RESEARCH NOTE

Role of Research in Ensuring Continuing Quality Improvement in Outcome-Based Education in the Health Professions

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Abstract

The Philippine Commission on Higher Education (CHED), through Memorandum Order 46 Series 2012, unmistakably espouses outcome-based education (OBE) as the main approach to higher education learning. To attain its goal of developing a critical mass of high-quality graduates, research that will drive technological innovation, economic growth and global competitiveness and provide directions to the country's policies and strategies must be supported. Research plays at least two roles in ensuring quality in outcome-based education – in curriculum development and in the implementation of OBE. Greater student involvement in research to hone their skills in research will help them become independent producers of knowledge and capable lifelong learners. Teachers enrich the content of their courses with research experience and findings, both from reviewing the literature and from the conduct of actual experiments and studies. To overcome problems with OBE implementation, research can be utilized as a problem-solving activity. Researches can provide situational analysis on the level of quality of education and monitor its trends, seek causal factors that account for variations in the attainment of quality standards, test for educational interventions and identify good/best practices in teaching and learning. This paper provides suggestions for designs for the application of research for these purposes.

Keywords: *outcome-based education, quality assurance, student research, teacher research, curriculum development, health professions education*

Introduction

The Philippine Commission on Higher Education (CHED), through Memorandum Order 46 Series 2012, unmistakably espouses outcome-based education as the main approach to higher education learning (Commission on Higher Education, 2012). It stipulates that the quality assurance system is enhanced by the use of learning competency-based standards and an outcome-based system of quality assurance. Under this mandate, the goal of Philippine higher education is to develop "a critical mass of high-quality graduates who meet national and international academic and industry standards."

This mandate recognizes that in order to attain this goal, research that will drive technological innovation, economic growth, and global competitiveness and provide directions to the country's policies and strategies must be supported. This focus on research in the memorandum order is aimed at ensuring the quality of the country's graduates. According to Section 26 of CHED Memorandum Order 46, "All Higher Education Institutions (HEIs) are expected to do research." The performance in research of an institution is a critical criterion for its designation as a Center of Excellence and Center of Development (Commission on Higher Education, 2012).

In this paper, research is taken both as a noun, where it refers to a study that addresses one or several research questions, and as a verb, where 'researching' relates to the different activities performed in conducting a study. Given these definitions of research, it has two important roles to play in ensuring quality in outcome-based education in the health professions. It can be integrated into the curriculum to enrich the content of courses that benefit both students and teachers. Another is its use as a problem-solving activity that finds practical solutions to difficulties encountered in the implementation of outcome-based education.

Role of Research in Curriculum Development

1. Student Engagement in Research

The training of health professionals involves the mastery of existing theories and principles in their respective fields and the capability to evaluate and produce new knowledge. Research is one of the ways through which knowledge is gained. In espousing a Discovery Paradigm in undergraduate education where students are treated as both learners and scholars, Hodge, LePore, Pasquesi, and Hirsch (2008) asserts that research-based learning removes the boundaries of a traditional course and provides a platform from which students' quest for understanding takes off. A student with well-developed skills in research becomes independent of teachers for his/her learning. Research enables students to believe they can become producers of new knowledge. This also leads to the faster maturation to a very capable lifelong learner. In addition, the knowledge base of students developed through research contributes to their practice knowledge (Rubin & Babbie, 1997).

For instance, by conducting research, a student becomes a health practitioner who can distinguish what prevalent untested practices in their fields are effective or not.

A survey of the program outcomes among the different health professions in the Philippines includes the development of research skills of their respective students. The following program outcomes are examples of this:

Table 1. Research as one of program outcomes in a sample of health professions[1]

Profession/Field of Study	Program Outcome
Medicine	Engage in research activities
Pharmacy	Conduct of relevant research and dissemination of findings
Physical Therapy	Demonstrate research-related skills in the application of best practice evidence in the performance of various roles in different practice settings
Nursing	Research (key areas of responsibility)

[1] Obtained from Dr. Melflor Atienza, Dr. Erlyn Sana and Prof. Elizabeth Grageda, professors from the National Teacher Training Center for the Health Professions, who participated in the drafting of these program outcomes.
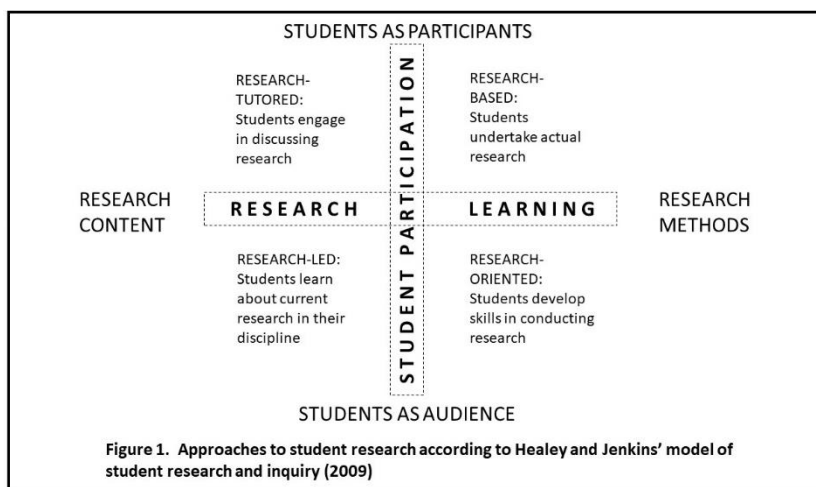
It then follows from these program outcomes that a graduate with well-developed research skills is significantly more desirable than one who is not.

Research capacity of faculty and graduates in a specific discipline is an indicator of the quality of higher education institutions (Commission on Higher Education, 2012).

Research capacities are developed through instruction, engagement, and application of research. HEIs, especially universities, are expected to be actively producing research outputs. They are rated based on inputs to institutional research such as technical expertise of faculty and staff, facilities and funding, and on outputs of research activities in the form of publications, presentations on scientific fora, and commercial products. The right combination of these inputs (expertise, facilities, and funding) will produce more opportunities for student involvement in research. Thus, integrating an effective research development program in a curriculum can lead to an improvement in the quality of graduates. The greater production of articles in peer-reviewed journals by faculty and graduates is indicative of a better curriculum. In a quick analysis done by this author on the data from the Quacquarelli Symonds (QS) World University Rankings in 2017 of top universities in the world, research score, as represented by citations of published research, was strongly correlated with the ranking of the university.

Using Healy and Jenkins' (2009) model of student research and inquiry defined along two axes, namely student participation and emphasis on research learning, there are four approaches for engaging students in research (Figure 1). Students learn about current research in the discipline but do not actively participate in a research-led strategy. Examples of this are attendance in lectures by

professors or other local academic staff and tutor-led discussions of research articles assigned for reading. A research-oriented approach emphasizes learning of research skills and techniques. Students can be given didactic lessons in research methodology and practical and laboratory exercises in different stages of the research process. Periodic assessment of student research skills may be done to diagnose problems of student learning in research methods. Students engage in discussions on research conducted by their institutions in a research-tutored approach. In these discussions which may take place in a research forum, students may contribute ideas to the refinement of the research problem, the conduct of study such as the development of tools, and implications of research findings. Lastly, in a research-based strategy, self-directed learning is developed by actual undertaking a research. Special studies and theses for undergraduate, master and doctoral students are examples of the applications of this strategy. Healy and Jenkins believed that curricula should provide a balance of these four approaches.

Figure 1. Approaches to student research according to Healey and Jenkins' model of student research and inquiry (2009)

Teacher Engagement in Research

Quality improvement in outcome-based education can also be pursued through teacher engagement in research.

Teachers can use findings of new researches by others in their respective disciplines or conduct their own studies on these fields. Those who are active in research are more likely to have up-to-date information on particular subjects. The content of their course syllabus would usually incorporate more recent advances (theories, methodologies, and findings) in their fields of teaching.

Research by teachers can also focus on their teaching strategies or on the learning environment. In her contributed article to the Learn NC Program of the University of North Carolina School of Education entitled "An Introduction to Teacher Research", Anderson (n.d) described activities of 'teacher research' that distinguishes it from similar daily activities good teachers do such

as preparing and executing plans of action, taking and analyzing observations, and then making adjustments to these plans to make them more effective. Altogether, one can already consider these activities as "researching". Anderson, however, provided a stricter definition: teacher research is "an intentional and systematic inquiry in order to improve classroom practice… Teacher research is simply good teaching that is planned and written down in a formal way."

Teachers can conduct systematic reviews or meta-analysis on the specific teaching strategies or use outputs of their own testing of strategies. By doing so, teachers are said to engage in evidence-based practice (EBP). Goldacre (2013) explains an important benefit of EBP in teaching – it empowers teachers into making informed decisions about what works best for their students, "setting a profession free from governments, ministers and civil servants who are often overly keen on sending out edicts, insisting that their new idea is the best in town." A good example could be the application of the findings of M Murad, Coto-Yglesias, Varkey, Prokop, & A Murad (2010) on the effectiveness of self-directed learning (SDL) on knowledge of students in a variety of health professions. While SDL may be expected to be more effective in imparting knowledge than purely didactic learning approaches, a teacher who finds out from this systematic review that SDL is more effective if students were involved in choosing learning resources, as found in Murad et al's study, will then try to increase available learning resources when they develop SDL curriculum.

The actual experience of conducting researches has immense benefits to the teacher. Aside from the confidence, it brings to the teacher, sharing his/her first-hand experience makes it more interesting to teach lessons to students than simply relating what one has just read from the book or a journal article. Those experiences usually involve unique challenges faced and the solutions adopted by the teacher-researcher to overcome them. For example, a teacher may be able to more effectively convince his/her students of the importance of patient-centered care if he/she learns in his/her research that an important risk factor for drop-outs among multi-drug resistant tuberculosis (TB) patients in directly-observed treatment short-course therapy (DOTS) is an unpleasant experience with the health care providers in a treatment facility. Additionally, teachers' researches are often used as the gateway of students to a live experience in a large-scale study. These collaborations often lead to lasting and deeply meaningful mentoring partnerships in the future career of students.

Role of Research in Addressing Problems with Implementation of OBE

The implementation of OBE is not without difficulty and its critics. Manno (1994) narrated OBE's long history in the USA where its adoption encountered a lot of resistance. Back then in the 1990's, obscure program outcomes were partly to blame by critics for OBE's failure to produce its anticipated results. Another report charged that OBE, as implemented in primary education, of producing 'deliberately dumb' students. Accordingly, because educators had to be accountable to their students in OBE, outcomes had to be set low to guarantee their attainment (Phyllis Schlafly Report, 1993). Kevin Donnelly, Director of Education Strategies in Australia, cited reports that in

Australia, the United Kingdom, and Canada, OBE had also not been at the least consistently successful. In addition to the problem of program outcomes specification, the implementation of OBE required difficult changes in the roles of the teacher and student assessment. The reduction of the emphasis on a strong foundation in subject knowledge in favor of student disposition and attitudes was another criticism (Donnelly, 2007). These problems with the adoption of OBE can lead to a diminishing quality of graduates.

As a problem-solving activity, research can be a tool for ensuring continuous quality improvement. Research, which may also be done in the guise of program evaluation, can be used to assess whether HEIs are meeting quality standards. CHED has provided five key result areas (KRA) for judging the performance of institutions in its recommended quality assurance process. A number of indicators have been defined for each KRA (Commission on Higher Education, 2012).

Table 2. Five Key Result Areas of the Institutional Sustainability Assessment (ISA) in CHED's Quality Assurance Process

1	Governance and Management (including management of resources)
2	Quality of Teaching and Learning (competency, programs, faculty)
3	Quality of Professional Exposure, Research, and Creative Work (including linkages)
4	Support for Students (learning resources and support structures)
5	Relations with the Community (extra-curricular linkages, service learning, outreach)

Source: CHED Handbook on Typology, Outcomes-Based Education, and Institutional Sustainability Assessment

Starting with an assessment of the institution's performance according to these indicators, research can be used to identify efficiency and limiting factors that could account for variations in the attainment of quality standards. These factors can become part of the mechanisms, procedures, and processes that need to be monitored to ensure continuing quality improvement in OBE. Examples of possible researches for quality improvement in OBE are provided along with their suggested designs. Some of these examples can be done by individual teachers while others are suggested for administrators and policymakers.

1. Situational Analyses

Situational analyses can be done nationally to determine the distribution of HEI's according to indicators stipulated for each KRA in the ISA. Baseline levels can be established with this kind of studies. These studies would preferably use representative samples of the population elements (schools, teachers, students, curriculum designs, etc.) under study. For example, to determine baseline levels of quality of teaching in nursing schools in the country, one can first stratify nursing schools according to the region, obtain a sample of schools with probabilities proportional to the number of teachers in a nursing school and then randomly sample a fixed number of teachers in a selected school.

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Cross-sectional studies, which include surveys, are conducted to find out associations between the level of these indicators and institution characteristics. Do these indicators differ by geographical location, private-public type of institutional ownership, urban-rural location, organizational structure, etc.? Cross-sectional studies establish these relations in a point-in-time. These can be done by getting selecting samples randomly to meet results need for representative samples as in surveys, or purposely to ensure variability to increase the power of the study to find associations. Useful findings can even come from cross-sectional studies assembled by convenience sampling if bias is not significantly affecting the results. Cross-sectional studies are useful for generating hypotheses about causal factors that could affect educational quality.

2. Trends in Quality Indicators

Monitoring of levels of quality indicators can be done using longitudinal studies. These studies employ repeated measurements of the same units over a period of time. The changes in the level of an indicator is obtained for each unit. A significant trend is established if a large proportion of the units demonstrate a similar pattern over time. Different trends may be observed for specific categories suggesting a relationship between the variable for categorization and the trends of levels of the indicator.

Monitoring can also be done in studies at the aggregate level. These studies consist of repeated cross-sectional studies. Explanations of these trends can come from significant events that occur just prior to these results, for example, the implementation of new policies affecting the curriculum.

3. Search for Factors Affecting Quality

Causal-comparative studies can be used to find causal associations between factors and levels of quality (Frankael & Wallen, 2010). These studies do not introduce any intervention on the part of the investigator. Rather these identify existing groups that represent different levels of a factor. These groups are then compared according to their quality indicators. Differences between groups would be indicative that the factor differentiating them could be causally related to quality.

These studies can also be assembled by identifying two groups of institutions according to levels of quality, for example, a group who meets standards and a group who does not. The characteristics of these groups can be compared to see if there are differences. Those characteristics where differences are found could be considered as possible causes of failure to meet quality standards.

These studies can also be done to test a specific hypothesis. For example, does the quality of instruction in pharmacy schools increase if teachers undergo training in curriculum development from a health professions education school? The design of these studies may consider control of

potential confounders, for instance, size of the school by assembling comparable groups according to the distribution of school size. One way of achieving this is by matching on size in the selection of schools.

4.   Testing for Interventions

Factors affecting quality may already be known a priori or from results for recently concluded studies. As in a previous example used, self-directed learning has been found to be more effective in improving the knowledge of students in the health sciences if these students were involved in choosing learning resources. Using this discovery, a teacher may develop a syllabus that would involve more self-directed learning and increase student learning resources and implement this to a new batch of students. Before doing so, he/she can take the assessment of student performance prior to this implementation as a baseline level. Then he/she can implement the intervention and obtain the assessments at the end. This before-and-after study design is often employed for testing effects of interventions.

Randomized experiments are also often used in studies in health sciences education. Results from randomized trials are given high regard because of the greater control of confounders and biases compared to other study designs. As an example, Aggarwal et al (2011) compared online and on-site training in health research methodology among a mixture of Indian scientists in medicine and other professions working on health research. They found similar improvements in knowledge of health research methodology between the two approaches to training.

5.   Search for Good/Best Practices in Teaching and Learning

Meta-analysis and systematic reviews involve the critical examination of retrieved studies that address a specific question. These investigations determine 1) if the collective analysis of reviewed studies lead to an overall conclusion that an educational intervention is beneficial or not, and 2) the conditions which could modify its beneficial effects. These studies are frequent sources of interventions in education that turn out to be 'evidence-based practices'. An example of this is the report of the US Department of Education on the evaluation of evidence-based practices in online learning. Blended-learning approaches had significantly higher average learning outcome scores (e.g. standardized test scores, grades, grade point averages) than either face-to-face instruction or purely online approaches (US Department of Education, Office of Planning, Evaluation, and Policy Development, 2010).

A new paradigm in organization development called 'appreciative inquiry' emerged from the Department of Organizational Behavior, Case Western Reserve University. Appreciative inquiry (AI) seeks to introduce change in an organization by seeking best experiences related to an object of inquiry, creating a logical vision of an ideal, planning to achieve this and then trying this out (Bushe, 2011). AI is now being applied in research where it involves asking questions that focus on the

positive aspects, i.e. strengths, of an entity's (organization, group or individual) characteristics, behaviors, processes and experiences, especially the exceptional ones that evoke inspiration (Boyd & Bright, 2007) A common output of studies using appreciative inquiry is the identification of best practices. Giles and Anderson (2007) provide a good example of how appreciative inquiry was able to identify social interactions between teachers and students that had a transformative impact on students' learning where the students were adults entering a tertiary institution for the first time. One theme that emerged in this study was that for adult students, the relationship with the educator as a friend, confidant and companion was critical for learning (Giles & Alderson, 2007).

Summary

Research can be utilized by students, teachers and school administrators to improve quality in outcome-based education. This can be achieved by incorporating research into the curriculum. Research can also serve as a problem-solving activity that seeks causes of the low quality of education, test interventions to improve quality and identify good/best practices in teaching and learning.

Conflict of Interest

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About the Author

Jesus N. Sarol, PhD has over 25 years of experience in teaching epidemiology, biostatistics and education research to graduate students at the University of the Philippines College of Public Health, National Teacher Training Center for the Health Professions and School of Statistics. He served in various capacities as principal/co-investigator, epidemiologist, biostatistician, data manager and computer programmer in large-scale health surveys, clinical trials, epidemiological studies and program evaluations in areas such as tuberculosis, mental illness, blindness, air pollution, oral health, hospital performance, essential drug availability and health research capacities. He was awarded Outstanding Young Scientist 2003 by the National Academy of Science and Technology and Gawad Chancellor Award for Outstanding Researcher 2014 by UP Manila. His educational training came from UP Diliman (BS Statistics), University of California Los Angeles (MS and PhD Epidemiology) and Free University of Berlin (post-doctoral Biostatistics). He is currently Senior Biostatistician at the University of Illinois Urbana-Champaign, USA.