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Pedagogical practices predicting perceived learning of social skills among university students

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ABSTRACT

The aim of this study was to examine what kinds of pedagogical practices predict perceived learning of university students' social skills in classes where these skills are not set as learning outcomes. Data were collected from students of various disciplines by means of a questionnaire and then analysed using regression analysis. Students' learning of social skills was explained by pedagogical factors related to 1) the modes of teaching and learning, 2) the features of the constructivist learning environment, 3) the features of the integrative pedagogy, and 4) the circumstances pertaining to the atmosphere of the learning environments involved in their studies. Factors belonging to three of these elements predicted the learning of social skills amongst university students. The regression models explained 46–58% of the learning of social skills. The results showed that collaborative learning typical of a constructivist learning environment plays a critical role in the learning process. In contrast, the modes of traditional or individual learning, such as listening and feedback or evaluation given by the teacher, loaded negatively in the regression model. Overall, the results suggest that collaborative and active forms of learning are highly significant in the learning of social skills. The study also brought up new perspectives to consider in the teaching of social skills.

Social skills as key competences in life and work

In general, social skills can be defined as tools that enable people to interact with other people and society harmoniously (Dowd & Tierney, 2017). They can be expressed in practical situations in a variety of ways, such as listening to others, an ability to view a situation from others' perspective (perspective taking), communicating clearly, and an ability to collaborate with other people. Social skills play a crucial role at different stages of life, like in families, day care and school, various hobby-related and other peer groups, and in working life (Brackett, Rivers & Salovey, 2011; Greene & Burleson, 2003; Poulou, 2014). The significance of social skills has recently been stressed, especially in regard to the workplace, since employees' versatile social skills are considered a key asset for the functioning of individuals and work communities alike (Carnevale & Smith, 2013; Forbes, 2015; Robles, 2012). In many studies and needs assessments, highly educated professionals have highlighted the pivotal importance of collaborative and other generic skills in their work (Arevalo, Pitkänen, Gritten & Tahvanainen, 2010; Rekola, Nippala, Tynjälä & Virtanen, 2018; Tholen, James Relly, Warhurst & Commander, 2016). Also, in studies on students' work experience, students have reported that they have learned social skills at the workplace, such as collaboration and communication skills (Crebert, Bates, Bell, Patrick & Cragolini, 2004; Jackson, 2015; Virtanen, Tynjälä & Collin, 2009).

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According to various predictions, the role of social skills at the workplace will gain even greater emphasis in the future (Future Work Skills 2020, 2011; New Skills for New Jobs, 2010). Work will increasingly take place in networks and projects with varying compositions (Fadel, Bialik & Trilling, 2015; Oivallus, 2011). This type of working calls for personal willingness and the capability to collaborate, as well as requiring a readiness to address problems in an entrepreneurial manner (Oivallus, 2011). According to the American Institute for the Future, one of the most important human skills – amidst the effects of all-pervasive technological advancements and other megatrends – is social intelligence (Future Work Skills 2020, 2011). Socially intelligent employees are able to quickly interpret the feelings and emotions of people around them based on their verbal expressions, tone of voice and gestures (Future Work Skills 2020, 2011). This human feature is considered to be a competitive asset of people over machines (Future Work Skills 2020, 2011), and persons sensitive to other people's feelings have also been found to succeed better in their work than others (Cherniss, 2000; also Brackett et al., 2011; Troth, Jordan, Lawrence & Tse, 2012). In economic studies, it has been discovered that social abilities are reflected even in income and rewards in working life (Deming, 2017; Edin, Fredriksson, Nybom & Ockert, 2017; Weinberger, 2014).

In the field of education, the role of social skills is twofold. On the one hand, the above-mentioned significance is acknowledged. For example, the frameworks for 21st century skills, which are used as a basis for curricular planning in many countries, point out the significant role of social skills in daily life and work at present and expectedly in the future (ATC21S 2012; Gordon et al., 2009; OECD, 2005; P21). Social skills are described in the framework of Assessment and Teaching for 21st Century Skills (ATC21S) as *ways of working* in future society (Binkley et al., 2012). Also, the x0027 (European Council's Recommendation for European Qualifications Framework 2017) sets certain requirements for the social skills of graduates from different levels of education. On the other hand, although social skills are included in the learning objectives of many study programmes, quite little is known about the teaching and learning of these as well as other generic skills. Naturally, various social skills, such as emotional and interaction skills, can be developed in specific courses (Scoular & Care, 2018; World Economic Forum 2016), *but we also need more knowledge about how the development of students' social skills could be supported through a "hidden curriculum"* (Kian, Ehsangar & Izanloo, 2020) *in major and minor subject studies in different fields*. In our previous study, we have shown that certain pedagogical practices support the development of certain generic skills (such as problem solving and critical thinking) – in courses where the learning of generic skills was not a curricular aim (Virtanen & Tynjälä, 2019). The development of social skills was not included in the previous study, which is why this article explores *what kinds of pedagogic practices in university courses may contribute to students' learning of social skills*. These examined courses focused on the content of the students' major subject, whereas learning and development of social skills were not set as explicit learning goals or learning outcomes.

Learning of social and other generic skills in university studies

In this study, social skills are part of a larger set of working life competences, more recently being referred to as *generic skills*. In higher education, some of these generic skills have been traditionally taught in separate courses focusing on particular skills. These include, for example, various language and communication courses. Learning generic skills may have been integrated into other studies as well. For example, courses related to information searching are often taken in connection with graduate thesis seminars. Generic skills may also be seen to develop alongside or as a by-product of other studies. Especially this last aspect has been reinforced in recent decades in research on the learning of generic skills (e.g., Kember, Leung & Ma, 2007; Virtanen & Tynjälä, 2019). However, it seems that such learning would require certain types of pedagogic solutions. In particular, in this regard, the following themes emerge from the literature: 1) different modes of teaching and learning, 2) constructivist learning environments (CLE), 3) integrative pedagogy (IP), and 4) emotional atmosphere of learning. Research on these aspects formed the theoretical basis of our empirical study, and they are discussed in more detail in the next sections.

Interactive and collaborative modes of instruction supporting the learning of generic skills

Crebert and colleagues (2004) examined university graduates' views on the development of generic skills during their university studies and at work. Most of the respondents experienced that generic skills can be learned both at university and at work. The graduates also found that, in the university context, generic skills were learned particularly through group work. Correspondingly, at work, the learning of generic skills was promoted, above all, by working together with colleagues. In other words, in both contexts, the learning of generic skills was promoted in settings calling for *interaction and collaboration with others* (Crebert et al., 2004).

Also (de la Harbe et al., 2000) showed that the learning of generic skills was promoted by *collaborative learning rather than by individual learning*. Similar results have also been reported by Moy (1999) as well as Ballantine and McCourt Larres (2007), who found that the *cooperative learning approach* supported students' learning of generic skills. Smith and Bath (2006) studied the learning of generic skills as part of a learning community and noticed that, according to students' experiences, particularly the social, interactional and collaborative characteristics of the learning community were crucial factors in the learning of generic skills.

Kember et al. (2007); also Kember, 2009; Kember & Leung, 2005) analysed a large set of questionnaire data collected from students of the University of Hong Kong to find out what kinds of features in the learning environment support the learning of generic skills. They noticed that the nature of teaching played the greatest role in this respect. To support such learning, teaching should aim at personal understanding. The teacher can promote this type of instruction by providing real-life examples related to the subject matter and by encouraging students to examine things themselves. The teacher should aim at active learning, which referred here especially to interaction between the teachers and students. When it comes to assessment, the teacher should draw from diverse methods. The learning of generic skills seemed to be facilitated by a consistent curriculum as well, where different domains were logically linked to

each other. With the help of a consistently designed curriculum, students can see the connections between matters to be learned. In addition to the nature of teaching, also teacher–student interaction and students’ mutual interaction proved significant for the learning of generic skills.

In all, previous studies suggest that the learning of generic skills is promoted by such forms of teaching and learning that involve collaborative working and call for interaction. In particular, students’ mutual collaboration seems to facilitate the learning of social skills (Kember et al., 2007).

Constructivist pedagogy and learning atmosphere in the learning of skills

The above-described findings by Kember and colleagues encompassed strong traits of *constructivist learning environments*. Such traits include, for example, highlighting the student’s active role in learning, instruction involving discussion and collaboration, and assessment linked to the learning process (e.g., Loyens & Gijbels, 2008; Tynjälä, Pirhonen, Vartiainen & Helle, 2009). In the studies by Kemper and colleagues, all of these features were strongly connected to the learning of generic skills (Kember et al., 2007).

Hence, a constructivist learning environment seems to provide a promising basis for the learning of generic skills. One application of the CLE is the model of *integrative pedagogy*, which has proven successful in the development of university students’ social skills (Tynjälä, Virtanen, Klemola, Kostiainen & Rasku-Puttonen, 2016). In this model, the fundamental principle in the design of a learning environment is that the basic elements of expertise – that is, conceptual or theoretical knowledge, practical knowledge and skills, self-regulation skills and knowledge, as well as sociocultural knowledge – are present and integrated with each other (Tynjälä, 2008). Thus, theory and practice are connected with the help of active and reflective learning tasks. The model of integrative learning also takes the emotional dimension of learning into account (e.g., Tynjälä et al., 2016). Emotional aspects and the meaning of *learning atmosphere* have been strongly highlighted in pedagogic research in recent years (Chemi, Grams Davy & Lund 2017; Kiuru et al., 2015; Pekrun & Linnenbrink-Garcia 2014; Virtanen & Tynjälä, 2019). It has been found that learning environments with a positive and confidence-inducing atmosphere are highly significant to creativity, in particular (Binkley et al., 2012; Eteläpelto & Lahti, 2008; Hämäläinen & Vähäsantanen, 2011; Vila, Perez & Morillas, 2012).

Table 1

Summary of Pedagogical Practices explaining Students’ Learning of Social Skills (i.e., Explanatory variables of the regression model).

Modes of teaching and learning (MTL) (min. 1, max. 5)	Features of constructivist learning environment (CLE) (min. 1, max. 5)	Features of integrative pedagogy (IP) (min. 1, max. 5)	Factors related to learning atmosphere (min. 1, max. 4)
<ul style="list-style-type: none"> - Teacher lecturing (3.31) - Instruction/guidance given by teacher (3.48) - Feedback/assessment given by teacher (3.07) - Discussion (4.42) - Listening (4.26) - Watching (3.40) - Reading (2.63) - Writing (2.82) - Assessment of own work/performance (3.29) - Assessment of others’ work/performance (2.94) - Working alone (2.72) - Working with other (4.09) 	<ul style="list-style-type: none"> - Sharing and utilizing students’ earlier experiences and knowledge ($\alpha = 0.89$; $M = 3.77$) • Sharing personal experiences • Learning from other students’ experiences • Utilising other students’ experiences • Utilising other students’ earlier knowledge - Feedback, assessment, and summarising tasks ($\alpha = 0.87$; $M = 3.15$) • Receiving feedback • Practising giving feedback • Summarising of key contents by the students • Summarising of key contents by the teacher • Developing assessment skills - Critical examination of knowledge ($\alpha = 0.86$; $M = 2.96$) • Analysing things from different perspectives • Critical evaluation of theories by the teacher • Critical evaluation theories by the students • Developing a critical view • Seeking different explanations for the same thing • Comparing different theories 	<ul style="list-style-type: none"> - Acting at the interface between theory and practice ($\alpha = 0.88$; $M = 3.62$) • Acquiring practical knowledge • Integrating theory and practice • Teacher relating and demonstrating practical examples • Connections between teaching and working life • Students looking for examples on their own • Applying theory to practice • Analysing familiar phenomena with the help of theoretical knowledge • Students analysing their own learning experiences with the help of theoretical knowledge - Learning of theoretical knowledge ($M = 2.96$) 	<ul style="list-style-type: none"> Positive atmosphere during the course ($\alpha = 0.83$; $M = 3.61$) • <i>It was easy to get one’s own voice heard during the course.</i> • <i>It felt easy to share one’s own opinions and thoughts.</i> • <i>The threshold to ask for clarifications was low.</i> • <i>Communication with the teacher felt natural.</i> • <i>Collaboration with other students was smooth.</i> • <i>We had good team spirit in this course.</i>

Thus, in the light of previous research, different pedagogical practices seem to have an impact on the learning of generic skills. Our study investigates what kinds of pedagogical practices are associated to university students' perceived learning of social skills during their major subject courses. Hence, we are not looking at courses that are specifically aimed at the learning of social skills, but, instead, at courses that deal with various subject matters of different fields. The social skills in focus are described more specifically in conjunction with the regression model design. Pedagogical practices refer here to the above-described 1) modes of teaching and learning; 2) pedagogical approaches and practices, especially in regard to the features of constructivist learning environments and integrative pedagogy; and also 3) factors related to learning atmosphere. In other words, our study provides information on what kinds of teaching and learning modes as well as pedagogical approaches and practices can be used in different subject studies in order to promote students' learning and development of social skills. Hence, our research question is formulated as follows: *What kinds of pedagogical practices predict university students' perceived learning of social skills in their field-specific subject studies.*

Data and method of analysis

The target population consisted of Finnish university students from three different subject fields (chemistry, sport pedagogy, teacher education) ($N = 163$, $n = 123$). Thus, both so-called hard and soft sciences are represented in our study (e.g., [Becher & Trowler, 2001](#)), since these have been found to differ significantly in terms of their ways of teaching ([Lindblom-Ylänne, Trigwell, Nevgi & Ashwin, 2006](#); [Lueddeke, 2003](#); [Ylijoki, 2000](#)).

The data were collected from the students by means of an online questionnaire at the end of a subject study module involving face-to-face teaching. The examined study modules were carried out during intermediate studies of the bachelor's degree in these three major subjects; therefore, most of the respondents were students in their second year of study. The study modules differed from each other in their number of students (20–80), but the actual teaching groups consisted of about 20 students. In other words, large classes were divided into several smaller groups (about 20 students). These modules also included independent studying, the modes of which varied slightly across the courses. In one course, students worked independently on preliminary learning assignments before each teaching session. Another course included two writing assignments to be accomplished during the course, based on the teaching and course literature accompanied with the self-assessment of one's learning. With a similar basis and self-assessment, the third course involved an essay to be written after the course. [Table 1](#) provides an overview of the course-specific pedagogical practices, including the mean values for variables measuring each pedagogical practice. The table shows that a variety of pedagogical practices and different forms of teaching and learning were used in the courses, which makes it meaningful to study their role in the learning of social skills. Of the respondents, 62% were female and 38% male with an average age of 22.

The questionnaire used in our present study has been developed, tested and applied over a long period in regard to higher education and vocational education (e.g., [Tynjälä & Virtanen, 2005](#); [Tynjälä et al., 2016](#); [Virtanen & Tynjälä, 2019](#); [Virtanen, Tynjälä & Eteläpelto, 2014](#)). Besides background variables (such as age, gender, major subject), the questionnaire includes a section measuring the perceived learning of generic skills (altogether 43 different skills), and another section for pedagogical practices covering 12 forms of teaching and learning, 24 features of constructivist learning environments and integrative pedagogy, as well as 22 statements on the course design, teaching, and learning atmosphere. The list of generic skills derives from earlier research and expected future work skill needs (e.g., [Barnett, 2004](#); [Barrie, 2006](#); [Crebert et al., 2004](#); [Future Work Skills 2020 2011](#); [Jones, 2009](#); [Kember et al., 2007](#); [New Skills for New Jobs 2010](#); [Oivallus 2011](#)). The features describing constructivist learning environments and integrative pedagogy are based on research on learning and instruction (e.g., [Kember et al., 2007](#); [Loyens & Gijbels, 2008](#); [Tynjälä, 2008](#); [Tynjälä et al., 2009](#)). The items are described more closely in connection with the regression model design.

The data were analysed by means of regression analysis with a confirmatory setting. In other words, the explanatory factors to be included in the model were chosen on the basis of the theoretical framework, which is described in connection with the model design. The regression analysis followed a stepwise pattern so that the final model included only those variables that were associated with strong explanatory factors. This also maximised the explanatory power of the model.

Constructing the explanatory model for the learning of social skills

In this design, the dependant variables were composed of social skills. Since social skills include a rich variety of different components (e.g., [Carnevale & Smith, 2013](#); [Creene and Burleson 2003](#); [Dowd & Tierney, 2017](#)), it was necessary to limit the number of skills to be evaluated in this study. Therefore, we focused only on three skills. The students were asked to rate, on a five-step scale, to what extent they felt having learned the following during the course: 1) collaboration skills, 2) interaction skills, and 3) looking at things from other people's perspectives (perspective taking). The first two are quite ordinary social skills in many studies on generic skills (e.g., [Crebert et al., 2004](#); [Jones, 2009](#); [Kember et al., 2007](#); [Krause, 2014](#)), whereas the third one, the ability to look at things from other people's perspective, has been used far more rarely in this context. Nevertheless, social skills are considered to include perspective taking and empathy, that is, the ability to identify with another person's feelings ([Bar-On, 2006](#); [Brackett et al., 2011](#); [Dolev & Leshem, 2017](#)). For this reason, in the present study, students were asked to evaluate this aspect as well. The above-mentioned social skills were not set as explicit goals or learning outcomes in the examined courses, but in our study we examined whether students can learn these skills as a result of different forms of teaching and pedagogical practices.

The explanatory (independent) variables in the regression model were those of pedagogical practices consisting of four different sets. The first set of variables was composed of the modes of teaching and learning. Although previous research has strongly highlighted the role of collaborative and interactional modes for the learning of skills (e.g., [Ballantine & McCourt Larres, 2007](#); [Crebert et al., 2004](#)), the students were asked to also evaluate the presence of more traditional modes of university pedagogy that call for

independent working. On the basis of existing research into the educational patterns of various fields (e.g., Lueddeke, 2003; Neumann, Parry & Becher, 2002; Potter, 2008; Ylijoki, 2000), 12 different modes of teaching and learning were defined (Table 1, left column). The students evaluated these modes on a five-step scale at the end of their courses. Table 1 shows the mean values for each pedagogical practice as a quick overview of the practices applied in the courses.

The second and third sets of variables consisted of the features characteristic of a *constructivist learning environment* (CLE) (e.g., Loyens & Gijbels, 2008; Tynjälä et al., 2009) and *integrative pedagogy* (IP) (e.g., Tynjälä, 2008; Tynjälä et al., 2016). These features were described above in the section regarding the theoretical background. Altogether fifteen features depict a constructivist learning environment, while nine features are associated with the model of integrative pedagogy. The questionnaire administered at the end of the course asked students to estimate, on a five-step scale, the occurrence of these features during their course. The features concerned were not presented as statements but as a sort of list (cf., Table 1).

The CLE features were divided into three aggregate scales according to the above-described theoretical basis (Table 1). The CLE involved the following aggregate scales and scores: 1) *Sharing and utilising students' earlier experiences and knowledge* ($\alpha = 0.89$; four items); *Feedback, assessment, and summarising tasks* ($\alpha = 0.87$; five items); and *Critical examination of knowledge* ($\alpha = 0.86$; six items). The features of the IP model present in the aggregate scale were *Acting at the interface between theory and practice* ($\alpha = 0.89$; eight items) and, one single variable, *Learning of theoretical knowledge*. As can be seen from the description of the aggregate scales, the internal consistency of each group is confirmed by Cronbach's alpha (α). As generally recommended, only variables that showed a correlation of at least 0.30 with the aggregate scale were accepted (e.g., Costello and Osborne 2005; Tabachnick and Fidell 2001). The fourth set of variables dealt with the atmosphere of learning situations (Table 1, right column). The students were asked to respond to six statements pertaining to the learning atmosphere, using a four-step scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree).

Results

Of the three social skills in focus, the students found that they had learned most in the area of interaction skills (mean 4.2, max. 5). The other two areas received slightly lower ratings, namely: looking at things from other people's perspectives (mean 3.89), and collaboration skills (mean 3.86). Tables 2–4 describe the pedagogical practices that explained students' learning of collaboration and interaction skills as well as their ability to look at things from other people's perspectives. For an educational study, the explanatory power of the regression models was high (46–58%). Due to the limited space, the collinear indices of the regression analyses (tolerance and VIF, *variation inflation factor*) are not presented in these tables. These indices indicate the degree of mutual multi-collinearity (Azen & Budescu, 2009). In our present study, the tolerance values ranged from 0.418 to 0.701 and the VIF values from 1.427 to 2.392.

The regression model for students' learning of collaboration skills included three sets of explanatory predictors, that is, pedagogical practices, which accounted altogether for 58 percent of this learning (Table 2). The variable with the greatest explanatory power was 'working with others' ($\beta = 0.446$). In other words, the more the course involved working with others, the more the students experienced having learned collaboration skills during the course. Within the three categories presented in Table 1, the variable 'working with others' falls into Modes of teaching and learning. The second strongest predictor for the learning of collaboration skills was the aggregate scales 'feedback, assessment, and summarising tasks', which belongs to the category of constructive learning environment (CLE) ($\beta = 0.223$). The third strongest explanatory variable here was 'sharing and utilising students' earlier experiences and knowledge' ($\beta = 0.203$), a feature of the CLE where students' prior experiences and knowledge are utilised and shared in teaching and learning.

The explanatory variables for students' learning of interaction skills (Table 3) were fairly similar to those for collaboration skills. 'Working with others' was the strongest predictor here as well ($\beta = 0.622$). The second strongest explanatory variable was 'sharing and utilising students' earlier experiences and knowledge' ($\beta = 0.297$), which appeared in the top three also in the previous model. The third most significant variable here was 'listening' from the category of Modes of teaching and learning, and it loaded negatively in this model ($\beta = -0.170$). In other words, the more listening the university courses involved, the less the students experienced that they had learned interaction skills during the course. In all, together, these four variables explained up to 57 percent of the students' learning of interaction skills during the course.

Table 2
Pedagogical Practices Explaining University Students' Learning of Collaboration Skills (Coefficient of determination 58%) .

R	R ²	Adjusted R ²	Std. error of estimate		
.762	.581	.569	.712		
R ² change	F change	df1, df2	Sig. F change		
.021	5.338	1, 105	.023		
Predictors		Unstandardised	Standardised	coefficients	coefficients
	B	Std. error	B	t	Sig.
1) Working with others (MTL)	.465	.091	.446	5.120	.000
2) Feedback, assessment, and summarising tasks (CLE)	.299	.155	.223	2.600	.011
3) Sharing and utilising students' earlier experiences and knowledge (CLE)	.270	.117	.203	2.310	.023

Abbreviations: MTL = mode of teaching and learning, CLE = constructivist learning environment.

Table 3
Pedagogical Practices Explaining University Students' Learning of Interaction Skills (Coefficient of determination 57%).

R	R ²	Adjusted R ²	Std. error of estimate		
.756	.572	.560	.686		
R ² change	F change	df1, df2	Sig. F change		
.019	4.665	1, 105	.033		
Predictors		Unstandardised	Standardised	coefficients	coefficients
		B	Std. error	β	t
1) Working with others (MTL)	.618	.089	.622	6.908	.000
2) Sharing and utilising students' earlier experiences and knowledge (CLE)	.375	.105	.297	3.565	.001
3) Listening (MTL)	−0.248	.115	−0.170	−2.160	.033

Abbreviations: MTL = mode of teaching and learning, CLE = constructivist learning environment.

Table 4
Pedagogical Practices Explaining University Students' Learning to Look at Things from Other People's Perspectives (Coefficient of determination 46%).

R	R ²	Adjusted R ²	Std. error of estimate		
.659	.435	.413	.809		
R ² change	F change	df1, df2	Sig. F change		
.028	5.085	1, 104	.026		
Predictors		Unstandardised	Standardised	coefficients	coefficients
		B	Std. error	β	t
1) Feedback, assessment, and summarising tasks (CLE)	.476	.149	.365	3.200	.002
2) Working with others (MTL)	.258	.098	.254	2.644	.009
3) Acting at the interface between theory and practice (IP)	.335	.149	.242	2.255	.026
4) Feedback or evaluation given by teacher (MTL)	−0.237	.095	−0.221	−2.504	.014

Abbreviations: CLE = constructivist learning environment, MTL = mode of teaching and learning, IP = integrative pedagogy.

In regard to the students' ability to look at things from other people's perspectives, the regression model analysing pedagogical practices in this respect explained 44 percent of their development during the course (Table 4). In terms of the explanatory variables, this model deviated somewhat from the two previous models. Here, the strongest explanatory variable was 'feedback, assessment and summarising tasks' ($\beta = 0.365$), which was a feature of CLE (Table 1). The second strongest explanatory variable for the ability to look at things from other people's perspective was 'working with others' ($\beta = 0.254$, Table 4), which describes the modes of teaching and learning (Table 1). The third strongest explanatory variable in this model was 'acting at the interface between theory and practice' ($\beta = 0.242$), which represents the feature of IP (Table 1). The fourth significant explanatory variable was 'feedback or evaluation given by teacher'. This variable, which describes the Modes of teaching and learning (Table 1), loaded negatively in the model ($\beta = -0.221$). In other words, the more a student received feedback or evaluation from his/her teacher, the less he or she felt having learned to consider things from other people's perspectives.

Discussion and conclusion

This study examined what kinds of pedagogical practices might contribute to university students' learning of social skills. The students from different fields assessed to what extent they had learned these skills during their courses, in which curricular aims did not include the learning of social skills per se. This approach is considered to be invaluable as there is currently a strong emphasis on social skills in the workplace, current and future (Binkley et al., 2012; Fadel et al., 2015; Future Work Skills 2020 2011), meaning that it is necessary to invest in this area more than has been the case earlier. Overall, the model designed for this study – where the learning of social skills was explained by 1) different modes of teaching and learning, 2) the features of constructivist learning environments (CLE), 3) the features of integrative pedagogy (IP), and 4) the positive atmosphere during the course – explained 46–58% of this kind of learning. These percentages are high for an educational study. The predictors for the learning of social skills arose, however, from three groups of variables, and the positive atmosphere during the course did not explain the learning of social skills. Another interesting finding was that traditional or individual modes of university learning, such as listening and the feedback or evaluation given by the teacher, received negative loadings in the social skill regression models. Pedagogical practices that promote the learning of social skills are elaborated in detail below.

According to the results of the present study, the learning of collaboration and interaction skills, in particular, was found to

necessitate close cooperation with others. This was a logical and self-evident finding that is also in line with the findings of previous research. For example, teaching and learning that involves collaboration and interaction has been found to promote students' ability to learn social and other generic skills elsewhere (Ballantine & McCourt Larres, 2007; Kember et al., 2007; Smith & Bath, 2006). The analysis results of the current research also indicate that a constructivist learning environment (CLE) and integrative pedagogy (IP) foster the development of social skills. This is not a surprise, since social interaction is one key feature of CLE, and, consequently, the aggregate scales concerning CLE and IP were characterised by interaction and collaboration.

However, the present study yielded some new findings as well. Previous research has not pointed out the negative correlation of traditional ways of individual learning in regard to the learning of social skills. In the current study, traditional or individual modes of university learning, such as listening and the feedback/evaluation given by a teacher, received negative loadings in the regression model for social skills. In other words, the extent to which classroom work included listening or receiving feedback (evaluation) from the teacher had a direct, inverse correlation to the extent to which students experienced having acquired social skills. On the one hand, it is logical and understandable that mere listening would not facilitate the development of social skills. On the other hand, listening is a key aspect of interaction and collaboration. Therefore, qualitative analysis is needed to examine the role of listening and its relation to other aspects of communication in classroom interaction. It should be kept in mind though that, while the acquisition of social skills is currently seen as an important learning objective, the goals of university education are much broader. Not everything is learned in a group together with others (Dillenbourg, Järvelä & Fischer, 2009), and working individually also has its place in expert learning (Tynjälä, 2008). It is not necessary, therefore, to avoid all individual working in education, even if the learning of social skills calls for joint activities. The use of diverse pedagogical methods as well as alternating between independent and collaborative work seems to be best for the development of versatile competences at university (Anthony & Garner, 2016; Kember et al., 2007; Virtanen & Tynjälä 2019).

An interesting finding of the present study is that the atmosphere of the learning environment was not emphasised as being crucial to the learning of social skills. This is surprising since the factor of a learning environment being experienced as positive has previously been identified as important when learning social and creativity-related skills (Eteläpelto & Lahti, 2008; Klemola, Heikinaro-Johansson & O'Sullivan, 2013; Vila et al., 2012; Virtanen & Tynjälä, 2019). Also, in recent years, the interaction skills of teachers, in particular, have been strongly associated with emotional competence; experts talk about affective and interactive skills, for example (Klemola et al., 2013). In general, research related to emotions has gained significant momentum in the field of education in recent decades (Pekrun & Linnenbrink-Garcia 2014), but there is also growing interest in emotional dimension in the workplace (Brackett et al., 2011; Cherniss, 2000; Hökkä, Vähäsantanen, Paloniemi & Eteläpelto, 2017; Troth et al., 2012).

The current study findings are significant for the development of university pedagogy and informing social and collaborative modes of teaching and learning. In regard to future graduates' working life, the findings of our study are both promising and concerning. In previous research, university graduates have reported that social skills are invaluable in their workplace setting, but, at the same time, they have reported that these skills were learned mostly at the workplace rather than at university (Tynjälä, Slotte, Nieminen, Lonka & Olkinuora, 2006). The present study shows that essential social skills can be learned in field-specific subject studies provided that the teaching methods motivate the students and engage them in collaborative work behaviour. Accordingly, an optimistic expectation is that, along with improved pedagogy, the future labour market will receive university graduates who have enhanced social skills. Nevertheless, the pedagogical approaches that motivate students and involve collaborative working are often typical of small group teaching, which is being reduced at varying levels owing to increasingly scarce economic resources. Indeed, if education cutbacks are planned, it will be important to take into account that social skills are not learned in mass lectures, for instance, or through independent learning, but that learning these skills is expedited through face-to-face teaching in small groups and requires adequate teacher resources. In other words, if the financing of small group teaching is reduced, university education will not produce a socially skilled labour force adequately prepared for the workplace.

The demands and expectations set for education regarding the use of information and communications technology (ICT) in teaching and learning also pose pedagogical challenges concerning social skills (Hämäläinen, Kiili & Smith, 2017). The present study, within the context of face-to-face university subject courses, demonstrates that cooperation with others is pivotal to the acquisition of collaborative and interactive skills. Activities of this kind are not simple to organise in a technology-enhanced learning (TEL) setting (Hämäläinen & Häkkinen, 2010) as the tools are not always designed with collaborative learning and teaching in mind (Laurillard, 2009). Collaborative learning can, of course, be arranged and take place in TEL environments too, but, to be successful, it is necessary for the interaction between learners to be supported in one way or another (Arvaja, Häkkinen & Kankaanranta, 2008; Kobbe et al., 2007). Hence, student learning in a technological environment calls for guidance and overall pedagogical planning (Hämäläinen & Cattaneo, 2015). This approach differs to the practices used in traditional classrooms and other educational settings (Hämäläinen & Cattaneo, 2015) and therefore poses an additional challenge to teacher education.

The measurements of pedagogical practices and social skills in the present study are based on the responses obtained through a student questionnaire. The questionnaire has been developed, tested and applied over a long period of time across several studies (e.g., Tynjälä & Virtanen, 2005; Tynjälä et al., 2016; Virtanen et al., 2014). The development has followed normal procedures, including theoretical and conceptual analyses, and tests related to reliability measures. Also, the applied version of the questionnaire includes measures indicating reliability, such as Cronbach's alphas, in the construction of aggregated variables. In addition, the questionnaire has produced similar findings as studies using other questionnaires or scales. As a method, self-assessment has been criticised, especially because performing an evaluation of oneself or one's own actions is not considered reliable (Paulhus & Vazire, 2007). Nevertheless, a strong correlation between assessments by teachers and students has been demonstrated in some studies (Asikainen, Virtanen, Postareff & Heino, 2014; Falchikov & Goldfinch, 2000), and this also extends to the learning of social skills, particularly teamwork skills (Wang et al. 2009). It should be borne in mind, however, that the present study and its findings address only the extent

to which these students experienced having learned social skills during their course. Further research, based on teacher-designed assessments or tests that specifically measure social skills, is warranted to confirm and expand these findings.

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