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Engaging with practice: Information literacy instruction as a part of developing reflective thinking and clinical judgement in nursing studies

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Abstract

This study examines how nursing students in their final year use skills in information literacy (IL) in clinical placements when working on an assignment in evidence-based practice. The IL instruction and the assignment were designed to give the students room for reflective thinking. Reflective thinking is crucial for developing good practice and adequate care in nursing. The study is qualitatively oriented and sets out to examine what kind of skills and knowledge the students demonstrate when doing an assignment that is practically oriented, and where IL is integrated in other tasks. The empirical material consists of written reflection notes from clinical placement. These notes have been analysed using a version of Bloom's taxonomy. For educators it is important to focus on how to bridge the theory-practice gap and combine IL with practical work. In this study we have identified some factors that may need more attention when designing similar assignments for students. The conclusion drawn from the reflection notes is that the students are on different levels of maturity and that in designing assignments related to real-life contexts, this should be given more attention.

Keywords

information literacy; Norway; nursing students; reflective thinking; qualitative study

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1. Introduction

University and college librarians work closely with faculty in many fields of education to teach information literacy (IL) to students at all levels. This is particularly true within healthcare studies such as nursing, medicine, or physiotherapy. Health librarians involved in nursing education spend much time teaching nursing students to search for literature, navigate databases, and evaluate what they find as part of the instruction in IL. This paper presents a case of nursing education in a Norwegian institution of higher education, but the closeness of health librarians to nurse educators and a focus on IL in nursing education is not limited to the Norwegian context.

We will use the 2018 definition for IL provided by CILIP: "Information literacy is the ability to think critically and make balanced judgements about any information we find and use. It empowers us as citizens to reach and express informed views and to engage fully with society" (CILIP, 2018). This definition guides our understanding of IL and how it is used in this paper. We consider IL to be necessary for all citizens, and believe that nurses who are information literate will be in a better position to interact with colleagues, patients and relatives in an

information-dense society. However, a lot of the practical IL-training in higher education has related and still relates to the former definition of 2004. This definition states that "information literacy is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner" (Armstrong et al., 2004). IL instruction is usually focused on learning certain tangible skills that are linked to evidence-based practice as discussed further below, and therefore easier to see in relation to the 2004 definition (see also Fig. 1 for an illustration). A discussion on a similar note was related to the introduction of the more concept-based *Framework for Information Literacy for Higher Education* by the Association of College and Research Libraries (ACRL) in 2016 to replace the former *Information Literacy Competency Standards for Higher Education* from 2000 (Franzen and Bannon, 2016). The *Standards* were seen as more concrete and therefore more easily connected to the skills required by evidence-based practices in healthcare. However, these two ways of framing IL could be complementary instead of the one replacing the other (Franzen and Bannon, 2016) and this is also what we see in current practice.

1.1 Problem statement

Nursing students in Norway spend roughly half the time of their 3-year study program in clinical practice. To learn from clinical practice, they need to be able to reflect on what they encounter in clinical placements and know how to handle information needs. The ideal is that students will be able to bring theory and practice together and learn how to build on previous experiences to develop professionally. The nursing curriculum in Norway, as in other countries worldwide, includes requirements on learning how to work in line with evidence-based practice, leading up to acquiring the competencies that are expected from practicing nurses. *The national regulations relating to a common curriculum for health and social care educations* (Ministry of education and research, 2020) in Norway, including nursing, states in one of the paragraphs that the graduates should:

> be able to acquire new knowledge and carry out professional assessments, decisions, and actions in line with knowledge-based practice. Graduates should also be able to document and communicate their professional knowledge.

The professional ethical guidelines for nurses in Norway (Norwegian Nurses' Organisation, n.d.), say that:

> 1.1 Nursing shall be based on research, experience-based competence and user knowledge. /…/ 1.4 The nurse keeps updated on research, development and documented practice within his/her own area of work, and contributes to the application of new knowledge in practice.

Competency standards for registered nurses in several countries, such as Canada, the UK and Australia include similar competencies (Wahoush & Banfield, 2014).

Thus, one important arena for using skills in IL is related to the implementation of evidence-based practice (EBP) in nursing, as in other healthcare specialties (Barr et al., 2020; Ramis et al., 2019). EBP is a triangle consisting of: best research evidence, clinical experience, and patient values. The aim is to work from all these three angles to provide every single patient with the best possible health services. In order to use the best evidence, the nurse must be able to search for information, find and evaluate research, and implement new knowledge. Additionally, the nurse must know where to find good-quality evidence. This may empower nurses as professionals who meet patients and relatives who also know where and how to search for information. Therefore, seeking information has become an essential part of nursing education, and this is even more important with rapid technological advances. As Sonia Hines, Joanne Ramsbotham, and Fiona Coyer (2015, p. 266) put it: "comparatively few nurses will

conduct research during their careers, but the ability to read, understand and utilize research is needed by all nurses".

This study set out to investigate how nursing students in their third and final year of the nursing programme in a Norwegian institution of higher education worked on an assignment in EBP that was related to focused instruction in IL. The current article will discuss how the students reflected upon what, how and if they learned using EBP and IL in a clinical setting, and how they used elements from these frameworks in the assignments. The assignment is presented more closely in the methods section. The theoretical framework for the study has been informed by a sociocultural perspective (Kress et al., 2021; Säljö, 2005; Wertsch, 1991) and the study uses a revised version of Harold Bloom's taxonomy (Anderson & Krathwohl, 2001) as an analytical framework.

Instead of examining what the students learned from sessions of instruction in IL by using pre- and post-intervention questionnaires, or by using questionnaires to ask how IL is used in practice (Diekema et al., 2019; Gross & Latham, 2013), we set out to examine what kind of skills and knowledge the students demonstrated when doing an assignment that is practically oriented, and where IL is integrated in other tasks. The study is therefore qualitatively oriented and analyses written reflection notes within an analytic framework that outlines six levels of knowledge. We do not aim, however, to measure the knowledge of certain elements of IL detached from a larger context, but how this is played out in an assignment where the aim is to engage in evidence-based work and thus, ideally, incorporate IL as an important element.

The questions we seek to investigate in the current article are the following: how do nursing students in their final year use what they have learned about information seeking, and what can we as instructors learn from soon-to-be nurses' reflections on evidence-based work?

1.2 Literature review

University and college library staff often co-operate with faculty in teaching and implementing EBP in nursing studies. The circle of EBP bears a lot of resemblance to the way IL has traditionally been taught (Barr et al., 2020), see Figure 1. In both circles we find inquiry and the role of reflecting, asking questions, searching for answers, and reflection again to assess and evaluate the answers that have been found in the process.
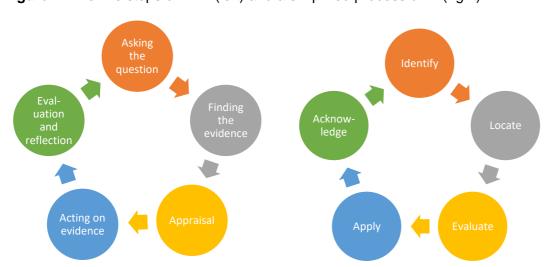
Figure 1: The five steps of EBP (left) and a simplified process of IL (right)

Source: The authors' own illustration based on standard presentations of EBP and IL.

However, several studies have suggested that we do not know much about the transition from nursing education to working as a clinical nurse and how IL training is used and implemented in practice (Diekema et al., 2019; Stokes et al., 2021; Wahoush & Banfield, 2014) or whether it is in fact effective (Forster, 2015; Hines et al., 2015). Working according to EBP is something nursing students should be prepared for during their study programme, but studies show that EBP may be hard to implement both in the study programme and in clinical practice, and the relevance of IL to EBP is often not clear for students (Aglen, 2016; Keib et al., 2017; Wakibi et al., 2021).

The theoretical starting point of the project behind this study is based on the conviction that learning, including information seeking, emerges through interaction, with dialogue, reflection, collaboration and feedback (Kress et al., 2021; Säljö, 2005; Wertsch, 1991). Teaching nursing students to search databases or use other tools without firmly linking it to a context, such as, in this case, the clinical placement, makes little sense. Adopting a sociocultural perspective when investigating IL practices help us highlight interactional and meaning-making aspects of IL (Søvik, 2014). Together, the two areas of EPB and IL demand higher level thinking and not just a reproduction of factual knowledge, procedures or technical skills (Anderson & Krathwohl, 2001; Pickard & Sterling, 2022).

Going back to John Dewey (1933), researchers emphasise the importance reflective thinking has for learning (Barbagallo, 2021; Guo, 2021; Pickard & Sterling, 2022). As noted by Lin Guo (2021, p. 118), in professional education programs such as healthcare, "reflective thinking is critical to gaining insights from real-life situations." Reflective practices are considered particularly important in nursing education because this competency is considered a means to drive forward the profession as well as the individual nurse's professional development, and also because this is where connections between theory and practice are strengthened (Barbagallo, 2021). In a recent meta-synthesis, Michael S. Barbagallo (2021) has developed a conceptual model of student perceptions of a quality reflection. Here knowledge (learning, barriers and enablers) and self-discovery (emotions and growth) come together in quality reflection and develop further into improved practice.

The theory-practice gap in nursing education has been discussed for decades, and seems to remain hard to close, although there are attempts to bridge the gap (Baxter, 2007; Scully, 2011; Zieber & Wojtowicz, 2020). Several studies have examined how various methods could help with connecting theory to clinical practice, and with a shift to reflection on practice (Allan, 2011; De Swardt et al., 2012). IL has been proposed as a part of this. A main finding in a systematic review on pedagogical strategies to teach bachelor students EBP was that IL is considered the core competency needed for EBP (Aglen, 2016). However, the students often do not see the point of IL, they do not see the relevance of research evidence for nursing practice, and they do not see themselves as "active knowledge creators" (Aglen, 2016).

A recent meta-analysis examining how one may evaluate interventions intended to promote learning outcomes in higher education found that the effect varied depending on intervention duration, peer interaction and reflective activities (Guo, 2021). Reflective activities in nursing education may come in forms such as journaling or debriefing, or be linked to IL as in the present case. Such reflective strategies are relevant for the development of clinical judgment, which may be defined as the ability to gather patient data, make sense of it, provide appropriate care, and evaluate both the patient's and one's own actions (Bussard, 2018). By using prompts and helping students to ask questions, we may assist them in developing clinical judgement (Smith, 2021).

However, training in IL, EBP and a focus on reflective activities will not suffice. Cognitive maturity is also of great importance when working with reflective activities and practices. Bjørg

Aglen (2016, p. 260) points out that the "students' novice stages of cognitive maturity hamper them to understand knowledge transfer." Other studies related to topics within nursing education also suggest that for transformative learning to happen, students must have a certain level of maturity and be able to motivate themselves both personally and professionally (Svellingen et al., 2021).

Patricia M. King and Karen Strohm Kitchener (2004) have developed a reflective judgment model that outlines three stages (or developmental phases) of how individuals develop cognitive maturity as well as the ability of critical thinking. At the most basic, less mature stage, students assume that knowledge is certain, that they can find correct answers to any question, and that this can be provided by authority figures. Instead of reasoning by using evidence to reach a conclusion, they will merely repeat beliefs or personal opinions. The next stage is the quasi-reflective thinking stage where one realises that there may be more than one answer, and that both uncertainty and evidence are part of the knowledge process. One will also realise that perspectives may change according to different types of evidence, and that issues may be framed in different ways. The last stage is where reflective thinkers will use evidence in a consistent way to support their conclusions. They will also be aware that new evidence or perspectives may emerge, something that may lead them to re-evaluate their conclusions. To help students move from one stage to the next, it is necessary to give them opportunities to work with ill-structured problems. They also need practice and feedback, and encouragement to examine their own assumptions, to gather and examine evidence, preferably from different perspectives, and to make their own conclusions based on the evidence.

2. Methodology

This article reports from a project that set out to develop ways of working with alternative methods of instruction in IL based on actual cases in connection to clinical placements rather than mainly connected to more theoretical course work. The material draws on reflection notes in which the students had to reflect on several steps regarding how to work according to EBP. We have chosen a qualitative methodology in order to try to link the use of IL to actual practice. In this way, we employ the kind of direct methods discussed in previous work on IL instruction (Pickard & Sterling, 2022). Information seeking was a central part of the assignment as it is an important part of working evidence-based in nursing. The students were supported by online, asynchronous IL instruction with continuous feedback as well as a continuous posting of digital learning objects with the aim of further supporting students in executing their assignments. Through the instruction we wanted to make the students aware of how to work with information seeking, evaluation and use of research literature in a clinical setting. Another goal of the instruction was to assist the students in reflecting on and making balanced judgements about what information they needed, found, and used in the assignments.

2.1 Research ethics, sample, and material

The students were informed about the project in the spring term of their second year of study when they had library instruction. They received written information and a consent form to sign. All students were informed that participation in the study would not have any implications on grades or relations to the clinical placement.

The librarian (first author) was involved in the instruction and in giving feedback on problem statements and search history, but not in grading the final assignment, giving feedback in relation to clinical placement, or giving feedback on the educational presentations the students handed in. This was done by nursing teachers who were not involved in this project. The students may still have wanted to hand in a reflection note with what they perceived as "correct answers" rather than reflections on how they worked, what worked and did not work. However, the variety of reflection notes suggests that this was not the case.

The project was notified to and assessed by The Norwegian centre for research data (formerly NSD, from 1.1.22 Sikt, Norwegian Agency for Shared Services in Education and Research), project number 51729.

The study took place when the students were in their third and final year of the programme in Bachelor of Nursing. During this year they had three periods of practice placements, of which two placement periods involved an assignment in EBP. The practice placements were in home-based services, that is performing nursing duties in people's homes, and in mental health and substance abuse wards at psychiatric clinics or outpatient care for persons with mental illness or substance addiction. Most students worked in groups of two or three, but 21 reflection notes were written individually. Some students did the assignment twice, but in different kinds of placements. Other students did it only once because they had a placement abroad the first term of the year and did not do the same assignments as the students at home. Table 1 gives an overview of practice placement periods and the number of student assignments handed in.

Table 1: Overview of student assignments and practice placements periods

	Home-based services	**Mental health and substance abuse**	**Health promotion**
Period 1: Week 40-47	10 students, 6 assignments	24 students, 12 assignments	No assignment
Period 2: Week 2-9	25 students, 11 assignments	22 students, 11 assignments	No assignment
Period 3: Week 15-22	32 students, 16 assignments	26 students, 13 assignments	No assignment
Total	33 assignments	36 assignments	

Four out of 79 students did not wish to participate. The assignments were obligatory, withdrawal from the project meant that the assignments would not be used as empirical material. All reflection notes were anonymized by the first author and stored at a safe server where only the two authors could access the material. 69 notes were handed in and 61 of these were written by students who consented to participate. The 61 reflection notes constitute the material for this paper. Each reflection note was around 1000-1100 words, and the instructions said they should not exceed 1200 words.

2.2 Practical arrangements

The nursing students got an assignment in EBP in connection to practice placements. They should identify an issue or problem in the clinical practice that they wanted to give an educational talk on either to colleagues in placements or to patients. To do that they needed to observe and reflect upon practices in placements, identify a topic, and discuss with their colleagues or tutors whether the question was feasible and of interest. They had to search for new and updated information on the topic, read, assess, and evaluate the information and make it presentable. In addition, they were asked to write a reflection note on the process. They were guided by prompts formulated as questions, such as "Where and with the help of whom did you gather information?", "Did you find results you could use and did you find an answer to your question?" and "How did you evaluate the information you found?"

The prompts were derived from most of the stages of EBP, overlapping with the stages of IL as illustrated in Figure 1 above. They were asked to identify their topic and reflect upon why they chose this topic, explain how they searched for information (both from *whom* and *where*), how they appraised what they found, and discuss what they discovered. Further, they were asked to

reflect on what obstacles they met and what surprised them in the process, or if there were any unexpected findings.

The students had learned about EBP, evaluation of research, and information seeking in their second year of study, and this was to be considered a repetition and implementation of what they had done in the previous year of study. The students had access to a learning management system (LMS) with digital resources and tips on how to work on the assignment. These resources were updated as the students asked questions or the librarian discovered areas where the students needed more guidance. A compulsory part of the assignment was to hand in a preliminary problem statement on what they wanted to examine, a PICO (or equivalent) developed from the problem statement and a preliminary search history. A PICO is a framework, among others, frequently used in nursing studies to guide the literature search in identifying the P (problem/population), I (intervention), C (comparison) and O (outcome) from a research question. The librarian gave feedback on these parts of the assignment to assist the students progressing with their work. All feedback was given through the messaging system of the LMS, and all communication with students was in written form.

2.3 Framework for analysis

The reflection notes have been read through several times and have been coded according to the revised version on Bloom's taxonomy (Anderson & Krathwohl, 2001). This taxonomy is found in a multitude of versions, also presented visually in many forms (see Armstrong, 2010). It has been used in previous studies in adapted versions (Keene et al., 2010; Plack et al., 2007). To distinguish the reflection notes in detail we kept all six levels of knowledge as illustrated in Table 2. These six levels of knowledge, represented by six different verbs, were used to analyse the reflection notes step by step according to the prompts the students were given. All reflection notes were divided into sections according to the prompts, and we scored each section depending on how the students described their thoughts and actions. Examples from each section from all reflection notes together with a score were mapped in a table to create an overall view of the content of each of the reflection notes. The codes for this mapping were derived from Bloom's revised taxonomy and the explanations for each level. In Table 2 we present elements we deemed to be necessary to reach each level of IL depending on what was expected from the assignment. We also examined the sections where students described how they chose the topic of their assignments, as well as where they reflected upon whether they learned something new or discovered something unexpected, in more detail. Here we found some patterns regarding the level of reflection as shown in Table 3 below where we present an overview of the findings.

Both authors took part in coding and agreed upon the scoring of the reflection notes. We read and scored all reflection notes separately and after that, we read through all notes together to agree on common scores. The reflection notes were graded from 1 (the highest level) to 6 (the lowest level) according to Bloom's revised taxonomy. However, Judith Keene, John Colvin and Justine Sisson (2010) point out that even though something is considered a low-level cognitive skill, the activity itself may be demanding for the student in order to attain the goal of a given assignment. Hence, it is not necessarily a linear and uncomplicated process from the lower cognitive skills to the highest, and some elements could be found on several stages. Finally, the notes got an overall score where all elements were considered. Thus, different parts of the reflection notes could receive different scores, but if they scored very low on some elements, it was not possible to receive an overall score of the highest level.

Table 2: Overview of the revised version of Bloom's taxonomy as used in this paper

	Level of knowledge	Explanation	Examples from assignments and level of IL
1	Create	Produce new or original work. Putting elements together to form a coherent or functional whole.	Discusses implementation and what might be problematic with a new model or implementation.
2	Evaluate	Justify a stand or decision. Making judgements based on criteria and standards through checking and critiquing.	Can see and discuss connections between theory and practice.
3	Analyse	Draw connections among ideas. Breaking materials or concepts into parts, determining how the parts relate to one another or how they interrelate, or how the parts relate to an overall structure or purpose.	Analyses the information need and the concrete situation where information is needed and why. Compares different studies and methods in order to say something more about content and results.
4	Apply	Use information in new situations. Carrying out or using a procedure through executing, or implementing.	Applies concepts from IL. Shows use of source criticism.
5	Understand	Explain ideas or concepts. Construct meaning from different types of functions be they written or graphic messages or activities like interpreting, exemplifying, classifying, summarising, inferring, comparing, or explaining.	Demonstrates some theoretical knowledge about research (terminology). Are able to retell research findings.
6	Remember	Recall facts and basic concepts Recognising or recalling knowledge from memory.	Can do a basic literature search and refer to some concepts (such as PICO). Knows what should be done, but does not demonstrate it.

3. Findings

We will briefly present an overview of the results from the analysis of the reflection notes before moving on to a discussion of the implications of our findings. Six of the reflection notes got the highest grade of 1, three got the lowest grade of 6 and another four got between 5 and 6 and were included in this group. In order to pinpoint more exactly what differed between the reflection notes getting the highest grade and the ones receiving the lowest grades, we reread these 13 reflection notes. We wanted to elicit commonalities within the group of the six with the highest grade on the one hand and the seven with the lowest grades on the other. The context did not differ: The notes were written by single students and groups of two or three. They represented all three placement periods, hence it was not necessarily a case of someone getting feedback in the first placement and improving to the next. Additionally, type of placement or choice of theme under discussion did not differ.

There were certain elements in common in the notes that we graded on level 1 (high level of reflection) and in the notes that we graded in level 5 or 6 (low level of reflection). Table 3 below

outlines the findings after analysing and grouping the reflection notes according to certain overarching themes we drew out from reading and rereading the notes.

Table 3: An overview of findings

High level of reflection	Low level of reflection
Level of reflection: students identify and present connections.	Level of reflection: students mostly tell what they did, without seeing the whole picture.
Implications for practice: students present and discuss how the issue or their findings might impact practice.	Implications for practice: students just present the article/findings without discussing them in context.
Students reflect upon dilemmas or challenges. They engage (emotionally) with the topic.	Students are "disengaged". Do not discuss potential dilemmas.
Students see themselves as "health personnel".	Students see themselves as "students". Write about the assignment from a student perspective.
Students take a patient perspective when presenting their topic.	Students have a focus on "us as students".
Students express that they learned something from this assignment.	Students express that this assignment interferes with their "learning in practice".
Students express that they could teach someone else (in placements, patients or relatives).	Students express that as students they should learn (not teach).

In the following, we will present and discuss examples from the assignments to illustrate the different levels of reflection.

> *We chose the [topic] because we have previous experiences that there is much focus on this [topic], but that it still is a huge problem. We also chose [topic] because we want to take a closer look on updated research on [topic], to compare new research with the experiences we gather in clinical placement and learn how health care staff work with [topic]. We have gained the impression that health care personnel already work with [topic], and we chose [topic] to create a base for discussion and reflection in the clinical placement, since we assume that health care staff have experiences and opinions when it comes to [topic].*

The excerpt above is chosen as an example of how some students set out with a clear EBP focus and aimed at linking their own observations with new research and the staff's experiences. These students followed up with a comparison of the research they found and examined concrete interventions. Further, they reflected on how they should ask questions concerning the material to be of most relevance for their colleagues. They explicitly stated that they tried to put themselves in the place of the staff when deciding on what might be interesting to present from the research they had found. Some of the research they found presented tools and education programs, which means that they discussed concrete interventions that are also linked to current practices in the clinical placement. The way these students take on the assignment is an illustration of a reflection note that scores highly.

In contrast, the following excerpt may illustrate a case of low level of reflection when it comes to both choosing a topic and working on the assignment:

> *We spent some time finding out what we wanted to write about. We didn't want to present something to the staff that they had already heard a lot about, for instance when other students were at the ward … It was first after some time at the ward that we*

realised what was repeated again and again at the report, was [topic]. It was challenging to find exactly what we wondered about as we more or less felt that there was not done a lot of concrete research on what we wanted to find an answer to. We found a couple of articles where it was mentioned in a sentence, but that this was not enough to base the articles on [sic]. We found some relevant research that gave us answers to the most important, and together with own observations it made us a bit wiser. … There were a lot of assignments in this placement period, and it has been challenging to do everything you are supposed to in addition to concentrate on your own development in the clinical placement. The focus may easily end up on all assignments that should be done, rather than on what actually happens on the ward.

These students scored low on several accounts. They did not want to present something the staff already knew something about, and instead chose a topic that they did not, according to themselves, find much new or relevant research on. They did not reflect on what the staff actually might need or wish for, in contrast to the excerpt above where the students chose a topic they assumed the staff were already involved in to use as a starting point for further discussion and reflection. They also clearly stated that they saw this assignment as something other than "being in practice", as separate from what they expected to learn in practice. As Aglen (2016) points out, some students do not see themselves in the role of a "knowledge creator", they "report a lack of power to influence clinical circumstances" and some students "tend to view research as a distraction from their primary purpose of learning about nursing practice". In other words, these students are effectively on the basic level of cognitive maturity in the model of King and Kitchener (2004), where students want correct answers provided by authorities and to learn from tutors in clinical placements, rather than seeing themselves as co-creators of knowledge in the placements. Further, they did not present research findings that they assumed could be of interest for the clinical placement or any reflections on how this might or might not be implemented or used in clinical practice.

4. Discussion

In general, on the lowest levels we find students who have done a literature search (demonstrating *declarative or factual* knowledge) and also display some level of *understanding* in presenting the information they had found. However, they do not display any sense of coherence between the topic they chose and actual connections to clinical practice. This resonates with what Aglen (2016, p. 260) points out, saying that:

> "When understanding knowledge transfer, information literacy and the research process may become relevant for the students … If students are not aware of how to use evidence, it should not come as a surprise that they do not see the relevance of learning information literacy."

4.1 Understanding implications

Hence, the students may be able to perform a literature search according to the checklists they have received but translating their topic into a good search or using what they found in that search to connect it to clinical practice may still be a challenge. This is shown in the reflection notes with an absence of reflections on how the literature can be used, what implications it might have for healthcare staff or patients, or how it relates to the issues the students set out to examine.

On the next level, to *apply*, we found reflection notes for instance demonstrating a full literature search with reflections on how and why the search was developed the way it was. On the level of *analyse* the reflection notes not only cited the research found, but they also contained an

analysis of the content and to some degree mentioned connections drawn between theory and practice.

At the second highest level, where one is expected to *evaluate* or make a synthesis, the reflection notes demonstrated maturity when it came to connecting theory to practice, arguing for the topic that was chosen and seeing the results in light of clinical practice. However, there was still a difference of the level of reflection between this level and the highest level, where the ones on the level of *create* had a certain way of seeing and reflecting on the whole picture. These students would take a firm stand with the patient, and display a sense of themselves as healthcare staff rather than being students. This may also have led to them being more reflective when it comes to seeing the results of what they have discussed in clinical practice, in implementation, and also in reflecting upon potential obstacles, as explained in the final stage of King and Kitchener's (2004) reflective judgment model.

4.2 From disengagement to emotional engagement

The nursing program aims at educating students who may take responsibility for the development of their profession. To engage in evidence-based work, look to what is needed in clinical practice, and continually work to improve practice are all practices that are part of this (Keib et al., 2017; Rees, 2013; Wakibi et al., 2021). To succeed, however, the students (and nurses) need to be able to reflect on what they see, what can be done about it, and how they can contribute to change. If the students feel they have nothing to contribute or that searching for evidence lacks relevance for what they do in practice, they have not reached a level of maturity where they see how they can take part in knowledge transfer or solve problems that are meaningful to themselves as well as to healthcare staff and patients.

We found that the reflection notes that we graded at the lowest levels seemed to be disengaged. They less frequently identified topics of interest that they explicitly stated would be of use to the patients or healthcare staff. The same could be said about the literature searches: they were familiar with the techniques, but the performance was not on a level where they actually engaged with the information they gathered and evaluated. Other studies have also found that emotional engagement may have an impact on reflective practices (Barbagallo, 2021). From an IL vantage point, the students did not demonstrate an ability to think critically and make balanced judgements about the information they found and used. They did not reflect upon how this information could empower the patient or themselves as nurses and citizens to reach and express informed views (CILIP, 2018).

4.3 Maturity and understanding of own role

How students approach and carry out such an assignment is dependent on the cognitive maturity of the students and whether they have moved beyond the first two stages of the reflective judgment model (King & Kitchener, 2004). We find that there is a difference in whether the students have reached the reflective thinking stage where they are able to investigate a problem from different angles and are aware that any answers may be challenged by new evidence and new perspectives, and—maybe most importantly—that they may also contribute in observing situations in clinical practice, asking questions, and gathering evidence from research, clinical expertise, and the patient perspective in order to support the development of current practices.

Even though the data is drawn from reflection notes of around 1000 words, they tell us something about the students' connectedness to clinical practice, their relation to the role as student or healthcare staff, and how they relate to patients. The reflection notes also say something about how students feel prepared to engage in evidence-based work and use tools, such as instruction in IL, given during their educational programme. Do they, in a clinical setting, consider themselves to be "students", in the role of a "learner", or to be future healthcare

professionals? Certainly, they are still students until they graduate, but in clinical practice they nevertheless may be "knowledge creators" (Aglen, 2016), representing new knowledge and, in some cases, new ways of working. The question is how well and in what way we as librarians and nursing teachers can support students to understand this. The students had access to the librarian throughout placement periods, and received continuous feedback. They did use the resources provided for them, but there was a lot of variation within the student group as to what degree they engaged with the resources as well as the feedback from the librarian. This was a labour-intensive way of working with instruction in IL. Even though it seemed to be more effective than traditional one-shot instruction in the sense that all students did more than the minimum of what was expected, it may not be sustainable with large groups of students over time. As seen in other studies, student participation is a prerequisite for effective instruction (Pickard & Sterling, 2022), but one question that remains is how to ensure that the students make the best of it.

What we find in our material is that students as a group do not benefit from a "one size fits all" approach when it comes to this kind of reflective work. Even though they are in their final year and are close to starting their professional career, there are huge differences in the students' maturity and engagement. This kind of assignment, as also other similar reflective activities, may be of use for the students as structured tools that may help them reflect upon their clinical experience and their performance (Smith, 2021). However, even though the students were given an assignment that should have provided them with concrete "hooks" in executing the tasks given, the results when it comes to reflection and depth proved to be varied. One thing that was clear, however, is that engagement with staff and patients in clinical practice was central to mature reflections and understanding the role of IL in finding relevant research evidence.

4.4 A holistic approach to IL?

This way of working with an assignment, by combing the cycles of EBP and IL in clinical placements, is in line with a more holistic view embedding IL in the problem-solving cycle as proposed by Keene, Colvin and Sissons (2010). It also resonates with a sociocultural perspective on learning, and how learning comes about through interaction and engagement. However, from the current study we may learn something about what students might struggle with when they work on assignments that are supposed to bridge the gap between theoretical and practical knowledge. In the reflective notes that scored lowest we found that students had problems seeing the whole picture, or the context they were in, they seemed less engaged and worked primarily with a "student perspective", and they did not see the connection between this assignment and learning in practice. In another study, however, graduated nursing students suggested that more instruction in information seeking and research skills should be taught together with clinical experiences, as well as working with time-constraints and more realistic assignments (Diekema et al., 2019). Hence, this insight may come after they actually start working and no longer think of themselves as students.

In the end, an insight into these potential barriers may help us design better assignments for students, ensuring that they gain maximum benefits from assignments they are given. How can we, through all three years of study, make sure that students reach a level of maturity that will help them enter professional life as nurses with the tools to be critical, reflective and oriented towards professional development? Based on our study, some suggestions may be: we need to focus even more on helping students to see connections between theory and practice, learn to discuss how new evidence may impact practice, reflect upon dilemmas and challenges, take a patient perspective, and understand that even though they are students, they can offer important and new knowledge to clinical practice.

4.5 Strengths and limitations

One strength of the design is the way that different clinical placements are represented in each part of the project, and that some students did the assignments two times in different placements (see Table 1). Hence, the risk of bias due to differences in placements is low.

A limitation is that the empirical material is derived from reflection notes, thus the format of the material is somewhat limited. We do not know what the students presented to their practice placement colleagues and how it was received. A few students mentioned this in their reflection notes, but it was not explicitly mentioned as one of the prompts/questions they should address.

Since the design of the study is qualitative, we cannot measure or evaluate the outcome of one specific intervention, and we do not set out to test how a particular intervention has worked. Rather, this study gives us a glimpse of how these nursing students use skills in IL in an assignment in clinical practice.

The context of this study was nursing education in a Norwegian institution of higher education and although some requirements may be specific to this context, elements of nursing education are similar in many countries around the world. Preparing nursing students to be able to work according to evidence-based practices, stay professionally updated when working as a nurse, and make balanced judgements about information is of importance for nursing education all over the world. Therefore, findings from a Norwegian context may still be relevant for nursing education, or other healthcare education, in other educational and cultural contexts.

5. Conclusion

We have analysed the students' own reflections on working with IL and EBP in clinical placements according to an analytic framework built upon Bloom's revised taxonomy. This was done to establish whether the students merely reproduce and retell simple ways of doing a literature search and present research evidence or whether they display a "higher" order of reasoning and reflection. Questions that guided the analysis are how they reflected on *what* they wanted to find information about, *how* they used this information, and *what* they learned from searching and reproducing the knowledge they gained. Some students did not display a more profound way of reasoning about the assignment they were given, whereas others clearly established that they had learned something more from this combination of clinical practice, theoretical knowledge and reflecting on the work process. It is important to keep a focus on how to bridge the theory-practice gap and combine IL with practical work. In this study we have identified some factors that may need more attention when designing similar assignments for students.

References

Aglen, B. (2016). Pedagogical strategies to teach bachelor students evidence-based practice: A systematic review. *Nurse Education Today*, *36*, 255–263.

Allan, H. T. (2011). Using psychodynamic small group work in nurse education: Closing the theory–practice gap? *Nurse Education Today*, *31*(5), 521–524.

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing. A revision of Bloom's Taxonomy of Educational Objectives*. Longman.

Armstrong, C., Boden, D., Town, S., Woolley, M., & Webber, S. (2004). *CILIP defines Information Literacy for the UK*.

Armstrong, P. (2010). *Bloom's Taxonomy*. Vanderbilt University Center for Teaching.

Barbagallo, M. S. (2021). Nursing students' perceptions and experiences of reflective practice: A qualitative meta-synthesis. *Teaching and Learning in Nursing*, *16*(1), 24–31.

Barr, N. C., Lord, B., Flanagan, B., & Carter, R. (2020). Developing a framework to improve information and digital literacy in a bachelor of paramedic science entry-to-practice program. *College & Research Libraries*, *81*(6), 945–80.

Baxter, P. (2007). The CCARE model of clinical supervision: Bridging the theory–practice gap. *Nurse Education in Practice*, *7*(2), 103–111.

Bussard, M. E. (2018). Evaluation of clinical judgment in prelicensure nursing students. *Nurse Educator*, *43*(2), 106–108.

CILIP (2018). Information literacy group: Definitions and models. *CILIP Definition of information literacy*.

De Swardt, H. C., Du Toit, H. S., & Botha, A. (2012). Guided reflection as a tool to deal with the theory–practice gap in critical care nursing students. *Health SA Gesondheid*, *17*(1).

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process.* D.C. Heath and company.

Diekema, A. R., Hopkins, E. (Betsy) S., Patterson, B., & Schvaneveldt, N. (2019). Using information practices of nurses to reform information literacy instruction in Baccalaureate nursing programs. *Evidence Based Library and Information Practice*, *14*(4), 72–102.

Forster, M. (2015). Six ways of experiencing information literacy in nursing: The findings of a phenomenographic study. *Nurse Education Today*, *35*(1), 195–200.

Franzen, S. & Bannon, C.M. (2016). Merging information literacy and evidence-based practice in an undergraduate health sciences curriculum map. *Communications in Information Literacy*, *10*(2), 245–263.

Gross, M., & Latham, D. (2013). Addressing below proficient information literacy skills: Evaluating the efficacy of an evidence-based educational intervention. *Library & Information Science Research*, *35*(3), 181–190.

Guo, L. (2021). How should reflection be supported in higher education? — A meta-analysis of reflection interventions. *Reflective Practice*, 1–29.

Hines, S., Ramsbotham, J., & Coyer, F. (2015). The effectiveness of interventions for improving the research literacy of nurses: A systematic review: Interventions for nurses' research literacy. *Worldviews on Evidence-Based Nursing*, *12*(5), 265–272.

Keene, J., Colvin, J., & Sissons, J. (2010). Mapping student information literacy activity against Bloom's Taxonomy of Cognitive Skills. *Journal of Information Literacy*, *4*(1).

Keib, C. N., Cailor, S. M., Kiersma, M. E., & Chen, A. M. H. (2017). Changes in nursing students' perceptions of research and evidence-based practice after completing a research course. *Nurse Education Today*, *54*, 37–43.

King, P. M., & Kitchener, K. S. (2004). Reflective judgment: Theory and research on the development of epistemic assumptions through adulthood. *Educational Psychologist*, *39*(1), 5–18.

Kress, G. R., Selander, S., Säljö, R., & Wulf, C. (Eds.). (2021). *Learning as social practice: Beyond education as an individual enterprise*. Routledge.

Ministry of Education and Research (2020). *National regulations relating to a common curriculum for health and social care education*. [Accessed 30 May 2023].

Norwegian Nurses' Organisation (n.d.). *The professional ethical guidelines for nurses*. [In Norwegian. Accessed 28 May 2023].

Pickard, E., & Sterling, S. (2022). Information literacy instruction in asynchronous online courses: Which approaches work best? *College & Research Libraries*, *83*(2), 184–220.

Plack, M. M., Driscoll, M., Marquez, M., Cuppernull, L., Maring, J., & Greenberg, L. (2007). Assessing reflective writing on a pediatric clerkship by using a modified bloom's taxonomy. *Ambulatory Pediatrics*, *7*(4), 285–291.

Ramis, M.-A., Chang, A., Conway, A., Lim, D., Munday, J., & Nissen, L. (2019). Theory-based strategies for teaching evidence-based practice to undergraduate health students: A systematic review. *BMC Medical Education*, *19*, 267.

Rees, K. L. (2013). The role of reflective practices in enabling final year nursing students to respond to the distressing emotional challenges of nursing work. *Nurse Education in Practice*, *13*(1), 48–52.

Säljö, R. (2005). *Lärande i praktiken: Ett sociokulturellt perspektiv*. Norstedts akademiska förlag.

Scully, N. J. (2011). The theory-practice gap and skill acquisition: An issue for nursing education. *Collegian*, *18*(2), 93–98.

Smith, T. (2021). Guided reflective writing as a teaching strategy to develop nursing student clinical judgment. *Nursing Forum*, *56*(2), 241–248.

Søvik, M. B. (2014). Practices of ambiguity: Becoming 'information literate' in two Norwegian schools. *Journal of Information Literacy*, *8*(2).

Stokes, P., Priharjo, R., & Urquhart, C. (2021). Validation of information-seeking behaviour of nursing students confirms most profiles but also indicates desirable changes for information literacy support. *Journal of Documentation*, *77*(3), 680–702.

Svellingen, A., Røssland, A., & Røykenes, K. (2021). Students as facilitators: Experiences of reciprocal peer tutoring in simulation-based learning. *Clinical Simulation in Nursing*, *54*, 10–16.

Wahoush, O., & Banfield, L. (2014). Information literacy during entry to practice: Information-seeking behaviors in student nurses and recent nurse graduates. *Nurse Education Today*, *34*(2), 208–213.

Wakibi, S., Ferguson, L., Berry, L., Leidl, D., & Belton, S. (2021). Teaching evidence-based nursing practice: A systematic review and convergent qualitative synthesis. *Journal of Professional Nursing*, *37*(1), 135–148.

Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Harvard University Press.

Zieber, M., & Wojtowicz, B. (2020). To dwell within: Bridging the theory–practice gap. *Nursing Philosophy*, *21*(2), e12296.

Declarations

Ethics approval

Please see above, section 2.1, "Research ethics, sample and material", p. 73.

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