OULU UNIVERSITY OF APPLIED SCIENCES

SUBSTANTIATING VOCATIONAL COMPETENCY IDENTITY IN REINDEER HERDING STUDIES

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Master's Thesis
Spring 2020
Master's Degree in Education
Entrepreneurship Programme
Oulu University of Applied Sciences

Oulu University of Applied Sciences
Master's degree in Education Entrepreneurship

Title: Substantiating vocational competency identity in reindeer herding studies
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Term and year of completion: Spring 2020   Word count: 9208

ABSTRACT

Vocational education reform in Finland highlights the need for students to develop competency identity. This study explores competency building in a reindeer herding vocational study programme. This study reviewed key factors related to improving the educational design in reindeer herding studies and a digital tool to enhance students' competency identity development. The study design was based on a case study of educational design research in a northern Finnish Lapland vocational school, the Sámi Education Institute. The research data were gathered from reindeer herding students (N = 23) and teaching and administrative personnel (N = 5) using open-ended narrative interviews, focus group discussions (N = 4), and participant feedback (N = 23) collected in workshops. As part of the educational design research, students designed ePortfolios to demonstrate their competency development. Based on research findings associated with vocational students of reindeer herding, ePortfolios provide a platform for visualising the process of competency identity construction, which encompasses the progression of their learning and presents their skills and expertise. This study presents practical research-based knowledge about students' competency identity development through the creation of ePortfolios and the connection of studies with working life—the very objective of the vocational education reform.

Contents

1   INTRODUCTION

Vocational education seeks ways of promoting workplace-based learning. The purpose of workplace-based learning is to promote professional knowledge, skills, attitudes, and interactivity as the intended outcomes of learning. This article examines ways of enhancing learners' competency identity development in vocational education.

Recent vocational education reform in Finland has made vocational studies more competency-based. Therefore, there is a need to develop approaches to enhance students' ability to recognise and express their strengths and competencies. Students should also be taught to understand how their perception of themselves as future competent professionals is constantly developing throughout their studies and experiences (Raudasoja, Rinne, & Heino, 2019).

The current study was conducted in the context of reindeer herding studies. Studying to become a professional reindeer herder involves learning content in a programme that often contains experience-based, meta-knowledge. Competency identity building in an intercultural study programme can be challenging and complex: training for a traditional career of reindeer herding consists of digitized learning in a socio-ecocultural landscape. The socio-ecocultural landscape consists of people, stakeholders, nature, and the surroundings of reindeer herding, which include animals, plants and other ecosystems (see e.g. France, 2010; Hong, 2011; Meristö et al., 2004; Okamura et al., 2015). This study explores the theoretical concept of competency identity and discusses its possible educational and study-based dimensions in the socio-ecocultural landscapes of reindeer herding.

Although reindeer herding studies are not connected to a specific ethnicity, the reindeer herding profession is an important part of the Sámi culture. The indigenous Sámi people live in mid and northern parts of Sweden, Norway, northern Finland and the Kola Peninsula in Russia. Today, many youths choose to study reindeer herding and become reindeer herding professionals. According to Keva (2019), 13% of the Sámi people work in reindeer herding. After finishing their studies or receiving a specific number of study credits, students may begin working as professional reindeer herders and become eligible for economic support.

Vocational education refers to all vocational education and training, as well as to skills acquired within a profession and proven by evidence of formal qualifications. Being able to cope and orient oneself in nature are key elements of the reindeer-herding profession. Sustainability, the idea of

using nature in a sustainable way and preserving it, is also important. A key component of sustainable thinking is the preservation of the Indigenous way of life, language, and culture as reindeer herding is strongly connected to Indigenous people's traditional livelihood and living style (Sara, 2009). Benjaminsen, Eira, and Sara (2016) conceptualize reindeer herding as a pastoral livelihood with flexible customization. In addition to flexibility, they add concepts of elasticity and resilience, meaning ability to adapt to changing circumstances in reindeer herding as a livelihood (Benjamisen, Eira, & Sara, 2016).

The context of the present study was a northern Finnish vocational education study programme on reindeer herding (Figure 1)— at the Sámi Education Institute. Students from different backgrounds from all over the reindeer herding district of northern Finland participate in the study programme each year.

Figure 1. The content covered in the three-year reindeer herding programme.

Figure 1 presents the content covered in the three-year reindeer herding programme. During the first year of studies, the focus is on a sustainable way of working. Topics covered include knowledge of nature, Sámi language and culture, skills to cope in nature, skills to use different kinds of equipment (snowmobile, chain saw, quad bike, welding, small machines, and safety), as well as digital tools related to reindeer herding working life and studies. In addition, students may study fishing and elective studies.

During the first year of studies, reindeer herding students and nature and environmental degree students study together. During the second year, studies focus on reindeer herding studies, reindeer meat processing and reindeer herding as a tourism business. Lastly, during the third year, students study general subjects (PI, mathematics, physics, IT, culture, and society), Sámi traditions, and elective studies.

Modern reindeer herding incorporates the use of digital devices. Learning in this context can be assisted and enhanced with the help of digital technologies as they allow students to learn while

working off-campus, according to study programme plans. These digital solutions can be free, simple, and flexible to use.

The present study explores ways to support competency identity building in a study programme that combines on- and off-campus work. According to the research literature, a potential solution for enhancing vocational competency, ePortfolios have been presented as a way to promote student-centred learning (McKenney & Reeves 2018; Munday, 2017). ePortfolio-based study is a student-centred method that allows students to track their learning, outline their studies, and present their learning process and skills in a multimodal and visionary way.

ePortfolios can be a valuable tool to make one's formal and informal learning visible, not only to others but also to oneself. They have been recognised as a suitable way to enhance students' connectedness to their career identity negotiation (Bennett et al., 2013) because they enhance students' awareness of their motivations for learning (Gough & Hamshire, 2012). They are also documents of progression and achievement that can help the student to reflect on his or her competency development, which can later be showcased, for example, to potential employers (Munday, 2017). From a supervision and mentoring perspective, ePortfolios can be used to outline students' competency and objectives, deliberate their career goals, and encourage them in their study plans. In a student group, the use of ePortfolios allows space for peer learning and feedback (Ursin, 2019).

The practical study activity connected to this study involved developing ePortfolios for the reindeer herding students. It was based on educational design research (ERD) (McKenney & Reeves, 2018), which seeks to find solutions to the challenges associated with such studies. Every profession has its own set of skills necessary for the successful completion of the work. Professional competency takes shape during vocational studies and during practical training. In this process, skills and knowledge affect an individual's identity and developing competency identity.

In this paper, the process of competency identity building during studies is discussed. Essential questions addressed in this article include:

1. What are the key themes for improving educational design in reindeer herding studies?
We are looking at this question from both personnel's and students' perspectives.
The findings of question 1 lead to the educational design of an ePortfolio and the main research question:
2. How can ePortfolios support and showcase competency identity development?

This study addresses the current issue of professional development and competence identity construction in competence-based vocational education and attempts to develop a method for students to recognise and visualise their developing skills.

The concept of competency identity

This article is grounded in the concept of competency identity found in vocational education (e.g., De Bruijn, Billett, & Onstenk, 2017; Kotila & Vanhanen-Nuutinen, 2019; Raudasoja, Rinne, & Heino, 2019; Vähäsantanen et al., 2008). For the purposes of this study, the following definition of competency identity by Obi (2008) is used and modified to fit the context of reindeer herding: Competency identity develops through recursive experiences and interpretations of 1) acceptance into the fold of reindeer herding, 2) responsibility to work as a valued part of a team, 3) competence to use the knowledge and skills acquired to execute the work, which leads to 4) the confidence that comes from the combination of knowledge and experience.

Competency identity is involved in the reindeer herding study programme in two ways. Firstly, competency identity construction is involved in the professional development of the individual. Secondly, it is involved with the professional components and living style of the reindeer herder, as a member of a reindeer-herding cooperative. The students develop their competency identity in competence-based vocational training. However, this development needs support so that the students can recognise their knowledge, competency, agency, and skills as professional reindeer herders, and their ability to function in working life. The students should also be able to recognise areas of competency that need further work and development in order to achieve the goals of vocational competency (Raudasoja, Heino, & Rinne, 2019).

According to Nagaoka et al. (2015), the vocational education model for youth provides a framework that takes three key factors into account: agency, integrated identity, and competencies. Agency means that the learner has the ability to make choices about and take an active role in her or his life path. Furthermore, agency means that strategies, and adjustments to those strategies, are based on purposefulness and planning ahead, which also reflect the person's own identity, particular competency and knowledge, and values (Nagaoka et al., 2015). Nagaoka et al. (2015) further explain that people have multiple social identities concerning factors such as profession, ethnicity, gender, religion, and culture. However, one needs to have internal consistency in these different integrated identities, providing one with stability and supporting one's choices. One's capability is constructed from competency and identity, encompassing several factors. Competency is the skills and knowledge needed for the intended work. Identity is

constructed from inclusive dimensions, such as roles, traits, culture, and behaviour (Bowles, 2005). The strengthening and development of capabilities can occur collectively provided that the environment offers opportunities for students to learn and sufficient challenges to test their capabilities (Hipkins, 2013). In vocational education, this applies to both classroom and practical work. The above definitions of competency identity by Nagaoka et al. (2015) and Bowles (2005) take into account the parallel and interlaced dimensions of competency and identity. However, the recursive development of it is given more focus in this paper as the context is vocational education.

2   METHODOLOGY

2.1   Ethics

The first author of this study is a non-indigenous Finnish researcher belonging to a minority with decades of experience in multicultural contexts. The second author is Sámi, similarly with decades of experience in multicultural contexts, and has extensive experience with educational and research tasks. Her family is involved in reindeer herding. Thus, both authors have a strong connection to culturally sensitive research in addition to being university researchers and lecturers with pedagogical competence.

The authors share common interests in developing intercultural education in multiple contexts. They found their scholarly backgrounds and years of experience in educational fields as researchers and teachers to be beneficial in the research process and as Maher et al. (2018) point out, design research is dependent upon the researchers' creative interpretation of the data. A design researchers' approach, which is grounded in a practice that maximizes researcher–data interaction in a variety of learning modalities, ensures the analysis process is rigorous and productive and consults research literature (Maher et al., 2018).

The writers have adhered to the ethical guidelines put forward by the Finnish Advisory Board on Research Integrity (TENK, 2020) on research ethics as well as the special requirements of the Indigenous research ethics (e.g., Porsanger, 2004). According to the guidelines, research must be based on prior consent, protect the research participants' anonymity, and treat them in a respectful and sensitive way. The knowledge must also be delivered from those who the knowledge is about and who benefit from the research knowledge (Forskningsetiske komiteer, 2002.) The context of Indigenous research fields is sensitive, based on power relations and minority situations. The research has been conducted so as to not harm the participants in any way in a sensitive context (ALLEA, 2017; Linkola & Keskitalo, 2016.)

2.2   Educational design research

The research methodology used in this study was based on educational design research (EDR) (McKenney & Reeves, 2018; Spector et al., 2013). In the context of the present study, this means that the study aimed to produce knowledge by identifying the key problems faced by the personnel, meaning teachers and administrative personnel, and students in the educational context studied and developing suggestions and solutions to these issues. This kind of problem-solving process should occur in close cooperation with qualified educators in a specific educational setting (Anderson & Shattuck, 2012).

According to Spector et al. (2013), EDR aims to develop solutions to practical and complex educational problems that are specific to the setting based on scientific inquiry. This means that the focus is on the design of the solutions (Anderson & Shattuck, 2012; McKenney & Reeves, 2018), which can include educational practices, products, processes, programs, and policies. The solution, in this respect, is an educational solution specific to the educational study programme process.

The benefit of EDR is that it not only targets significant problems facing educational practitioners but also seeks to discover new knowledge that can inform the work of others facing similar problems (Spector et al., 2013). In that sense, this study aimed to design a solution for multicultural vocational education in a socio-ecocultural context that could serve as an example for Indigenous peoples' vocational education or other educational contexts facing similar problems. According to McKenney and Reeves (2018) and Spector et al. (2013), working systematically and simultaneously toward these dual goals of solving problems and informing others facing similar problems is perhaps the most defining feature of EDR. Furthermore, the final testing of the designed solution in real-life context enables better understanding, both theoretically and practically (McKenney & Reeves, 2018).

In the present study, the researchers adapted one iterative design cycle (McKenney & Reeves, 2018) to explore the contexts of the EDR and identify relevant empirical research. This was followed by the design, development, and testing of a solution. The iterative process was reflected upon throughout the study process and was analysed at the end (McKenney & Reeves, 2018). The iterative process is shown in figure 2.

Figure 2. The educational design research process followed in the present study. Modified from the process presented by McKenney and Reeves (2018).

First in the design process, the reindeer herding field was explored. The problematic issues were identified through carefully planned group interviews after motivational group dynamics workshops with the teaching staff and administrators involved in the reindeer herding programme. This was followed by an analysis of the data and designing of a potential intervention solution, which was then tested in practice. The intervention was evaluated through reflection, and the understanding gained through this reflection recorded.

The cycle presented in figure 2 was performed over a one-year period. The cycle started with mapping the context described in phase 1. To do this, the researchers spoke with the vocational school personnel several times in order to prepare for the next steps. The authors also helped steer group meetings and received guidelines on how to proceed with the project. The mapping and exploration phase provided an outline of the larger picture of the research and helped develop

the research questions. Phase 2 was based on the findings of the mapping and exploration phase and involved planning the first interview design.

According to the findings of phase 1, it was clear that in order for the students to be able to function wholly in a learning situation, they needed proper motivational exercises. These exercises were planned in phase 2. This phase involved group dynamics sessions in which the group interviews with the students and individual interviews and mapping-based discussions with the personnel were carried out. The resulting data were analysed in phase 3.

Phase 4 involved reflecting on the results of phase 3 and designing the intervention solution to create ePortfolios. Phase 5 included the testing of the designed ePortfolio intervention based on the previous phases of the design research. The third workshop in phase 5 consisted also of discussions of ePortfolio's functionality not only as a tool to demonstrate one's learning activities to the teacher, but also as a method to showcase the competency as an entrepreneur to potential customers or employers. Phase 6 involved evaluating and reflecting on the intervention solution of ePortfolio. All phases are discussed in this article. Phases 1 to 3 are also reported on by Keskitalo, Frangou, and Chohan (2020) as they relate to the students' motivation in the reindeer herding studies reflected in the triple E-framework (Kolb, 2017).

2.3 Interviews and workshops

The data collection consisted of teaching and administrative personnel interviews (N = 5), student interviews (N = 23), workshop discussions (N = 4), and written feedback (N = 23) provided by the students about the workshops. All the interviews and workshop discussions were recorded (seven recordings) and transcribed (93 pages).

Four workshops were held. The first and second workshops were organized in spring 2019, the third in autumn 2019, and the fourth in early spring 2020. The fourth included an exhibition to showcase the study project. The planning modus before the workshops consisted of discussions with a coordinating teacher and other personnel (N = 5) individually in order to fit the needs of educational development. The researchers aimed to identify the needs of the study programme, students, and personnel through discussions.

Workshops with students and teachers were planned according to information gathered during discussions. In the discussions, the need to develop information and communication technology

knowledge of the students was a key theme. The motivation of the students was also mentioned as, according to previous research, competence-based education requires a focus on student motivation, teacher–student interaction, and changing teacher roles (Misbah et al., 2015). According to these themes, the authors of this article planned workshops, which were held in conjunction with interviews. To create a motivating dialogue and ensure the quality of the interview atmosphere (Cohen et al., 2013), all interview sessions and workshops began with motivating group dynamics exercises and activities (e.g., Sweet & Michaelsen, 2007; Wheelan, 2015).

In the open-ended narrative interviews, the researchers began by assembling the ideas of personnel and then students about the organisation of reindeer herding studies and what aspects of the programme they believed should be developed. This interview-based section led to the next steps of the EDR. The researchers sought to identify issues and develop and test an innovative solution to these problems practically. The information gathered from the first round of interviews during the first three workshops was analysed. The fourth workshop was designed to visualize issues discovered during the process.

2.4   Analysis

During the interviews, personnel and students expressed that the profession of reindeer herding was the key element that dictated the organization of the study programme. Based on the issues that the students and personnel brought up in the interviews, which were then reviewed as transcripts, key themes were identified regarding the study of reindeer herding. These themes were coded based on content analysis by noting repeating patterns and themes (Cohen, 2013). The themes included ideas about study organisations, motivation, devices, and IT skills to address competency identity building which was the objective of this study. A thematic analysis of the themes is presented in figure 3.
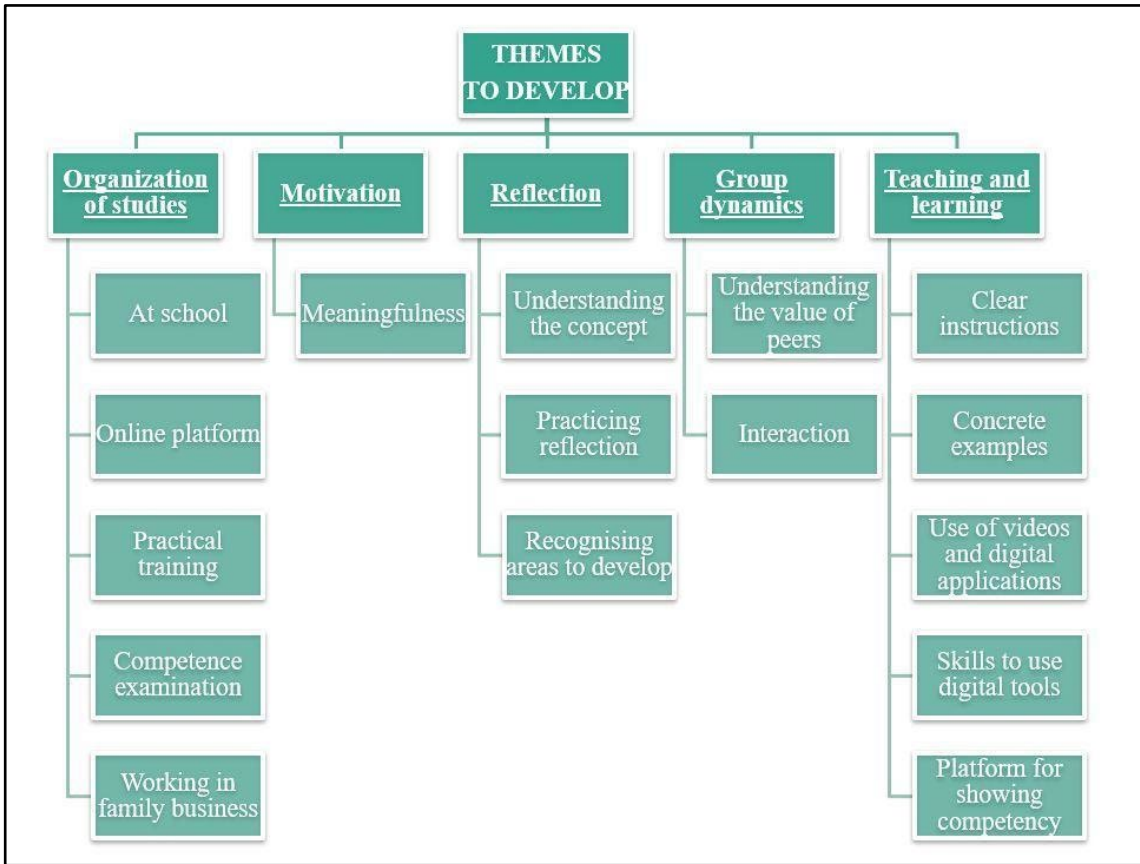
THEMES TO DEVELOP

- **Organization of studies**
  - At school
  - Online platform
  - Practical training
  - Competence examination
  - Working in family business
- **Motivation**
  - Meaningfulness
- **Reflection**
  - Understanding the concept
  - Practicing reflection
  - Recognising areas to develop
- **Group dynamics**
  - Understanding the value of peers
  - Interaction
- **Teaching and learning**
  - Clear instructions
  - Concrete examples
  - Use of videos and digital applications
  - Skills to use digital tools
  - Platform for showing competency

Figure 3. Key themes to support in the reindeer herding study programme derived from interviews with students and personnel.

The key themes that require support in the reindeer herding programme are organisation of studies, motivation, reflection, group dynamics, teaching, and learning. Content analysis was conducted with all data by first reviewing all transcribed data carefully. After this, the data were categorized according to the purpose of the research, after which the developing patterns were reflected upon. Emerging themes were then identified and condensed. Subthemes were then added under each theme. This was followed by the interpretation of the discovered data (Cohen et al., 2013).

3. RESULTS

In this section, the findings relating to each research question are summarized. The findings related to the testing of the intervention solution are also presented.

3.1 Key themes for improving educational design for reindeer herding studies according to personnel

The teaching and administrative personnel interviews uncovered themes related to the students' own understanding of their developmental needs, how their competency develops in a process, and how they can demonstrate their competency in examination tasks. The teachers felt that students need more knowledge and practice of reflection, starting with the concept itself, to develop and grow their awareness of their own abilities, knowledge, and skills.

Another area to work on, according to the personnel, was the group atmosphere. Sometimes the students were not pleased about group work, and some students tended to be less talkative than others. Positive group dynamics can make a difference in students' motivation to study and participate in different study-related activities as well as in their learning outcomes (Wenzel, 2017). For this reason, all workshops conducted in this study began with group dynamics exercises (Photo 1), which aimed to model the problem of working with high motivation during studies.

The researchers applied Wheelan's (2015) ideas about the significance of team spirit and group dynamics. Group dynamics increase not only motivation but also a sense of belonging and interaction (Fukada, Falout, Fukuda, & Murphey, 2019; Keskitalo, Frangou, & Chohan, 2019). Research on group dynamics and positive classroom atmosphere has been proven to increase academic accomplishments (Wentzel, 2017) and have a motivating effect on learning (Eddy-U, 2015; Keskitalo, Frangou, & Chohan, 2019). It is vital to have motivational aspects in demanding professional settings in order to support individuals effectively in their construction of their competency identity in today's changing contexts.
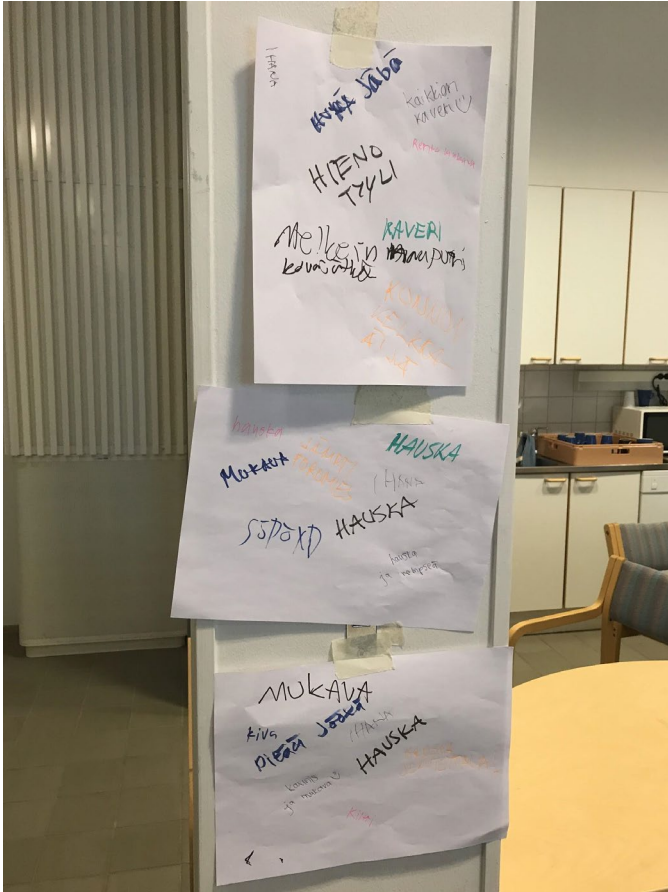
Photo 1. All workshops and interview sessions started with motivating group dynamics exercises.

According to research literature, the prerequisite of competency identity education and development is a positive group atmosphere. Through this, motivation makes students' learning to be successful and therefore motivational issues of studying should be considered. (Wheelan 2015.) Photo 1 illustrates the positive words the students wrote to one another on pieces of paper taped to each of their backs. When students received their papers after the exercise, they could not tell who had written what message (for example, "you are cute XD"). This is one example of the activities that contributed to a positive atmosphere in the workshops as well as the discussions and interviews. The students were visibly pleased with the positive feedback. Furthermore, the positive atmosphere enabled the successful conduction of our study and as that, forms part of the educational design research cycle.

3.2 Key themes for improving educational design for reindeer herding studies according to students

According to the students, themes that could improve the educational design of the reindeer herding programme involved the organisation of the studies, teaching and learning, and

motivational issues (Figure 3). According to the students, smooth execution of the studies required very clear instructions and updated solutions. For example, assignments were often sent by email but sometimes involved writing or filling in the blanks on paper. Sometimes it was unclear if parts of the course were possible to complete through distance learning or if it was obligatory to come to school. Similarly, it was sometimes unclear where to turn-in assignments or how to attend exams.

The students also pointed out that sometimes information did not reach them in time. The distances in northern Finland are vast, and the school is located outside the students' villages in an old reindeer herding research station in the Toivoniemi area. As some of the students were young, they did not have a driver's license, meaning that a guardian or other adult had to drive them to school as public transport between the villages and the school area is rare or non-existent. These issues reflect the students' motivation and their view of the meaningfulness of the assignments and the way in which they are completed.

The students talked about their experience of the general organisation of their school studies. They expressed that sudden changes to the timetable required them to be flexible, although it often was the profession itself and its seasonal work that caused these changes. These kinds of changes sometimes caused feelings of frustration. Long distances placed extra importance on receiving timely information so the students could avoid being in the wrong place at the wrong time. Students also mentioned technology related issues (see figure 4) in connection with communication, working life, its potential to support studies in the future, its use in school assignments, and its use in teaching and learning.
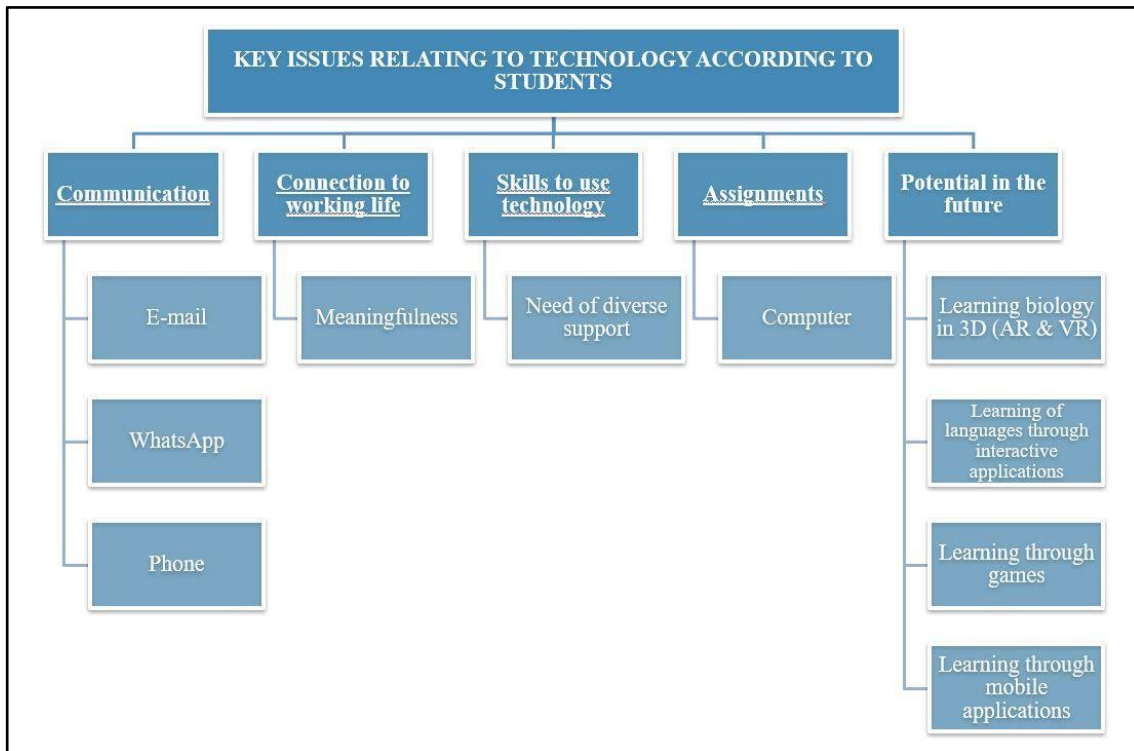
Figure 4. Key issues relating to technology, according to students.

Students expressed their desire for smooth, timely, and easy communication of information using the newest technology (Figure 4). Despite this, not all of the students had the newest mobile devices required to participate in a WhatsApp group where schedule changes, for example, were normally announced. Other communication methods were email or phone calls. It was an obvious challenge for the teaching staff to contact students in several different ways, having to remember to call certain students who were not in the WhatsApp group. This obviously elevates the need to supervise the students, but with good communication, the students can feel that their presence and needs are important. The findings of this study support the idea of shared responsibility: individuals, student groups, and supervisors all play a role in communication and spreading knowledge over digital devices so that it is timely and accessible. The knowledge spreading should be planned ahead, and the instructions should be familiar to everyone. The student group should help spread the knowledge and ensure everyone is aware of any changes. The supervisor should post the changed plans for everyone to see on a previously agreed-upon platform. Any sudden changes to plans can be challenging to students that live far away from the school.

> I assume that I get answers to my questions I have sent to supervisors and that our plans will not change immediately because of long distances. Sometimes these issues have been problematic. (Student 2.3.B)

Students also mentioned that technology use learnt during the studies should be connected to working life in order to make their learning more meaningful. The reindeer herding profession requires herders to function as independent entrepreneurs. Therefore, their administrative skills need to be strong in order to cope in today's demanding professional settings. Sometimes, students need to help the older generation to understand these new settings that require them to use the newest technology. This can be seen in one student's comment about home-use of a computer:

> Mother and I [use it] a bit. (Student 2.3.B)

> Yes, father always shouts at the emails and swears at them that they don't work and damn these machines. (Student 2.3.B)

In reindeer herding studies, students gain knowledge of digital tools so that they can pursue their studies with digital solutions on- and off-campus and gain the skills required to be independent entrepreneurs in the future. An example of a new digital tool that can be used in reindeer herding is drones. The students had different levels of experience using them:

> One new and useful technological invention that has been tried are drones. They tried them for gathering the herd, and they (reindeer) quickly got used to the noise and are not afraid anymore. (Student 3.1.T)

> We use them for gathering the herd and for checking for predators. (Student 2.3.B)

> [Technological devices] should not be complicated, because reindeer herders do not have much to do with technology. My father runs to me for help when things don't work with the drone. (Student 2.3.B)

Few students had their own drones at home, but all of them agreed that learning to use one would be good for their future working life.

The role of digital tools in teaching and learning is significant in vocational reindeer herding studies. However, skills to use technology varied and it appeared that students need diverse support to develop their competency in using technology. The students expressed that they were not always able to use digital devices because they did not always have the knowledge and competency required to do so. Some of the students did not have a smartphone, although they had a telephone with no internet. All of the students had access to a computer for schoolwork.

They felt that the use of digital devices would be a necessity in their future work, even if not all of them were thrilled about using them.

> I wish to stop the development of technologies. (Student 3.2.B)

> I have an old Nokia... No point buying a new one as this works fine. (Student 3.1.T)

> But my brother has (a smartphone) and he has some Norwegian reindeer herder Facebook friends but they communicate very little. (Student 2.3.V)

Computers were mentioned to be the main device to make assignments. Assignments were normally picked up and returned on a Moodle -platform or sent by email or by filling photocopied papers. This was considered by the students rather uneventful and unmotivating. Also, they mentioned that writing a learning diary is particularly hard.

> I just somehow don't feel like writing it and then it looks like I haven't done
> anything, that I have been lying on the sofa. (Student 3.1.L)

Another challenging assignment to write on the computer mentioned by the students were writing the practice report and competency examination, particularly in the context of working for their family business. The students stated that it would be beneficial for students to be able to do more practical work, including competency examinations, at home, provided that easy ways to demonstrate their skills and competency were developed and refined even further.

> I must try to explain what I did in writing and then write how do I demonstrate   my
> competency in something I did not do. I mean really? (Student 3.1.L)

Students suggested that mobile device solutions should be increased in order to be more convenient. About future technological possibilities it was also discussed that learning subjects through different kinds of applications and solutions (fex. VR/AR) could provide a new perspective.

> In biology technology could help because it is quite hard to recognize intestines from drawings. (Student 3.1.T)

A majority of student respondents mentioned that they wished they could take advantage of the existing free applications offered on digital devices, such as plant recognition apps, navigation,

and language learning (Swedish and English) applications. They were interested in learning games and the possibilities of augmented or virtual reality environments for learning. The teachers also felt that digital solutions and games could be useful for different kinds of tasks, such as learning languages and about slaughtering, plant species recognition, and reindeer biology, provided that they were easy to use. Digital applications would make it easier to learn and recognise plant species or reindeer development from a calf to adult in an augmented or virtual reality environment than from a paper. The importance of learning how to use a drone for collecting reindeer was also mentioned by the students.

> Yes, it's quite convenient in the sense that in case of assembly work and
> especially if there is difficult terrain, you don't need to go for a five-kilometer   round
to check, it is easy to fly and see if there is a need to go there.   (Student 3.1.T)

The process of competency identity construction is also emphasised more by today's multiple digital environments. Social media and Web 2.0 have transformed the way people communicate and socialize, effectively creating learning environments and worlds without borders (Fuchs, 2014; Kietzmann, Hermkens, McCarthy, & Silvestre, 2011), thus having a remarkable impact on people's understanding, being, and identity.

As per the objectives of EDR, the authors sought to find a way to support and visualise students' competency identity development with a digital tool throughout the research process (Figure 2, phase 4, 5 and 6). The authors reflected on the students' comments about the rigidness of Moodle platform and unmotivating writing tasks about practical issues. Additionally, the authors reflected on the teaching and administrative personnels' views, and the relevant empirical and theoretical literature, and concluded that an ePortfolio could provide a student-centered opportunity for demonstrating one's developing competency. Accordingly, the final workshop was designed for students to learn how to make an ePortfolio to demonstrate their diverse professional competency with all the dimensions that a digital platform allows. This provided insight into the key research question of the study, as discussed in the following section.

3.3 ePortfolio support and substantiation of competency identity development

The final workshop lasted a full day. It began with motivating group dynamics exercises (Wheelan 2015). These were followed by hands-on instruction on how to make a webpage or blog—in other words, an ePortfolio—for the purpose of making one's competency and its development visible

not only to oneself but also to the teacher and potential employers later on. This was the result of educational design work that took into account the personnel's and students' views heard during the interviews, the relevant empirical and theoretical literature familiarized during the process and the authors reflections on all these. On the website, students are able to post their assignments with photographs and videos, make a gallery of the photos and videos they took during practical training, add some text to explain the events in the photos and videos and present their competency to the reader in any way that they wish. An ePortfolio offers students a flexible personalizable platform to show their competency. The completed assignments are not paper-based or hidden behind passwords but are available to view at any time in the ePortfolio (photo 2).
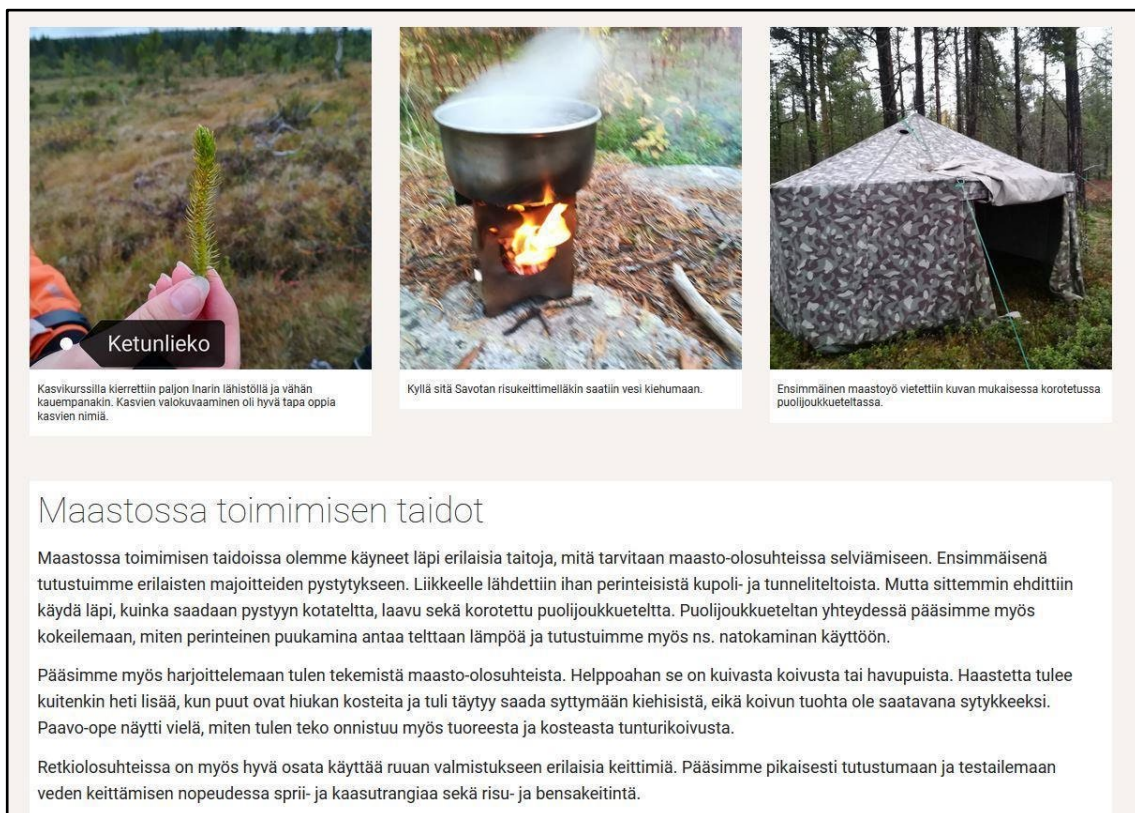

Photo 2. Example of a student's webpage.

After making their own websites (photo 2), the students worked on a photo exhibition project with three art teacher students from the University of Lapland that were responsible for all the practicalities of the exhibition. Part of workshop 4, the photo exhibition was an example of integrating several subjects into one. It combined the use of digital technologies to showcase one's learning with art project work and Finnish language lessons, thus creating a multidisciplinary learning entity. The exhibition was an opportunity for the students to see the possibilities involved in visualising one's skills and learning. The students had taken photographs while working and

learning in nature, and the photo exhibition was a way to present the students' abilities as experts of nature to the public.

Photo 3. Photo workshop. Students chose pictures for the photo exhibition.

The students had to choose the photographs they liked best from their mobile phones to use in their ePortfolios and show to other people in the exhibition. The chosen photos (photo 3) were first printed to see how they looked in print and to further refine the selection of photos for the exhibition. The three art teacher students showed the reindeer herding students how to transfer the digital photos from their mobile phones to a shared folder and how to add explanatory text for each photo. The reindeer herding students received credits from their vocational school for their participation in the exhibition, and the art teacher students received credit from the University of Lapland for organising it. The exhibition was opened in the Sámi Educational Institute in Inari (photo 4) and the University of Lapland Faculty of Arts in Rovaniemi (photo 5).

Photo 4. Exhibition opened at the Sámi Educational Institute in Inari.

Photo 5. Opening of the exhibition at the University of Lapland. The second writer is on the right in a traditional Sámi dress.

Photo 6. The exhibition at the University of Lapland makes the students' multicultural background and learning process visible to the viewers.

The opening of the exhibition attracted local and international guests, as well as media exposure from YLE Sámi TV, local newspapers, and a reindeer herding journal. The exhibition itself was a learning journey for the students since they learned how to work with photos and videos as part of ePortfolio work and competency identity building education, as well as how to write about the occurrences in a manner their audience would find interesting. They learned to make their competency and work visible to other people (photos 4, 5, and 6).

The third research question of this study asked how ePortfolios support and showcase competency identity development. The ePortfolio development process involved building a student-centered learning supporting platform, which was important for engendering the students' understanding of their learning process, enabling them to visualise and showcase their learning experiences. The entire study project or parts of it, in this case the digital ePortfolio platform, can be visualized even further by creating a concrete exhibition that peers, teachers and family can come to see and admire. Inviting media and visitors to come and see this exhibition enabled people to get a small peek of the working-life of a reindeer herder that is not well known. At the same time, it gave a positive learning experience to the students.

> All in all, I have to say that it was a great experience to be involved in this project. It has been a really long time since I have visited any art exhibitions. And never have any of my own work ended up in any exhibition. (Student 5.1.1.N)

Furthermore, the long-term process elicited personal meaning and emotion in an active learning context, culminating in students' competency identity development. The platform also connected reindeer herding studies with practice and working life.

In this study, teaching personnel and students were asked about the key competency themes needed to support reindeer herding studies. The identified themes provided an understanding of the multidimensionality of competency identity development in vocational education. The process of professional competency identity construction involving vocational reindeer herding studies is depicted in figure 5 in which elements of reindeer herding are added and further developed (for more on reindeer herding, see Heikkinen, Lakomäki, & Baldridge, 2007).
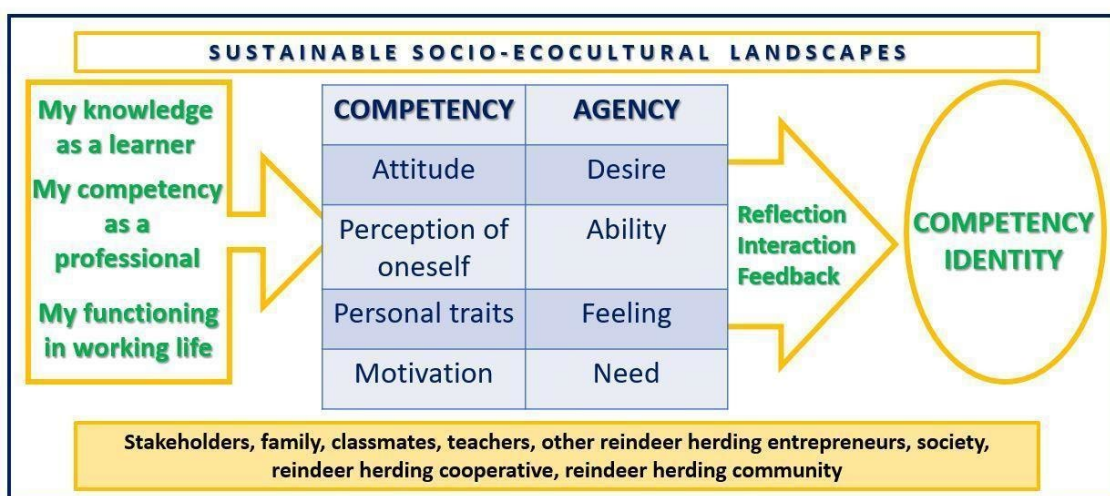

Figure 5. The process of competency identity development in vocational education of reindeer herding adapted and further developed from Raudasoja, Heino, and Rinne (2019).

The development of competency identity is a continuous process through which one's understanding of their knowledge as a learner, competency as a professional, and functioning in working life develop. An ePortfolio can offer a flexible personal learning platform for students in this development process, as discovered in the third workshop of this study. The students' feedback on the workshop and working with the ePortfolio supported the view that such a tool can be used to support the organisation of student-centred learning in on- and off-campus vocational education.

> I feel this is an easy and fun way to demonstrate what I have been working on in practice and I think that this is also a good idea to spend my spare time and show my work and hobbies to everyone. (Student 4.1.N)

After designing their own ePortfolio homepages, the students expressed their view that the format of a homepage ePortfolio was effective in helping them to build their own competency portfolio.

> I think it was kind of a feeling of success when I realized that I am able to use this tool. (Student 4.1.N)

> First, I thought I don't even have any nice pictures, but then it was so nice when I found so many good pictures on my phone. I was surprised and now I started to look at them differently. (Student 4.1.S)

Knowledge of one's competency development occurs through reflection, interaction, and feedback, without forgetting one's motivation, attitude, personality traits, and self-perception. Agency, however, requires desire, ability, feeling and emotion, and need (Raudasoja, Heino, & Rinne, 2019). Competency identity develops and shapes over time and with experience throughout one's working life and ePortfolios developed in this study support this process.

4 DISCUSSION

The evaluation of the workshops, ePortfolios, and exhibition, as well as the reflection on the process, are an integral part of the EDR process followed. Through this EDR process, the authors used a method to motivate students to engage in learning, to enhance and build upon that learning, and to extend that learning to their everyday and entrepreneurial working lives (Keskitalo, Frangou, & Chohan, 2020). The organised workshops, exhibition, and developed ePortfolio were used to find practical solutions and present examples of how to work in innovative ways that could be applicable in other contexts. Different study programs are often developed to meet the needs of society and the labour market. However, they need to be updated and constantly developed in order to keep up with the globalised, constantly changing world.

The first two interview workshops laid down the fundamentals for the final webpage workshop and exhibition. According to the interviews with students, more flexible and digitally enhanced methods of study were needed. Based on examples from the literature and interviews, a solution was created by the researchers in which students could benefit by exhibiting their existing knowledge, competency, and skills and demonstrate how they were developing in their competency in the present.

A student-centred webpage workshop and photo exhibition guided by the objective of visual meaning-making were organised. The students' own relations to the moments captured in each photo were discussed in the group (Choon-Lee, 2019; Rose, 2016). The photos chosen by students and each had a personal story behind them, which was shortly annotated next to the images in the exhibition. The workshop and exhibition not only made the students' professional and photographic skills visible to the public but also created a tight group of motivated reindeer herding students with plenty of competencies to exhibit. Social ties to people with shared interests can be significant to an individual's self-concept development (Spears et al., 2005) and their competency identity. Vocational studies would benefit from reforming their competency examinations and clarifying for students how to reflect and express what they have learned and evaluate what the learning experience means for their competence identity in a cultural, historical, or social context (Hatton & Smith, 1995).

Vocational pedagogy should be connected to working life. Vocational education and training (VET) is the incorporation of work-related learning into the curriculum to achieve close cooperation between VET and working life. This kind of thinking includes what are known as

vocational skills demonstrations (Ministry of Culture and Education 2020; Stenström, 2009). ePortfolios can have an effect on future working life by demonstrating these skills.

There were limitations to the present study connected to research position and resources. Firstly, the authors were outsiders looking in, meaning that they come from the university and participated in the development task as university partners. Although the authors are researchers, they were very much involved in all processes and practicalities, such as organising the exhibition, to mitigate the potential limitations that could be caused by constantly changing research personnel, thus creating an environment of openness and trust that are essential for successful implementation of new ways of learning. Secondly, the authors were initially eager to try out different kinds of digital tools with the students, such as augmented and virtual reality; however, reflections of discussions with the personnel and students helped the researchers to see that a good solution can sometimes be something very simple and low cost, such as making a homepage ePortfolio with free digital solutions and exhibition.

Future directions

The present study focused on exploring competency identity in a vocational education programme in a socio-ecocultural landscape containing Arctic social, ecological, and cultural aspects. As per the vocational education reform, students in vocational education should increasingly become aware of their ability to influence their own studies and the ways in which they acquire knowledge, skills, and competency during their studies. Practical work-based vocational training is essential for students to develop their competency identity and to evaluate themselves and their performance in relation to working-life demands. The purpose of competence-based vocational training is for students to acquire professional as well as educational skills, knowledge, and competency that will enable them to find employment and function in today's working life (Raudasoja, Heino, & Rinne, 2019).

Besides mapping the concept of competency identity in vocational reindeer herding studies, this study offers a concrete example of how to support competency identity construction in a diverse context. Similar to other educational contexts, reindeer herding students can use information and communication technologies and new media as tools to study and gain the competency they need to function in their working life. This development of learning tools and methods can be further advanced to meet the needs of learning institutions, personnel, and students.

Based on the gathered knowledge, a challenge was observed of how to encourage and convince educational institutions to implement student-centred ways of demonstrating competency. More

relevant digital applications and solutions are needed to improve learning, such as applications to augment learning about reindeer biology and plant species. This is clearly a dimension in need of further development, as mentioned by the students and personnel.

The key feature of EDR is that development and change are inevitable. Education institutions need to lead change in learning culture and motivate both personnel and students in the process by bridging studies with working life, digital technologies, and competency identity development. Creating ways to enhance student-centeredness is the key to changing learning culture in demanding contexts, highlighting the significance of a meaningful working life connection, as the ePortfolio workshop conducted in this study revealed. The objective of vocational education worldwide is to promote vocational education reform and workplace-based learning and provide students with professional knowledge, skills, and attitudes. ePortfolios offer an opportunity for successful integration of working life–connected activities with digital technologies. They can enhance and visualise students' competency identity development and, thereby, become a significant factor in their future employment seeking or development as entrepreneurs.

Acknowledgements

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