Health and Social Care Educators' Competence in Digital Collaborative Learning: A Cross-Sectional Survey

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Abstract

The ongoing change from traditional pedagogy to digital collaborative learning requires a new mode of teaching, learning, and educators' responsibilities. For competence in digitally mediated teaching, educators need understanding of how to provide appropriate digital environment to learn collectively and individually. The aim of this study was to describe and explore health and social care educators' perceptions of their current level of competence in digital collaborative learning and identify distinct educators' profiles. Data were collected via cross-sectional survey from educators in 21 universities of applied science and eight vocational colleges in Finland using an instrument covering two subdimensions: educators' competence in fostering construction of knowledge in digital collaborative learning, and supporting students in individualized collaborative learning. The data were analyzed by statistical methods. Three significantly differing clusters of educators' profiles were identified, and a significant association between type of current work organization and their self-reported competence in digital collaborative learning was found. The vocational college educators rated their competence in fostering construction of knowledge in digital collaborative learning as significantly lower than higher education educators. There were also remarkable differences in competence in supporting students' individual collaborative learning. To provide such support, sufficient competence in teaching in digital learning environment is essential, and our study highlights clear needs to enhance this competence.

Keywords

educator, competence, vocational, higher education, digital collaborative learning

Introduction

Health and social care is a dynamic sector, in which practices must be continuously adapted in accordance with rapidly evolving evidence-based knowledge, digital developments, and societal needs. Education clearly plays a crucial role in this adaptation; hence, health and social care educators' roles, working environments, and requirements have rapidly changed in European countries (and elsewhere) since the millennium (Miller et al., 2004; Zabalequi et al., 2006). Inter alia, a widespread change in the education from diploma to degree level has elevated the competence requirements for health and social care educators (Davies, 2008; Zambroski & Freeman, 2004).

Some recent interpretations or definitions of learning have implicitly or explicitly assumed that supportive technological learning environments or appliances would be used

to support complex cognitive tasks and thinking processes (Devolder et al., 2012). Hence, the use of digital technology

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is almost unavoidable in current teaching, and educators must be self-directed, manage digital learning environments, and deeply engage in professional, cooperative, evidence-based educational practices. Among other things, they need abilities to work collaboratively, by sharing know-how, synergistically exploiting competences, negotiating work styles, and cooperatively planning (Töytäri et al., 2016).

Contemporary health and social care educators must be prepared to serve as educators with pedagogical competence and researchers with investigative competence, with additional competence in leadership, management, and international networking (Mikkonen et al., 2018; McAllistair & Flynn, 2016). They are also expected to have experience in health and social care working practice with broad substance knowledge (21st Century Skills, 2016). Effective teaching in such contexts requires specialized skills related to curriculum, teaching strategies and methods, evaluation processes (Cangelosi et al., 2009; McCoy & Anmea, 2012), and research and other scholarly activities (Mikkonen et al., 2018; Jackson et al., 2011). Health and social care educators with these suites of competences are vital for enabling students to learn and develop into professionals who use research findings when making decisions in their professional practice (Ervin, 2002). New pedagogies combining digital collaborative learning provide educators with substantive alternatives for responding to the evolving challenges emerging from current health care and higher education systems, such as increasing multiplicity; differences among students; shortages of educators, clinicians, and students; as well as concerns regarding the quality and nature of student experiences. For competence in digitally mediated teaching, health and social care educators need understanding not only of the content but also how to present it, provide an appropriate digital environment for students to learn, collectively and individually, and exploit the unique learning affordances of online learning environments (Conceião & Taylor, 2007). Digital collaborative learning can considerably enhance students' learning outcomes (Männistö et al., 2019b). Moreover, nursing students taking an online course may self-reportedly work harder, and feel more like part of a group, than peers taking a traditional face-to-face course, taught by the same educator (O'Neil & Fisher, 2008). However, such positive outcomes will only be obtained if educators have the required competences in digital collaborative learning (Mikkonen et al., 2019a; Kalaian & Kasim, 2017; Scardamalia & Bereiter, 2014).

These include skills in designing digital learning activities that promote students' collaborative knowledge building, using student-centered methods; identifying and catering for students' individual needs for guidance; exploiting various tools for collaborative work and interaction in digital learning environments; and knowing teachers' roles in digital collaborative learning.

Background

The competence of health and social care educators has been described in various terms and as a complex,

multidimensional phenomenon (Mikkonen et al., 2018). Common core competencies of health and social care educators include skills in four areas: academic, research, clinical practice, and management (Mikkonen et al., 2018; Costa & Barbieri Figuereido, 2008). The American National League for Nursing (2005) has published a list of eight Core Competencies of health and social care educators. One of those is "Facilitate Learning," defined as responsibility for creating environments in classroom, laboratory, and clinical settings that facilitate student learning and the achievement of desired cognitive, affective, and psychomotor outcomes. Currently, that also includes use of new pedagogical methods and digital learning environments, which will change the approach to the role of health and social care educator. International and national legislation has defined health and social care educators' competencies as including competence in creation and application of evidence-based theoretical and practical knowledge; relevant skills for working life; pedagogical competence in learning theories and use of digital options in different learning environments; curriculum planning, implementation, and evaluation; developing their own teaching methods and profession; management and leadership of organization and people; evaluation of students' learning; and generic skills including proficient consideration of ethical issues, communication, collaboration, self-direction, decision-making, problem-solving, and critical thinking (Mikkonen et al., 2018; "Ethical Principles for the Teaching Profession," 2017; European Commission, 2017; National Qualifications Framework, 2017; Organisation for Economic Co-operation and Development, 2017; University of Applied Sciences Act 2014/932; World Health Organization, 2016). Health and social care scientists have published similar definitions of educators' competence (e.g., Salminen et al., 2013, Mikkonen et al., 2018, Männistö et al., 2019b; Topping et al., 2015; Töytäri et al., 2016).

Innovative use of these core competencies empowers health and social care educators to shape their own practice and advance education and lifelong learning, thus transforming the future of education (Kalb, 2008). Teaching should be context-bound, enhance digital attitudes, and utilize students' own experiences (Yarborough & Klotz, 2007). In addition, health and social care educators should be able to adjust their teaching methods to meet students' specific learning needs (Gardener, 2014; Valiee et al., 2015). Effective educators use multiple teaching approaches, connect with their students, and accommodate students' diverse learning needs to engage them in the learning process. Furthermore, health and social care educators should be adequately prepared for the transition from clinical practice to teaching in universities (Boyd & Lawley, 2009; Staykova, 2012). They should have sufficient prior knowledge of their role; awareness of appropriate teaching methods, theories, and strategies (Salminen et al., 2009; Billings, 2008; Gardener, 2014; McArthur-Rouse, 2008; Poindexter, 2013); and knowledge of curriculum development (Poindexter, 2013; Shanta et al., 2012). Teaching proficiency should be demonstrated in both clinical and classroom or

digital learning environment settings, with the ability to assess and evaluate students' learning progress (Garrow & Tawse, 2009; Poindexter, 2013).

The shift in pedagogical model in health and social care education to digital collaborative learning requires a new mode of thinking about approaches to teaching, learning, and responsibility. Pedagogy in digital collaborative learning includes the following aspects (Dillenbourg & Jermann, 2011; Scardamalia & Bereiter, 2014). Students play an active role in the learning process, they must be engaged in mindful processing of information, and they are responsible for the outcome. Their previous knowledge provides foundations for their construction of new knowledge. They work together in digital learning environments, building new knowledge in cooperation with each other and exploiting each other's skills. They should try actively and willingly to achieve cognitive objectives. Learning tasks should be situated in meaningful real-world tasks or introduced through case- or problem-based real-life examples. They should develop the ability to apply knowledge and skills acquired from learning situations and contexts to other situations, articulate what they have learned, and reflect on the processes and decisions involved.

Such pedagogy is rooted in socio-constructivist learning theory (Hmelo-Silver, & Chinn, 2015). Construction begins with engaging learners in the meaning-making process and ends with enabling them to handle real-world problems. Educators must carefully assess students' self-direction skills before implementation of the socio-constructivist educational paradigm (Järvelä et al., 2013), as it is rooted in the student-centered notion that knowledge construction and learning are natural tendencies for individuals (Järvelä et al., 2016). Moreover, these processes are best fostered through collaborative and cooperative approaches, in which students have wide autonomy and freedom (Nikitina, 2010).

However, in a recent study we found that health care students exposed to a digital collaborative learning intervention were less satisfied with their educational experience than peers exposed to traditional classroom learning (who engaged in less educator-independent group work), although they obtained higher grades (Männistö et al., 2019b). This highlights the complexity of digital collaborative learning and may be related to the competences of the health care educators involved, which warrants further attention. More knowledge is needed to provide robust guidance for educational leadership in continuous education for educators to strengthen and/or further develop their competence in digital collaborative learning. Furthermore, such knowledge can be used for the development of curricula for master's-level health and social care teacher degree programs. The aim of the study presented here was to contribute to acquisition of such knowledge by evaluating health and social care educators' perceptions of their current level of competence in digital collaborative learning and identify distinct educators' profiles.

Methods

Study Design

A cross-sectional survey design was used.

Setting and Participants

Health and social care educators based at 21 universities of applied sciences and eight vocational colleges in Finland ($N = 2,330$) were invited to participate in the study. The sole inclusion criterion for participation was a working position in the social and/or health care (including rehabilitation) educational sectors at one of these institutions. The sample size required for the study was estimated by power analysis, following previous recommendations (Koivula et al., 2011). The minimum number of participants required for the study was 506 according to power analysis, based on requirements for an effect size according to Cohen's *d* (obtained from a two-tailed test, with significance set at $p < .05$) of 0.8 (Koivula et al., 2011). Thus, with an expectation of a 30% response rate, at least 1,687 candidates had to be invited to participate in the study. Since we found no precise information on the total population meeting our criterion in Finland, the data were collected by inviting all educators from 21 universities of applied sciences and randomly chosen (regionally representative) vocational colleges.

Data Collection

Data were collected, as part of a larger project funded by the Finnish Ministry of Education and Culture, via a Webropol online survey in August–December 2018. An invitation to participate was sent, by email, to all targeted educators via a contact person at each selected educational institution. The contact person informed one of the researchers collecting data confirmation that an invitation and link to participate in the study (by completing a questionnaire, described below) has been forwarded. After the invitation and link had been sent, four reminders were sent at two-weekly intervals.

Instrument

The questionnaire consisted of 11 background questions and a 7-item digital collaboration learning competence instrument developed for this study, covering two self-assessed subdimensions: competence in fostering construction of knowledge in digital collaborative learning (four items), and supporting students in individualized collaborative learning (three items). Educators' perceptions were measured with a 1-to-4 Likert-type scale (1 = *fully disagree*, 2 = *disagree to some extent*, 3 = *agree to some extent*, 4 = *fully agree*). The items were developed based on two systematic reviews (Mikkonen et al., 2018, Männistö et al., 2019b) and a qualitative study

Table 1. Results of Exploratory Factor Analysis[a] of Scale in Educators' Competence of Digital Collaborative Learning.

Items	Factor 1	Factor 2
Factor 1—*Fostering construction of knowledge in digital collaborative learning*		
1. I can design virtual learning so that it promotes the construction of students' collaborative knowledge.	.932	
2. I can use various tools for collaborative work and interaction in virtual learning.	.912	
3. I know how to identify students' needs for guidance in virtual teaching.	.794	
4. I know what my role is as a teacher in virtual teaching.	.733	
Factor 2—*Supporting students' individualized collaborative learning*		
5. I know how to take into account students' individual needs when planning teaching/mentoring.		.780
6. I use student-centered methods in my teaching/mentoring.		.691
7. I am familiar with the pedagogical premises of collaborative learning.		.489
Eigenvalue	4.015	1.112
Percentage of variance explained	57.4	15.9
Total percentage of factor model		73.3
Cronbach's alpha	.91	.72

[a]Extraction method: Principal axis factoring with Promax rotation, presented in Pattern Matrix, only loadings ≥.300 presented in the table.

(Mikkonen et al., 2019a). The items' content validity was tested by a panel of five experts including educators and researchers. The instrument was pilot-tested before the main data collection in three institutions ($N = 149$, $n = 33$) to ensure that the questions were understood and correctly interpreted (Kimberlin & Winterstein, 2008; Ritter & Sue, 2007).

The Kaiser–Meyer–Olkin test (.859) and Bartlett's test for Sphericity (1,494.394; $df = 21$, $p < .01$) indicated that the data met criteria for exploratory factor analysis with principal axis factoring (PAF), which was therefore applied to test the instrument's construct validity. The functionality of the factor model was validated by an eigenvalue >1 (indicating that the factors could satisfactorily explain the observed variables' dispersion) and adequate communalities of the factors ($≥0.30$), which indicate how much of the variance of observed variables is explained by identified factors. PAF was used to estimate the number of significant factors by oblique rotation (Promax), assuming multivariate normality of variables (Williams et al., 2012).

Promax rotation, including variables with communality >0.30 (Yong & Pearce, 2013), provided almost identical factor loadings to Varimax rotation in sensitivity analysis, with differences in two items' cross-loading between two factors ("I can design virtual learning so that it promotes the construction of students' collaborative knowledge" and "I know how to identify a student's need for guidance in virtual teaching"). The construct validity tests indicate that a two-factor model was most suitable. An eigenvalue of 4.02 was obtained for the first factor, *Fostering construction of knowledge in digital collaborative learning*, which explained 57.4% of total item variance. The second factor, *Supporting students' individualized collaborative learning*, had an eigenvalue of 1.11 and explained 15.9% of the total item variance. The instruments' reliability was validated by Cronbach's alpha values of .91 and .72 for the first and second factors, respectively (Table 1; Rattray & Jones, 2007).

Data Analysis

The data were analyzed using IBM SPSS 24.0®. Summary statistics (frequencies, percentages, means, and standard deviations) were calculated, and three groups of significantly different profiles among the educators (each including at least 5% of the total sample) were identified by K-means clustering, with several repetitions. Differences in demographic variables among the three clusters were compared by applying one-way analysis of variance (ANOVA) to normally distributed data and chi-square tests to categorical data. Fisher's exact test was conducted if the expected frequency was less than 20%. Significant differences in variables among the three clusters of profiles were detected using the Kruskal–Wallis test and Mann–Whitney test with Bonferroni correction. In all tests, statistical significance was set at a value of $p < .05$. Means and standard deviations are reported in $M \pm SD$ format.

In addition, binary logistic regression analysis was performed on one factor "Fostering construction of knowledge in digital collaborative learning." The factor was dichotomized into lower competence ($0 = 1$–2.49 Likert scores) and higher competence ($1 = 2.50$–4 Likert scores), and then the goodness of fit for the resulting variable in the model was assessed by log-likelihood ratio (2LL), Omnibus model coefficient, Hosmer–Lemeshow, Cox and Snell, and Nagelkerke R^2 tests (as implemented in the mentioned software). The results are presented in odds ratios (ORs) with 95% confidence intervals (CIs; Munro, 2005).

Results

Participant Characteristics

In total, 422 educators participated in this study, so the response rate was 18%. As shown in Table 2, the mean age of the educators was 51 ± 8.63 years. Most were female (90%),

Table 2. Educator Profiles (N = 422).

Characteristics	Cluster A (n = 71)	Cluster B (n = 170)	Cluster C (n = 181)	p value
Age, years	50.62 (9.62)	50.06 (8.90)	51.77 (8.08)	.17[a]
Female, %	93.0	89.4	88.4	.48[b]
Finnish language, %	90.1	92.9	90.1	.60[b]
Education, %				.40[c]
Vocational qualification	0.0	0.6	0.0	
College degree	0.0	1.2	1.1	
University (bachelor's) degree	8.5	8.2	5.5	
University (master's) degree	80.3	68.8	69.6	
University (doctoral) degree	11.3	21.2	23.8	
Teacher training (pedagogical education), %				.86[c]
Vocational teacher training	35.2	35.9	36.5	
Teacher training in health sciences	50.7	52.4	54.1	
Teacher training in educational sciences	12.7	11.2	9.4	
No teacher training	1.4	0.6	0.0	
Year of completion of highest degree	2007 (8.15)	2007 (7.82)	2006 (8.50)	.42[a]
Current teachers' work field, %				.62[c]
Social services	16.9	19.4	23.8	
Health care	64.8	65.9	56.4	
Rehabilitation	5.6	7.6	7.2	
Physical activity	0.0	0.6	0.6	
Social services and healthcare	5.6	2.9	7.2	
Health care and rehabilitation	2.8	0.6	0.6	
Social services and rehabilitation	1.4	1.8	1.1	
Social services, health care, and rehabilitation	2.8	1.2	3.3	
Current employment, %				.06[c]
Part-time teacher	4.2	5.3	1.7	
Full-time teacher	29.6	18.2	12.7	
Lecturer	54.9	65.9	71.3	
Head teacher (principal lecturer)	9.9	7.6	12.2.	
Head of education	1.4	2.9	1.7	
Other	0.0	0.0	0.6	
Current work organization, %				**.00**[b]
Vocational college	38.0	20.0	16.0	
University of applied sciences	62.0	80.0	84.0	
Work experience as an educator, years	12.32 (9.04)	13.45 (9.41)	14.56 (8.25)	.18[a]
Work experience in the corresponding field, years	16.24 (9.54)	16.02 (10.09)	18.71 (9.92)	**.03**[a] (B, C profiles—p < **.01** in Bonferroni correction)
Competence in fostering construction of knowledge in digital collaborative learning	1.96 (0.43)	2.80 (0.33)	3.68 (0.29)	**.00**[d]
Competence in supporting students' individualized collaborative learning	2.83 (0.44)	3.42 (0.37	3.78 (0.30)	**.00**[d]

Note. M = mean (SD = standard deviation).
[a]One-way analysis of variance. [b]Chi-square. [c]Fisher's exact test. [d]Kruskal–Wallis test.
p < .05 (marked in bold).

native Finnish speakers (91%), and had at least a master's degree (71%). Just over half had received teacher training in health sciences (53%). Shares working in health care, social services, rehabilitation, and other (mixed health and social care) sectors were 62%, 21%, 7% and 10%, respectively. The mean work experience as an educator was 14 ± 8.88 years, and 79% worked in universities of applied sciences and 21% in vocational colleges.

Educator Profiles

Three groups of significantly differing profiles of educators were identified designated Clusters A–C, with characteristics shown in Table 2. Cluster A included 71 participants (17%), with a mean age of 51 ± 9.62 years and mean work experience as an educator of 12.3 ± 9.04 years. Over half of them (62%) worked at a university of applied sciences. Participants

in Cluster A had ambiguous perceptions of their competence in fostering construction of knowledge in digital collaborative learning (mean Likert score: 1.96 ± 0.43, almost exactly half-way between agreeing to some extent and disagreeing to some extent that they had mentioned competencies). However, they rated their competence in supporting students in individualized collaborative learning substantially higher (2.83 ± 0.44).

Cluster B included 40% of participants with a mean age of 50 ± 8.90 years and mean work experience of 13 ± 9.41 years. Most (80%) worked at a university of applied sciences. Profile B participants rated their competence in fostering construction of knowledge in digital collaborative learning as moderate (mean Likert score: 2.80 ± 0.33) and supporting students in individualized collaborative learning quite strongly (mean: 3.42 ± 0.37).

Cluster C included 43% of the participants. The mean age and work experience of this group were 52 ± 8.08 and 15 ± 8.25 years, respectively. Only 16% of them worked in a vocational college. The Profile C participants rated their competence in both fostering construction of knowledge in digital collaborative learning (mean: 3.68, *SD*: 0.29) and supporting students in individualized collaborative learning highly (mean Likert scores: 3.68 ± 0.29 and 3.78 ± 0.30, respectively).

There were several significant differences between these three clusters of educators' profiles. Current work organization was significantly associated with their ratings of competence in digital collaborative learning. The proportion working in vocational colleges was highest in Cluster A, who rated their competence in fostering digital collaborative learning significantly lower than their colleagues in Clusters B and C ($p < .01$). There were also remarkable differences in competence in supporting students in individualized collaborative learning ($p < .01$). The largest differences in this respect were between Clusters A and C (in which 38% and just 16%, respectively, worked in a vocational college). The general finding that educators in vocational colleges rated their competence in fostering construction of knowledge in digital collaborative learning substantially less highly than educators in universities of applied sciences was confirmed by binary regression analysis (OR = .28, 95% CI = 0.16–0.47, $p < .01$; Table 3).

There were no significant between-cluster differences in educators' previous education ($p = .40$), teacher training ($p = .82$), or year of completion of the highest degree ($p = .50$). Neither current employment nor educators' work field was related to their competence in fostering construction of knowledge in digital collaborative learning or supporting students in individualized collaborative learning. Furthermore, there were no significant between-cluster differences in educators' age, gender, or language. The work experience in the corresponding field in years significantly differed among Clusters B and C (mean scores: 16.02 ± 10.09 and 18.71 ± 9.92, respectively; $p = .03$).

Discussion

In Europe, there have been several health and social care education reforms in recent decades, including various efforts to harmonize it, but there are still many variations in the social and health education systems among European countries (Salminen et al., 2010). In Finland, health and social care educators are highly trained by global and European standards. Current minimum qualifications for new staff in the role include a master's degree, pedagogical competence, and at least 3 years' work experience in the social or health care field (Salminen et al., 2010). Most participating educators in this study had at least a master's degree. In the results of regression analysis of associations between background factors and educators' competence in digital collaborative learning, there was no statistical significance found among age, year of completion of higher degree, and work experience in the corresponding field relating to the digital collaborative competence. In the analysis of educator profiles, it was additionally visible that those background factors of the participants were relatively homogeneous, without showing statistical difference among the groups. The work experience in the corresponding field statistically differed among Profile B and Profile C. The Profile C educators scored the highest in the competence of digital collaborative learning and they had higher work experience in the corresponding field. In a previous study conducted by Koivula et al. (2011), educators' background factors significantly differed among levels of educators' competence in multidisciplinary teaching, but not other educators' competence.

Competence as a health and social care educator is regarded as a complex combination of pedagogical competence, expertise in the taught subjects (e.g., aspects of social and/or health care and rehabilitation), and knowledge (articulated and embodied) of professional conduct (Mikkonen et al., 2018). In this study, we explored the self-rated competence in digital collaborative learning (which is also a complex set of skills) of Finnish health/social care and rehabilitation educators. Previous studies have explored the skills of each professional group separately to some extent, but health and social care educators' competence has been poorly defined (Mikkonen et al., 2018). This extensive research provides evidence-based information on the overall competence of these professional groups in collaborative digital learning and teaching.

A previous study recommended integration of collaborative learning into health and social care education due to its positive effects on student learning outcomes (Zhang & Cui, 2018), and it is highly compatible with current professional education reforms intended to promote interprofessional teamwork (Baumberger-Henry, 2005). The implementation of collaborative learning has varied in different settings, but key elements always include learner interaction and collaboration. It has been used (as either a primary teaching

Table 3. Results of Regression Analysis of Associations Between Background Factors and Educators' Competence in Digital Collaborative Learning.

	Outcome variable	
	Competence in fostering construction of knowledge in digital collaborative learning	
Independent variable	OR (95% CI)	*p* value
Age	0.98 [0.94, 1.01]	.199
Year of completion of highest degree	1.00 [0.97, 1.04]	.902
Work experience in the corresponding field, years	1.02 [0.99, 1.05]	.254
Current work organization		
Vocational college	0.28 [0.16, 0.47]	**.000**
University of applied sciences (ref.)		
Omnibus		**.000**
Hosmer–Lemeshow		.609
Cox and Snell, Nagelkerke R^2	5.8%–9.2%	
Classification	80.1%	

p < .05 (marked in bold).

approach or supplementary component of lectures) to promote student learning, together with other instructional strategies such as case study (Baumberger-Henry, 2005), simulation (Eggenberger et al., 2015), and digital learning (Lin & Shen, 2013).

Digital collaborative learning is becoming an increasingly common way to provide education for students with diverse learning needs, as it offers flexible modes of teaching and assessment that are convenient, interactive, and engaging for learners (O'Connor & Andrews, 2015). Clearly, strong competence in collaborative digital teaching is required, but the health and social care educators who participated in this study evaluated their competence as educators in digital collaborative learning as moderate. There is an urgent need to explore much more the differences between the competences of digital collaborative learning between educators of the university of applied sciences and vocational colleges. There was a remarkable, and unexpected, significant difference between educators based at universities of applied sciences and vocational colleges. One explanation for this difference in competence levels may be a reform of vocational upper secondary education in Finland in 2018. It has introduced a new funding model that is intended to improve the effectiveness and quality of education and training (Ministry of Education and Culture 2018). The reform was intended, inter alia, to encourage vocational education providers to adopt measures that reduce discontinuation of studies and to recognize students' previously acquired competence more efficiently. This also means that vocational organizations have more freedom to organize their education (Krumsvik, 2012; Margaliot et al., 2018). Such changes have allowed attention to be paid to other activities and education structures rather than to the competence of educators. However, in previous studies, it was shown that the new pedagogies and digital learning environments are playing an increasingly important role to educators and the students (Mikkonen et al., 2019a).

In Finland, there is a strong emphasis on digital learning in the development of higher education. So far, there is still much more traditional classroom teaching in vocational schools (Koramo et al., 2018). Consequently, vocational social and health care educators have not used digital learning environments as much as educators in universities of applied sciences (Koramo et al., 2018). Thus, it could contribute to inferior competences of vocational educators. With the reformation, education providers do have more freedom to organize education and training through new licenses. However, scarcity of resources has reduced vocational educators' opportunities to acquire training to enhance their competence in digital collaborative learning.

In our previous study, it was indicated that students did not evaluate the teachers' performance in provision of digital learning environments highly (Männistö et al., 2019b, Männistö et al., 2019c). This may be related to educators' poor competence and highlights the need for further enhancement of both pedagogical competence and competence in digital collaborative learning. There is no universally recognized "best" approach as yet for developing and implementing digital pedagogy competencies and education in health and social care (De Gagne et al., 2012). So, it is important to define best practices to ensure the provision of high-quality health and social care education and training programs at undergraduate, postgraduate, and continuing professional development levels. Such programs should include appropriate health-related digital knowledge and skills to enable learning and the application of informatics approaches in all areas of professional conduct.

Collaborative digital learning pedagogy could further support and enable health educators to incorporate informatics into future training programs. The quest for innovative teaching strategies to improve health and social care graduates' preparation continues, with some educators implementing digital collaborative learning environments. In the future,

working life will require new kinds of competence, but less funding will be available for education (ARENE, Rectors' Conference of Finnish Universities of Applied Sciences, 2016; Helminen et al., 2017; Saarikoski et al., 2013). For reasons such as these, digital learning environments and new approaches to pedagogy will play increasingly major roles in education and training.

In summary, health and social care educators require complex pedagogical competence, with strong and extensive training in the use of collaborative digital learning environments that helps students to learn new content. This should also be considered in nursing curricula (Flott & Linden, 2016; Lee et al., 2018) that advocate approaches based on students' self-directed learning (Cadorin et al., 2017; Kim & Suh, 2018) and constructivist teaching methods, founded on students' subjective experiences (Aliakbari et al., 2015). Ongoing hindrances in Europe include reductions in resources for health and social care education (ARENE, Rectors' Conference of Finnish Universities of Applied Sciences, 2016; Helminen et al., 2017; Saarikoski et al., 2013). In Finland, these reductions are mainly due to governmental cuts in higher education (ARENE, Rectors' Conference of Finnish Universities of Applied Sciences, 2016), the new principle of performance-based funding for universities of applied sciences (University of Applied Science Act 2014/932), and the government reform of vocational secondary upper school. Clearly, they may impair the quality of education. Nevertheless, rapid changes in the health and social sector, and the need for professional expertise, also call for further development of health and social care education and educators' competence in digital collaborative learning. Furthermore, changes in technology are occurring not only in social and health care settings but also in educational environments. The use of technology has been commonly studied, but online learning environments have received far less attention, although they appear to pose substantial challenges for health and social care educators (Zlatanovic et al., 2017).

Limitations and Strengths

The study has several limitations and strengths. First, despite sending frequent invitations to educators, the response rate remained low. It would have been strengthened by more participants. The study was part of a larger project, which enhanced the quality of the data collection, but may also have reduced the response rate, since three scales measuring different phenomena were used in the project. Second, the results are based on educators' self-assessment and may have differed if educators' competence had been assessed by students, particularly as we have previously found that participants tend to exaggerate their competence. Third, since the data were collected electronically, there were no missing values, which enhances the quality of the data. Fourth, sensitivity analysis (involving comparison of factors associated with different clusters of profiles and binary regression analysis) was applied to strengthen the results.

Conclusion

Three significantly differing clusters of educators' profiles were identified, and a significant association between type of current work organization and their self-reported competence in digital collaborative learning was found. The vocational college educators rated their competence in fostering construction of knowledge in digital collaborative learning as significantly lower than higher education educators. There were also remarkable differences in competence in supporting students' individual collaborative learning. Educators play a key role in preparing the next generation of health and social care professionals to meet growing demands for health and social care services. They must provide their students with the technical skills they need for success in their field and the ability to help improve the quality of client care. To provide such support, sufficient competence in teaching in digital learning environment is essential, and our study highlights clear needs to enhance this competence. There would be a need to develop educators' skills and to raise awareness of digital teaching tools and how to use them. The best way to improve the skills of social and health care educators has not been directly demonstrated. Continuing education is one way, but it alone does not guarantee an improvement in skills. Therefore, it would be important to identify best practices to ensure high-quality education at all levels of education and in continuing education. In addition, it would be important to look at how organizations provide resources for the development of education competences. Ensuring educators' competence in digital collaborative learning needs to be emphasized.

The findings of this study suggest the need for implementing social and health care educators' competence and teaching strategies that will help to learn not only operational nursing competence but also digital and collaborative ones for the 21st-century nursing competences. These competence must be fully integrated into all teaching and design subjects to create a collaborative-based digital curriculum and to enable the development of the required competence of educators to use digital learning environments.

opportunity to further research on educators' competence and express our appreciation of the educators for taking time to participate in our survey. Furthermore, we would like to acknowledge Sees-Editing Ltd (http://www.seesediting.co.uk) service for improving the language and helping us to communicate our findings to readers of the Journal.

Ethical Consideration

Permission to conduct the cross-sectional survey was granted by all eight vocational colleges and 21 universities of applied sciences. The study was carried out according to published guidelines for ethical research conduct (Finnish Advisory Board on Research Integrity [TENK], 2012; Medical Research Act 488/1999). Approval by a formal ethics committee was not required for the survey (Medical Research Act 488/1999) since participants were not exposed to any physically or psychologically harmful influences. All the participants received an email with information about the study objectives, methodology, and guarantee to maintain anonymity. Their agreement to participate in the study included consent to share their data with researchers involved in the project (GDPR, 2018). The acquired data are stored and managed by the university of this study, in duly protected folders.

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Supplemental Material

Supplemental material for this article is available online.

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