowledge by focusing on only one of them. However, both the preparation and performing the movement are essential aspects of making the turn, which is an argument for retaining the initial choice regarding the object of learning. This aligns with earlier studies (Ahlstrand, 2014, 2018) which have discussed the surprisingly complex knowledge involved in such a defined object of learning. This is an advantage to the overall purpose of this study, which was to be able to articulate aspects of an object of learning and develop a subject-specific language. This can be useful
when planning teaching in relation to a defined content (cf. Carlgren & Nyberg, 2015). The results can also be used in relation to assessment and in communication with the students. What is obvious, is that choosing such delimited content is time-consuming, which must be considered in relation to the gains received in terms of developing a subject-specific language and the overall knowledge about certain ways of knowing an object of learning.

**In the process of developing a subject-specific language**

When working in a learning study cycle, the teachers’ experiences and previous knowledge in relation to the object of learning are important inputs for developing knowledge about the object of learning (cf. Carlgren, 2019). We argue, throughout the text, that defining an object of learning, analysing the pre-test, planning the lessons and implementing and revising the research lessons contribute to articulating the tacit dimensions of the object of learning and in this way contribute to a subject-specific language. This does not mean that the teachers and students do not speak to each other. However, some of the communication in the dance classroom is expressed, for example, in terms of metaphors. This is shown in Excerpt 4, where the teacher, during research lesson number 2, uses the metaphor ‘nail in the floor’. We assume that since ‘nail in the floor’ was treated as a critical aspect in research lesson 2, the explanation of how to ‘perform the metaphor’ is rather concrete and specific:

T2: Inhale and exhale and think about pushing the foot down to eh, get up in position, so now push down, think of that nail in the floor as well as the foot and leg, stretch through. Press down that foot and at the same time, also press down the shoulder blades in the back, as if you have a table in front of you that you, as mmm [shows] press down. Rest your arms here on a … a table.

In this study, the students are third-year students, and they are probably familiar with the teachers’ metaphors. The students have experienced the tacit dimension of different objects of learning (cf. Ahlstrand, 2014; Carlgren, 2020; Carlgren et al., 2015; Carlgren & Nyberg, 2015). Still, it is not obvious that teachers and students have the same understanding of the metaphors. And when meeting first-year students or working with new colleagues, it is crucial not to take the metaphors for granted but to try to make them explicit and, for example, to discuss them in relation to filmed material. Does the teacher team have the same (or similar) opinions about how to use, for example, the metaphor ‘nail in the floor’? When analysing the material together, questions of this kind can be explored. In this way, a common subject-specific language can develop. This is important, in a teacher team, for planning teaching and assessing the knowing involved in the object of learning.

The learning study model is useful for collectively and systematically creating and implementing lesson plans. Variation theory and phenomenography are both powerful tools to use when planning, revising and analysing the material that is collected in the learning study model.
The aim of our theory is to make theoretical tools available for analysing the extent to which the necessary conditions for achieving specific aims for learning are present in certain situations. Then, these tools can also be used to create necessary conditions to achieve those aims. (Marton, 2018, p. 60)

The excerpts presented in the results section give examples of how the teachers analyse the students’ physical expressions as different ways of knowing and in that sense develop and articulate a subject-specific language. This is useful for, as Marton describes above, planning teaching activities that create necessary conditions for learning.

Excerpt 2 brings another issue into focus. Even though the students are third-year students and, as pointed out, probably familiar with the teachers’ metaphors, none of them are performing ‘the nail in the floor’ in the desired way in the pre-test. This is a reason to call this aspect critical. The differences between the categories of description in the outcome space also reveal what is critical for learning. ‘The nail in the floor’ is an aspect that is critical for performing a parallel pirouette, and therefore we planned the teaching situation in relation to what is critical when performing a parallel pirouette. Even if the teachers are using the metaphors and the students are used to hearing them, this does not mean they can perform the object of learning in the desired way. This is, on the one hand, where a structured method of planning teaching with, for example, the help of the theory of variation, can make a difference. This can, on the other hand, be criticised. Does the teacher’s articulation of the aspects of knowing relate to a first-order perspective? (cf. Marton, 1981). We argue that it is the description of how a phenomenon is experienced by people in a variety of ways that guides the analyses. Again, the phenomenon in this study is formulated as different ways of knowing the parallel pirouette expressed in a physical form. What the research team in Excerpt 3 are discussing, is an example of this, but one that also leads to the question of taste and genre. Another topic could be that what the teachers articulate, are their own preferences and have to do with their own aesthetic taste. But the genre that the teachers have chosen is commonly described as a jazz dance genre, and it is an argument for the importance of articulating aspects of knowing in relation to this specific genre to build, as previously pointed out, a common subject-specific language. It is, though, important to stress that this study is one in the emerging process of developing a subject-specific language. More studies of the same kind but with different objects of learning, are desired. Additionally, we can identify similar needs in other school subjects.

**Continuity**
This was a two-year project: one year with the theatre teacher team and one with the dance teacher team. As we know that school development takes five to seven years (Blossing, 2008), it is also desirable that long-lasting models/projects should be organised. The project has hopefully contributed to a more long-lasting school
development impact. One teacher was selected as “förste lärare” [first teacher], a career title in the Swedish school system, as a consequence of the project, for example. That teacher can now continue to organise school development projects in the teachers’ college, which works with aesthetic subjects.

The headmaster of the National Arts programme at the school was very supportive of the project, and the teachers were all allowed some extra meeting time to pursue it. Even so, the researchers had more time for the project and more time to carry out the pre-analyses, for example. This led to an imbalance in possible time shared between researchers and teachers. This is an issue in the learning study model which has been discussed by other researchers (cf. Thorsten & Johansson, 2017). It would be preferable for the teachers to have more time to read and discuss literature about variation theory and phenomenography with the researchers. This argument is based on the idea that when teachers start such a project, teachers and researchers embark upon it as a research team. In the project discussed here, the researchers had an introductory lecture concerning methods and theory, and the teachers were given articles to read in their own time. The researchers organised the project. However, it is inescapable that the researchers must take greater responsibility for doing the initial analyses of the material. Conducting the initial analyses provided a direction for the results, even if the analyses were later developed and revised in collaboration with the teachers. In future ULF projects, it is essential that the universities and municipalities develop stronger agreements concerning funding which can be used to pay researchers and teachers for their work on the projects and to pay substitute teachers while other teachers are working on projects. This can strengthen the validity of the analyses. Additionally, it is important to think about the impact of the research lessons in relation to the ongoing teaching plan. It is an advantage if the object of learning can support the yearly teaching plan (cf. Andersson & Ahlstrand, 2022).

This article presents practice-based research: research that is based on issues and challenges that are essential for teachers to know about and can use to improve their teaching. Research that contributes to collaboration between teachers and researchers, and that is characterised by the understanding of both the teachers’ and the researchers’ experiences, is important for the development of new knowledge. As mentioned in the introduction, curriculum reforms in Sweden have developed competency-based syllabi, where developing certain ways of knowing is underlined. What different subject-specific capabilities consist of, is not articulated in the syllabi. Research on different ways of knowing different objects of learning can be a way to strengthen the knowledge about subject-specific capabilities.
Acknowledgement

The authors are grateful to the teacher team: Inga-Lisa Kleberg, Karin Richardson and Nina Thomas, who have also approved the article.

The text is proofread by Anchor English proofreading services:
https://www.anchorenglish.com

Gratitude to Catherine MacHale Gunnarsson for consultation on the language in the final version.

The authors wish to express special thanks to the two anonymous reviewers for their helpful and insightful comments.

About the authors

Pernilla Ahlstrand is a senior lecturer of educational work at the University of Gothenburg. Her research interests relate to subject didactic problems and teaching development research. She has conducted several school development and research projects in the school subjects dance, music and theatre.

Institutional affiliation: Department of Pedagogical, Curricular and Professional Studies, University of Gothenburg, Läroverksgatan 15, 411 20 Gothenburg, Sweden.

Email: pernilla.ahlstrand@gu.se

Ninnie Andersson is an assistant professor of dance pedagogy at Stockholm University. Her research interests relate to dance pedagogy with a focus on assessment, dance for people over 65, and how dance knowledge is expressed in curricula and can be articulated in teaching.

Institutional affiliation: Department of Dance Pedagogy, Stockholm University, Brinellvägen 58, 114 28 Stockholm, Sweden.

Email: ninnie.andersson@uniarts.se

References


