

**This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.**

**Author(s):** Virtanen, Anne; Lauritsalo, Kirsti; Mäkinen, Tommi; Hurskainen, Heikki; Tynjälä, Päivi

**Title:** The role of positive atmosphere on learning generic skills in higher education - Experiences of physical education students

**Year:** 2022

**Version:** Published version

**Copyright:** © 2022 Virtanen, Lauritsalo, Mäkinen, Hurskainen and Tynjälä

**Rights:** CC BY 4.0

**Rights url:** <https://creativecommons.org/licenses/by/4.0/>

**Please cite the original version:**

Virtanen, A., Lauritsalo, K., Mäkinen, T., Hurskainen, H., & Tynjälä, P. (2022). The role of positive atmosphere on learning generic skills in higher education - Experiences of physical education students. *Frontiers in Education*, 7. <https://doi.org/10.3389/feduc.2022.886139>



## OPEN ACCESS

## EDITED BY

Tarja Tuononen,  
University of Helsinki, Finland

## REVIEWED BY

Anna Parpala,  
University of Helsinki, Finland  
Johanna Rämö,  
University of Eastern Finland, Finland

## \*CORRESPONDENCE

Anne Virtanen  
anne.virtanen@jyu.fi

## SPECIALTY SECTION

This article was submitted to  
Higher Education,  
a section of the journal  
Frontiers in Education

RECEIVED 28 February 2022

ACCEPTED 01 July 2022

PUBLISHED 22 July 2022

## CITATION

Virtanen A, Lauritsalo K, Mäkinen T,  
Hurskainen H and Tynjälä P (2022) The  
role of positive atmosphere on  
learning generic skills in higher  
education—Experiences of physical  
education students.  
*Front. Educ.* 7:886139.  
doi: 10.3389/feduc.2022.886139

## COPYRIGHT

© 2022 Virtanen, Lauritsalo, Mäkinen,  
Hurskainen and Tynjälä. This is an  
open-access article distributed under  
the terms of the [Creative Commons  
Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use,  
distribution or reproduction in other  
forums is permitted, provided the  
original author(s) and the copyright  
owner(s) are credited and that the  
original publication in this journal is  
cited, in accordance with accepted  
academic practice. No use, distribution  
or reproduction is permitted which  
does not comply with these terms.

# The role of positive atmosphere on learning generic skills in higher education—Experiences of physical education students

Anne Virtanen<sup>1\*</sup>, Kirsti Lauritsalo<sup>2</sup>, Tommi Mäkinen<sup>2</sup>,  
Heikki Hurskainen<sup>3</sup> and Päivi Tynjälä<sup>1</sup>

<sup>1</sup>Finnish Institute for Educational Research, University of Jyväskylä, Jyväskylä, Finland, <sup>2</sup>Department of Teacher Education, Faculty of Education and Psychology, University of Jyväskylä, Jyväskylä, Finland, <sup>3</sup>Faculty of Sport and Health Sciences, University of Jyväskylä, Jyväskylä, Finland

The purpose of this study is to examine what kind of role does positive atmosphere play in learning generic skills. The study was carried out in the final year of Finnish physical education (PE) teacher education where teachers of this study module have developed their pedagogical practices for a long time to foster and maintain the positive learning atmosphere of the course. In this study the learning atmosphere was examined from the perspectives of students addressing the following research questions: (1) How do the students perceive and experience the constructed learning atmosphere? (2) What generic skills do PE students report to learn during the final year study module? (3) What kind of relationship exists between the perceived learning atmosphere and learning generic skills? The data of this study were collected via an internet questionnaire ( $N = 189$ ,  $n = 125$ ) and interviews ( $n = 19$ ) and analyzed applying qualitative content analysis and using statistical methods. According to the results, the PE students felt that the learning atmosphere of their final year study module was warm and conversational; it was easy to get their own voice heard during the final year. The PE students reported that they had learned versatile and plenty of different generic skills, particularly various social skills. There were statistically significant associations between positive atmosphere and some generic skills, such as the development of creativity, but they were not very strong. To understand this finding, the instruments of the study are discussed, especially from the perspective of the development of the questionnaire statements. Although the relationship between perceived positive atmosphere and learning generic skills was only moderate, the findings are promising. For example, the good practices documented in this study, such as how to construct a warm educational atmosphere, may be applied when developing other study modules.

## KEYWORDS

generic skills, atmosphere, learning, students, physical education, higher education

## Introduction

### Generic skills in the world of work and education

Generic skills (also referred to as generic attributes, generic capabilities, key skills, or soft skills), such as critical thinking skills, problem-solving skills, social skills, and skills concerning creativity, are greatly needed and sought after in today's world of work and education (Kember, 2009; Lavi et al., 2021; Virtanen and Tynjälä, 2022). Kember (2009, p. 52), one of the most influential researchers of generic skills, has stated aptly that “few, if any, would disagree with the need for graduates to possess a range of generic capabilities to equip them for lifelong learning in today's knowledge-based society.” In the world of work, the need for generic skills is seen, for example, in competency mappings about the current occupational requirements (e.g., Rekola et al., 2018; Sudirman et al., 2020), in studies on requirements of graduates (Kalfa and Taksa, 2015; Clarke, 2018; Cotronei-Baird, 2020), and in lists and models that describe the needs and demands of future work life (e.g., Fadel et al., 2015; Forbes, 2020). In education, generic skills are integrated into different national and international frameworks (e.g., Gordon et al., 2009; EQF, 2018; P21, 2020; ATC21S, 2022). These frameworks have been formulated for the evaluation, comparability, and development of education programs. Based on these frameworks, generic skills, or twenty-first century skills (Tight, 2021), are incorporated into many countries' curricula (e.g., Ahonen and Kinnunen, 2015).

Although the need for generic skills is recognized in both working life and education, little is known about how these skills are learned and how they should best be taught. Specific generic skills, such as presentation skills and scientific writing, can be prepared as separate courses. In recent years, however, it has been demonstrated that learning generic skills has an interrelationship with the pedagogy used (Kember, 2009; Anthony and Garner, 2016; Virtanen and Tynjälä, 2019, 2022). In other words, generic skills can be learned as a part of regular teaching, but certain forms of teaching and learning are needed. For example, according to Kember (2009), students' intellectual capabilities develop well when teaching activities demand critical thinking, self-managed learning, and problem-solving. Similarly, Virtanen and Tynjälä (2019) found that the pedagogical practices in which students assess knowledge critically support the development of students' critical thinking skills.

Group work and other methods that demand working together foster students' collaborative skills (Kember, 2009; Kostiainen et al., 2018; Mäkinen et al., 2022; Virtanen and Tynjälä, 2022). This is a logical and self-evident finding, but it is worth stressing for developing teaching and pedagogical practices in different educational institutes. Tuononen et al. (2019) found that the graduates most often mentioned

challenges related to their social and presentation skills which they felt were not taught well enough in their institutions. Research has shown that pedagogy that utilizes interactive and collaborative work fosters not only the learning of social skills but also other generic skills. For example, Virtanen and Tynjälä (2019) found that teaching that requires working together develops students' decision-making and problem-solving skills. In their study, acting at the interface between theory and practice also played an important role in explaining students' learning of generic skills. Anthony and Garner (2016) found similar results. They noticed that assignments involving real-world applications and examples, and projects that engaged students or had practical applications, were the most helpful activities for business students to learn generic skills.

The studies presented above are in line with Kember's statement: “It might be noted that a very common model of university teaching—a professor lecturing to students who sit listening—does not provide practice in the generic capabilities” (2009, p. 53). In contrast, the practices that seem to support and foster the learning of generic skills demand students to participate rather than just sit and listen. Many studies also suggest that, in interactive and collaborative learning and teaching, teachers must put effort into constructing a positive and safe learning atmosphere (Vila et al., 2012; Kiuru et al., 2015; Mäkinen et al., 2022). Next, we will review research on the topic.

### The role of a positive and safe atmosphere for learning

Feeling safe is a prerequisite for all learning. Recent findings support the view that the quality of the learning atmosphere has an even greater impact on learning than the ability of the learner (Pakarinen et al., 2014; Ratmawaty, 2018; Calavia et al., 2021; Visiers-Jiménez et al., 2021). For example, a study carried out in six countries reported that the quality of the supervisory relationship and pedagogical atmosphere in which learning took place were closely linked to the students' learning success and their satisfaction with their education (Visiers-Jiménez et al., 2021). A positive and safe atmosphere can affect a student's attitude toward learning, which is considered the most important factor for improving their achievement and confidence (Ratmawaty, 2018; Suyatno et al., 2019). Therefore, increased attention is being paid to the atmosphere in which learning will take place.

In many studies on the learning atmosphere, particular attention is paid to the teacher-student relationship (e.g., Pianta et al., 2008; Kember, 2009; Kiuru et al., 2015; Kostiainen et al., 2018; Pöysä et al., 2019). For example, Ratmawaty (2018) states that a good classroom atmosphere is characterized by a pleasant interaction between the teacher and student during the learning process. In studies of work-related learning, it has been shown that it is the job supervisor rather than the teacher who has the

role of the important person (e.g., [Visiers-Jiménez et al., 2021](#)). In other words, the construction of a learning atmosphere seems to emanate from the adult that guides the student's learning; for example, from a teacher or job supervisor.

Positive and safe atmosphere offers the basis for productive collaboration (e.g., [Alles et al., 2019](#)), and as we concluded above, the learning of generic skills seems to require interactive and collaborative pedagogy. However, we found only a limited number of studies on the relationship between learning atmosphere and the learning of generic skills. For example, [Zeng \(2021\)](#) found that there is a positive association between the two; this association, however, was not very strong. [Calavia et al. \(2021\)](#) perceived that a positive learning atmosphere fosters students' creativity, which [Virtanen and Tynjälä \(2019\)](#) also confirmed.

The aim of this study is to examine more closely the relationship between a positive learning atmosphere and learning generic skills. The study should be, then, carried out in such an environment where the learning atmosphere is known to be good. Therefore, this study was conducted in a context where extensive development has resulted in a learning atmosphere where students would feel safe, trust each other and have the courage to take part in class by engaging in discussion with the teacher and other students. This kind of developmental work is in line with current studies on a positive learning atmosphere, which emphasizes trust, general appreciation (i.e., talking to each other politely, listening to each other, and letting each other finish speaking) and pleasant teacher-student and student-student interactions during the learning process ([Kiuru et al., 2012](#); [Ratmawaty, 2018](#); [Alles et al., 2019](#); [Suyatno et al., 2019](#)). The above-mentioned characterization also describes how a positive learning atmosphere is understood in this study. Next, the context of this study and the developmental work concerning the learning atmosphere will be described in depth.

## Context of the study

The research context was the final year of Finnish physical education (PE) teacher education, when most PE students carry out the major part of their pedagogical studies. In Finland, PE teacher education is a master's degree program (300 ECTS credits), which is highly valued; only 5–6 percent of applicants are accepted annually. PE students carry out one-third of their pedagogical studies in their own faculty where they are integrated as a part of their own major subject, sport pedagogy. Two-thirds of the pedagogical studies are taken in the Faculty of Education, in the Department of Teacher Education. This study focuses particularly on the separate pedagogical study module that PE students carry out at the Department of Teacher Education in their final academic year. It is a large study module (28 ECTS credits) and lasts one academic year. There are 45–60

students in these modules annually, taught by two professors (later in this text called teachers).

The final-year study module consists of three theoretical courses and three practical training periods, taken simultaneously. The final module has been developed over several years ([Klemola et al., 2013](#); [Tynjälä et al., 2016](#); [Lauritsalo et al., 2019](#)). As this final-year study module is a key component in the professional development of teachers, all courses and training periods have been developed in a way that best supports the developing teacher.

The pedagogical practices of the final year study module are based on self-determination theory ([Ryan and Deci, 2000](#)) and [Gordon's \(2003\)](#) interaction model ([Lauritsalo et al., 2019](#)). Feeling safe and belonging to the community are core feelings that teachers hope students experience during the pedagogical practices of the final year. Therefore, they consciously constructed the final year study module to incorporate practices that support and foster a sense of community and solidarity. For example, at the beginning of the year, the teachers assigned different duties and responsibilities to their students. While one PE student group was responsible for the wellbeing of peer students, another was in charge of guiding students' learning tasks and a third organized the party at the end of the year. In addition, one female student was elected and named "mama" and one male student "papa" for the year. The mama and the papa of the final year acted as messengers between the students and the teachers. The aim of these above-mentioned examples of the responsibilities was to support and maintain a sense of community throughout the year.

Teachers stressed that student commitment to the pedagogical practices in the final year was important because there were only two teachers for every 45–60 students annually, and their teaching in the final year occurred primarily through discussion and collaboration. As such, students were required to trust and work with each other throughout the year. The teachers considered the first week of the final year critical. During that time, they implemented plenty of instruction and face-to-face teaching and included several practices to help the students trust and get to know each other better. The teachers conveyed that the work and actions in this first week were crucial to the success of the entire study module. After the first week, nurturing the learning atmosphere is a goal in every teaching situation throughout the year. Students were asked to take care of their peers and organize different activities supporting the learning atmosphere also in their spare time.

At the beginning of the final year, teachers also introduced students to the Three K model, which is a pedagogical practice based on three different values. Values are respect (*kunniotus*), encountering (*kohtaaminen*), and presence (*kiireettömyys*) (the letter "K" refers to the first letter of each word in Finnish). The model's values were carried out in all formal and informal situations and meetings throughout the year. Respect referred to every person's importance and value: "I'm important, you're

important, and we're important;" encountering the described thought, "With an open mind and interest, I watch other people and new things. I ask for help, and I give help;" and presence denoted the presence of all students and teachers in all formal and informal situations: "I'm present right now." Teachers returned to this model several times throughout the year to remind the class of its existence.

## Aim and research questions of the study

Teachers of this final-year study module have done a lot of work to develop the learning atmosphere, making this a suitable context for this study which aim is to examine the relationship between the learning atmosphere and learning generic skills. Before examining this relationship, the experiences of PE students with the learning atmosphere and the learning of generic skills during this final year study module are investigated. More specifically, we addressed the following research questions: (1) How do the students perceive and experience the constructed learning atmosphere? (2) What generic skills do PE students report to learn during the final year study module? (3) What kind of relationship exists between the perceived learning atmosphere and learning generic skills?

## Materials and methods

This study was carried out in a collaboration between teachers and researchers. Teachers planned and took care the teaching, whereas researchers conducted the study (data gathering, analyses). Despite having these different tasks, our experience was that we conducted this study together. For example, teachers helped the researchers to collect data as a part of their own teaching, analysis was discussed jointly and teachers felt that they had received valuable information for the development of their teaching.

This study's data were collected *via* an internet questionnaire and interviews. Participation in this study was voluntary. The questionnaire data was gathered from all PE students ( $N = 189$ ) of four final year study modules during four different years; 125 of them (66%) answered the questionnaire. The questionnaire has been developed and tested in different educational contexts over the course of many years (e.g., Tynjälä and Virtanen, 2005; Virtanen et al., 2014; Virtanen and Tynjälä, 2019). The questionnaire consisted of two different themes: (1) learning outcomes, which included questions about learning generic skills; and (2) learning processes, which included questions related to the integration of theory and practice, assessment and feedback, the nature of teaching and learning, and the learning atmosphere. In the study, only certain parts of the themes of the questionnaires were used: the 20 highest-scoring generic skills

from the theme of learning outcomes, and statements relating to the learning atmosphere from the theme of learning processes.

The questionnaire was analyzed using different statistical methods (e.g., a comparison of the mean values, Pearson's correlation coefficient, and regression analysis). First, using a five-point scale, students were asked to assess the learning atmosphere of their final year study module with the help of six statements. Statements are based on current studies on a positive learning atmosphere, which emphasize trust, general appreciation and pleasant teacher-student and student-student interactions during the learning process (Kiuru et al., 2012; Ratmawaty, 2018; Alles et al., 2019; Suyatno et al., 2019). These statements, with their received mean values and standard deviations, are presented in Table 1. For further analysis, the aggregate scale "Positive learning atmosphere" ( $\alpha = 0.68$ ) was formed from the statements shown in Table 1. This aggregate scale was used in the correlation analysis (Pearson correlation coefficient), where the relationship between positive learning atmosphere and learning generic skills was examined. This relationship was also assessed *via* regression analysis in a confirmatory setting. In this design, the seven generic skills (see Table 2) were the dependent variables and the aggregate scale "Positive learning atmosphere" was the independent variable. The regression analysis followed a stepwise pattern so that the final model included only the variables that were associated with strong explanatory factors. Only the highest coefficient of determination is reported, as all others were minor ( $R^2 = 0.91-0.96$ ). Second, students were asked to assess their learning of generic skills during the final year study module on a five-point scale (1 = nothing, 5 = a great deal). Altogether, the list of generic skills included 55 different skills. It included 22 basic academic skills (BAS), such as critical thinking skills, problem-solving skills, and skills for knowledge acquisition; 12 social skills (SS), such as interaction skills, collaboration skills, and the ability to listen to others; and 19 other skills (OS), such as independent working skills, the ability to operate in

TABLE 1 Mean values of statements describing the learning atmosphere of the final year study module assessed by PE students.

Statements concerning learning atmosphere of the final year study module	Mean values min. 1, max. 5	Standard deviations (SD)
Communication with the teacher felt natural.	4.81	0.40
We had good team spirit in this course.	4.75	0.44
Collaboration with other students was smooth.	4.74	0.44
The threshold to ask for clarifications was low.	4.71	0.59
It was easy to get one's own voice heard during the final year.	4.58	0.64
It was easy to share one's own opinions and thoughts.	4.48	0.78

**TABLE 2** Associations between a perceived positive learning atmosphere and learning of the generic skills (Pearson Correlation Coefficient).

Generic skills	Correlations with positive learning atmosphere
Resourcefulness, innovativeness, or creativity (OS)	0.404**
Planning one's own career (OS)	0.310**
Basic skills of one's occupation/field (BAS)	0.309**
Continuing learning skills (OS)	0.308**
Written communication skills (BAS)	0.307**
Oral communication skills (BAS)	0.304**
Project-work skills (BAS)	0.302**

BAS, Basic academic skills; SS, Social skills; OS, Other skills; \*\* $p < 0.01$ .

**TABLE 3** Mean values of variables describing perceived learning of generic skills among PE students during their final year study module ( $n = 119$ ).

Generic skills	Mean values (min. 1, max. 5)	Standard deviations (SD)
Interaction skills (SS)	4.48	0.68
Holistic thinking (BAS)	4.39	0.65
Ability to listen to others (SS)	4.36	0.70
Seeing things from the perspective of others (SS)	4.31	0.67
Increased awareness of one's know-how (OS)	4.26	0.71
Taking responsibility for one's work (OS)	4.24	0.77
Developing an overall picture of one's field (BAS)	4.18	0.75
Collaboration skills (SS)	4.18	0.78
Ability to apply learned skills and knowledge in different situations (OS)	4.17	0.68
Assessing one's own work (OS)	4.17	0.68
Ability to operate in new situations (OS)	4.14	0.71
Planning and organization skills (BAS)	4.14	0.76
Basic skills of one's occupation/field (BAS)	4.14	0.78
Deep understanding of things learned (BAS)	4.13	0.70
Increasing one's self-confidence (OS)	4.07	0.75
Ability to evaluate the actions of others (SS)	4.01	0.76
Oral communication skills (SS)	4.00	0.75
Independent working skills (OS)	4.00	0.83
Critical thinking skills (BAS)	3.97	0.79
Continuing learning skills (OS)	3.97	0.80

BAS, Basic academic skills; SS, Social skills; OS, Other skills.

new situations, and increasing one's initiative. In addition, our questionnaire included two negative outcomes: disadvantages of the field and bad practices. Due to our extensive list of generic skills, we reported only the 20 highest scores of generic skills assessed by students (Table 3).

Interviews ( $n = 19$ ) with PE students involved three different final year study modules. Teachers asked volunteers for the interview. The researcher contacted the prospective interviewees, informed them of the purpose of the study and carried out the interviews, each of which lasted about 45–60 min. These interviews were collected 6 months after the end of the final year study module. Student interviews were intentionally carried out several months after the final year study module in order to make sure that students would have an overall impression of the final year. Student interviews included questions about structure, forms of activities, teachers, learning atmosphere, assessment and feedback, practical training of the final year, and the role of the final year as a part of the PE qualification. Specific pedagogical practices covered in the final year, such as the Three K model, and different duties and responsibilities of PE students, were discussed in the interviews as well. All interviews were transcribed verbatim.

The transcribed interviews were analyzed by applying qualitative content analysis (Elo and Kyngäs, 2008). Students' answers to questions concerning the learning atmosphere and the Three K model were extracted from the interview transcripts. The analysis focused on the same issues that the teachers assessed as significant for the construction of a positive learning atmosphere. These included descriptions of the students' experiences and views of their duties and responsibilities, the first week of the final year study module and the Three K model. Summaries of these views may be found in the results of this study.

## Results

### RQ1: Learning atmosphere of the final year study module—Students' perspectives

As shown in Table 1, all mean values of the statements concerning learning atmosphere were rather high (4.48–4.81, max. 5). Thus, the students perceived the final year's learning atmosphere as positive. For example, PE students felt that the communication with the teacher (4.81) and with other PE students (4.74) were natural and smooth.

The findings from the student interviews are in line with the quantitative analysis regarding the learning atmosphere of the final year assessed by PE students above: the students experienced that the teachers succeeded in their goal of constructing a positive atmosphere for learning and professional development. The students reported that the learning atmosphere was warm, dialogic, and interactive. For example, one participant described the learning atmosphere of the final year: "I had such a warm and safe feeling here."

According to the students, the teachers not only put effort into the learning atmosphere at the beginning of the final year

but maintained it in various ways throughout the whole year. For example, one student said that, at the start of almost all lessons, the teachers asked the students for news or carried out certain exercises that required them to take part in action or in discussion. After this kind of active beginning, the students found it easier to take part in the interactive and collaborative work required for their lessons.

While the students initially felt that the responsibilities they received were slightly separate from their other studies and the work required of them for their final year, they found that they became naturally connected to the pedagogical practices and actions of their studies. One student said, “Responsibilities were one part of the sense of community during our final year. We were all responsible for how things happened during the year.” Moreover, students said that teachers gave them responsibility over their own learning, helping them feel that the teachers completely trusted them.

According to the students, the Three K model was highly visible and present during the final year. The students felt that the teachers themselves manifested the model they developed. An excerpt from an interview with one student illustrates this perspective:

...Teachers are so warm. They convey very strongly that they are interested in us, and they want to help us. And we [the students and teachers] are working together this year. They do not always have the right answers or solutions, but they are ready to work and think together with us... When they said that they would like to foster such things [the student is referring to the Three K model], it is clear in their actions. For example, if they talk about interaction skills and say that active listening is very important in interactions, they themselves use active listening. In other words, they don't just say that this is the thing that you must learn but act on the lessons and elsewhere they teach (Student 4).

As noted in the excerpt above, the students recognized that the teachers themselves acted in line with their own demands. The students also claimed that they would like to emulate their teachers in the future.

## RQ2: Perceived learning of generic skills among physical education students during their final year study module

As shown in [Table 3](#), among the 20 highest scores for skills were eight generic skills from the category “other generic skills,” as well as six generic skills from the “basic academic skills” and “social skills” categories. These categories are represented by the following abbreviations: BAS, basic academic skills; SS, social

skills; and OS, other skills, and are included with each generic skill provided in [Table 3](#).

According to the PE students' assessments, the highest scores were given to various social skills: interaction skills (mean value was 4.48, max. 5), ability to listen to others (4.36), seeing things from the perspectives of others (4.31), and collaboration skills (4.18). From the BAS category, students particularly reported learning holistic thinking (4.39) and developing an overall picture of one's field (4.18). From the OS category, students assessed that they learned increased awareness of one's know-how (4.26) and taking responsibility for one's work (4.24). Thus, the pedagogical practices of the final year study module seem to offer opportunities to develop versatile social skills and increase students' awareness of themselves as professional agents (increased awareness of one's know-how) and their profession in the wider context (developing an overall picture of one's field, holistic thinking).

## RQ3: Relationship between perceived learning atmosphere and learning generic skills

As shown in [Table 2](#), it was established that a positive learning atmosphere was associated with the learning of resourcefulness, innovativeness, creativity; ability to plan a career; basic field-specific occupational skills; continuing professional development, and few generic academic skills (i.e., written and oral communication skills, project-work skills). These associations, however, were not strong ( $p < 0.01$ ).

Due to moderate associations between the generic skills and the positive learning atmosphere, the coefficients of determination were also minor. The highest coefficient of determination was for “resourcefulness, innovativeness or creativity” ( $R = 0.404$ ,  $R^2 = 0.163$ ,  $F = 15.768$ ,  $p < 0.001$ )—that is, the positive learning atmosphere explained 16 percent of the learning of resourcefulness, innovativeness or creativity.

## Discussion

In this study, the role of a positive learning atmosphere for learning generic skills was examined during the final year of Finnish physical education (PE) teacher education. This context was suitable for examining this topic because teachers of the module have developed their pedagogical practices for a long time and were therefore able to foster a sense of community and solidarity in the class (e.g., [Tynjälä et al., 2016](#); [Lauritsalo et al., 2019](#); [Mäkinen et al., 2022](#)). The study focused on (1) PE students' experiences of atmosphere during the final year of the module, (2) their assessments of learning generic skills, and (3) the relationship between perceived atmosphere and learning generic skills.

The results concerning the atmosphere indicate that the teachers succeeded in their objective of constructing a

positive environment for PE students' learning and professional development. Students reported that the atmosphere was warm and conversational; they also felt that it was easy and natural to speak their minds. It could be said that the students felt equal to their teachers. They felt that their teachers trusted them completely, giving them considerable responsibility in terms of their own learning, thinking and collaboration.

Furthermore, perceived learning of generic skills was very strong. In this study, only the 20 most learned generic skills were reported. The mean values for all of them were rather high; almost all had a 4 or above, with a maximum of 5. In other words, PE students assessed they learned these skills considerably well during the year. Earlier studies have shown that interactive and collaborative teaching practices particularly support and foster the learning of generic skills (Kember, 2009; Anthony and Garner, 2016; Virtanen and Tynjälä, 2019). This study supports those findings as teaching in the course was interactive and the PE students reported learning many different social, basic academic and other skills.

There were associations between positive learning atmosphere and some generic skills, such as the development of creativity, but the correlations were only moderate ( $p < 0.01$ ). This finding is also in line with earlier, limited number of studies on the topic (e.g., Zeng, 2021). For example, Virtanen and Tynjälä (2019) and Calavia et al. (2021) also found that a perceived positive atmosphere supports creativity. We discuss our findings more closely below.

During the final year, the module in question aimed to support, above all, the professional growth of PE teachers, whereas the learning of different generic skills is not the primary goal.

The teachers created a positive and safe atmosphere to foster their students' professional development. According to the findings of this study, the teachers succeeded in their aim of constructing a positive and safe learning atmosphere for their students. In further studies it would be interesting to examine whether a strong relationship exists between perceived positive atmosphere and professional development of student teachers. However, the findings do not show how the learning atmosphere of the final year study module should be developed in order to support and foster the learning of generic skills.

The relationship between learning atmosphere and learning generic skills was examined *via* a questionnaire. Although the analysis of the questionnaire data shows that PE students assessed the learning atmosphere very highly, the statements (see Table 1) were related to the atmosphere in a rather general way. For example, they did not investigate the teacher-student relationship in detail despite the fact that it has been found to be a significant factor in constructing a positive learning atmosphere in earlier studies (e.g., Kiuru et al., 2015; Kostiainen et al., 2018; Pöysä et al., 2019). Kember (2009) found that an interactive teacher-student relationship was associated with the development of higher-order thinking capabilities. For this reason, the questionnaire statements should be further

developed so that they may more accurately convey the teacher-student relationship.

As to limitations of the study, attention can be paid to the fact that the results of the analysis of the questionnaire data are based on the respondents' self-assessed answers. As a method, self-assessment has been criticized because assessments of one's own actions are considered unreliable (e.g., Paulhus and Vazire, 2007). For example, Braun and Brachem (2017) state that self-reported competences cannot be equivalent to an objective assessment of competences. In the Finnish educational context, however, an interesting phenomenon has been found. For example, Virtanen (2013) found in her doctoral thesis that Finnish students assessed their learning and professional development during their workplace learning periods more critically than their teachers or workplace trainers did. Moreover, in her study, the workplace trainers saw the learning and professional development of students at workplaces in the most positive light. A strong correlation between assessments by teachers and students has also been demonstrated in other studies (e.g., Falchikov and Goldfinch, 2000; Wang et al., 2009; Asikainen et al., 2014). It is also noteworthy that the questionnaire used in this study has been developed, tested and applied over a long period of time across several studies (e.g., Tynjälä and Virtanen, 2005; Virtanen et al., 2014; Virtanen and Tynjälä, 2019). Reliability of the research findings can also be supported with the use of triangulation of the methods. The learning atmosphere findings were examined with the help of both interviews and questionnaires and both results were completely in line with each other.

To conclude, although this study found only moderate relationship between perceived positive atmosphere and learning generic skills, its other findings are promising. The research context's atmosphere was considered very positive and safe. Moreover, the learning of generic skills was assessed as strong and versatile. Therefore, the good practices documented in this study, such as how to construct a warm educational atmosphere, may be applied when developing other study modules.

## Data availability statement

The original contributions presented in this study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.



## Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships

that could be construed as a potential conflict of interest.

## Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

## References

- Ahonen, A., and Kinnunen, P. (2015). How Do Students Value the Importance of Twenty-first Century Skills? *Scand. J. Educ. Res.* 59, 395–412. doi: 10.1080/00313831.2014.904423
- Alles, M., Seidel, T., and Gröschner, A. (2019). Establishing a positive learning atmosphere and conversational culture in the context of a video-based teacher learning community. *Prof. Dev. Educ.* 45, 250–263. doi: 10.1080/19415257.2018.1430049
- Anthony, S., and Garner, B. (2016). Teaching soft skills to business students: an analysis of multiple pedagogical methods. *Bus. Prof. Commun. Q.* 79, 360–370. doi: 10.1177/2329490616642247
- Asikainen, H., Virtanen, V., Postareff, L., and Heino, P. (2014). The validity and students' experiences of peer assessment in a large introductory class of gene technology. *Stud. Educ. Eval.* 40, 197–205. doi: 10.1016/j.stueduc.2014.07.002
- ATC21S (2022). *Assessment & Teaching of 21st Century Skills*. Available online at: <http://www.atc21s.org/> (accessed February 28, 2022).
- Braun, E., and Brachem, J.-C. (2017). "The labour market's requirement profiles for higher education graduates," in *Higher Education Transitions. Theory and Research*, eds E. Kyndt, V. Doehne, K. Trigwell, and S. Lindblom-Ylänne (London: Routledge), 219–237. doi: 10.4324/9781315617367
- Calavia, M. B., Blanco, T., and Casas, R. (2021). Fostering creativity as a problem-solving competence through design: think-Create-Learn, a tool for teachers. *Think. Skills Creat.* 39:100761. doi: 10.1016/j.tsc.2020.100761
- Clarke, M. (2018). Rethinking graduate employability: the role of capital, individual attributes and context. *Stud. High. Educ.* 43, 1923–1937. doi: 10.1080/03075079.2017.1294152
- Cotronei-Baird, V. S. (2020). Academic hindrances in the integration of employability skills development in teaching and assessment practice. *High. Educ.* 79, 203–223. doi: 10.1007/s10734-019-00405-4
- Elo, S., and Kyngäs, H. (2008). The qualitative content analysis process. *J. Adv. Nurs.* 62, 107–115. doi: 10.1111/j.1365-2648.2007.04569.x
- EQF (2018). *The European Qualifications Framework: Supporting Learning, Work, and Cross-Border Mobility*. Available Online at: [http://www.ehea.info/Upload/TPG\\_A\\_QF\\_RO\\_MK\\_1\\_EQF\\_Brochure.pdf](http://www.ehea.info/Upload/TPG_A_QF_RO_MK_1_EQF_Brochure.pdf) (assessed Feb 28, 2022).
- Fadel, C., Bialik, M., and Trilling, B. (2015). *Four-Dimensional Education: The Competencies Learners Need to Succeed*. Boston: Center for Curriculum Redesign.
- Falchikov, N., and Goldfinch, J. (2000). Student peer assessment in higher education: a meta-analysis comparing peer and teacher marks. *Rev. Educ. Res.* 70, 287–322. doi: 10.2307/1170785
- Forbes (2020). *The Top 10 Skills Recruiters are Looking for in 2021*. Jersey City: Forbes.
- Gordon, J., Halasz, G., Krawczyk, M., Leney, T., Michel, A., Pepper, D., et al. (2009). *Key Competences in Europe: Opening Doors for Lifelong Learners Across the School Curriculum and Teacher Education*. CASE Network. Reports No. 87. Warsaw: CASE, Center for Social and Economic Research.
- Gordon, T. (2003). *Teachers' Effectiveness Training: The Program Proven to help Teachers Bring out the best in Students of all Ages*. New York, NY: Three Rivers Press.
- Kalfa, S., and Taksa, L. (2015). Cultural capital in business higher education: reconsidering the graduate attributes movement and the focus on employability. *Stud. High. Educ.* 40, 580–595. doi: 10.1080/03075079.2013.84221
- Kember, D. (2009). Nurturing generic capabilities through a teaching and learning environment which provides practice in their use. *High. Educ.* 57, 37–55. doi: 10.1007/s10734-008-9131-7
- Kiuru, N., Aunola, K., Lerkkanen, M.-K., Pakarinen, E., Poskiparta, E., Ahonen, T., et al. (2015). Positive teacher and peer relations combine to predict primary school students' academic skill development. *Dev. Psychol.* 51, 434–446. doi: 10.1037/a0038911
- Kiuru, N., Poikkeus, A.-M., Lerkkanen, M.-K., Pakarinen, E., Siekkinen, M., Ahonen, T., et al. (2012). Teacher-perceived supportive classroom climate protects against detrimental impact of reading disability risk on peer rejection. *Learn. Instr.* 22, 331–339. doi: 10.1016/j.learninstruc.2011.12.003
- Klemola, U., Heikinaro-Johansson, P., and O'Sullivan, M. (2013). Physical education student teachers' perceptions of applying knowledge and skills about emotional understanding studied in PETE in a one-year teaching practicum. *Phys. Educ. Sport Pedagogy* 18, 28–41. doi: 10.1080/17408989.2011.630999
- Kostiainen, E., Ukskoski, T., Ruohotie-Lyhty, M., Kauppinen, M., Kainulainen, J., and Mäkinen, T. (2018). Meaningful learning in teacher education. *Teach. Teach. Educ.* 71, 66–77. doi: 10.1016/j.tate.2017.12.009
- Lauritsalo, K., Mäkinen, T., Virtanen, A., Klemola, U., and Tynjälä, P. (2019). "Final year of physical education studies – Supporting physical education students' professional development as a teacher," in *Paper presented at the Conference "International Association for Physical Education in Higher Education" (AIESEP "Association Internationale des Écoles Supérieures d'Éducation Physique")* (New York, NY).
- Lavi, R., Tal, M., and Dori, Y. J. (2021). Perceptions of STEM alumni and students on developing 21<sup>st</sup> century skills through methods of teaching and learning. *Stud. Educ. Eval.* 70:101002. doi: 10.1016/j.stueduc.2021.101002
- Mäkinen, T., Kostiainen, E., and Klemola, U. (2022). "Significant in life: Core learning outcomes of a social and emotional course in physical education teacher education," in *International Approaches to Promoting Social and Emotional Learning in Schools: A Framework for Developing Teaching Strategy*, eds M. Talvio and K. Lonka (London: Routledge), 167–189. doi: 10.4324/9781003093053-13
- P21 (2020). *Partnership for 21st Century Learning*. Available online at: <http://www.p21.org/> (accessed October 20, 2020).
- Pakarinen, E., Aunola, K., Kiuru, N., Lerkkanen, M.-K., Poikkeus, A.-M., Siekkinen, M., et al. (2014). The cross-lagged associations between classroom interactions and children's achievement behaviors. *Contemp. Educ. Psychol.* 39, 248–261. doi: 10.1016/j.cedpsych.2014.06.001
- Paulhus, D. L., and Vazire, S. (2007). "The self-report method," in *Handbook of Research Methods in Personality Psychology*, eds R. W. Robins, R. C. Fraley, and R. F. Krueger (New York, NY: Guilford Press), 224–239.
- Pianta, R. C., La Paro, K. M., and Hamre, B. K. (2008). *The Classroom Assessment Scoring System. Manual*. Baltimore, MD: Brookes.
- Pöysä, S., Vasalampi, K., Muotka, J., Lerkkanen, M.-K., Poikkeus, A.-M., and Nurmi, J.-E. (2019). Teacher-student interaction and lower secondary school

- student' situational engagement. *Br. J. Educ. Psychol.* 89, 374–392. doi: 10.1111/bjep.12244
- Ratmawaty, S. (2018). How to improve classroom atmosphere and undergraduate nutrition students' performance in learning nutrition care process? *Int. J. Learn. Teach. Educ. Res.* 17, 154–174. doi: 10.26803/ijlter.17.11.10
- Rekola, M., Nippala, J., Tynjälä, P., and Virtanen, A. (2018). Modelling competences and anticipating the future competence needs in the forest sector. *Silva Fenn.* 52, 1–19. doi: 10.14214/sf.9983
- Ryan, R. M., and Deci, E. L. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemp. Educ. Psychol.* 25, 54–67. doi: 10.1006/ceps.1999.1020
- Sudirman, I., Siswanto, J., and Aisha, A. N. (2020). Software entrepreneurs' competencies based on business growth. *J. Res. Mark. Entrepreneursh.* 22, 111–132. doi: 10.1108/JRME-12-2017-0055
- Suyatno, A., Wantini, M., Pambudi, D. I., and Amurdawati, G. (2019). The impact of teacher values, classroom atmosphere, and student-teacher relationship towards student attitude during learning process. *Int. J. Learn. Teach. Educ. Res.* 18, 54–74. doi: 10.26803/ijlter.18.8.4
- Tight, M. (2021). Twenty-first century skills: meaning, usage and value. *Eur. J. High. Educ.* 11, 160–174. doi: 10.1080/21568235.2020.1835517
- Tuononen, T., Parpala, A., and Lindblom-Ylänne, S. (2019). Graduates' evaluations of usefulness of university education, and early career success – A longitudinal study of the transition to working life. *Assess. Eval. High. Educ.* 44, 581–595. doi: 10.1080/02602938.2018.1524000
- Tynjälä, P., and Virtanen, A. (2005). Skill Learning at Work: Investigations into Student Experiences of On-the-Job Learning. *Learn. Skills* 7, 106–116. doi: 10.1097/OPX.0000000000001594
- Tynjälä, P., Virtanen, A., Klemola, U., Kostiaainen, E., and Rasku-Puttonen, H. (2016). Developing social competence and other generic skills in teacher education: applying the model of integrative pedagogy. *Eur. J. Teach. Educ.* 39, 368–387. doi: 10.1080/02619768.2016.1171314
- Vila, L. E., Perez, P. J., and Morillas, F. G. (2012). Higher education and the development of competencies for innovation in the workplace. *Manag. Decis.* 50, 1634–1648. doi: 10.1108/00251741211266723
- Virtanen, A. (2013). *Opiskelijoiden oppiminen ammatillisen peruskoulutuksen työosaamisen järjestelmässä [Students' workplace learning in Finnish Vocational Education and Training]*. Ph.D. thesis. Jyväskylä: University of Jyväskylä.
- Virtanen, A., and Tynjälä, P. (2019). Factors explaining the learning of generic skills: a study of university students' experiences. *Teach. High. Educ.* 24, 880–894. doi: 10.1080/13562517.2018.1515195
- Virtanen, A., and Tynjälä, P. (2022). Pedagogical practices predicting perceived learning of social skills among university students. *Int. J. Educ. Res.* 111:101895. doi: 10.1016/j.ijer.2021.101895
- Virtanen, A., Tynjälä, P., and Eteläpelto, A. (2014). Factors promoting vocational students' learning at work: study on student experiences. *J. Educ. Work* 27, 43–70. doi: 10.1080/13639080.2012.718748
- Visiers-Jiménez, L., Suikkala, A., Salminen, L., Leino-Kilpi, H., Löyttyniemi, E., Henriques, M. A., et al. (2021). Clinical learning environment and graduating nursing students' competence: a multi-country cross-sectional study. *Nurs. Health Sci.* 23, 398–410. doi: 10.1111/nhs.12819
- Wang, L., MacCann, C., Zhuang, X., Liu, O. L., and Roberts, R. D. (2009). Assessing teamwork and collaboration in high school students: a multimethod approach. *Can. J. Sch. Psychol.* 24, 108–124. doi: 10.1177/0829573509335470
- Zeng, L. M. (2021). How much does it differ? How much does it matter? The research experience of Mainland Chinese and Hong Kong students in a Hong Kong University. *Stud. High. Educ.* 46, 606–623. doi: 10.1080/03075079.2019.1647412