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Title: Making the link between critical appraisal, critical thinking and critical analysis

Abstract

Nursing has become an all-graduate profession; as such, student nurses must develop their skills of critical analysis. The need to develop critical analytical thinking has been identified as the single most important skill in undergraduate education and reaching the academic requirements of level six study. In degree-level healthcare programmes, students are frequently asked to complete a structured critical appraisal of research. This paper examines how critical appraisal activities can be an opportunity for students to develop transferable critical thinking skills. Critical appraisal teaches objectivity, reflection, logic and discipline, which encourage students to think critically in both theory and practice.

Introduction

In 2008 the Nursing and Midwifery Council (NMC) decided that nursing would become an all-graduate profession at the point of registration. This decision was pre-empted by a review that stated nurses required critical thinking skills to enable them to deliver care in an increasingly complex healthcare environment (Alpha Research, 2008). Subsequently, all nurses who qualify from 2015 and beyond will have successfully completed degree level education to obtain registration with the NMC (Stains, 2008).

Although degree level education is not new in pre-registration nursing or midwifery, it has often sat alongside diploma and advanced diploma programmes. With each programme leading to entry onto the professional register, not all students chose to study at degree level. Within a political context of widening participation in pre-registration nursing programmes (Department of Health (DH), 2010), students are encouraged to enter programmes through more diverse models of educational experiences and non-traditional qualifications (Glasper, 2010). However, Glasper (2010) stated 'students will be required to have appropriate academic prowess commensurate with any university undergraduate programme.' Therefore, with the advent of all-graduate education, concern has been raised that students may struggle to reach the academic requirements of level 6 (Alpha Research, 2008). The need to develop critical analytical thinking has been identified as the single most important skill in undergraduate education (Cottrell, 2008). However, the difficulty in fostering these skills is not unique to nursing programmes and has been identified across the student population (Cottrell, 2008).

Several papers in nursing literature have explored the requirements of degree-level writing; of particular note are Knowles and McGloin (2007) and more recently Duffy et al (2009). These papers have detailed the expectations of academic writing with some excellent exemplars that help students to see the detail, clarity and emphasis that should be reflected in an academic submission. However, what is missing from these papers is a detailed discussion of what strategies students can employ to actually develop and improve their own academic writing style. Therefore, this paper will address this gap and discuss how the act of critical appraisal can be an opportunity for students to develop critical thinking skills. Critical thinking underpins critical analysis and can be used to facilitate a more proficient writing style.

Critical appraisal

Critical appraisal facilitates students to carefully and systematically examine research and make judgements regarding the appropriateness of applying findings to clinical practice (Burls, 2009). As such, effective critical appraisal is a fundamental component of evidence-based practice. Without such skills students may be unable to use the evidence base effectively within their practice (Stevens, 2005).

Perhaps because of the term 'critical', students often begin with an assumption that the appraisal process is to pick fault with the publication (Duffy et al, 2009). The ability to present a balanced discussion in terms of both the strengths and limitations of a study increases as knowledge and understanding of the research process develop. However, significant barriers exist such as learning the language of research and being comfortable with the many debates that exist within the research literature (Rebar et al, 2010). Understandably, students seek confirmation that they are 'doing it right', but struggle when there is no definitive answer and that all critical appraisal is itself open to critique. However, there are opportunities within an academic setting to overcome such challenges. These include group critiquing activities and peer review, prioritisation of important research issues and joint appraisal exercises between students and academics (Box 1).

Structured critical appraisal

Structured critical appraisal involves using pre-designed tools that facilitate a more rigorous and systematic approach, helping students to move beyond what can be a naïve and subjective appraisal of research. However, Katrak et al (2004) identified the existence of 121 published critical appraisal tools. With Booth (2008) stating practitioners 'must use [...] the best available tool to reach the best available decision', students are understandably concerned regarding which tool to use. With so many tools to choose from, it is important students understand the common structure and purpose associated with all appraisal tools.

Appraisal tools are most commonly either design-led or generic. Design-led appraisal tools are those that ask questions pertinent to individual types of studies. The strength of these tools is that they ask direct questions about the intricacies of the particular approach. Examples include the Critical Appraisal Skills Programme (CASP), which provides appraisal tools including those for randomised controlled trials, case control, cohort studies and systematic reviews (www.caspuk.net). Rees et al (2010) have identified CASP as one of the main sources for appraisal checklists. From experience, students would appear to have a preference for the tools provided by CASP. In part, this decision is based on

the rigour of these tools, their ease of use, explicit structure and wide use within the literature. When their investigation focuses on a clinical question that is tightly focused on the efficacy of an intervention, or the relationship between particular variables, CASP is a logical choice. However, anecdotal evidence would suggest students often try to use CASP when another tool would in fact be more appropriate.

When students investigate more descriptive or exploratory subject matter the evidence base is often more varied in terms of the study designs utilised within the research reports available. In this case, generic tools can be more helpful to students. Although generic, it is generally accepted that there are different tools for quantitative and qualitative methodologies. Examples can be found in the core research literature and students frequently utilise those from authors such as Parahoo (2006), Polit and Beck (2010), LoBiondo-Wood and Haber (2010), Holland and Rees (2010) and Gerrish and Lacey (2010), to name a few. However, because these tools can ask an extensive number of questions to cover all types of study design, students can be put off, as the questions do not always seem relevant to the paper they wish to critique. Some of the questions can overlap and students perceive this as repetition and become frustrated. In addition, there are now more mixed method studies in the

evidence base and these are problematic to critique with little consensus as to the right approach (O’Cathain et al, 2008; Pluye et al, 2009).

Therefore, students frequently report that they find the process of critical appraisal a difficult and laborious activity. In addition, Duffy (2005) suggests structured appraisal is inefficient in a real-world clinical setting and the realities of professional practice. It would seem then that students are introduced to a process that is rarely used outside an educational setting. Therefore, it is important to emphasise that structured critical appraisal also teaches objectivity, reflection, logic and discipline, so that students can engage with the process. However, beyond the classroom setting students need to be able to apply the principles of a more rapid approach (Melnik and Fineout-Overholt, 2005). Rapid appraisal becomes easier as students become experienced with the process. This is a similar process to assessing a patient’s needs, where at first an inexperienced nurse needs to use a good systematic assessment tool or problem-solving framework to ensure a comprehensive assessment, but with experience is able to complete the process unaided (Slevin, 2003).

The principles of rapid appraisal emphasise the common elements that are shared between all appraisal tools (Box 2). Whether the appraisal tool asks 5 or 50 individual questions, these elements include judging the rigour of the methods employed by the researchers, assessing the size and strength of the findings reported and understanding how the findings can inform local practice. Students and practitioners alike must be able to draw out the core principles of appraisal even when not in site of a structured appraisal tool. This ability requires students to develop confidence in their critical thinking skills.

Critical thinking

Critical thinking is defined as ‘weighing up the arguments and evidence for and against’ (Cottrell, 2008). Thinking critically about a text is essential to assess its value and contribution to the wider debate and has been referred to as ‘friendly scepticism’ (Wallace and Wray, 2011). Although critical appraisal is taught predominantly to allow students to assess the validity of research studies, they are also learning transferable critical thinking skills.

Critical thinking is a core component of critical analysis (Knowles and McGloin, 2007; Browne and Keeley, 2010). As such, developing these skills is said to be essential to academic success (Cottrell, 2008). However, critical thinking is a cognitive process that involves a series of steps that include: attention, categorisation, selection and judgement; therefore it takes time and effort. When these are coupled with other personal and emotional factors, significant barriers to a student developing these skills may arise (Slevin, 2003).

Critical appraisal activities provide an opportunity to foster critical thinking by helping students to ask questions, have an informed opinion, rationalise their thoughts and articulate ideas. Although rarely acknowledged, the pursuit of objective, structured, rational critique also encourages students to find their scholarly voice. Scholarly voice is difficult for students to develop, and even harder for academics to teach, but ultimately scholarly voice is demonstrated through reasoning and reflection, precision and clarity, and an ability to express ideas in a measured rather than emotive way (Price and Harrington, 2010). The more sophisticated their reasoning becomes, the more flexible and comfortable they are to consider new problems. These characteristics are important for registered practitioners who will face complex problems in practice and who will need to be confident to think critically and creatively to identify solutions.

Critical thinking is then the building block for students to progress and demonstrate critical analysis within their written work. Without it, students may struggle to understand the requirements that underpin degree level education.

Critical analysis

To demonstrate critical analysis in academic writing students must first foster their analytical skills. However, Greetham (2008) suggests analysis is the most under-used and under-developed skill in students and yet it is the most pertinent to improving academic writing. Examining the components of analytical thinking processes shows their close alignment to the act of critical appraisal (Box 3).

Cottrell (2011) defines analytical writing as:

'Writing that looks at the evidence in a detailed and critical way. In particular, it weighs up the evidence, pointing this out to the reader so that it is clear how the writer has arrived at judgements and conclusions.'

A descriptive writing style is not sufficient at level six and students must extend well beyond this if they are to demonstrate an analytical approach (Box 4). Critical analysis requires a close account of the process students were engaged in to weigh up the evidence and show the reader what exactly made one piece of evidence more or less valid or trustworthy than another (University of Leicester, 2012). Yet it is also important that in making this judgement students are not dismissive of evidence simply because of its limitations, but can understand how to interpret the evidence in light of the limitations identified (Wallace and Wray, 2011).

However, Greetham (2008) makes a pertinent point that 'we see what we want to see, even when it is perfectly obvious that we've got it wrong.' This statement may hold the key to explain why students find it hard to develop analytical skills. It may be reasonable to suggest students seek evidence to support their assumptions, rather than challenge them. Therefore, it is important students acknowledge their own biases and the evidence judged by its merits alone (Masterson, 2010).

Synthesising the literature

The next logical step following the appraisal of individual research papers is to bring together different sources of literature. This synthesis involves combining the evidence in a coherent way and enables the student to develop a coherent discussion on a given topic (Aveyard, 2010). The aim is to summarise, interpret and contextualise the results of the evidence in a structured way.

Whittaker and Williamson (2011) discuss a general approach to structuring literature synthesis called funnelling. The writer starts with a broad outline to the background context of the work and then progressively narrows and focuses the discussion. However, ways to facilitate a more detailed synthesis include identifying themes across the evidence base (Whittaker and Williamson, 2011). A table can be useful to summarise the author, aim, type of study, main findings, strengths and limitations (Aveyard, 2010). By doing this, the student should be able to understand and translate the studies more clearly and draw comparisons between them (Szuchman and Thomlison, 2011). Alternatively, a story board could be used to map out the intended debate (Thomas, 2009). Assigning codes to the main findings and discussion points within publications can also help in developing the key themes for discussion (Aveyard, 2010). Another practical method to help synthesise the literature is to write each theme on a postcard along with the supporting references and key points. These can be sorted and linked into relevant sections and later transcribed into the written prose.

The process of synthesising the literature is made easier when all the evidence collated reflects the same point of view. However, this is not always the case. The student then needs to identify why the literature presents these opposing perspectives and what research strategies could have led to these contradictions or inconsistencies (Szuchman and Thomlison, 2011). Therefore, synthesising the literature is about looking for themes and differences within the research findings or telling a story of the data and interpreting these in light of the strengths and limitations of the research methodologies (Aveyard, 2010). This will enable the incorporation of information from the critical appraisal into the literature synthesis. However, it is important to highlight that after reviewing the

literature, gaps within the evidence base may become apparent and questions left unanswered, the implications of which need to be critically evaluated and discussed (Aveyard, 2010).

Writing style

Once students understand the process of synthesising the literature, attention then turns to engaging in academic discourse that will enable a portrayal of their understanding to readers of their work. Importantly, Cottrell (2008) suggests students should develop the same critical approach to their own writing that they are applying to the sources of others. Cottrell (2008) goes on to suggest that students' work is weakened when their thoughts are not clear before they start to finalise their work. A narrative or a synthesis of the literature is normally written in the third person or objective tense, in a continuous prose without the use of sub-headings (Hutchfield and Standing, 2012). Price and Harrington (2010) discuss three important components to successful academic writing: firstly, thorough preparation or planning; secondly, structuring the work coherently; and finally, enabling the student to develop their academic voice. Thinking before they write enables the student to allocate the word count better, address their focus of inquiry, structure the discussion and provide a succinct conclusion (Price and Harrington, 2010). Developing a timeline for completion of academic work can enable the student to keep on track and not over focus on one area (Hutchfield and Standing, 2012). Students will also need to be prepared to review and edit their work on several occasions (Davis et al, 2011). Students should not put off writing their literature synthesis aiming to get it perfect in the first draft, but instead should start writing early and often, and expect to refine and develop their work (Delmont et al, 2004).

Writing critically is a skill that can be learned. Duffy et al (2009) suggests different words or phrases that can be used to compare and contrast the literature to develop an argument or discussion (Box 5). Similarly, Hutchfield and Standing (2012) highlight other phrases that develop critical writing. These include 'this view can be challenged because...' or 'when implementing this policy, practice challenges emerge such as...'. It is also strongly advised that students should read widely and review a variety of texts through which they have the opportunity to understand the writing style of published authors so they too can develop their own writing style further.

Conclusion

As nursing moves to an all-graduate profession, all student nurses will need to develop critical thinking, writing and analysis skills to deliver quality care in the complex healthcare environment. For student nurses who are unfamiliar with the analysis of research, critical appraisal can provide a vehicle or framework to develop these skills in a structured and systematic way, enabling them to write reasoned arguments and discussion. By understanding the critical appraisal process, it is possible for students to understand the structure and purpose associated with appraisal tools and how to learn objectivity, reflection, logic and discipline, and develop their scholarly voice. At first this may seem a laborious process, but once learnt it can be rapidly applied to enable them to quickly draw core principles from research work, even without a tool being available. Therefore, students will be able to develop a more sophisticated form of reasoning and with that will come the ability to become more flexible and comfortable in the face of new and complex problems.

Conflict of interest: none

Alpha Research (2008) A review of pre-registration nursing education-Report of consultation findings. <http://tinyurl.com/kyhpo7z> (accessed 9 July 2013)

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Box 1: Challenges and opportunities associated with structured appraisal tools

Challenges	Opportunities
Preference for choosing short appraisal tools Ignoring more complex and lengthy appraisal tools Perceived repetition and overlap between questions Knowing how much discussion to include in answers Restricting critique to specific questions asked Not thinking beyond the appraisal tool	Use and discussion of several different appraisal tools Group critiquing activities and peer review Helping students to prioritise important issues Joint appraisal exercise between student and academic Ensure students can articulate a sound rationale for choosing an appraisal tool Encourage the use of supporting references to increase the rigour of discussion

Box 2: Core elements of critical appraisal

Krainovich-Miller et al (2009)	Melnyk (2003)
Quality (strengths and limitation of the methods and methodology) Quantity (number and size of the studies, strength of the findings) Consistency (comparison of study designs and similar/opposing findings)	Validity (rigour of methods employed) Findings (what the studies actually found) Applicability (Will the results help locally?)

Box 3: Components of analytical thinking (Cottrell, 2008)

Standing back from the information given Examining it in detail from many angles Checking closely whether it is completely accurate Checking whether each statement follows logically from what went before Looking for possible flaws in the reasoning, the evidence, or the way conclusions are drawn Comparing the same issue from the point of view of other theorists or writers Being able to see and explain why different people arrived at different conclusions Being able to argue why one set of opinions, results or conclusions is preferable to another Being on guard for literary or statistical devices that encourage the reader to take questionable statements at face value Checking for hidden assumptions Checking for attempts to lure the reader into agreement

Box 4. The difference between descriptive and critical analytical (Cottrell, 2008)

Descriptive writing	Critical analytical writing
States what happened	Identifies the significance
States what something is like	Evaluates strengths and weaknesses
Gives the story so far	Weighs one piece of information against the other
States the order in which things happened	Makes reasoned judgements
Says how to do something	Argues a case according to the evidence
Explains what a theory says	Shows why something is relevant or suitable
Explains how something works	Indicates why something will work
Notes the method used	Identifies whether something is appropriate or suitable
Says when something occurred	Identifies why the timing is of importance
States the different components	Weighs up the importance of component parts
States options	Gives reasons for selecting each option
Lists details	Evaluates the relative significance of details
Lists in any order	Structures information in order of importance
States links between items	Shows the relevance of links between pieces of information
Gives information	Draws conclusions

Box 5. Useful words that can be used to develop critical debate (Duffy et al, 2009)

Similarities	Differences
Similarly	In contrast
Agrees	Conversely
In agreement	Alternatively
Concurs	On the other hand
Complements	However

Additionally	Additionally
	Moreover
	Whereas