Integrated teaching for vocational knowing: A systematic review of research on nursing-related vocational education and training

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Abstract

The aim for this review was to systematize, describe and critically analyse previous research concerning school-based integrated teaching for vocational knowing in nursing-related training in upper secondary and in higher level education. Searches were conducted in four databases, two specifically for Swedish hits, and two for international hits. Also, search was made in a Nordic journal on vocational education and training. References in included studies were also assessed for further inclusion of studies. Altogether, 14 studies were included and assessed for quality and coherence with GRADE CERQual. Review findings comprised three types of integrated teaching, through embeddedness or streaks, problem-based learning, and between school and workplace; vocational knowing relating to a professional and academic context; and methodological significance for the vocational knowing highlighted in the studies. In conclusion, the methodological approach typically used in the primary studies related to a quantitative approach, which was also discerned as quality measure. The primary studies brought forward a partial understanding of integrated teaching and vocational knowing, which is dependent on the methodological approach. In order to enhance understanding about the research topic, there is a need for more studies on integrated teaching utilizing a qualitative approach.

Keywords: integrated teaching, nursing, vocational education, vocational knowing, systematic review

Introduction

Integrated teaching challenges the traditional notion of didactics concerning the organization and method of teaching to a specific discipline, the actual teaching and learning content, as well as the teacher and student relationship (Comenius & Kroksmark, 1999; Kansanen, Hansén, Sjöberg & Kroksmark, 2017; Kansanen & Meri, 1999; Werner & Meyer, 1997). Consequently, integrated teaching is surmised to have implications for the type of knowing that is made available for the students. In relation to these aspects of divergence from established ideas of teaching, the purpose of this study was to explore the didactical significance of integrated teaching between school subjects, for the development of vocational knowing, specifically in nursing-related education and training, mainly targeting nursing assistants and nursing students. The purpose was also to understand the current research field on vocational didactics in terms of integration for vocational knowing. For this, previous research on 'integrated teaching' for 'knowing' in nursing-related education and training was systematized, described, and critically analysed.

Integrated teaching is a didactical approach in which teaching and learning content is organized towards a shared focal point, and performed in a varied organization of horizontal, vertical and parallel order within a school context. While horizontal order includes the traditional organization of educational courses, vertical and parallel order goes beyond tradition and includes innovation. Thus, vertical order involves the integration between the same or different subjects, across different school semesters, while parallel order involves the integration between the same or different subjects in the same school semester (Wraga, 2009). Even though teaching is delimited by the school context and specifically by the classroom walls, the organizational variation enables teaching in conformity with nature (Comenius & Kroksmark, 1999). The combination of disciplines to a point of contact through a varied set of didactic techniques (Beane, 1995; Comenius & Kroksmark, 1999; Dewey, 1996; Engeström & Middleton, 1998; Tanner & Tanner, 1980) enables students to encounter real-world issues. These issues may be explained as related to students' everyday life. In the school context, they are incorporated and strengthened by the addition of material and resources from everyday life to teaching.

In integration, the role of the teacher as facilitator is to contribute with a knowledge-base of the subject matter, and to genuinely engage and communicate with the students (Hmelo-Silver & Barrows, 2006; Kjellén, Lundberg & Myrman, 2008; McNergney, Ducharme & Ducharme, 1999; Schmidt & Moust, 2000). Main responsibility of the learning process is placed on the student, which is characterized by a continuous negotiation and collaboration between the individual student with other students, and in which knowing is made available (Kjellén et al., 2008; McNergney et al., 1999).

The concept of knowing adopted here, and referred to as vocational knowing, relates to the requirements of a vocation, specifically the nursing vocation (Lindberg, 2003). Knowing involves theoretical and practical aspects, that are intertwined (Billett, 2001; Carlgren, 2015; Lindberg, 2003; Moxey, 1994). Theoretical aspects are acquired through formal education and instruction, and practical aspects are acquired through practice, and experience (Berner, 2010). This notion of knowing separates from the perspectives of knowledge as declarative and procedural, and from knowledge detached from its true context (Billett, 2001; Hiim, 2017). Instead, knowing is highlighted as a dynamic and reciprocal activity engaged with the world, and here specifically within a nursing context (Billett, 2001). Integrated teaching performed in a school context was here expanded with a vocational context, i.e. connecting school and vocation (Gessler & Moreno Herrera, 2015). In research on workplace learning, integration is processed through the concept of connectivity, which specifically highlights the relation between learning in school and work experience (Guile & Griffiths, 2001; Virolainen, 2014). Connectivity is surmised to make for students available a development related to situational flexibility and polycontextual knowledge that in turn may give rise to new practices and forms of knowledge (Griffiths & Guile, 2003; Guile & Griffiths, 2001, 2002, 2006). Altogether, the connection between school and workplace is highlighted as significant for the enhancement of learning in both environments (Tynjälä, 2008, 2013). However, the connection between school and workplace made here is based on a school context.

Basic principles of integration are valid for education and training of all educational levels, making integration a shared didactical approach. However, differences in integration may be related to the levels of specialization in education and training, affecting the character of teaching and learning content. In basic education (compulsory and upper secondary) teaching and learning content, of discipline-based and of integrated character, are organized in general subjects. However, in vocational education, content that is linked to the students' future vocation is specifically arranged in vocational subjects (Beane, 1995). In higher-level education of nursing, teaching and learning content is organized in subject areas (nursing, medicine and public health) (The Swedish Red Cross University College, 2015). Certain content, such as ethics and person-centred care, may be organized in the format of streaks permeating a nursing programme (Currie, Bannerman, Howatson, MacLeod, Mayne, Organ, Renton & Scott, 2015; Milton, 2004). Aspects concerning literacy and numeracy may be contextualized to (Mazzeo, 2003) or embedded in (Alkema & Rean, 2014) a vocational context in upper secondary as well as in higher vocational education and training.

Integrated teaching requires an organizational support, which is not apparent neither equal in all cases. In the Nursing programme, the teaching environment may be described as specialized towards the students' future vocation and vocationally strengthened with longer periods of workplace training. Thus, there is a

clear organization that supports specialization. However, in upper secondary nursing assistants' education and training there is a lower degree of specialization. Requirements of balancing general subjects with workplace-training make vocational strengthening non-plausible. Instead, vocational contextualization is made dependent on resources in the specific school context. Two previous case-studies (Christidis, 2014, 2019) on a Swedish upper secondary Health and Social Care programme, for future nursing assistants, highlighted the vocational teachers' experience and resources from a vocational context as a contribution significant for the vocational contextualization of teaching. The following example on the three recent curricula from 1970, 1994, and 2011 for the Swedish upper secondary nursing assistants' education, illustrates the influence of educational organization on the conditions of integration.

The Swedish Case

In the three recent curricula (1970, 1994, and 2011) for the Health and Social Care programme there are recommendations on integrated teaching that promote a holistic understanding on the teaching and learning content (Skolverket, 2006, 2011; Skolöverstyrelsen, 1971). However, conditions for integration have been dependent on educational reforms (change of curriculum), that have affected the overall aim of the programme, and caused organizational changes.

In the 1970s curriculum (Skolöverstyrelsen, 1971), the overall aim of the programme was vocationally focused. This was reflected in the organization of subjects. The vocational subjects were few, but substantial, and had coherent time for teaching, whereas the general subjects comprised a smaller number and had to adjust schematically to the vocational subjects. Integration was referred to as collaboration (Swe. samverkan) and was most probably, in regard to the aim and schematic conditions, performed in favour of the vocational context.

In the 1990s curriculum (Skolverket, 2006) the overall aim for the programme was expanded. It now comprised a focus on the vocation, on social responsibility, and eligibility for further and higher education (Berglund, 2009). The programme was expanded in time (2 years in the 1970s, 3 years in 1994), and in content. Vocational subjects were divided into minor courses, which increased their number in total. Time was schematically distributed between general and vocational subjects. Integration was called infusion (Swe. infärgning) and involved the support of general subjects by vocational subject, for instance by the exchange of teaching material. Integration of this kind enabled students to approach general subjects from a vocational perspective, to highlight the importance of general subjects for the students' future vocation, and for motivating them to further studies (Lindberg, 2003).

In the present curriculum from 2011 (Skolverket, 2011), the general aim of the programme has a vocational emphasis. Eligibility for higher and further educa-

tion is directed to areas of Health and Social Care. Although the vocational context has been strengthened through the aim, the organizational conditions established by the curriculum of 1994 remain, which affects integration. Integration referred to as interaction (Swe. samspel) implies an equal value between general and vocational subjects, but within a vocational framework. A mapping performed in a previous study (Christidis, 2014) on the Swedish upper secondary Health and Social Care programme in Stockholm county during spring 2012, showed that integration between vocational and general subjects was a recurrent and dominating feature, while integration between vocational subjects was in minority.

However, recurrent recommendations on integration in Swedish curricula does not seem to correspond to the research field, in which the issue of integration appears to be scarcely explored.

Defining nursing-related education and training

The term nurse refers to a person whose primary responsibility is caregiving (Cambridge Dictionary, 2019). The nurse may historically be traced to international nursing orders, motivated by spirituality, religion and culture, and primarily focusing on practical aspects, while contemporary nursing can be argued as inspired by the Nightingale school, with focus on theory as well as practice (Anderson, 1981; Nelson & Rafferty, 2012). A nursing assistant refers to the category of health care personnel that works in close relation to registered nurses (Cambridge Dictionary, 2019; Nurse.org, 2018). The relationship between a nurse and a nursing assistant is based on issues of leadership in school and in the workplace, and vocational responsibilities (Andersson, 2002; Derbring, 1993; Emanuelsson, 1990; Erlöv, 1992). Drawing on the Swedish context, when medical care expanded, this entailed a development of the health care system, and a need for workers qualified within nursing care (Rehn, 2008). Nursing assistants were introduced as an additional health care category, to nurses and care givers. Nursing assistants shared responsibilities of caregiving with nurses and worked under their supervision. Initially, training was workplace-based, but formalized in 1958 and since then conducted on upper secondary-level (Gaaserud, 1991; Herrman, 1998). In line with workplace tradition, nurses were responsible for the teaching of future nursing assistants. However, a recent educational reform changed this position.

While the term 'nurse' is understood in general sense, the term 'nursing assistant' is specific to a Swedish context, with education and training on an upper secondary level, as an unlicensed and unregulated vocation (Socialdepartementet, 2017). The responsibilities of a nursing assistant comprise a primary focus on caregiving, supervision (over the care assistant), technology, communication and service (Socialdepartementet, 1962; Törnqvist, 2006). There are also other terms signifying the same health care category with an equivalent educational

level and vocational responsibilities, and these occupational titles depend on variations in national educational systems (Høst & Larsen, 2018; Laiho & Ruoholinna, 2013). In order to find relevant research that used other terms than nursing assistant, search terms that enabled a wider expansion of search area were used.

Purpose and review questions

The purpose of the review was to explore the current research field of vocational didactics concerning integrated teaching in nursing-related education and training, and vocational knowing made available in integration. Focus was mainly put on the integration of school subjects, and on shared approaches of integration in the education and training of nursing assistants and nursing students. Thus, the following research questions were posed for this review: a) What kind of integration was conducted within a school context in nursing-related education? b) What in terms of vocational knowing was highlighted as a result in the studies through integrated teaching? c) What was the relation between study aim and analytical method for the vocational knowing that was highlighted?

Method and material

Considerations concerning search strategy for Swedish and international research in relation to review questions, assessment tools, and guidelines are hereby presented.

Defining and expanding the search

For Swedish search in databases National Library Systems (LIBRIS), and Academic publications at Swedish universities (Swepub), and in Nordic Journal of Vocational Education and Training (NJVET) there were no thesaurus, terms or keywords as resource. However, there was a resource for international search in databases EBSCOhost and ProQuest Social Sciences. Possibility of combining keywords with 'AND' was available in EBSCOhost and ProQuest Social Sciences, but not in LIBRIS, Swepub, and NJVET. Therefore, in Swepub and in LIBRIS every keyword was applied for search in isolation, and consequently enabled hits partially relevant. NJVET did not provide an electronic search engine, therefore a manual search of all issues published up until 2018 was performed.

Searches for Swedish and international research was based on keywords that related to the review questions on nursing, integrated teaching, and vocational knowing. In the Swedish search, to increase the possibility for hits, the search area was widened with the keyword 'subject integration', to include more variation of integrated approaches, also relevant for upper secondary level education. Also, the keyword 'vocational education' was used to include terms and occupational titles corresponding to nursing assistants. In the international search (see

Table 1), the search area was widened with keywords concerning educational integration relating to curriculum and teaching, specifically 'fused curriculum', 'integrated curriculum', 'integrated teaching method', and 'thematic approach'. In addition, the search area on nursing was widened with keywords relating to 'nursing assistants', 'nursing', 'education, nursing', 'nursing education', and 'vocational education'. The widening of keywords, and the combination of keywords with 'AND' in (international) searches, aimed to increase the possibility of including research concerning nursing assistants, but only in the case that other equivalent terms and occupational titles were used.

Table 1. Specification of keywords for the international database search. Presentation of keywords, thesaurus, and MESH-terms retrieved and processed in EBSCOhost, and in ProQuest Social Science Database.

Keywords	Thesaurus
Integration in education	
Integrated curriculum	ProQuest, ERIC, CINAHL
Fused curriculum	ERIC
Integrated teaching method	ERIC
Thematic approach	ERIC
Health care education	
Nursing education	ProQuest, and ERIC
Nursing assistants	ProQuest, ERIC, CINAHL
Education, nursing	MEDLINE, CINAHL
Vocational education	
Vocational education	ProQuest, ERIC, CINAHL, MEDLINE

Delimitations

The delimitations in both Swedish and international research were made to integration performed in an educational and in a school context, also referred to as school-based integration, this in relation to nursing – for nursing assistant students and nursing students, and subjects of nursing. Publication date for both searches was delimited to the present century, 2000–2018. Another delimitation for both was Case Method and Problem-based learning, as they are admitted approaches of integration in higher education. The intention was to identify school-

based integrated teaching that was shared between upper secondary level and higher level of education and training within nursing, and that contributed to the development of vocational knowing. This is another reason for the use of key-word 'subject-integration' in Swedish search and 'thematic approach' in international search. Subject integration denotes integration between subjects that is performed in Swedish upper secondary level education and training, while thematic approach is a corresponding term that involves the integration of subject areas, which is valid for education and training in both upper secondary and higher level. Both integrations are performed in terms of a point of contact, which often comprises of some sort of theme.

Other delimitations concerned filter options. For Swedish search, there was an inadequacy of filter options, but set to articles in Swepub and articles/book chapters for LIBRIS, the latter demanding a manual sorting process. NJVET had no filter options at all. For international search in ProQuest Social Sciences and in EBSCOhost, delimitations in the mode of advanced search were made to keywords in abstracts, peer-reviewed and scholarly articles, and abstracts (for the first sorting only). Concerning language options, in Swedish databases the Swedish language was selected. In ProQuest Social Sciences the filter was set to Danish, English, Greek, Norwegian and Swedish, while in EBSCOhost only English as language could be and was chosen. Search hits that could not be read, as they were written in a language not mastered, were excluded. Doctoral theses were excluded because of their limited presentation of the subject matter in terms of perspective/view.

Swedish hits concerning vocational education, integrated teaching, or vocational knowing, that did not relate to nursing were also excluded. Excluded articles comprised for instance of studies on teacher education, actors, librarians, mathematics, preschool teachers, and areas of construction, as well as workplace-related nursing issues such as palliative and elderly care. The reason for excluding these search hits was for delimiting hits to school-based integration, and this in relation to nursing.

International hits that were not relevant to the review questions concerning school-based integration related to nursing, and vocational knowing were excluded, with few exceptions. This included research that partially or indirectly matched the review questions.

Excluded articles concerned for instance studies on simulation, inter-professional collaboration, students' and teachers' perspectives, attitudes and evaluation on teaching, evaluation of job satisfaction, stress, gender, power relations, technology integration and the use of digital platforms, meta analyses of a subject matter, collaboration between school and workplace, in-service/workplace-based learning/distance learning, and professional identity.

Swedish research

Searches for Swedish research within the subject area of nursing, integrated teaching, and vocational knowing was performed in two databases, LIBRIS, and Swepub. Also, a manual search in NJVET was conducted in November 2018, covering the first issue in 2011, to the most recent issue in 2018 (vol. 8, issue 3). Table 2 presents the keywords used for search, the hits for each database, and included hits. There were no hits assessed adequate for inclusion. Note that the presentation of initial hits for LIBRIS includes both articles and chapters, and that the Swedish keywords are translated into their English counterpart.

Table 2. Search in Swepub and in LIBRIS. Keywords, initial hits, and included hits.

Keywords	Swepub – Initial hits	Included (N)	LIBRIS – Initial hits	Included (N)
Subject integration *(Sw. ämnesintegrering)*	3	0	3	0
Integrated teaching *(Sw. Integrerad undervisning)*	0	-	3	0
Nursing *(Sw. Omvårdnad)*	0	-	53	0
Vocational knowing *(Sw. yrkeskunnande)*	0	-	21	0
Vocational education *(Sw. Yrkesutbildning)*	0	-	69	0
∑ 152	3		149	
∑ 0		0		0

Table 3. Search in ProQuest Social Sciences and in EBSCOhost. Keywords, initial hits, and hits included.

Keywords	ProQuest – Initial hits	Included (N)	EBSCOhost – Initial hits	Included (N)
Integrated curriculum AND nursing education	70	0	-	
Fused curriculum AND nursing education	1	0	-	
Integrated teaching method AND nursing education	22	0	-	
Thematic approach AND nursing education	59	1	-	
Integrated curriculum AND education, nursing	-	-	49	8
Fused curriculum AND education, nursing	-	-	12	0
Integrated teaching method AND education, nursing	-	-	37	2
Thematic approach AND education, nursing	-	-	133	0
Integrated curriculum AND nursing assistants	2	0	35	0
Fused curriculum AND nursing assistants	0	-	22	0
Integrated teaching method AND nursing assistants	1	0	117	0
Thematic approach AND nursing assistants	8	0	12	0
Integrated curriculum AND vocational education	-	-	4	0
Fused curriculum AND vocational education	-	-	8	0
Integrated teaching method AND vocational education	-	-	2	0
Thematic approach AND vocational education	-	-	18	0
Integrated curriculum AND vocational education	43	3		
Fused curriculum AND vocational education	0	0		
Integrated teaching method AND vocational education	5	0		
Thematic approach AND vocational education	10	0		
∑ 670	221		449	
∑ 14		4		10

International research

Searches for international previous research within nursing, integrated teaching, and vocational knowing was performed in two databases, ProQuest Social Sciences and EBSCOhost. ProQuest Social Sciences includes databases related to a varied range of subject areas, for instance Arts, Business, Health and Medicine, Literature and Language, while EBSCOhost relates to areas of nursing, health, medicine, education and profession. Table 3 illustrates the search in EBSCOhost and ProQuest Social Sciences in terms of initial hits and included number of articles for the review.

Snowball search

For the included hits, a snowball-search was performed, which involves an evaluation of the reference lists of each of the included articles in terms of inclusion. None of the references were judged as relevant to include.

Limitations

The most evident limitations of this review were the absence of search hits in all databases used here concerning upper secondary level nursing education and training that in a whole matched the review scope, and thus combined the issues of nursing, integrated teaching, and vocational knowing. A first strategy to overcome this issue was widening the search area with the use of search terms connecting to vocational and integrated education, but also specifying admitted approaches of integration in upper secondary level, namely thematic (international databases), and subject-integration (Swedish databases). A second strategy, that could only be applied in searches in EBSCOhost and ProQuest Social Sciences was the use of 'AND' for the combination of search terms, and through this include the variation of terms and occupational titles equivalent to nursing assistants. This was performed manually in LIBRIS, Swepub, and NJVET. Thus, it was proven necessary to include hits for sorting and assessment that were partially relevant to the review scope. However, there were more relevant hits that matched the review scope in whole for research conducted in higher education. Altogether, search results did not show any relevant previous research in Sweden, and sparsely relevant international research, which were conducted on a higher level of nursing education and training. This indicates a serious gap of research in upper secondary level nursing education and training.

Also, in Swepub and LIBRIS the filter options were not as adequately detailed as in EBSCOhost and ProQuest Social Sciences, so articles could not be separated from book chapters, which demanded a manual sorting process. In NJVET there was no search engine available and thus no filters, therefore all issues were manually assessed in relation to the review questions.

GRADE CERQual

The assessment of confidence in the review findings was performed with an approach referred to as Confidence in the Evidence from Reviews of Qualitative research, shortened to CERQual. This approach draws from the principles that developed the GRADE approach, that is used for assessment of quality of evidence in systematic reviews (Schünemann, Brożek, Guyatt & Oxman, 2017). Taken together, the approach utilized here is referred to as GRADE CERQual. The primary studies that were included in this review were all assessed by four components, and these are methodological limitations, relevance, coherence, and adequacy. Methodological limitations refer to concerns on the design and conduct of the primary studies. Relevance involves the extent to which the body of data from the included studies is applicable to the context of the review question. Coherence focuses on how clear and cogent the fit is between data from the included studies and the review findings that synthesize that data. Finally, adequacy of data concerns a general determination of the degree of richness and quantity of data that supports the review finding. The assessment of each primary study was performed in terms of concerns, from no concerns to high concerns.

The Microsoft Office 365 Excel-software and the structure of sheets, were used for deconstructing and sorting information from each of the studies. The information comprised the motivation of the study, i.e. problem formulation, aim, selection of data, data collection, ethical considerations, data analysis, including analytical presentations, results, and discussion. The information from each study was judged in isolation, and in relation to each other for the assessment of alignment, for instance the alignment between aim, methodology and results. Also, there was an assessment performed of the four components for all articles taken together. Support for the assessment was offered by textual resources comprising definitions and examples retrieved from the GRADE CERQual project group. Also, support was provided by a number of articles authored by members in the project group, that elaborate on the methodological application of GRADE CERQual, and give further examples on analysis and presentation of results (Lewin, Bohren, Rashidian, Munthe-Kaas, Glenton, Colvin, Garside, Noyes, Booth & Tunçalp, 2018). After assessment of the four components, a final assessment was performed concerning the overall confidence in each review finding. Confidence may be described as the understanding that each review finding should be a reasonable representation of the focal point of the inquiry, here comprising the purpose of integrated teaching in nursing-related education and training for vocational knowing. Confidence is judged as high, moderate, low or very low, depending on factors that weaken the assumption of confidence in the review findings (Lewin et al., 2018). These factors depend on the assessment made by the four components presented previously. Taken together, areas of concern were diverse, and comprised of alignment issues between aim, method

and results, and sometimes concerned ethical considerations, or an inadequate presentation of the data collection, of a problem formulation, of methodology, or of analysis. Overall, the assessment of confidence in the review findings was here valued as moderate.

Findings

Review findings concerned school-based integrated teaching within nursing-related education, the vocational knowing made available through integrated teaching, and the relation between study aim and methodology for the results on vocational knowing.

Integrated teaching

Review findings brought forward three types of integrated teaching, integration through: embeddedness or streaks, problem-based learning, and between school and workplace. Integration was performed through case studies, simulations, classroom instruction, clinical experiences, and workplace-training. Integrated teaching is managed as a given didactical approach.

Predominantly, the primary studies bring forward integrated teaching as an approach that enables an addition of knowledge, which was described in terms of a specific content, skills, abilities and competences, that can be prepared for in teaching, measured and evaluated. Thus, integrated teaching is motivated by a varied usage of the following descriptive terms: to establish, promote, sustain, develop, arouse, understand, facilitate, build, enhance, influence, strengthen, apply, and to provide depth (Arthur, 2001; Barrere, Durkin & LaCoursiere, 2008; Chan, 2013; Cónsul-Giribet & Medina-Moya, 2014; Cook, Mccance, Mccormack, Barr & Slater, 2018; Creese, Gonzalez & Isaacs, 2016; Hernández & Brendefur, 2003; Hiim, 2017; Holland, Tiffany, Tilton & Kleve, 2017; Li & Kenward, 2006; Meechan, Mason & Catling, 2011; O'Shea, Campbell, Engler, Beauregard, Chamberlin & Currie, 2015; Park, 2009; Whitehead, 2002).

Integrated teaching was performed through themes of which most common were connected to nursing care, concerning end-of-life, person-centeredness, pharmacology, and ethics (Barrere et al., 2008; Cook et al., 2018; Holland et al., 2017; Meechan et al., 2011; O'Shea et al., 2015; Park, 2009). Other themes involved more specific areas, such as academic writing, mathematics, alcohol, pharmacology, and ethics (Arthur, 2001; Hernández & Brendefur, 2003; Whitehead, 2002). Also, there were themes that concerned abilities and competency, such as creativity, critical and reflective abilities, and nursing competency (Chan, 2013; Cónsul-Giribet & Medina-Moya, 2014).

The primary studies referred to integration as an approach, that focuses on organizing a content, rather than to a concrete method. The approach is characterized by the process of a content in a classroom-setting facilitated by teachers

and occasionally by students. The integration is structurally held together by learning objectives formulated in a school context. Thus, the school context is the starting and the ending point for integration. The approach is different from other approaches considering the choice of processing a content, for instance in terms of a problem, an issue, and/or in connection with the workplace. Also, there are differences in where integration is performed, while problem-based learning may be performed regardless of context, integration in connection to the workplace specifies a performance related to this context. The studies convey integrated teaching as a given didactical approach and emphasize a particular content, or subject matter that relates to nursing practice. In Table 4, the distribution of the three main types of integrated teaching identified in the primary studies are illustrated. Hereby follows an example of each approach of integration identified in the review findings.

Table 4. The distribution of the three main approaches of integration identified in primary studies.

Integrated teaching	*Embedded/integration through streaks*	*Problem-based learning*	*Integration between school and workplace*
Number of studies*	3 out of 12	3 out of 12	6 out of 12
Study author/year	Hernández et al., 2003; O'Shea et al., 2015; Whitehead, 2002	Arthur, 2001; Chan, 2013; Cónsul-Giribet et al., 2014	Barrere et al., 2008; Cook et al., 2018; Hiim, 2017; Holland et al., 2017; Li et al., 2006; Meechan et al., 2011

* Two studies (Creese et al., 2016; Park, 2009) were not included in the table, because they did not offer any information on classroom implementation of integrated teaching.

Embedded integration, or integration through streaks was highlighted in the study by O'Shea et al. (2015) with focus on an integrated curriculum of a 4 years programme, with content concerning palliative and end-of-life care for paediatric and perinatal patients. Two intervention groups with baccalaureate nursing students, each group from different schools, received basic education on palliative and end-of-life care on two occasions, during their second year (3rd and 4th semester), and during their third year of training (5th and 6th semester). Basic education was related to the adult patient and included definitions, theories, and background information. During students' third year (6th semester), they could

choose between two courses, paediatric nursing or maternal child health. Teaching was performed by faculty members with long experience (25 years) in the subject area and with training according to the end-of-life education consortium (ELNEC). In each course, the students received a total of 35 hours of teaching over 14 weeks, and 42 clinical hours. In the maternal health course, integration was performed with simulations and scenarios. In the paediatric course, integration included three modules on communication, pain and symptom management, processed with PowerPoints, lectures, case studies, and a simulation scenario. The courses ended in the students' fourth year (7th semester). The end-of-life content was thus processed through different perspectives (adult, paediatric, perinatal) and courses during the entire programme, with a didactical variation.

Problem-based learning was brought forward in the study by Arthur (2001) in relation to an alcohol early-intervention education package at a nursing programme. Students processed teaching/learning content in relation to weekly objectives. Each week had a first seminar for introducing problem scenarios for the identification of learning needs and directions, and a second seminar for exploring issues, findings, and for clarifying direction in studies. The teaching material related to vocational situations and included case studies and patient data. Students met regularly with their teachers, for addressing consistency issues, and for discussing and reflecting on compatible attitudes for work with problem drinkers. Five weeks into integration, students met a simulated client, for which they stepwise identified own learning needs, built up a case history, and prepared to interview. Problem-based learning gives emphasis to processing a problem, which requires students' active participation, and motivation, as well as the facilitation of the learning process from teachers and fellow students.

Holland et al. (2016) exemplify integration between school and workplace with focus on Patient-centered-care coordination (PCCC) at a nursing programme. PCCC involves the support of patients in the management of health, and improvement of outcomes, by development of quality, safety, and efficiency of care. Integration lasted 5 weeks, and comprised a conceptual framework, a didactic content, and five clinical experiences with related assignments. These experiences comprised ambulatory care, home care, hospice, support groups, and transitions of clinical care experiences. Students received preparation material for the clinical experiences, that comprised recorded presentations of educational character, videos, electronic health records, and a selection of readings. For instance, the ambulatory care clinical experience was linked to Second Life® virtual simulation, that focused on chronic illness self-management support. The virtual simulation included students' interaction with an avatar patient, and face-to-face clinic patient encounters. Also, students engaged in a simulation of a telephone message follow-up, linked to a next-day telephone contact with one of the patients. The completion of the ambulatory care clinical experience included

development of a teaching plan for an individual patient. This approach highlights the students' active participation, and student connection between the didactical facilitation of the learning process in school, and vocational situations.

An organizational perspective on integration focusing on preconditions for integrated teaching was offered by four studies (Creese et al., 2016; Hernández & Brendefur, 2003; Hiim, 2017; Park, 2009). The study by Creese et al. (2016) analysed integration in the curricula of six high-performing countries, according to OECDs 2009 PISA assessments, and in two US-states. Creese et al. (2016) forwarded that curriculum organization is moving towards an integration across disciplines and moving away from a discipline-based structure. In addition, the integration of 21st century skills in the curriculum (abilities and skills, or a combination of these to competences) was regarded significant for the future knowledge society. For secondary vocational education, connection to real-world issues were stressed for the development of skills required professionally. Park (2009) focused on the integration of ethics as described in legal requirements of five US-states. Ethics, in licensure regulations for nurses, was related to a professional nursing practice and associated with un-/professional actions. Generally, ethics in curriculum was indirectly referred to. Continuing education was required by most of the selected states, such as end-of-life and domestic violence, but concrete areas were not always defined. Park (2009) highlighted the use of integration by most nursing programmes but criticized the integration of ethics with other nursing content as failing an adequate systematic approach of ethical core content, thus arguing for the need of isolated ethics courses. Hiim (2017) stressed the connection between school and workplace for the relevance of educational content for students' future profession. As an example, Hiim (2017) used the Norwegian 2+2 model built on a rationalist understanding, which assumes that theoretical knowledge can be learned isolated in the first part of training, and then applied in vocational practice. The study by Hernández and Brendefur (2003) provides insight in the conditions for collaborative work between teachers, in their aim of integrating mathematics with vocational subjects. Basis for successful collaboration comprised a reflective dialogue on the understanding of authentic integration, experience of collaboration and organizational resources, and teaching focusing on professional concepts.

Vocational knowing

Review findings on vocational knowing discerned that vocational knowing was understood as skills, abilities, and competencies for a professional context. The studies investigated the integration of a content in terms of measuring and evaluating enhancement of this specific content. A conceptual description of vocational knowing was brought forward on a curriculum level. Generally, vocational knowing was focused in terms of professional responsibilities and academic qualities.

Table 5. Vocational knowing as described in the primary studies, the mode of formation for a vocational knowing, and the character of vocational knowing.

Study author, year	Vocational knowing – What?	Vocational knowing – How?	Character
O´Shea et al., 2015	The nursing care of pediatric and perinatal palliative and end-of-life-care	Enhancement	Professional
Whitehead, 2002	Academic writing as a special style to adhere to	Understanding	Academic
Arthur, 2001	Knowledge concerning clients that consume alcohol, on attitude and nursing role-related activities	Influencing	Professional
Chan, 2013	Creative, critical thinking, reflexivity, analytical reasoning, adoption of patient perspective, and empathy	Arousing, developing, promoting	Professional
Cónsul-Giribet et al., 2014	Team cooperation, communication skills, critical thinking, autonomy (independence), responsibility, confidence, and in-depth knowledge of selected themes for integration	Understanding	Professional
Barrere et al., 2008	Attitudes of end-of-life care of the dying person	Affecting	Professional
Holland et al., 2016	Person-centered care coordination specifically relating to communication and assessment skills, and to the nursing role and responsibilities	Developing	Professional
Meechan et al., 2011	Competent pharmacology decision-making skills in nursing practice	Promoting	Professional
Cook et al., 2018	Caring attributes within person-centred care	Sustaining, further developing	Professional
Hiim, 2017	Professional knowing in an authentic relation between school subjects and the vocation	Developing	Professional
Li et al., 2006	Evidence-based nursing education elements that prepare students or enhance their feeling of preparedness for professional nursing practice	Establishing	Professional
Park, 2009	Ethics	No information on classroom implementation	Professional
Creese et al., 2016	21st century skills in relation to national and international requirements	No information on classroom implementation	Academic and professional

* The study by Hernández et al. (2003) did not specifically address the issue of vocational knowing and was therefore not included in table 5.

Vocational knowing primarily comprised specific areas of nursing care, such as end-of-life-care, alcohol consumption, person-centered care coordination, and pharmacology (Arthur, 2001; Barrere et al., 2008; Cook et al., 2018; Hiim, 2017; Holland et al., 2017; Li & Kenward, 2006; Meechan et al., 2011; O'Shea et al., 2015). Vocational knowing was also presented in terms of skills and abilities, such as creativity, critical thinking, reflexivity, analytical reasoning, empathy, communication, collaboration, autonomy, responsibility and confidence (Chan, 2013; Cónsul-Giribet & Medina-Moya, 2014). All these specific areas were related to various patient groups, from perinatal to adults. In addition, a more neglected part of nursing was brought forward through the issue of academic writing (Whitehead, 2002). These findings are further presented in Table 5. Next follows a presentation of four primary studies, with different integration approaches, for highlighting what integration made available in terms of vocational knowing.

In the study by O'Shea et al. (2015) the application of embedded integration, or integration through streaks, enabled students to process the issue of end-of-life care from a variety of patient groups, adults, paediatric and perinatal. Students were thus offered three different perspectives that contributed to a progression in their learning process and probably to an in-depth understanding of the subject matter.

Integration through problem-based learning in the study by Chan (2013) focused on students process and production of poetry, composition of songs, and role-play. The purpose was to develop abilities of creativity, critical thinking, reflexivity, analytical reasoning, and patient empathy, as part of nursing competency. Students appreciated the creative activities and experienced a development towards a higher degree of patient empathy. However, they were uncertain of the connection between creative ability and their future vocation. For them, nursing was equal to critical thinking and not creativity. In this case, the composition of nursing competency in relation to creativity needed to be further explored.

Integration between school and workplace was emphasized in the studies by Holland et al. (2016), and Meechan et al. (2011). Both studies forward the notion of vocational knowing as highly complex and comprising of intertwined aspects that students need to regard and be able to manage equally efficient. In Holland et al. (2016) vocational knowing was highlighted primarily as communication and assessment skills, and role-related aspects. Communication skills involved communicating clearly, in a concerned and caring manner, self-management and lifestyle changes to the patient. Assessment skills included assessment of patient needs for determining self-management resources. In addition, vocational knowing was discerned as identifying and understanding the role of the professional nurse as educator, as patient resource, resource gatherer and provider, as care coordinator, and as patient advocate. Also, this included under-

standing the responsibility of valuing the patient and family experience as a factor that may impact on the patient's health. Other role-related aspects included the need to be flexible, to adapt honing skills of time management, autonomous decision making and interprofessional communication.

In Meechan et al. (2011) vocational knowing was described as the ability to recognize, identify, manage, undertake and interpret pharmacological requirements and results in nursing care. This included the ability to recognize contraindication of drug treatment in terms of deviation, to identify the right drug from case and charts, to be able to manage effects of medication in terms of nursing management, to perform mathematical analysis, and accurate calculations, to interpret visual results from patient observations.

Vocational knowing was also forwarded from an organizational perspective. The study by Park (2009) and the study by Creese et al. (2016) emphasized curriculum level integration. Park (2009) highlighted ethics in legal requirements of nursing education as integrated but in need of isolated attention, and Creese et al. (2016) brought forward 21st century skills as related to national and international requirements, and comprising of for instance creativity, innovation, critical thinking, communication, collaboration and team work, information literacy, personal and social responsibility, cultural awareness, and cultural competence.

Methodological concerns

The relationship between study aim, and methodology was shown to be of significance for what was highlighted in terms of vocational knowing in the primary studies. Thus, this result section brings forward findings from a methodological analysis.

The study aims were generally descriptive in character and the following terms were used variedly: to evaluate, compare, investigate, describe, examine, illustrate, to provide an overview, to determine and identify, to contribute, to explore (Arthur, 2001; Barrere et al., 2008; Chan, 2013; Cónsul-Giribet & Medina-Moya, 2014; Cook et al., 2018; Creese et al., 2016; Hernández & Brendefur, 2003; Hiim, 2017; Holland et al., 2017; Li & Kenward, 2006; Meechan et al., 2011; O'Shea et al., 2015; Park, 2009; Whitehead, 2002).

Altogether, six studies used a quantitative character of analysis (Arthur, 2001; Barrere et al., 2008; Cook et al., 2018; Li & Kenward, 2006; Meechan et al., 2011; O'Shea et al., 2015), while five studies used a qualitative character of analysis (Chan, 2013; Creese et al., 2016; Hiim, 2017; Park, 2009; Whitehead, 2002). There were three studies that combined a qualitative and a quantitative analysis (Cónsul-Giribet & Medina-Moya, 2014; Hernández et al., 2003; Holland et al., 2017). Based on the included studies, a quantitative character of analysis was consequently identified as the main quality measure for investigating the issues of vocational knowing in classroom studies.

Consequently, the aim of the study combined with the choice of data collection and analytical approach may as quality measure have influenced what kind of vocational knowing could be discerned in the study. In studies by Arthur (2001), Barrere et al. (2008), Cook et al. (2018), attitudes concerning a particular patient group (alcohol, end-of-life), or how students perceived caring attributes, was measured with questionnaires, forms and inventories. These were complemented with pre-formulated areas of inquiry, that could be answered by scoring or other type of gradation, or with a range of pre-determined answers. This design limited the range of answers that could be included in the results. Consequently, narrowly defined areas of inquiry put focus on a specific aspect of vocational knowing but risk excluding a holistic understanding of the subject matter. In table 6, each study aim is put in relation to analytical approach and to results on vocational knowing. The analytical approach includes method for data collection and character of data analysis.

There is a difference between quantitative and qualitative studies in how they choose to describe vocational knowing and what aspect is brought forward. In the qualitative studies by Whitehead (2002) and Chan (2013) vocational knowing was approached in terms of understanding a phenomenon (academic writing), or in terms of arousing, developing and promoting the type of vocational knowing that is made available by three approaches of teaching (composition of songs, role-playing, poetry writing). On the contrary, in quantitative studies by Arthur (2001), Barrere et al. (2008), Cook et al. (2018), Li and Kenward (2006), Meechan et al. (2011), and O'Shea et al. (2015) terms used include to enhance, to influence, to affect, to promote, to sustain and further develop, to establish, a specific subject matter (end-of-life, alcohol, pharmacology, person-centered care, evidence-based elements). There is a predetermined aspect of vocational knowing, in terms of a particular content or subject matter, that is investigated in quantitative studies, whereas in qualitative studies the investigation can go beyond a subject matter. For instance, in Whitehead (2002), focus on academic writing is expanded by a phenomenological framework that seeks to understand student experiences of the phenomenon, which can include more aspects that the one initially focused on. In qualitative studies, nothing is ruled out, but treated as related to the focal point of study. The study by Cónsul-Giribet and Medina-Moya (2014), and Holland et al. (2016), combined quantitative and qualitative methodology, which resulted in an analytical triangulation enabling a descriptive but also in-depth understanding of the study aim.

Ultimately data collection and analytical approach are matters of choice in relation to study aim but contribute to what perspective of vocational knowing that is brought forward. The review findings show a predominance for quantitative studies, that bring forward certain aspects of vocational knowing. This finding argues for the need of more qualitative studies for understanding vocational knowing as a whole.

Table 6. Each study aim, here simplified for reasons of clarity, is put in relation to keywords describing the analytical approach in terms of method for data collection, the character of data analysis, and the type of vocational knowing discerned.

Study author, year	Study aim	Analytical approach – keywords	Analytical character	Vocational knowing
O'Shea et al., 2015	To evaluate knowledge of end-of-life (EOL), and to compare with control group	Control groups, pretest and posttest, statistical analysis	Quantitative	Enhancement of student knowledge of the nursing care of pediatric and perinatal palliative and end-of-life-care
Whitehead, 2002	To investigate experiences of academic writing	Unstructured open conversations, hermeneutic process, thematic analysis	Qualitative	Understanding academic writing as a special style to adhere to
Arthur, 2001	To examine attitudes, ability for brief counselling and knowledge on alcohol-related problems	Longitudinal, statistical analysis, Questionnaire – pretest and posttest, A principal component factor analysis for reliability issues	Quantitative	An influence on knowledge concerning clients that consume alcohol, on attitude and nursing role-related activities
Chan, 2013	To examine experiences of teaching activities song composition, role-playing and poem writing, and to illustrate student participation	Focus groups, semi structured interviews, thematic analysis	Qualitative	Arousing, developing and promoting creative, critical thinking, reflexivity, analytical reasoning, adoption of patient perspective, and empathy
Cónsul-Giribet et al., 2014	To identify and describe nursing competency strengths and weaknesses after PBL	Questionnaire, numerical assessment, discussion groups, constant comparison method – category coding and units of meaning	Quantitative, Qualitative	Understanding team cooperation, communication skills, critical thinking, autonomy (independence), responsibility, confidence, and in-depth knowledge of selected themes for intergration
Barrere et al., 2008	To evaluate the influence of EOL education on attitudes working with the patient group	Transformative Learning theory, quasi-experimental, longitudinal, questionnaire, pretest and posttest, scale assessment, statistical analysis	Quantitative	Affecting attitudes of end-of-life care of the dying person
Holland et al., 2016	To provide an overview of the development of a person-centred care coordination module, and to investigate the influence on	Quasi-experimental, mixed-methods, surveys – pretest and posttest, demographic form, inventory – baseline value. Focus groups –	Quantitative, Qualitative	Development of person-centered care coordination specifically relating to communication and assessment skills, and

	student learning outcomes	semi structured. Statistical analysis. Qualitative narrative analysis, thematical analysis		to the nursing role and responsibilities
Meechan et al., 2011	To examine the efficacy on the acquisition of applied drug/pharmacology knowledge.	Assessment tools, Online testing, statistical analysis.	Quantitative	Promotion of competent pharmacology decision-making skills in nursing practice
Cook et al., 2018	To determine perceived caring attributes and identify what nursing actions are ranked as most caring	Inventory, yearly, comparison	Quantitative	Sustaining and further developing caring attributes within person-centred care
Li et al., 2006	To identify educational elements that best prepare nurses for practice.	2-tiered process – stratified random samples, surveys	Quantitative	Establishing evidence-based nursing education elements that prepare students or enhance their feeling of preparedness for professional nursing practice
Hiim, 2017	To contribute with an epistemological conceptual framework, for the development and research on a vocationally relevant curriculum.	Epistemological investigation, rationalism, pragmatism	Qualitative	*
Hernández et al., 2003	To examine, to describe interdisciplinary, collaborative approach between mathematics and vocational subjects	Ethnographic approach, semi structured interviews, evaluations, descriptive statistics, systematic comparative method, thematic analysis	Quantitative, Qualitative	*
Creese et al., 2016	To examine the instructional systems and intended curricula of six high-performing countries and two US-states.	Desk research, policy documents.	Qualitative	*
Park, 2009	To explore the legal basis of nursing ethics education, and to examine whether there are legal requirements for nurses to complete ethics courses.	Manual search, categorization of key concepts	Qualitative	*

* Four studies were excluded in table 6, in column vocational knowing because their study aim had another focal point of investigation, namely, on the process of team collaboration (Hernández et al., 2003), on curriculum level (Creese et al., 2016), on legal documents (Park, 2009), and on an epistemological investigation (Hiim, 2017).

Summary of results

The main findings concerning school-based integrated teaching in nursing-related education comprised three types of integration, namely, integration through embeddedness or streaks (Hernández et al., 2003; O'Shea et al., 2015; Whitehead, 2002), problem-based learning (Arthur, 2001; Chan, 2013; Cónsul-Giribet & Medina-Moya, 2014), and integration between school and workplace (Barrere et al., 2008; Cook et al., 2018; Hiim, 2017; Holland et al., 2017; Li & Kenward, 2006; Meechan et al., 2011). Main findings concerning vocational knowing related to professional (Arthur, 2001; Barrere et al., 2008; Chan, 2013; Cónsul-Giribet & Medina-Moya, 2014; Cook et al., 2018; Hiim, 2017; Holland et al., 2017; Li & Kenward, 2006; Meechan et al., 2011; O'Shea et al., 2015; Park, 2009) and academic character (Creese et al., 2016; Whitehead, 2002). Finally, methodological issues concerning the relation between aim, method for data collection and analysis (quantitative/qualitative), were proven significant for the results, in terms of the type and perspective of vocational knowing that were highlighted in the primary studies.

Concluding discussion

Generally, methods within research are not regarded neutral, but connected to specific perspectives of ontological, epistemological, and axiological character (Cohen, Manion & Morrison, 2017; Larsson, 2005; Åsberg, 2001). An ontological perspective relates to the individual's sense of reality and the world, and an epistemological perspective connects to the foundation and validity of knowledge, linked to ways of researching a phenomenon, while axiology involves the individual's values and beliefs (Cohen et al., 2017). Together, they bring forward an understanding of the phenomenon that is studied, not only from an individual, but also from a sociocultural perspective which in turn makes the understanding valid in present time. Here, the phenomenon of interest concerns integrated teaching in nursing, and vocational knowing, and what kind of understanding is brought forward by previous research. Apart from including a statement on reflexivity, it is important with a clarification on method, on whether it is about an ontological springboard, a theory of knowledge (episteme), or a methodological aspect (empirical). It is also important to clarify the relationship between philosophy and research as overlapping disciplines that benefit from interaction (Johansson & Lynøe, 2008; Åsberg, 2001). Here, methodology is particularly brought forward in the completion of the literature review with respect to the primary studies and to the review results. Epistemological and empirical aspects are critically analysed to measure the quality of the primary studies.

Epistemological considerations on integrated teaching are briefly commented upon, and in relation to constructivism (active participation, conversation, and facilitation) in the introduction of only two studies (Chan, 2013; Cónsul-Giribet

& Medina-Moya, 2014). Thus, the limited attention on the relationship between learning theory and integration gives the impression that integrated teaching is an acknowledged didactical approach, that does not need any epistemological introduction or further elaboration. Another aspect that confirms the notion of integrated teaching as an acknowledged didactical approach, is that integration was briefly or partially brought forward in the primary studies. For instance, Hiim (2017) highlighted the value of integrated teaching between school and workplace for vocational knowing, but through an epistemological (pragmatic and rationalistic) elaboration, and no empirical ground. Also, six studies particularly stressed the importance of the faculty teachers and educational connection to the workplace as significant aspects for integration, but none elaborated further on these components in relation to vocational knowing (Barrere et al., 2008; Cook et al., 2018; Hiim, 2017; Holland et al., 2017; Li & Kenward, 2006; Meechan et al., 2011). Conclusively, integrated teaching was sparsely described in the primary studies, and consequently the didactical process and its value could not be properly highlighted. Also, integrated teaching could not be analysed or discussed regarding what it made available in terms of vocational knowing as it was not addressed empirically. Thus, a holistic perspective linking integrated teaching to vocational knowing was neglected.

Considering the epistemological perspective of positivism, there are no data included in the primary studies comprising observations of integrated teaching (see Table 6). Positivism is a philosophical perspective on knowledge from the 16th century, that claims the validity of observations as empirical ground on studies concerning human social life (Benton & Craib, 2010; Cohen et al., 2017; Johansson & Lynøe, 2008). Instead, data comprised written and/or verbal verifications, on integrated content and on integration, which cannot be argued to entirely represent social actions performed in integrated teaching that may be significant for understanding integration and its link to vocational knowing. If the studies had included observations on integrated teaching, it would have enabled the perspective needed to perform a relational reading, which is suitable for studying a human in a social situation. Instead, the type of data that the primary studies included, only brought forward specific aspects, and thus provided with partial understanding about integrated teaching, and consequently on vocational knowing. The primary studies share a focal point of pre-defined areas of study, concerning a particular content, a theme, and abilities, that are integrated in teaching. Accordingly, the methodological approach in the primary studies contributed to a notion that vocational knowing is something that can be measured, defined, and prepared for in teaching, and not something that can be holistically shaped and understood in the didactical situation, considering sociocultural, and historical aspects (Engeström, 2006; Engeström & Sannino, 2010).

All the primary studies either present, treat or remark upon integrated teaching as a didactical approach that enables vocational knowing, but they do not

represent a sufficient epistemological background or an empirical ground to substantiate these statements. Clearly there is a methodological contradiction. A plausible explanation may be remnants of an early attempt by the social sciences to capitalize cultural authority originating from the natural sciences (Benton & Craib, 2010). The capitalization of methodology may probably have had implications for what could be highlighted from the object of study. Some parts, that maybe significant for understanding the phenomenon of integrated teaching, may have had to be compromised for claiming reliability, objectivity and usefulness of the knowledge offered by social studies (Benton & Craib, 2010). However, this should not be the case today, when social studies have reached a cultural authority of its own. Most probably, we deal with remnants of the early attempt that lingers on in present time. In addition, we deal with a limbo concerning research area. Higher level nursing education and training connects primarily to medical education, while upper secondary level nursing education and training relates to pedagogical and didactical research together with basic education (primary and lower secondary education). Thus, the research tradition involves educational boundaries, in which integrated teaching is a shared didactical process.

Since the majority of the included studies had an quantitative approach one can speculate this to be the quality measure of the research area (Arthur, 2001; Barrere et al., 2008; Cook et al., 2018; Li & Kenward, 2006; Meechan et al., 2011; O'Shea et al., 2015). Ultimately, the choice of aspect is defined by the aim, which in turn directs the theoretical and methodological underpinning (Larsson, 2005). However, it is important to be aware of and to clarify that any type of delimitation on the method, here including data collection and analysis, contributes to the promotion of a certain aspect of the phenomenon that is studied (Åsberg, 2001). A plausible explanation for choosing a quantitative method may be validity through a large data sample. Statistical analysis, shown as a predominant analytical approach in the primary studies, may manage the large amount of data but not be able to regard nuances, or other aspects than what can possibly be identified by a statistical analysis (Cohen et al., 2017). The review results show that integrated teaching and vocational knowing have been investigated in terms of specific aspects, and not as a whole. Thus, there is a gap concerning qualitative research on integrated teaching for vocational knowing. Qualitative research involves the addition of methods for data collection and analysis, that can provide further perspectives, nuances, and that can enable a relational reading, bringing about an in-depth and whole understanding of the phenomenon. A suggestion for future research would be to focus on studying a minor group of students in a specific didactic situation, in the format of a case study. This would enable a triangulation of data, that is the collection of different kinds of data on a studied phenomenon, to include sociocultural, and historical aspects in the analysis (Denscombe, 2010; Denzin & Lincoln, 2000; Yin, 2009). This would also help expand the notion of quality in research, as not only related to quantitative methods

with a large amount of data, but also to qualitative methods with minor, however more comprehensive data on the phenomenon studied.

Note on contributor

Maria Christidis is a doctoral student in didactics, in a collaboration between Stockholm University and the Swedish Red Cross University College. The working title of the thesis is *Integrated teaching for vocational knowing*, which is studied in the Swedish Health and Social Care programme. Maria's research focuses mainly on didactic issues regarding teaching and learning, with a specific focus on Health-care education. Maria is a registered nurse, and an upper secondary teacher in the subjects Swedish, English, Greek and Healthcare, as well as an author of course literature for the upper secondary Health and Social Care programme. She is currently a lecturer at the Swedish Red Cross University College.

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