

Teacher's Agency and the Cooperation With Entrepreneurs in Entrepreneurship Education

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Abstract

Purpose: Vocational education and training (VET) in Finland takes place more and more at workplaces. Hence, the teachers' cooperation with companies has become important. Little research has been done on the teacher's activities in business cooperation and the factors affecting business cooperation. The teacher's decisions and choices are made possible through the teacher's autonomy and agency. The teacher's agency is understood as a capacity to utilise autonomy. In this study, the teacher's agency is reflected in their activity in developing entrepreneurial learning environments and activity in developing regional entrepreneurship education (EE). The study was conducted among Finnish VET teachers. In Finland EE is understood in its broad sense and the teacher is in a significant position choosing where, how and with whom they implement EE. The main research question in this article is: How does the VET teacher's agency in EE affect their cooperation with entrepreneurs?

Methods: The data consists of 933 vocational teachers' responses. An open online survey tailored for teachers was used in the data collection (Measurement Tool for Entrepreneurship Education). Ordinal regression analysis has been used to analyse the data.

Results: The teacher's agency is a significant factor explaining his/her level of cooperation with entrepreneurs. The results show that the teacher's activity, desire, and ability to express

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agency, strengthens the use of companies in teaching. Surprisingly, the teacher's personal entrepreneurial background and the number of companies in the area do not act as explanatory factors for entrepreneurs' cooperation. The study makes several suggestions on teachers' perceptions of the factors explaining and creating agency as an entrepreneurship educator.

Conclusions: In Finland, teachers' autonomy is high. Teachers have the freedom to utilise their agency in many ways. They can, for example, make their own decisions and renew their teaching in many ways if they are willing and encouraged to do so. It seems like the question is more about management and teacher identity. The teacher's agency should be strengthened, and the teacher should be given the option to act more freely. Furthermore, the teacher's autonomy is not enough; agency is also needed.

Keywords: VET Teacher, Agency, Entrepreneurship Education, Cooperation With Entrepreneurs, Regional Context

1 Introduction

This study examines the vocational education and training (VET) teacher's agency and how it affects business cooperation in entrepreneurship education (EE). Generally, the concept of agency refers to the teacher's ability to act in a certain socio-cultural context (Hunter & Cooke, 2007). In this study the socio-cultural context is related to entrepreneurs and companies in the region. Utilising his/her agency, the teacher makes independent choices about his/her teaching, and especially about where, how and with whom the teaching takes place (Eteläpelto et al., 2013; Vähäsantanen, 2015). EE benefits from cooperation with entrepreneurs and local businesses (Fayolle & Gailly, 2008) and therefore requires the teacher's active role in organising circumstances for cooperation. Moreover, several EE studies have shown that studying in a real-life context and with entrepreneurs has a positive effect on students' learning of entrepreneurship (Birdthistle et al., 2016; Cooper et al., 2004; Kickul et al., 2010; Seikkula-Leino et al., 2010; Sommarström et al., 2017).

Agency is reflected as the activity of the teacher in cooperating with the region's entrepreneurs in his/her teaching and as the activity of the development of EE in their region (Andersson & Köpsén, 2019). In VET, learning and teaching increasingly takes place in workplaces and thus business cooperation is especially important (Hievanen et al., 2022; Tapani & Salonen, 2019).

Teachers have been found to be autonomous in their teaching (Erss & Kalmus, 2018; Teng, 2019). In this study we suggest that agency is strongly related to teachers' autonomy (e.g., Erss & Kalmus, 2018). In effect, autonomy enables the teacher to express his/her agency within his/her capacity to act in different contexts (Hunter & Cooke, 2007; Ryan & Deci, 2000; Sommarström et al., 2021; Vangrieken et al., 2017; Vähäsantanen, 2015).

EE research has covered several different viewpoints in the VET context, including teaching practices (e.g., Ruskovaara & Pihkala, 2013), teacher education (Seikkula-Leino et al., 2012; Zafková & Ambrozy, 2019) and students' skills (Sandirasegarane et al., 2016). There is some research concerning teachers' autonomy and agency (van Dam et al., 2010; Erss & Kalmus, 2018; Hadar et al., 2019; Molla & Nolan, 2020; Sommarström, 2022; Teng, 2019; Vangrieken et al., 2017). However, the connection between the VET teacher's agency and EE has remained empirically unexplored. To fill this research gap, the main research question in this article is: *How does the VET teacher's agency in EE affect their cooperation with entrepreneurs?*

In this research, the teacher's agency is reflected in their activity in developing entrepreneurial learning environments and their activity in developing regional EE. Earlier studies have suggested that a region's entrepreneurship level (e.g., Dodd & Hynes, 2012) and the teacher's own entrepreneurship experience and connections with entrepreneurs may have an impact on cooperation with entrepreneurs (Mårtensson et al., 2019).

This article makes two major contributions: First, it theoretically introduces teacher's agency as a relevant concept highlighting the factors guiding teachers in their implementation of EE. Second, it empirically shows the role of a teacher's agency in EE through the teacher's participation in the development of learning environments for EE and of regional EE development.

2 VET and Entrepreneurship Education in Finland

In Finland, EE is understood in its broad sense. It includes both an active and self-initiated individual, an entrepreneurial learning environment, education, the cooperation of an activity network that supports entrepreneurship, and society's active and entrepreneurial policy (Ministry of Education, 2009). The Finnish entrepreneurship guidelines are guided by measures of entrepreneurship promotion and EE at different school levels. Entrepreneurship is defined as a key competence for lifelong learning in basic vocational qualification. This includes learning to adapt to the changing conditions of working life and acquiring the necessary capabilities and skills needed to manage new situations (Ministry of Education and Culture, 2017).

This study has been conducted among Finnish VET teachers who work at VET institutes. VET study programme is 180 ECTS credits in total, the curriculum is competence-based, and the studies are customer-oriented. This kind of curriculum has been used in Finland since the VET reform in 2018. An individual study and competence development plan is drawn up for every student. Students can acquire skills in different learning environments and flexibly combine them. Teaching organized in the workplace in connection with practical tasks is called learning in working life. Studying at the workplace can cover an entire degree, a module, or a smaller part of the studies (Vocational Education and Training Act 531/2017).

VET has the national qualification requirements, where entrepreneurship is present as a compulsory course for all students, that is called Entrepreneurship and entrepreneurial activities (1 ECTS credit). Every VET student completes this course. In addition to this, students have the opportunity to choose two optional courses. One of the courses, Business planning (15 ECTS credits), focuses especially on the contents of the business idea and competences related to starting a company. The other optional course, working in a company (15 ECTS credits), focuses on planning a company's operations and profitability, building customer and cooperation relationships and implementing business operations (eRequirements, n.d.).

Learning outcomes are defined in the national qualification requirements. The concept of entrepreneurship is the observation and seizing of opportunities and the ability to transform ideas into activities that produce economic, cultural, social, or societal value. These include creativity, innovativeness, risk management and responsibility, as well as the ability to plan, set goals and lead activities to achieve goals (Ministry of Education and Culture, 2017). The English concepts "enterprise education" and "entrepreneurship education" are the closest in content to the Finnish concept of entrepreneurship education. In VET the term refers to the development of skills required of an entrepreneur, but also to the skills of lifelong learning intended for all employees (Ministry of Education, 2009).

3 Concept Definitions, Theory and Hypothesis Development

In Finland, teachers have a great deal of autonomy in their work. Teacher autonomy refers to a positive notion of freedom to make professional pedagogical decisions (e.g., Vangrieken et al., 2017). In this article we use the concept of agency to describe the actions in which the teacher may or may not choose to use his/her autonomy. In understanding the teacher's undertakings in EE, the teacher's autonomy is an important factor affecting his/her activities. However, the teacher's autonomy is a latent capacity, and its usefulness depends on the teacher's choice of using it (Vangrieken et al., 2017). In this sense agency and autonomy form a tight theoretical setting that we use in understanding the teacher's activities in the use of entrepreneurs in teaching.

In this study, we define an entrepreneurial learning environment as an environment which develops students' creativity and self-direction (Ettis, 2022; Fillis & Rentschler, 2010). Cooperation with entrepreneurs refers to the teacher's activity in inviting companies and/or entrepreneurs in the region to the school and/or to going with the students on a visit to a company (Cooper et al., 2004; Kickul et al., 2010; Pittaway & Cope, 2007; Pittaway & Hannon, 2008; Shepherd, 2004; Solomon, 2007). We define the teacher's activity in participating in regional development with the help of three aspects. The development of EE refers to the preparation of strategic documents and plans, such as the teacher being involved in developing either regional entrepreneurship, the curriculum, and/or the EE strategy of the region (Seikkula-Leino et al., 2010; Seikkula-Leino et al., 2012). Next, we describe the theory in more and we justify the formation of the hypotheses.

3.1 Agency–Autonomy Connection

Research on the teacher's agency is extensive and covers several different perspectives, e.g., the social (Bandura, 2006; Emirbayer & Mische, 1998), gender and equality perspectives (McNay, 2004) and the concept has been defined in different ways depending on the discipline (Eteläpelto, 2008). In this research, agency is seen as the teacher's actions to utilise autonomy (Hunter & Cooke, 2007). Agency is understood as a socially created and functional phenomenon, which especially includes influencing and making choices and decisions (Eteläpelto et al., 2013). These decisions and choices include, among other things, 1) making decisions at work, 2) participating in common work practices, 3) renewing work practices, and 4) negotiating identity (Vähäsantanen et al., 2017). In addition to these, Hökkä et al. (2014) also point out that activity, initiative, participation, and experience in managing one's own work and life are most often agency-related issues. Thus, agency depends on one's own activity and it is based on acting as desired. The desired behaviour can come either from oneself, from the management or from outside the educational institution (Eteläpelto et al., 2013; Tan & Ng, 2012; Vähäsantanen et al., 2009; Vähäsantanen, 2015).

Autonomy can be made possible or limited by management and regulations (Hardie et al., 2022; Hargreaves, 2000; Joensuu-Salo et al., 2023; Slemp et al., 2020; Sommarström et al., 2020; Tan et al., 2012). Autonomy motivates the teacher (Slemp et al., 2020). Sommarström et al. (2021) found out that in the implementation of EE, the impact of autonomy influences the teacher's actions. They showed how autonomy is utilised in three different ways in relation to the national curriculum requirements, as either exceeding the requirements, following them carefully or ignoring them. Autonomy can lead to either excellent or poor results in EE (Sommarström et al., 2021). Autonomy gives the teacher and school opportunities to act, but it does not explain the teacher's agency and background factors behind those actions. The point is that even if the teacher's autonomy to make decisions in EE is significant, it does not necessarily increase the utilisation of entrepreneurs in EE. Teachers make independent decisions and interpret qualification requirements differently (Sommarström et al., 2021). Agency and exploring the issues behind the decisions would give a better picture of the decisions made by the VET teacher.

3.2 The VET Teacher's Activity in Creating an Entrepreneurial Learning Environment and Cooperation in EE

There is evidence that the learning environment and teaching practices are the most consequential factors for students' learning in EE. Several researchers have stated that active teaching practices, i.e., those that are student-led, practice-oriented and entail projects done in a real-life environment are more effective (Birdthistle et al., 2016; Cooper et al., 2004; Kickul et al., 2010; Seikkula-Leino et al., 2010; Sommarström et al., 2017). However, it has

also been stated in previous literature that teacher-led teaching practices would be more effective in learning entrepreneurship (Stadler & Smith, 2017). In any case, the opposite view has gained more weight in the research literature.

To implement practice-oriented and real-life teaching, the teacher needs good connections with entrepreneurs and has to act autonomously towards achieving this aim. Andersson and Köpsén (2019) state that cooperation with companies develops the teacher's professional skills and strengthens his/her agency (see also Bandura, 2006; Eteläpelto et al., 2013; Vähäsantanen, 2015). The teacher's strong agency is related to feelings of competency and possibility for action (Beijaard et al., 2004). If a teacher thinks it is important to work with entrepreneurs, and is able to do so, he/she will make choices and take a stand on what makes them an agent of their own work (Eteläpelto et al., 2013; Molla & Nolan, 2020).

However, entrepreneurship is still often implemented in a school environment rather than in cooperation with entrepreneurs (Haase & Lautenschläger, 2011; Huusko et al., 2018; Ruskovaara et al., 2015b; Ruskovaara & Pihkala, 2013, 2015; Sommarström, 2022). Earlier research has shown that teachers have difficulties in changing from teacher-led teaching to teaching with entrepreneurs (Kunnari et al., 2021; Sommarström et al., 2017), and teachers' knowledge of the real-life context is minimal (Puustinen et al., 2022). There are various views on the reasons for these difficulties. Recently, Sommarström (2022) argued that the main problem with utilising entrepreneurs in teaching seems to be the lack of school leaders' support and resources for cooperation. Van Dam et al. (2010) suggests that the teacher's willingness to cooperate with companies depends on the school's atmosphere, that is, its entrepreneur-friendliness. Developing EE practices, learning environment and cooperation require the teacher's active role, support from the leaders and sufficient resources (Hardie et al., 2022).

Interestingly, according to Ruskovaara et al. (2015b) the teacher's personal entrepreneurial experience does not explain entrepreneurial cooperation, and VET teachers may have difficulties in teaching entrepreneurship and may feel unsure about teaching it (van Dam et al., 2010; Fejes et al., 2019) as they are specialists in teaching their profession (Andersson & Köpsén, 2019; Brennan Kemmis & Green, 2013; Farnsworth & Higham, 2012; Unwin, 2008). According to Huusko et al. (2018), VET teachers' competence of teaching entrepreneurial knowledge and skills or using proper teaching practices are not at a level that encourages students to learn entrepreneurship. They do not use proper teaching practices in relation to collaboration with entrepreneurs.

According to agency theory, the teacher implements and renews his/her own work by making decisions, and the teacher also creates his/her professional identity and thereby takes a stand on how teaching should be carried out. The teacher's agency is reflected in his/her activity in developing entrepreneurial learning environments, and this in turn supports cooperation activities with entrepreneurs. Therefore, we propose hypothesis 1:

H1: A teacher's agency reflected by his/her activity of developing entrepreneurial learning environments has a positive relationship with his/her cooperation with entrepreneurs

3.3 The VET Teacher's Activity Regarding the Regional Development Aspect in EE

The importance of VET institutes performing regional development is not clear to leaders, teachers, and entrepreneurs. Even though studies and teaching of entrepreneurship have expanded (Huusko et al., 2018) and some schools have set up centres in the region to support entrepreneurship in cooperation with entrepreneurs (Oksanen-Ylikoski & Ylikoski, 2015), the promotion of entrepreneurship and EE contents still requires structuring in VET school (Huusko et al., 2018). Teachers can be seen as key actors in making connections with entrepreneurs and creating structures for EE.

Galvão et al. (2017) state that EE can be utilised to develop region and that a common goal for the relevant actors is needed for this. Also, investments in EE positively influence regional development (Galvão et al., 2020). Walter and Dohse (2012) found that in areas where entrepreneurial activity and density are low, active teaching methods produce better entrepreneurial activity and attitudes among students. They suggest that through EE, teachers can increase students' self-employment intentions by using active teaching methods, including real-life projects in cooperation with entrepreneurs. In this setting, teachers respond to the regional circumstances by adjusting their level of EE (Walter & Dohse, 2012).

Earlier research has raised the issue of the relationship between EE and regional entrepreneurship (Dodd & Hynes, 2012; Järvi, 2012; Kolho et al., 2022; Kotey, 2006; Walter & Dohse, 2012). Dodd and Hynes (2012) examined the importance of the regional context for increasing entrepreneurship and implementing EE in six European countries. According to their study, regional features shape EE and its contexts, such as educational objectives, outcomes, resources, and cultures for schools' entrepreneurship programmes. From this perspective, the specific features of the region have an impact on EE (Bandera et al., 2018; Lindh & Thorgren, 2016; Nabi & Liñán, 2011; Thomassen, 2020; Walter & Dohse, 2012). According to Dodd and Hynes (2012), the regional specificities should be considered in the planning and implementation of EE.

The regional specificities are reflected as the large regional variation in entrepreneurship. For example, in Finland, the new enterprise rate varies largely among the regions. In Kainuu, the new enterprise rate is 50% lower than in Uusimaa (Statistics Finland, 2018) Recently, Roundy (2022) suggested that teachers' autonomy and ability to design their own work is crucial in how they are able to utilise the regional entrepreneurs and companies, in teaching entrepreneurial skills (e.g., Roundy, 2022; Yemini & Bronshtein, 2016). Based on the discussion above, we formulate hypothesis 2 as follows:

H2: A teacher's agency as reflected by his/her activity in developing EE in the region has a positive relationship with cooperation with entrepreneurs.

As entrepreneurial activity and density in the region (Davidsson & Wiklund, 1997) as well as teacher's own background may both have an effect on EE (see Ruskovaara et al., 2015b; Walter & Dohse, 2012), we include two control variables in our study: Entrepreneurial activity in the region (measured by the business density and new business rate in the region) and teacher's entrepreneurial background. Figure 1 illustrates the research model between teachers' agency and entrepreneurs' cooperation in EE.

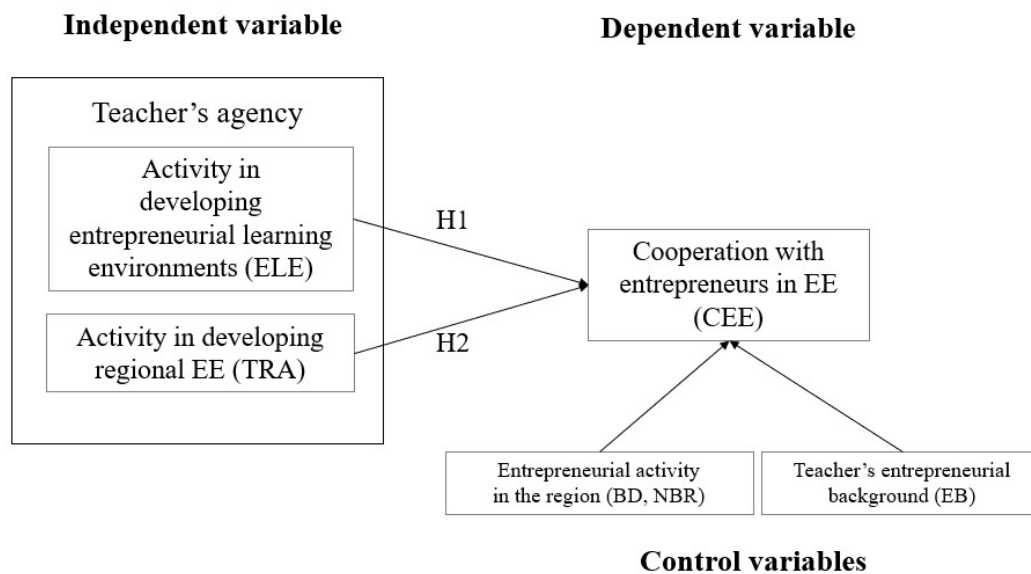


Figure 1: Research Model

4 Data and Methods

In this section, we outline the data and the methods used for conducting this research. The discussion is divided into three subsections: Context and data collection, respondents, and finally, the approach used for data analysis.

4.1 Research Context and Data Collection

This study was conducted in Finland. EE has been included in the VET qualification criteria since 1995 in Finland (Ministry of Education, 2009; Ministry of Education and Culture, 2017). The national qualification criteria are a set of rules that teachers must follow (eRequirements, n.d.), but teachers are free to plan how they teach and implement the criteria,

for example, how they collaborate with local businesses in their teaching. The teacher's own activity therefore plays an important role in the development of both teaching and cooperation. The regional development task for the institutes is defined in the Act of Vocational Education and Training 531/2017. According to Kukkonen (2018), this regional development task means that teachers should be involved in developing working life, i.e., cooperating with entrepreneurs in their field.

The data was gathered by using the Measurement Tool for Entrepreneurship Education (MTEE) (Ruskovaara et al., 2015a), which is an open online survey tailored for teachers (www.lut.fi/mittaristo). Professional networks and different entrepreneurship promoters have been helping to share the link with VET teachers, who were encouraged to respond to it voluntarily. In the survey, teachers self-evaluate their teaching, its contents and teaching practices used in EE as well their regional activity in developing EE. The survey consists of approximately 140 questions. In this study, six of the questions were examined.

4.2 Respondents

The data used in this article consists of 933 VET teachers' responses. In the data, 562 (60.2%) of the respondents were women and 371 (39.8%) were men. In Finland, 54% of vocational education teachers are women. Thus, the respondents represent the distribution relatively well. Among the fields of vocational education, engineering education is the largest in Finland (Vipunen, 2019). The respondents represent well all fields of vocational education, not only the so-called female-dominated fields. The share of teachers who had no experience as an entrepreneur was comparatively high at 58.5%. From this point of view, it seems that the data is not biased with VET teachers that are positively inclined towards entrepreneurship. Overall, the respondent profile corresponds well with the general characteristics of Finnish VET teachers, and they effectively represent all Finnish regions and all areas. Half of the respondents represent teachers from Southern Finland.

4.3 Variables, Reliability, and Validity

The MTEE survey has been carefully developed and formulated as a questionnaire together with a test group of teachers to improve the readability and clarity of the objects, and finally, tests and re-tests have ensured the tool's reliability and validity (Ruskovaara et al., 2015a). The items are based on earlier research on entrepreneurship and EE (see Table 2). Each variable in table 2 is explained more detailed and what is their theoretical background in the study. Please see more in chapter 2.

Table 2: Variables and Their Theoretical Background

Variable	Items	Source
<i>Dependent variable</i>		
Cooperation with entrepreneurs in EE (CEE)	Invited entrepreneurs or representatives of the business world to take part in instruction	Cooper et al., 2004; Cope, 2007; Pittaway & Solomon, 2007
	Arranged a field trip to a business enterprise	Kickul et al., 2010; Solomon, 2007
	Invited an entrepreneur to present their work	Pittaway & Hannon, 2008; Shepherd, 2004; Solomon, 2007
<i>Independent variables</i>		
Teachers' activity in developing entrepreneurial learning environments (ELE)	Developed learning environments that inspire creativity	Eteläpelto et al., 2013; Vähäsantanen, 2015
	Developed learning environments that encourage self-directed actions of students	
Teachers' activity in developing regional EE (TRA)	Developed competence and skills of work life in the region	van Dam et al., 2010; Dodd & Hynes, 2012; Walter & Dohse, 2012
	Developed regional curriculum in relation to entrepreneurship education	

4.3.1 Dependent Variable

The dependent variable in our study is cooperation with entrepreneurs in EE (CEE). This was measured with three items related to involvement of an entrepreneur in the implementation of teaching. Teachers were asked to evaluate how many times in the preceding six months they had implemented the following teaching practices:

CEE1: Invited an entrepreneur to participate in teaching.

CEE2: Arranged a field trip to a business enterprise.

CEE3: Invited an entrepreneur to their classroom to present their work.

The internal consistency of the scale was good. Cronbach's alpha was 0.85, which is well above the recommended cut-off value of 0.70 (Nunnally & Bernstein, 1994). All of the factor loadings were 0.80 or above, and the composite reliability was 0.86. Hair et al. (2010) recommends factor loadings greater than 0.60 and composite reliability greater than 0.70. In addition, the average variance extracted (AVE) value was 0.68, which was above the recommended value of 0.50 (Fornell & Larcker, 1981). Thus, the convergent validity was at a suitable level.

We converted the variable to indicate three levels. The first level includes teachers, who had values from 0 to 1.0 on the CEE scale. These teachers were considered to be at the 'basic level'. There were 35.9 percent basic-level teachers in our data. The second level includes teachers with values 1.1 to 5.0 on the CEE scale. These teachers were considered to be at the

'intermediary level'. There were 38.6 percent of teachers on this level in the data. The highest level includes teachers with values over 5.0 on the CEE scale. These teachers were classified to be at the 'master level'. Ultimately, 25.5 percent of the teachers in the data fell into this category.

4.3.2 Independent Variables

The independent variables in our study are teachers' activity in developing entrepreneurial learning environments and teachers' activity in developing a regional entrepreneurial ecosystem (see Table 3), which both reflect teachers' agency. We included teachers' own entrepreneurial background and entrepreneurial activity in the region as control variables in our study.

Teachers' activity in developing entrepreneurial learning environments (ELE) was measured with two items. Teachers were asked to evaluate on a scale of one to five, how actively they were involved in (1) developing learning environments that inspire creativity (ELE1), and (2) developing learning environments that encourage self-directed actions of students (ELE2). The factor loadings were above 0.80, AVE was 0.67, Cronbach's alpha 0.80, and composite reliability 0.80. Thus, the scale showed reasonable convergent reliability.

Teacher's regional activity (TRA) was measured with a sum variable that was created based on three dummy variables. The dummy variables were:

- 1) Has the teacher developed competence and skills of work life in the region? (Yes/No)
- 2) Has the teacher developed a regional curriculum in relation to entrepreneurship education? (Yes/No)
- 3) Has the teacher developed a regional plan for entrepreneurship education? (Yes/No)

The final scale had values ranging from zero (all three items "no") to three (all three items "yes").

4.3.3 Control Variables

Entrepreneurial background was operationalised as zero for teachers with no entrepreneurial background and one for teachers with entrepreneurial background. Regional entrepreneurial activity was measured with two independent variables: Business density in the region (the number of companies/the number of inhabitants) and new business rate in the region (the number of new companies/the number of companies).

The discriminant validity of the scales was examined with average shared variance and maximum shared variance. As both values were smaller than the average variance extracted (see Hair et al., 2010), we concluded that the discriminant validity was good.

Table 3 presents the minimum and maximum values, mean values, and standard deviations of the original scales. For performing ordinal regression analysis in the next phase, all the scale values were standardised. Table 3 includes the correlations of the scales.

Table 3: Descriptive Statistics of the Scales and Correlations

	Min/Max	Mean	SD	1	2	3	4	5
1. CEE	1.0/3.0	1.89	0.78	1				
2. BD	0.06/0.09	0.07	0.01	-0.03	1			
3. NBR	0.05/0.12	0.09	0.02	-0.02	-0.411***	1		
4. ELE	0.0/4.0	2.40	0.89	0.33***	-0.046	0.02	1	
5. TRA	0.0/3.0	1.31	0.93	0.269***	0.040	-0.07*	0.32***	1
6. EB	0.0/1.0	0.41	0.49	0.07*	0.01	-0.06	0.16***	0.18***

Note: CEE=Cooperation with entrepreneurs in EE, BD=Business density, NBR=New business rate, ELE=Teacher's activity in developing entrepreneurial learning environments, TRA=Teacher's regional activity, and EB=Teacher's entrepreneurial background; *p<0.05; ***p<0.001

5 Results

We used ordinal regression analysis to examine (H1): *A teacher's agency reflected by his/her activity of developing entrepreneurial learning environments has a positive relationship with his/her cooperation with entrepreneurs.* With the same analysis we tested (H2): *A teacher's agency reflected by his/her activity in developing EE in the region has a positive relationship with cooperation with entrepreneurs.* There were three levels of CEE: The basic level, the intermediary level, and the master level. The control variables were regional entrepreneurial activity measured by business density and new business rate and the teacher's entrepreneurial background.

The proportional odds (PO) model was used. There are some assumptions for using the model. The dependent variable should be measured on an ordinal level, and independent variables should be measured on either the continuous, categorical, or ordinal level. There should be no multi-collinearity, and the assumption of proportional odds should be met (i.e., the effects of any explanatory variables are consistent or proportional across the different thresholds). The first two assumptions were met. For checking possible multicollinearity, we analysed variance inflation factors (VIF). All the VIF values were below 10 (from 1.0 to 1.2), which indicates no multicollinearity. The assumption of proportional odds was examined

with the test of parallel lines. It produced a non-significant p-value of 0.96. Hence, all the four assumptions for performing ordinal regression analysis were met.

Hypothesis 1: Ordinal regression analysis shows that the teacher's agency reflected by activity in developing entrepreneurial learning environments has a significant positive relationship with his/her level of CEE (Wald 63.656, $p < 0.001$). The more active the teacher is, the higher his/her level of CEE.

Hypothesis 2: The same applies to the teacher's agency reflected by regional activity (Wald 33.949, $p < 0.001$); his/her activity in regional development has a significant positive relationship with his/her level of CEE. The higher the teacher's activity in developing the regional entrepreneurial ecosystem, the higher his/her level of CEE. Hypotheses one and two are thus both supported.

Control variables: Entrepreneurial activity in the region does not explain the teacher's level of CEE. Neither business density nor new business rate have statistical value in the model. In addition, the teacher's entrepreneurial background has no statistical value in the model.

The fit for the model is strong (Chi-square 149.746, $p < 0.001$). Non-significant values of Pearson and deviance also indicate a good fit. The Pseudo R-Square value of Nagelkerke is 0.18.

In summary, the main result of our study is that the teacher's agency in EE has a positive and a direct effect on cooperation with entrepreneurs. This agency is reflected by the teacher's activity in developing learning environments in their school, and by the teacher's activity in developing regional EE plans, skills, and curriculum. Thus, the teacher's agency is a significant factor explaining the teacher's activity in cooperating with entrepreneurs; the stronger the agency, more likely the teacher uses entrepreneurs actively in his/her teaching.

6 Discussion

Our study focused on the research question of how the VET teacher's agency in EE affects cooperation with entrepreneurs. We used the agency theory to understand how the teacher's activity affects cooperating with entrepreneurs in the region. By doing so, we wanted to provide understanding on the factors behind activity regarding cooperation. We stated two hypotheses 1) A teacher's agency reflected by his/her activity of developing entrepreneurial learning environments has a positive relationship to the cooperation with entrepreneurs, and 2) A teacher's agency reflected by his/her activity in developing EE in the region has a positive relationship with his/her cooperation with entrepreneurs. Both hypotheses were supported.

There are two important points to consider regarding the research results. First, based on earlier research, the entrepreneurial activity of students and the entrepreneurship of the region can be helped by using active teaching methods in a real-life learning environment (Birdthistle et al., 2016; Cooper et al., 2004; Kickul et al., 2010; Seikkula-Leino et al., 2010;

Sommarström et al., 2017). Our results suggest that the teacher needs to have the option of expressing his/her agency and acting accordingly. This activity empowers them as agents of their own work (Eteläpelto et al., 2013; Molla & Nolan, 2020).

These results imply that if the goal is to get companies more actively involved in the implementation of VET and EE, the teacher must be given time and encouraged to cooperate with entrepreneurs. Peers and management are likely to have an important role in encouraging the teacher in their entrepreneurial tasks (Joensuu-Salo et al., 2023; Slempe et al., 2020; Sommarström, 2022).

Second, our research results show that the more opportunities the teacher is given to develop EE, the more he/she utilises the companies and entrepreneurs of the region in his/her work. Exploiting his/her agency, the teacher assumes responsibility for his/her work and seeks relevant partners for cooperation in the implementation of EE. The teacher's agency can promote the active involvement of the teacher as a part of the world around the school and the construction of learning environments.

Our study shows that the teacher's agency is a relevant concept that guides them in their implementation of EE. This is important as the teacher's unwillingness or inability to carry out the EE curricula is one of the most striking puzzles within EE research (Seikkula-Leino et al., 2012). The teacher's agency, in this case active development in EE, has a positive relationship with cooperation with entrepreneurs. This suggests that supporting teacher autonomy and encouraging entrepreneurial activity are key elements in boosting the teacher's activity in a local context (e.g., van Dam et al., 2010; Slempe et al., 2020).

As we stated earlier, agency is a necessity for autonomy (Hunter & Cooke, 2007). Concerning this article's research context, previous research has stated that in Finland, teachers' autonomy is high (Erss & Kalmus, 2018). According to Vähäsantanen et al. (2017), teachers in Finland have the freedom to utilise their agency in many ways. They can, for example, make their own decisions and renew their teaching. Contrary to previous research results, the activity of cooperation with companies it is not related to the teacher's own entrepreneurial background (Ruskovaara & Pihkala, 2015) or the number of companies in the area (Davidsson & Wiklund, 1997), nor the autonomy of the teachers (Hunter & Cooke, 2007; Ryan & Deci, 2000; Slempe et al., 2020; Sommarström et al., 2021; Vangrieken et al., 2017; Vähäsantanen, 2015). Instead, based on our results, this is more likely a question of the teacher's agency that needs to be developed and given the possibility to act accordingly. Subsequently, the teacher's autonomy is not sufficient; agency is also needed.

Educational authorities have maintained that wider cooperation with entrepreneurs is needed in VET if entrepreneurship in society is to be increased (Ministry of Education, 2009; Ministry of Education and Culture, 2017). Following this, the teacher must be given the opportunity to utilise their agency and the power to decide where, how and with whom they implement EE. According to our research, the teacher's cooperation activities with

entrepreneurs are improved by the fact that they have the opportunity to develop learning environments that promote entrepreneurship and the opportunity to participate in the development of EE in their school and region.

The results of our research show that when the teacher gets to influence his/her own work, and he/she has the opportunity to develop learning environments, the curriculum and the activities of his/her region, business cooperation and agency are also strengthened (see Vähäsantanen et al., 2017). It seems that it is a question of management and increasing the teacher's motivation to engage in cooperation outside the school environment (Joensuu-Salo et al., 2023; Slemp et al., 2020; Sommarström et al., 2020). In addition, teacher identity needs to be re-examined (Vähäsantanen et al., 2017).

Finally, this raises the question how we train VET teachers for this cooperation task and what kind of teacher identity teacher training strengthens. It is evident that cooperation networks are highly important for teachers implementing EE in VET institutions (Hievanen et al., 2022; Kunnari et al., 2021; Sommarström et al., 2017; Tapani & Salonen, 2019).

7 Limitations and Suggestions for Further Research

This study has some limitations. First, the data was gathered from only one country. In Finland, teachers are free to make choices and independent decisions if they want to cooperate with entrepreneurs and to implement EE. The teacher is free to use their autonomy and act, i.e., implement agency. This may have affected the generalisability of the results of the study. However, the teachers' agency and the factors behind it are the topics of wider interest and of interest to international readers. Second, our study builds on a dataset with fewer than one thousand respondents. As the empirical research on the relationship between teacher autonomy, agency and EE is sparse, we suggest that wider quantitative studies are required to observe the mechanisms related to the factors explaining and creating the VET teacher's agency as an entrepreneurship educator. Also, the management involvement effect on the teacher's autonomy, agency, and activity warrants more careful analysis. As far as we know there are no studies on the role of VET management in EE although they are likely to be highly relevant. The first studies concerning management have recently been published, and they deal with basic education and higher education (see Joensuu-Salo et al., 2023; Sommarström et al., 2020). In addition, it is very interesting that according to this study neither the teacher's own entrepreneurial background nor the volume of entrepreneurs in the region are significant regarding how actively the teacher uses companies in his/her teaching. In other words, if the cooperation with companies needs to be enhanced in VET schools the solution is not to recruit teachers with an entrepreneurial background but instead to support the agency of the teachers. Future research should concentrate on the factors that promote the teacher's active engagement with the world outside the school.

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Ethics Statement

This paper did not require approval by an ethics committee. For data collection, the Measurement Tool for Entrepreneurship Education (MTEE) was used. MTEE is an online survey accessible at www.lut.fi/mittaristo, which remains open at all times. Finnish VET teachers participated in the survey voluntarily by providing their responses. The ethical principles in accordance with the IJRVET Ethics Statement were implemented.

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