JNPD Journal for Nurses in Professional Development • Volume 32, Number 3, 122–129 • Copyright © 2016 Wolters Kluwer Health, Inc. All rights reserved.

Measuring Return on Investment for Professional Development Activities

CE 2.5 ANCC Contact Hours

A Review of the Evidence

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In the current complex healthcare environment in which organizations are dealing with reimbursement challenges, nursing professional development practitioners must increasingly demonstrate that the time and resources dedicated to educational activities are worth the impact they have on outcomes. Measuring return on investment guides decisions on resources (people, supplies, time) used for professional development activities by showing the financial impact of such activities. The purpose of this project was to review the literature on return on investment for professional development activities to best guide decision-making for limited resources. This is Part I of two articles, the first of which provides a review of the literature. The second article provides guidance for conducting financial analyses of nursing professional development activities.

Nursing professional development (NPD) practitioners are challenged by the question: "What is the return on investment (ROI) for the time and resources spent for professional development?" Although orientation, staff competence assessment, and educational response to critical events are essential, resources are often limited for educational activities. Either the team planning and providing the learning activities is restricted because of staffing, equipment, and supplies, or the clinical staff needing the learning activity is unable to leave the work area. This demonstrates the "push-me-pull-you" life of an NPD practitioner.

NPD practitioners are often the first to be called when a problem surfaces and the first to experience reductions when the budgets are tight. For the purposes of this discussion, the terms learning activities and continuing education of staff are used interchangeably to represent either what has traditionally been called "inservices" and "continuing education." These terms explicitly defined as different in the past are now generally accepted as ongoing development/education of staff.

Using the seven steps for the evidence-based practice (EBP) change process (Melnyk & Fineout-Overholt, 2015) as a framework, the authors evaluated best practices for ROI measurement for professional development activities as found in the literature today. These seven steps of EBP include (0) clinical inquiry, (1) population–intervention–comparison–outcome (PICO) question, (2) search for evidence, (3) critical appraisal of evidence, (4) integration into practice, (5) evaluation of outcomes, and (6) dissemination of results.

Step 0: Clinical Inquiry

The Association for Nursing Professional Development 2014 learning needs assessment of its membership identified great interest in determining best practices regarding impact evaluation and ROI for professional development activities. In response to this identified need, members of the Association for Nursing Professional Development Education Committee set out to identify these best practices. A task force was formed with a goal to clarify how ROI has been measured and used in decision-making regarding professional development activities based on the current available literature. Therefore, the clinical inquiry that motivated this project was to determine if routine ways to build measurement of ROI into the work of professional development already exist.

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The authors have disclosed that they have no significant relationship with, or financial interest in, any commercial companies pertaining to this article.

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DOI: 10.1097/NND.0000000000000262

Kirkpatrick's levels of evaluation

Kirkpatrick and Kirkpatrick (2009) introduced the well-known educational program evaluation methodology consisting of four hierarchal levels for conducting evaluation in a business partnership approach. Kirkpatrick's levels of evaluation consist of reaction, learning, behavior, and results.

In Level 1, reaction, the lowest and easiest level of evaluation, the focus is on the learner's perceptions of the training (Kirkpatrick & Kirkpatrick, 2009). This level often uses surveys, questionnaires, or other rating scales for measurement (DeSilets, 2009). The next level, learning, measures the increase in knowledge, skill, or capacity due to the learning event. This level often uses posttests, checklists, or return demonstration for measurement. The third level, behavior, considers the extent of behavior change and the improvement achieved by application of the educational content. This level may be measured through observation of behavior, chart audits, or self-report of learners at a later date, after the content of the learning activity has had an opportunity to be applied in the work setting. Finally, the highest level of evaluation, results, considers the effect on the business or environment based on performance. This level is the most time-consuming to measure because it often takes a long time to actually see changes in outcomes as a result of the learning activity. Applying Kirkpatrick's four-level evaluation model builds a compelling chain of evidence for the value relationship between the learning activity and the organization's financial bottom line (Kirkpatrick & Kirkpatrick, 2007).

Kirkpatrick and Kirkpatrick (2009) state that formal educational activities alone do not deliver optimal bottom-line outcomes and results. The educational event is typically just one factor influencing the outcome. In addition to education, reminder systems, physical environment changes, unit culture, and being held accountable by leadership are examples of other influences on outcomes.

To account for additional system influences, Kirkpatrick and Kirkpatrick (2009) expanded their emphasis to focus on collective efforts to identify the return on stakeholder expectations. With the return on stakeholder expectations, outcome indicators are more holistic and focus on both qualitative and quantitative components of a variety of interventions. Using questions to clarify and refine, stakeholders are able to adapt expectations into measurable outcomes that meet the bottom line of the organization.

Phillips's ROI methodology

Phillips (2003) built upon the foundation of Kirkpatrick's model of evaluation by adding a fifth level, ROI. Phillips five-level model begins with reaction/satisfaction/planned action by measuring the learners' satisfaction and the plans to incorporate new learning into practice. Next, assessing the amount of information acquired describes the learning level. The third level, behavior/application/implementation, measures actual implementation into practice, whereas the fourth level, results, focuses on measuring the organizational impact by determining the output, quality, costs, and time in relation to the benefit/cost ratio. The last and most critical level is ROI, which evaluates the ultimate value with potential investment opportunities (Phillips & Phillips, 2002). Throughout the evaluation process, Phillips states that credibility depends on the isolation techniques and intangibles identified. The focus is on normalizing so that benefits and costs can be compared to all factors influencing measureable performance outcomes.

Paramoure's measurable instructional design

Paramoure (2013) presents a model of Measurable Instructional Design to facilitate measurement of ROI of education. This model begins with identification of the key performance metric (KPM) that is the target of an educational activity. Specific skills associated with the KPM are delineated and lead to the development of measureable performance outcomes. Teaching methods are created to align with these measureable objectives and ultimately lead to the evaluation of the learner's achievement of the objectives. Finally, application of new behaviors in the work setting is evaluated along with its impact on the KPM. Key components of the Measurable Instructional Design model include collaboration with managers to ensure that educational activities align with organizational and departmental goals and prospectively developing a "chain of evidence" (p. 36) to measure the impact of education. ROI is subsequently measured by quantifying the cost of education and the monetary value of the changes in the KPM.

Step 1: PICO Question

To guide the search for external evidence, the next step for EBP changes is to create a PICO question to inform the literature search (Melnyk & Fineout-Overholt, 2015). This project had a meaning-type PICO question, which does not incorporate the comparison component.

> *"How do healthcare organizations (Population) with effective professional development programs (Intervention) measure the return on investment for professional development activities (Outcome)?"*

Step 2: Search for Evidence

After development of the PICO question, the search for evidence began. The keywords used to search for evidence in the literature included *nurse educator, staff development, professional development, education, return on investment, cost–benefit analysis, impact, and educational outcome measurement*. MEDLINE, CINAHL, and ERIC databases were searched from 2004 to 2014, followed by additional review of references from articles. From that further review, one more study from 2002 was identified and included in review (Zack et al., 2002).

To guide the search for evidence, inclusion criteria for articles were that the article must (a) identify an educational intervention for professionals, not patient educational activity; (b) describe the outcomes measured before and after the educational activity; and (c) provide a calculation for ROI. When few articles describing ROI were found, the search was broadened to include measurement of other financial impacts such as cost-effectiveness and benefit–cost analysis. A total of 69 articles were identified. Of these, 58 described educational impacts without including either financial analysis or outcomes measurement. The remaining 11 studies met the criteria for inclusion in the review of the literature.

Step 3: Critical Appraisal of Evidence

Once articles that met the inclusion criteria were identified, critical appraisal of the evidence began. Both qualitative and quantitative studies were identified during the literature search. The Melnyk and Fineout-Overholt (2015) rapid critical appraisal tools consider description of study; validity, reliability, and applicability of questions; and strength of the study design in appraising a study. The team discovered that commonly used evidence appraisal tools like Melnyk and Fineout-Overholt's (2015) Rapid Critical Appraisal and the AGREE II (Brouwers et al., 2010) only included a cursory analysis of financial considerations. In these instruments, cost is mentioned under applicability of the study but does not evaluate financial impact measurement. As a result, an article lacking financial data may receive a "good" rating using these appraisal tools whereas an article achieving a "fair" rating may contain essential financial data. This discrepancy caused the review team to realize that they must look beyond the scores or word ratings (e.g., excellent, good, fair, poor) in standard evidence appraisal tools to assess the true value of the article for this project's purpose. When completing the appraisals, additional notes were included as represented in Table 1.

Sample description

The review of literature found 11 studies between 2002 and 2013 that evaluated the financial impact of educational interventions. The educational interventions identified in these 11 studies were computer modules (1), newly licensed nurse residency or fellowship programs (4), customized orientation plan (1), blended learning approach orientation program (1), and multifaceted programs (4). The content of the educational interventions included topics such as medication safety, ventilator-associated pneumonia (VAP) prevention, pressure ulcer prevention, ergonomics, and a wellness program.

Educational activities comparison

In the studies reviewed, the measurement of the financial impact of professional development activities varied, including comparing cost of educational activities to the following:

1. cost of preventing an error resulting in litigation;
2. cost of avoiding expenses from error;
3. cost of employee turnover;
4. previous educational program costs and outcomes;
5. payments for injuries, personal days, and workers compensation; and
6. expense of employing agency nurses.

In these 11 studies, the calculation of financial impact measured efficiency and/or effectiveness of the educational interventions using a variety of calculations including cost-effectiveness analysis, benefit–cost ratio, and ROI.

Appraisal of evidence

Dennison (2007) calculated the cost savings including per error annual impact, length of stay, and litigation concluding that the minor expense of education was well worth the investment. Using a quasiexperimental design and providing detailed information of how calculations were performed contributed to the credibility of the conclusions.

Hillman and Foster (2011) calculated turnover cost savings over 4 years resulting from implementation of a newly licensed nurse residency program. Although significant cost savings due to reduced turnover was realized, this study was conducted in a children's hospital and should be replicated in other settings to ensure the generalizability of the findings.

Morris et al. (2009) evaluated program costs for a revised critical care orientation focused on critical thinking and competence validation. Outcomes measured included retention, vacancy rates, and staff satisfaction. The authors used a mixed-methods research design. The discussion of costs was limited, making it difficult to evaluate financial impact of the revised orientation.

Nelson et al. (2006) described benefit–cost comparisons by calculating injury prevention education and capital equipment costs, then comparing it to the treatment expenses, payments for injuries, personal days, and workers compensation savings. The authors provided detailed information, raising awareness of comprehensive cost analysis and validating their ROI.

Pine and Tart (2007) calculated total expenses, expenses per nurse resident, net program benefit, and cost savings of their Baccalaureate Nurse Residency Program. Their thorough ROI analysis provides a model for evaluating financial impact of professional development programming. A 13% reduction in turnover showed how a program that requires an initial financial outlay can result in long-term savings for the organization.

Ryan and Tatum (2013) used a Prerequisite Exam for Pediatrics (PREP) exam to individualize orientation. They calculated potential savings from the reduction of the

TABLE 1 Summary of Studies Reviewed

Citation	Project/Methodology	Financial Impact	Strategy/Intervention	Outcomes Measured
Dennison (2007)	Education to reduce harm caused by med errors, specifically intravenous meds Education program: used before/after measures	$5,000 per error or annual impact of $2.8 million in a 700-bed teaching hospital Patient length of stay prolonged by 2 days average per error Litigation awarded 13% of cases with $3.1 million per award	Two 30-minute computer modules on medication safety Conclusion: need for strong administrative support, follow-up, hold accountable for changes in behavior	Statistically significant change in knowledge occurred, but no change in: 1. climate of safety 2. use of behaviors from program, 3. number of infusion pump alerts, 4. number of reported errors
Hillman and Foster (2011)	Residency program 1. preresidency 2. contracted residency 3. transitions residency Cohort comparison of 3 groups	Rate of retention improved with each program change for turnover cost savings of 4 million dollars over 4 years ($50,000 used as average cost to replace each nurse)	New graduate nurse residency program 1. nurse/work satisfaction 2. organizational commitment 3. clinical decision-making; 4. empowerment; 5. support and retention	New graduate retention rate moved from 50% to 72.5% 5 years after program adoption Increased job satisfaction, Increased confidence and competence
Morris et al. (2009)	Critical care orientation Prospective, quasi-experimental design; both quantitative and qualitative methods.	New program cost was only $24,810 more than the old program *included licensing fees for Web-based programs, dedicated full-time education consultant *excluded development time and other start-up costs	Blended learning approach New model for orientation focused on critical thinking and competence validation	Retention increased from 91.2% to 93.7%, Turnover was 8.77% before and decreased to 6.29% 1 year after Vacant FTE positions decreased from 31.6 to 10.9 ICU vacancy rate decreased from 14.3% to 4.8%.
Nelson et al. (2006)	Multifacet ergonomics program Pre-/postintervention 23 units in 7 facilities Prospective data: surveys, weekly logs, injury logs, and cost logs	Training costs—$74,103; annualized cost of $7,410 for 23 units combined Total cost medical treatment decreased from $95,091 to $49,244 Facility payments for injured employees decreased from $134,763 to $35,200 Personal days—$55,743–$49,352 Modified days—$136,426–$42,500 Capital equipment recovered in 3.75 years Workers comp. savings $200,000/year.	The intervention's six elements: 1. Ergonomic assessment protocol 2. Patient handling assessment criteria and decision algorithms 3. Peer leader role, *"Back Injury Resource Nurses"* 4. State-of-the-art equipment 5. After action reviews 6. No lift policy	Changes noted in the areas of injury rates, job satisfaction, lost work days, modified work days, staff/patient acceptance Injury cost savings $245,727 Annualized savings calculated $327,636–$123,037 (program costs) = $204,599 (cost savings per year)
Pine and Tart (2007)	Baccalaureate nurse residency program: 1. Clinical practice, 2. Support of preceptor, 3. Monthly 4 hour cohort meetings Education Program used pre/post measure design	Program costs expenses: Total cost = $93,100.00; Total cost per resident = $2,023.91 Net program benefit: $1,098,240–$274,560 = $823,680 Orientation at 50% turnover = $1,372,800 Orientation at 13% turnover = $274,560	Designed to address: clinical judgment and decision-making, leadership, professional commitment, individual development, and evidence-based practice 1. Assist in transitioning from advanced-beginner to the competent nurse role 2. Provide understanding of the organizational and bureaucratic structure environment	Turnover at the end of year was 13%, a dramatic improvement from the 50% turnover rate in 2004 The ROI indicates that the program is cost effective The cost savings is $823,680

Continued

TABLE 1 Summary of Studies Reviewed, Continued

Citation	Project/Methodology	Financial Impact	Strategy/Intervention	Outcomes Measured
Ryan and Tatum (2013)	Customized clinical education for orientation based on weaknesses identified from a prehire screening examination PREP Descriptive, correlational study IRB approved	Average number of clinical orientation weeks reduced from 16 to 8 weeks Possible savings of $12,000 per RN if customized orientation plans are implemented Attrition rate of RNs went down (from 33.8% to 10.2%) in 1st year of project	84 RNs applying for pediatric positions Before orientation, PREP scores with strengths and weaknesses and recommended remediation for specific areas were provided to managers, educators, and participants Clinical concepts identified with a score lower than 800 (max. = 1,400) became areas of focus in orientation Resulted in implementation of the PREP test as part of the application process	The lower the PREP score, the longer the clinical orientation to meet competency PREP reduced frequency of extended length of orientation 82% of RNs achieving scores below 750 left the position within the 1st year
Sandhusen et al. (2004)	Implemented a perioperative nurse fellowship ROI analysis to justify creation and maintenance of program	$10,053 monthly expense for agency nurse $5,616 monthly fellow salary $4,437 net savings per month 16 months × $4,437 = $70,992 savings Fellowship expense $37,037 $70,992 − $37,037 = $33,955 ROI	Used the Phillips model as a framework for analysis Describes steps taken to ascertain program's costs and benefits	Computing ROI presented a clear financial rationale for the creation and maintenance of the perioperative nurse fellowship program Reduced expense for agency nurses
Sendelbach et al. (2011)	Pressure ulcer prevention program Multifacet program Comparison of before and after program incidence of pressure ulcers	Number pressure ulcers reported to the State of Minnesota decreased 33% after implementation of the program with a potential cost savings of up to $430,000 Budget for convening the workgroup and supporting the work was approximately a quarter of this cost	10 hospitals developed interventions to standardize 1. provider education 2. patient/family education 3. point-of-care resources for providers 4. timely nutritional assessment 5. Skin Day event to increase awareness	1. Coded data from documentation 2. Patient Safety Visitor Report, concurrent voluntary reports of hospital-acquired pressure ulcers 3. Quarterly P&I survey (NDNQI format) Reportable pressure ulcers decreased from 12 to 5, a 58% decrease in participating hospitals
Ulrich et al. (2010)	A structured evidence-based RN residency implemented in hospitals across United States Educational program used with before/after turnover rate comparison IRB approved	Using calculation of the replacement cost of each new nurse to be between $82,000 and $88,000; the cost to the hospital for replacing the 36 new graduates is estimated between $2,706,000 and $2,904,000 Outcomes data collected from 6,000 new graduate nurses who completed RN residency over a 10-year period Results: accelerated increase in competence and self-confidence; decrease in intent and actual turnover	Structured, nationally standardized 12-month program Versant RN residency curriculum includes: 1. classes with case studies, structured clinical immersion experiences with team 2. precepting, structured mentoring and debriefing/self-care sessions 3. looping to related departments 4. competency validation	Persuasive evidence that both new graduate nurses and organizations benefit from the implementation of a structured, clinical immersion RN residency The concepts measured: • Competency • Satisfaction • Confidence • Empowerment/autonomy/role • Group cohesion/org. commitment • Turnover intent

Continued

TABLE 1 Summary of Studies Reviewed, Continued

Citation	Project/Methodology	Financial Impact	Strategy/Intervention	Outcomes Measured
Val Palumbo et al. (2013)	Staff wellness program Multifacet wellness program for staff and students	Using hours of unscheduled absence as a proxy for staff wellness, there was a 75% of difference between mean hours of unscheduled absence during program compared to the previous 3 years Average hourly rate (including benefits) was multiplied by unscheduled absence ($11,409.17) The total cost of program delivery ($7,662.50) for 80 employees yielded ROI of $3,746.67	8-week program—Interventions included: 1. biometric screening 2. participation incentives 3. education delivered by staff and nurse practitioner students on the unit Engagement activities: -Wellness cart -Signage: positive cues for self-care, sleep, nutrition, physical activity; stress reduction, safety; posture, approaches to family stressors; humor, spiritual resources, games -Wellness coaching	73% of enrolled employees participated in activities offered; 73% identified the biometric screening incentive as motivating them 72% identified the wellness cart giveaways as motivating them 47% were satisfied with staff and graduate student contacts An employee wellness/health promotion program can reduce absenteeism
Zack et al. (2002)	Reducing VAP Education program used pre-/postintervention observational study	The estimated cost savings secondary to the decreased rate of VAP for the 12 months following the intervention were between $425,606 and $4.05 million	Self-study for multidisciplinary staff developed by a multidisciplinary task force Combination of 1. 10-page self-study module on risk factors and practice modifications involved in VAP 2. inservices at staff meetings 3. formal didactic lectures	191 episodes of VAP occurred in 15,094 ventilator days (12.6 per 1,000 ventilator days) in 12 months before intervention After implementation, rate of VAP decreased to 81 episodes in 14,171 ventilator days (5.7 per 1,000 ventilator days) A decrease of 57.6% ($p < .001$). A focused education intervention can dramatically decrease VAP

Note. FTE = full-time equivalent; ICU = intensive care unit; IRB = institutional review board; PREP = Prerequisite Exam for Pediatrics; ROI = return on investment; VAP = ventilator-associated pneumonia.

average number of weeks for orientation paired with a reduced attrition rate at 1 year. This study had a small number of participants and used an estimated cost for calculations as opposed to actual costs, challenging the generalizability of the findings.

A premier example of a study that evaluated both the benefit–cost and ROI analysis is Sandhusen, Rusynko, and Wethington (2004). They calculated the cost savings of implementing a 16-month nursing fellowship program. Using the Phillips ROI model, key areas of cost reduction were identified. The savings justified the fellowship program intervention by reducing the costs of agency nurses.

Sendelbach, Zink, and Peterson (2011) described statewide reduction of pressure ulcers after a bundle intervention program was implemented in 10 different hospitals. They showed a wide variation in estimated cost savings, reducing the value of the study results.

Ulrich et al. (2010) used replacement cost of new RNs to calculate benefit–cost of the newly licensed nurse residency program over 10 years. Although this longitudinal study showed significant reduction of turnover, the authors did not offer actual costs and savings to delineate ROI.

Val Palumbo, Sikorski, and Liberty (2013) calculated the total program costs and percentage difference in unscheduled absence days over 3 years to demonstrate ROI as money saved from their multifaceted wellness program. This well-designed study provides a clear description of ROI.

Finally, Zack et al. (2002) estimated cost savings following an educational intervention on prevention of VAP. The financial impact was reported by calculating the potential savings resulting from the reduction in the number of VAP episodes. This is a significant study with broad clinical implications not only for the reduction of

VAP in other institutions but also because the way the financial impact was reported could be used as a template for other educational interventions.

Synthesis of evidence

Synthesis of these 11 studies showed that describing the financial impact of professional development activities is more meaningful than simply measuring participant satisfaction in the current healthcare environment. However, a lack of consistent methods to describe financial and clinical impact of professional development activities was found.

Step 4: Integration Into Practice

In the current healthcare environment where all interventions are being evaluated for contributions to organizational outcomes, NPD practitioners must quantitatively demonstrate their value. Although this project was initiated to identify best practices related to measuring ROI of NPD activities, the lack of articles on ROI resulted in expanding the search to include other financial measures. As a result, cost per participant and benefit–cost analysis, were also found to be useful methods of demonstrating financial impact. The NPD practitioner can use all of these calculations to demonstrate the value for a variety of educational programs. Although time constraints prevent calculating financial impact of all educational interventions, realistically, considering stakeholders, values, and environmental factors, approximately 5%–10% of programing could be a goal for this analysis (DeSilets, 2010).

Although NPD practitioners may not have historically conveyed these financial impacts, routine reporting of the value of professional development activities to the organization's senior leadership is essential. Understanding the value of professional development activities guides senior leadership decisions in lean economic environments.

In addition, NPD practitioners need to publish data regarding financial impact of programs to advance the specialty practice of NPD. These publications can help others justify the need for and quantify the value of their own professional development activities.

Step 5: Evaluation of Outcomes

When implementing an EBP practice change, whether clinical or leadership focused, measuring the variables of interest before and after implementation is important. If positive outcomes are found, changes are supported. If negative outcomes are identified, problems with the interventions can be resolved. The outcomes measured in the 11 articles included in this review included employee behavior (e.g., retention, satisfaction, absenteeism) and/or patient care (e.g., number of infusion pump alerts, rate of VAP). Table 2 lists the 20 different outcomes reported in the literature reviewed. Overall, the financial outcomes measured in the reviewed articles showed that educational interventions yielded positive clinical and/or financial impacts.

TABLE 2 Outcomes Measured in Articles Reviewed

Absenteeism
Attrition
Competence and self-confidence
Expense for agency nurses
Injury rates
Job satisfaction
Lost work days
Modified work days
Number of infusion pump alerts
Number of pressure ulcers
Patient acceptance
Rate of ventilator-associated pneumonia
Reduced time for orientation
Reported errors
Retention
Safety climate
Turnover
Turnover intent
Use of behaviors from program
Vacant full-time equivalents

Step 6: Dissemination of Results

This final step is essential for all EBP projects to minimize the resources consumed by repeating the work on projects already completed in other settings. Dissemination can be oral, written, or poster formats and may be internal (within the organization) as well as external (outside the organization) such as presentations at conferences and in professional journals. For this EBP project, one method of dissemination is this publication.

Conclusion

In this first part of the series on measuring ROI for professional development activities, a review of the literature was completed using the seven-step EBP process. Only 11 of 69 studies found included an analysis of financial impact of professional development activities. Furthermore, the

reporting of financial impact was inconsistent and, in some cases, incomplete. In the current healthcare environment, NPD practitioners must demonstrate their financial impact to the organization to demonstrate their value. To facilitate this process, Part II of this series describes ways of calculating financial impact of educational activities including ROI. In addition, suggestions are provided for integrating financial impact measurement as an outcome of educational activities.

ACKNOWLEDGMENTS

Special thanks to the membership of Association for Nursing Professional Development for their requests for content on ROI as reported in the 2014 Annual Needs Assessment. Thanks also to the Association for Nursing Professional Development Education Committee for their support and guidance throughout this project.

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