The Kirkpatrick Assessment for the "Backworded™" Technique Approach for Scoping Review Training Course

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Abstract
Postgraduate students struggle with understanding the process of scoping reviews and how to effectively conduct them. This study aims to evaluate the application of Backwarded technique as a teaching approach in scoping review training course using Kirkpatrik model. The Backworded technique is a newly innovative approach emphasise fostering students' thorough comprehension of content by first pinpointing desired results, essential questions, knowledge, and skills, then creating assessments and instructional activities. The technique aimed to enhance teaching and learning objectives for the scoping review training course. This study utilised the 4 levels of Kirkpatrick model incorporating Relevancy, Satisfaction, Learning and Behaviour. Sixteen postgraduate students participated in the scoping review training course and were involved in the data collection. Results showed the majority of the students strongly agree to the relevancy and satisfied to the training course. 90% of the students learnt from the course and shows changing behaviour. The result explained that students improved skills in curriculum mapping, identifying learning priorities, and aligning objectives, assessments, and activities align with the Backworded technique. Teachers noted enhanced lesson clarity, increased student engagement, and improved ability to activate prior knowledge and customise instruction.
Keywords: Understanding by Design, Postgraduate, Research Education, Backword Teaching Style, Learning Style

Introduction
Postgraduates' students are having difficulty to learn about research and that could be the reason they are struggling on finding topic, research gaps, identify key concepts and writing academic writing (Kell, 2006). This lack of understanding can lead to ineffective scoping reviews and a limited contribution to the field of knowledge. Students may also struggle with understanding the process of scoping reviews and how to effectively conduct them. This lack of understanding can hinder their ability to contribute meaningfully to the research field (Dorji, 2020). To address the problem, the backward instruction design approach offers a valuable solution. By emphasizing the importance of starting with the end goals in mind and working backward to design a systematic and tailored review process, this approach provides

students with a clear and structured framework for conducting scoping reviews Erlinda & Dewi (2022) It helps them understand the significance of defining clear research objectives, developing structured data extraction forms, coding frameworks, and synthesis methods, and aligning these with the specific goals of the review.

The new teaching strategies, namely Backworded technique is newly developed underpinned the principle of the Understanding by Design (UbD). UbD is a framework developed by Grant Wiggins and Jay McTighe in 2005, focusing on curriculum planning, assessment, and instruction. It emphasizes teaching and assessing for understanding and learning transfer, with a backward design approach (Rubio, 2017). The UbD framework is based on seven key tenets, including purposeful curricular planning and continual improvement in student achievement. It provides a structured process to guide educators in designing effective units and assessments. The framework involves three stages: identifying desired results, determining acceptable evidence, and planning learning experiences and instruction (Walters & Newman, 2008).

Literature Review

Applying the Backward technique must begin with defining the outcomes and goals of the scoping review (Scalcione, 2022). This involves determining the key research questions, scope of the study, and the intended audience for the review. By starting with the end goals in mind, the researchers can then work backward to identify the specific resources, data sources, and search strategies needed to achieve those outcomes (Marbach-Ad et al., 2015). The Backworded technique is designed based on the Understand by Design frameworks (UbD). In the teaching and learning process has gained popularity in recent years because of its focus on helping students to develop and deepen their understanding of the essential concepts. Such framework can also encourage students to be more interested in the subject matters due to its emphasis on student autonomy and teacher facilitation, as opposed to direct teaching that often leads to fact memorization with little conceptual understanding (Wiggins & McTighe, 2005).

One important aspect of the Backwarded technique instruction design approach is the emphasis on the end-users of the scoping review, such as policymakers, practitioners, or researchers as well as the format and contents involved in a scoping review paper. By considering the needs and perspectives of these stakeholders from the outset, the researchers can ensure that the review is tailored to address the most relevant and pressing issues in the field. This approach also helps to focus the review on actionable recommendations and implications for practice or policy.

Furthermore, the systematic approach encouraged by the backward instruction design approach can help students overcome challenges in data collection, analysis, and synthesis. By providing a clear roadmap for conducting a comprehensive and relevant review, this approach equips students with the necessary tools to effectively contribute to the advancement of knowledge in their respective fields. Ultimately, by instilling a clear focus on the end-users' needs and the research objectives, the backward instruction design approach can empower students to conduct robust and impactful scoping reviews that inform practice in their field and contribute to future research directions. Students may also struggle with understanding the process of scoping reviews and how to effectively conduct them (Dorji, 2022)

This helps to outline the fundamental structures and guide individual sections of a successful manuscript while it helps both the authors and the readers to keep in mind the main objective throughout the writing. For example, in terms of the introduction section, the teachers can help to provide and justify the reasons behind the study and the particular focus of it. This is by comparing the scoping review paper writing as a whole and the traditional literature review type to differentiate the purposes of each type and hence to help provide a valid rationalization of why scoping review is important in today's publication.

Therefore, the purpose of the study is to determine whether the Backworded technique can be successfully implemented to teach scoping review paper writing. In particular, the researcher seeks to understand the impact of such a shift in course content and teaching approach on student learning outcomes, as well as to identify any potential challenges or barriers to effective implementation. Thus, this study aims to answer the following research questions: 1) What are the key Backworded technique principles and how can they be applied to teaching scoping review paper writing? 2) What is the process and the student learning outcomes of using the Backworded technique in teaching scoping review paper writing?

Methodology
Research Design
This research employed an action research design method. Sixteen postgraduates (n=16, M= 5, F=11) studying social sciences research participated in this study and attended the courses. This design was used because it is a form of self- reflective inquiries that serves to enhance understanding on its practices (McTaggart & Curro, 2009). Teachers are seen here as the subject of research who need to shift their understanding on how to teach research skills. Through action research, this research aimed to develop critical steps to improve teachers' understanding. As stated by Creswell (2015) the purpose of action research is to explore a practical problem with the intention of developing a solution to the problem. Action research requires the researcher to comprehend a methodical process to solve educational problems and make improvements (Tomal, 2010). The problem solving of this research consists of three critical steps; identify desired results, determine acceptable evidence, plan learning experiences and instructions. This is supported by Alber and Nelson (2010); Koshy and Cassey (2005); Somekh (2005) stating that action research basically uses the cycle of planning, implementing and reflection as this process leads to developing an action plan to solve problems.

The Backward instruction design approach encourages a clear and systematic approach to data collection and analysis. By starting with a clearly defined set of outcomes and goals, the researchers can develop structured data extraction forms, coding frameworks, and synthesis methods that align with the specific objectives of the review. This ensures that the resulting findings are both comprehensive and relevant to the intended audience, providing a valuable resource for decision-making and future research directions. This top-down approach, educators start with big ideas and then lead students to individual understanding. This form of teaching is known as "teach for meaning." The research indicates that this may help the students develop a more systematic view of the researching process. On the other hand, traditional research methods courses at the communication scholarship program do not provide a scoping review in their syllabi. However, literature reviews and systematic reviews are taught in various other courses like social scientific research methods and health

communication research methods. By integrating scoping review paper writing into the curriculum, the students will benefit from the newly added knowledge and skills.

Steps 1 : Identifying Desired Results
In this step, we establish the overarching goals or enduring understandings what will the students acquire from the scoping review training course. The sample of a good scoping review article was shown with a thorough of explanation regarding the format and content. Understanding the purpose, methodology, and implications of conducting a scoping review was also explained. Then, identify the essential questions that will guide the learning process and spark curiosity among students in which these questions should be thought-provoking, open-ended, and aligned with the desired outcomes. Then, teachers determined the specific knowledge and skills students should acquire in scoping review process, such as analysing, synthesizing literature, identifying research gaps, and communicating findings effectively.

Steps 2: Determining Acceptable Evidence
After the thorough explanation and shown example of a scoping review article, the next step is to determining acceptable evidence where teachers define the criteria or performance tasks that will demonstrate students' understanding and mastery of the desired results. These could include a written scoping review report, a presentation, or a critical analysis of existing scoping reviews. In this steps, teachers develop rubrics or evaluation tools that clearly outline the expectations and standards for assessing student work. These rubrics should align with the desired results and provide a clear pathway for students to demonstrate their learning. Also, teachers identify other forms of evidence that can showcase students' progress and learning, such as class discussions, reflective journals, or peer evaluations

Steps 3 : Planning Learning Experiences and Instruction
The final step was to design a sequence of learning experiences that align with the desired results and engage students in meaningful and authentic tasks related to scoping reviews. In this steps, teachers will incorporate various instructional strategies and activities that cater to different learning styles and promote active learning such as lectures, group discussions, literature analysis exercises, peer review sessions, and hands-on practice in conducting scoping reviews. Teachers also integrated relevant resources, such as academic databases, research articles, and guidelines for conducting scoping reviews, to support student learning and exploration. Then, teachers clearly planned formative assessments and check-ins throughout the learning process to monitor student progress, provide feedback, and make necessary adjustments to the instruction. Teachers also consider opportunities for differentiation and scaffolding to support diverse learners and accommodate varying levels of prior knowledge or skills. This way students would understand the genre; the students would understand research as a process; students would understand the benefit and intrinsic satisfaction of research; and that students will recognise the recursive and relevant quality of investigation and research.

Result
Data Analysis of Pre Action
The results of the study revealed that participation of the students on scoping review stronger, and the students produced better papers with fewer mistakes and more complex scholarly

work than in previous years. The students reported that they had a better understanding of the genre and research process and the specific lexicon of scoping reviews. They also reported that they felt better equipped to approach their comprehensive literature review paper. In addition, many students stated that they enjoyed working on a paper that builds over the semester where they can receive feedback incrementally as opposed to writing a paper for submission all at once.

However, survey data also highlighted that the students struggled with the iterative process that was new to them. They expressed concern that they didn't know how well they were doing and what they could do to correct things when they received feedback after their formative assignment. While that outcome was not explicitly part of our research questions, it was interesting to note these student responses. It may have implications for our understanding of the development of novice researchers and as to how best to improve writing and research skills in library instruction sessions. Table 1 shown the students` feedback on the training course.

Table 1
Course feedback responses

Scale/ item	Strongly agree 10	9	8	7	6	5	4	3	2	Strongly disagree 1
I took responsibility for being fully involved during this course	50%	18.8%	18.8%	6.3%				6.3%		
I was engaged with what was going on during the course	68.8%	12.5%		6.3%		6.3%		6.3%		
The class environment helped me to learn.	62.5%	12.5%	6.3%		6.3%	12.5%				
My learning was enhanced by the facilitator.	68.8%	12.5%	12.5%		6.3%					
This course held my interest.	81.3%	12.5%		6.3%						

Table 2: 4

Levels of Kirkpatrick evaluation of the training course

	Strongly agree 5	4	3	2	Strongly disagree 1
Level 1: Relevance					
I understand how to apply what I learned on the task	56.3%	31.3%	12.5%		
The course material will be helpful for my future success.	81.3%	18.8%			
I will be able to use what I learned immediately	62.5%	18.8%	18.8%		
What I learned in this course will help me on the task	68.8%	31.3%			
I understand why this course was offered.	81.3%	6.3%	12.5%		
The information in this course is relevant and applicable to my work.	81.3%	18.8%			
I am clear about what is expected of me on the job as a result of taking this class/course	62.5%	37.5%			
I am clear about what is expected of me on the job as a This course provided all of the information I need to be able to perform the skills I learned successfully.	62.5%	31.3%		6.3%	
The information provided in this course is fully applicable to my job.	62.5%	31.3%		6.3%	
Level 2: Satisfaction					
I received helpful information prior to the session	75%	18.8%	6.3%		
Taking this course was worth my time	81.3%	18.8%			
I would be glad to help others with what I learned.	87.5%	12.5%			
I would like follow-up to help me apply what I learned.	75%	25%			
The presentation style of the instructor contributed to my learning experience.	75%	25%			
Level 3: Learning					
It is clear why it was important for me to attend this course	93.8%	6.3%			
Level 4: Behaviour					
I have successfully applied on the task what I learned in class/course.	43.8%	31.3%	18.8%	6.3%	

I have been able to apply on the task what I learned in class/course.	56.3%	18.8%	25%		

The results discussed in table 2, level 4, majority of the students' improvements in students' confidence in applying the task learnt in course which indicating that they able to write various sections of the scoping review paper, and in their self-assessed competence in finding and organising literature. This kind of self-assessment is used in educational literature as a measure of transformative learning, which is seen as the goal of using constructivist frameworks such as Understand by Design (Lee & Yoo, 2015). Although this data is promising, the small sample size and lack of comparison group means that these results must be interpreted with caution. This kind of 'authentic' learning is seen as a key advantage of enquiry-based, or constructivist teaching methodologies such as Backworded Technique, and is likely to underpin transformative learning (Kivunja, 2015).

Overall, the analysis of student feedback demonstrates a thorough success of the implementation of the Backworded technique in the course. These findings were consistent with the student survey data. In short, the data showed that the students achieved those central goals at a statistically significant level. The analysis provided concrete evidence that the students improved their research habits and provided evidence that they understood the research process itself. Overall, the student survey data and paper improvement across all the main learning objectives, suggests that the course was a great success. The students demonstrated marked improvements in interpretation and comment on complex scholarly work and research; more than sixty percent fewer basic mistakes per student were a good indication of that growth. The analysis in this section will lend itself to the following and final subsection of results and discussion where broader implications of the study are considered alongside the success in meeting the goals of the course.

Discussion and Conclusion

In summary, the backward instruction design approach to scoping reviews emphasizes the importance of starting with the end goals in mind and working backward to design a systematic and tailored review process. By considering the needs of the end-users, maintaining a clear focus on the research objectives, and employing structured data collection and analysis methods, this approach can lead to a robust and impactful scoping review that advances knowledge and informs practice in the field. Add the problem statement where students are having difficulty to learn about research. Many students struggle to grasp the intricacies of research methodology, including data collection, analysis, and synthesis, which hinders their ability to effectively conduct scoping reviews and contribute to the advancement of knowledge in their respective fields (Dorji, 2020).

The findings of this study are consistent with previous assessments of Understand by Design and similar teaching methodologies, for instance that they improve students' confidence and autonomy in science subjects (Whitehouse, 2014). However, there does not appear to have been any other studies which have sought to quantify the benefits of implementing such a framework as part of a multi-week research project. This study therefore contributes to the growing literature on the efficacy of Backworded technique and adds to the already substantial body of work which demonstrates the critical importance of writing support in the education of student scientists and researchers. It is concluded that a substantial, scaffolded writing experience, rooted in constructivist theory and supported by

learning technologies, has the potential to be profoundly impactful in the development of student researchers in science and other evidence-based subjects.

Introducing the students in higher education to pass Backworded technique is going to make such transformation even greater. The application of this techniques not only informed the design of the scoping review paper writing unit but also supported students learning being more informed, meaningful, and stimulating. The review of feedback and assessment indicates the students were successful in translating Backworded technique in this course, a transformative way of lesson planning, into practical research led study to develop critical answers and problem-solving ability. The findings provide evidence that by following the three stages of Backworded technique it also enriches the time that spent on the actual teaching but also assists to grab different leap of students' learning progress because of the formative assessments and feedback.

In addition, the findings in this study suggest that the students can better align their research questions to the scopes of the studies. As established in the literature review, there have been criticisms towards the traditional/researcher-cantered teaching form. Whitehouse (2014) suggested that teachers often fall short in organizing and delivering the contents that foster the students' learning process. Nevertheless, the alternative methods such as "teach for understanding" as informed by backword design literature provides a clear structure and may help to achieve teachers' and students' objective of understanding. As of the data from this research, it suggests that the new strategy may facilitate improvements in students' learning and their autonomous development. Aligned with the paradigm shift to a student-cantered teaching climate in higher education, such findings could provide a useful reference for educators in developing communication research and teaching in the future (Lieberman & Guskin, 2003).

Different teachers teach different types of academic writing may implement this technique in different ways in their teaching processes. Therefore, it would be interesting to see the impacts of Backworded technique in teaching other types of academic writing or in other disciplines, so more future research in this area is needed. The effective implementation of this technique allows teachers to spend more time focusing on how to teach the scoping review as a process of knowledge discovery and encourages students to reflect on the knowledge construction process throughout the research. It is hoped that students' perceptions could be systematically assessed in future, as an additional method to measure how successful the use of

Future research could be conducted to explore students' understanding and perceptions of scoping review paper writing in other courses, especially the courses from other disciplines when students may be taught different types of academic writing. The findings in respect of this recommendation could provide additional evidence of the successfulness in teaching scoping review paper writing with the Backworded technique. However, possible future research could investigate how the scoping review might be related to and used in senior capstone projects or as a starting point for a thesis, as scoping review is getting more and more attention as a research methodology in various disciplines. In Sum, it appears that the process of implementing this new technique was a useful vehicle for instructing students to think about the research process and the constructions of knowledge.

In conclusion, this study shows that the implementation of the newly developed Backworded Technique has effectively improved both the teaching and learning outcome of scoping review paper writing. Through the backward design process, writing instruction could

be more focusing and goal directed. The analysis on the student outcomes shows they not only have a better understanding about the paper's scoping nature, but also have a more successful experience in overcoming the propensity to write a literature review that is too comprehensive.

Contribution/Originality
An action research approach, this research is trying to pioneer that a teaching from the end can change their understanding and result in better teaching performance.

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