Section I: Conceptual Frameworks for Assessing Innovation

A Framework for Understanding Assessment of Innovation in Teacher Education

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Context

Multiple sources of influence impact the decisions about what and how teacher educators are expected to operate, including the innovations that are adopted. Some of those sources of influence (such as teacher certification boards) can demand that certain curricula be adopted, specific instructional procedures be utilized, and delineate the conditions under which candidates will be selected for entry into teacher education programs. Other sources of influence include how other professionals are prepared (e.g., case-based or problem-based learning from legal and business preparation, constructivist teaching methods derived from educational psychology). Issues involving innovation in teacher education have been studied by education researchers, reformers, and practitioners. For example, in a seminal work, Lilly (1973) wrote, "A first premise is that the technical soundness of an innovation as demonstrated by educational research is seldom necessary and never sufficient to guarantee adoption of that innovation by educational practitioners . . . consider the success of educational inno-

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vations [between 1960-1970], some proving successful (*Sesame Street*) and others apparently dying on the vine (performance contracting)" (p. 227).

Since then, some teacher educators have evaluated instructional innovation (e.g., Barrell, 1996), and in 1996, an entire issue of *Teacher Education Quarterly* was devoted to innovative colleges of education. Other researchers have studied team teaching in teacher education (Cruz & Zaragosa ,1998); teacher educators' beliefs about professional development schools (DeWitt, Birrell, Cook, Ostlund, & Young, 1998); alternative teacher education programs such as school-university partnerships (Benton and colleagues, 1996). However, Melvin (1993) calls for more concerted efforts to study the influence of professional studies by faculties of education on actual practice in classrooms and schools.

Kenneth Zeichner, a past president of the Teacher Education Division of the American Educational Research Association, traced the types of scholarship in which teacher educators typically engaged between 1978 and 1999. He stated that the "new scholarship in teacher education is a much richer and more varied body of inquiry than that which existed 20 years ago" (p. 8). In addition to studies of the nature and impact of teacher education innovative practices such as electronic technologies, field-based programs, interdisciplinary or subject specific methods courses), methodologies have included case studies, narrative and life history methods, action research, life history and autobiographical methods (p. 11).

In this themed issue, "Assessing Innovation in Teacher Education," the editors hope to show that the types of innovation in teacher education as well as methodologies to study impact of innovation continue to show variety and ingenuity. In this article, the editors (a) summarize the definitions extant in the literature, (b) briefly describe several taxonomies for innovation, (c) explain the process of innovation, (d) explicate the challenges in assessing innovation, and (e) discuss the implications for teacher education research and practice.

Definitions of Innovation

A review of the literature on innovation yields multiple definitions, components, and processes that attempt to distinguish a unique element. Characteristic to all definitions are proximal, distal, and confluent properties of innovation. The proximal properties include definitions that conjoin to individual or micro perceptions of innovation, versus distal properties that ascribe a community, or macro, perception of innovation. Thus it can be argued that if an individual learns or performs a task for the first time it may be considered innovative. This also includes tasks that may have been available to the individual yet unperformed. The distal element underscores the value of the perceived task within a community or other external validating entity. Additionally, the confluence of the proximal and distal categories of innovation highlights a dynamic synergy for both personal and public innovations.

Foremost in any treatise of innovation is the foundational lexicon or definition

that anchors subsequent substantive discussions. Clapham (2003) states that "the word innovate comes from the Latin word 'innovare' which means to renew, to make new" (p. 366). Therefore, by definition, an innovation can be a renovation of a theme or a variation of an idea. The author further cites Smith (2003) who postulates that a critical component of innovation is "ideation." The notion of ideation suggests credibility to best practice research that in fact is grounded not only on ideation but also on data-based implementation. This resonates with Kostoff (2003) who suggests that "innovation reflects the metamorphosis from present practice to some new, hopefully, 'better' practice" (p. 388). Sternberg, Pretz, and Kaufman (2003) define innovation as "the channeling of creativity so as to produce a creative idea and/or product that can and wish to be used" (p. 158). Thus, an innovation may have only intrinsic value. Consequently, teachers as action researchers can discover innovative curricular, instructional, and management strategies that will effectively benefit their respective classes and may be transported to colleagues.

The concept of newness has been superimposed on the definition of innovation by Goldsmith and Foxall (2003) who posit three different qualities of newness: recency, originality, and similarity. Teacher educators have capitalized on the recency of curricular innovations, for example, by taking the leadership in implementing and evaluating whole-language, student-led individual education programs, and character education. The concepts of originality and similarity are meshed with the various approaches of positive peer culture, cooperative learning groups, and classroom communities.

Proximal Innovation

Rogers (1995) defines innovation in terms of its proximal, distal, and interactive associations by stating that things, ideas, or practices are perceived to be new or novel by an individual or other external entity. The onus of determining innovativeness falls to the individual perceiver as well as to the entity intending to embrace the innovation — the unit of adoption — as having deemed value to the innovation. This provides for an internal or proximal association to the perceiver. Rogers goes on to state it is of little consequence whether or not an idea is, in fact, new since its first use or discovery over time. The external or distal objectivity allows for validation of the innovation for the individual purpose. Rogers concludes by suggesting that individualization of perception regarding "newness" will determine the individual's reaction. Hence, there is a dynamic interaction between the internal perception and affirmation of the innovation, and the external validation and the consequent reaction — thus setting into motion perhaps yet another innovation. This circular pattern of perception, internalization, reaction, action, and perception seems to provide a template for the process of initiating innovation. In fact, Kostoff (2003) resonates with Boyer (1997) when he states that innovation is characterized as "discovery of previously unknown information, discovery and synthesis of publicly available knowledge whose independent segments have not

been combined and/or invented" (p. 388). Boyer's counterparts to Kostoff's categories include the scholarship of discovery and the scholarship of integration. Boyer states "knowledge is acquired through research, through synthesis, through practice and through teaching" (p. 24). Hence, this progression from research to teaching exemplifies the connectivity of innovation and the need for assessment of its outcomes.

Distal Innovation

Shavinina (2003) suggests that innovation and discoveries are central to human culture, echoing of collaborative definition of innovation advanced by Hauschildt (2003), who posits, "the success of innovation is to a great extent dependent upon the activities and abilities of individuals who enthusiastically support the new product or process" (p. 804). Hauschildt referred to these individuals as champions and promoters.

Parallels to teacher education can be easily drawn. First, innovation and discovery are embedded in the teaching and learning process in the culture of education. Second, both the teachers and students actively and intimately engage in collaboration with the curricula that address standards. Third, as champions and promoters, school administrators and parents advance the efforts of the teachers as they conduct action research and implement data-driven instruction in their classes to create instructional innovation.

Proximal and Distal Confluence

A 20th century innovator (inventor of the geodesic dome, for example), R. Buckminster Fuller (1981), described innovations in various industries such as ship building, architecture, and copper mining. He noticed that when half of the industries in a specific area have adopted an innovation, it stops being an innovation and enters a new phase. His notion is based on the distinctions between new practice and accepted practice wherein the majority of an industry is using that method. Thus, an innovation would have to be anything that hasn't reached 50% industry penetration. Generalizing this definition to teacher education, an innovative practice in teacher education would remain an innovation until at least half of the industry has adopted the innovation. In other words, if we make a distinction between teacher education researchers' standard practices and teacher education implementers' standard practices, half of the researchers in teacher education would need to adopt the innovation and half of the implementers would have to adopt it before it would enter the next phase of accepted or standard practice where the majority of the industry has adopted the method. For public school innovations, similarly: half of the schools must adopt it. Within a specific school, half of the faculty and staff would have to adopt it.

Admittedly, this definition is daunting, but it could provide a framework to explain differences of opinion about various innovations. Consider constructivist

pedagogical approaches. If you are a teacher education researcher, for example, you may have the experience that 50% of the researcher colleagues whom you know have adopted the practices of constructivist research. In comparison, other colleagues might be teacher educators who use constructivist practices and notice that less than 50% of their school of education faculty do NOT practice this method of teacher education research. Nor is it being implemented by 50% of the faculty in the local area public schools. Thus, in their experience, constructivism remains an innovation.

Another example might be the teaching practices associated with cooperative group learning. Many professors in university teacher education may still practice only one method of teaching, e.g., lecture. For them, cooperative group learning in higher education is an innovative way to teach, sometimes requiring them to engage in professional development activities to learn how to use it effectively. David and Roger Johnson (2002) indicate that it can take between two and three years of conscious practice to become proficient in using cooperative group learning so as to gain the research promise of increased achievement, increased cohesiveness among members of the class, and increased social interaction and even acceptance among people with diverse opinions, ethnicities, and so on. In spite of research-based evidence attesting to these desirable outcomes, cooperative group learning remains an innovation, because it has not reached 50% industry penetration in either university or public school teaching. There are many such examples of innovation in teacher education that have yet to achieve the 50% market penetration standard: professional development schools, teaching with educational technology, use of self-study, inquiry-as-stance, service-learning, socio-cultural pedagogical approaches.

Bailey and Ford (2003) presented a situational definition of innovation by stating, "innovation occurs when individuals produce novel solutions and members of the relevant domain adopt it as valuable variations of current practice" (p. 248). This phenomenon illustrates that the interdisciplinary nature of some innovations may be advanced by one discipline (e.g., engineering) and adopted by another (e.g., special education). The Kurtzweil assistive technology for populations who are deaf is one example.

Borrowing from an international business model, Hajimanolis (2003) defined innovation as "the search for and the discovery, development, improvement, adoption and commercialization of new processes, new products and new organizational structure and procedures" (p. 559). The No Child Left Behind Act of 2001 seems to enjoy the subcomponents of innovation in that, through innovative practices, a reformed organization structure can emerge for schools and colleges of teacher education to address the status of classroom practitioners as highly qualified teachers.

Taxonomies of Innovation

The literature is replete with components, types, and elements of innovation. The various categories further advance the notion that innovation is subjective to

internal and external validation. Sternberg, Pretz, and Kaufman (2003) suggest eight types of innovations based on Sternberg's propulsion model of creative innovations. The eight types of innovations include "replication, redefinition, forward incrementation, advance forward incrimination, redirection, reconstruction, re-initiation and integration" (p. 159). Teacher education innovations presented in this issue reflect this taxonomy. For example, innovation through integration can be seen in this issue in Teemant's application of socio-cultural theory to a bilingual distance education program. The innovation of reconstruction is highlighted in this issue by Whittaker, McDonald, and Markowitz, who reconstruct multicultural pedagogy to create new ways of providing instruction. In this issue the innovation of advance forward incrementation is evidenced in Sindelar, Bishop, Brownell, Rosenberg, and Connelly wherein special education teacher preparation is examined and projected in successive studies to provide viable and defensible avenues for future research.

In contrast, Robertson (1971) suggests three types of innovation: continuous innovation, dynamic innovation, and discontinuous. Continuous innovation in teacher education would include program revisions based on student outcomes assessment as recommended in this issue by Hall, Nowinski, and Smith and by Sindelar, Bishop, Brownell, Rosenberg, and Connelly and as practiced by Wong and Glass as well as Karayan and Gathercoal. Dynamic innovation is exemplified by data-based triangulation of assessments gathered from students, instructors, and field-based constituents for the purpose of program development and/or modification such as the research reported in this issue by Donnell and Harper as well as Wong and Glass. Finally, discontinuous innovation supports individual faculty efforts, perhaps through program improvement grants to produce innovation for a specific area, such as the study in this issue by McClintock, O'Brien, and Jiang in mathematics education. Moreover, the taxonomy of innovations in teacher education featured in this issue include collaborative partnerships (Sindelar et al.; Teemant; Wong & Glass; McClintock et al.); professional development schools (Wong & Glass); integration of technology (Karayan & Gathercoal; Teemant); standards-based teacher education (Hall, Nowinski, & Smith); data-based professional development (Teemant; Wong & Glass; Whittaker et al.); alternative certification (Sindelar et al); graduate follow-up programs (Whittaker et al.); teacher recruitment and induction (Wong & Glass). In addition, the topic of teacher education reform and accountability is addressed by all authors.

The Process of Innovation

Goldsmith and Foxall (2003) refer to the "innovative process by which new things, ideas and practices are created" (p. 322). Gassmann and Zedtwitz (2003) propose two phases to innovation — the pre-project phase and the discipline focus phase. In this issue, a two-step process is reflected in the work by Wong and Glass,

Karayan and Gathercoal, and Teemant, who report a pilot and/or pre-project phase prior to implementation and assessment.

Caravannis, Gonzalez, and Wetter (2003) proposed four dimensions in innovation — process, content, context, and impact. Such a continuum of innovation would support a singular and additive approach to assessment. An example of process assessment in teacher education could involve the assessment of cooperative learning strategies utilized in k-12 settings. This is a singular, targeted assessment. The four dimensions come under programmatic scrutiny in terms of accreditation assessment or program review (as suggested in the comprehensive framework for assessment of innovation described by Hall, Nowinski, and Smith in this issue). Marinova and Phillimore (2003) relate innovation as a creative process engaging a variety of activities, participants, and interactions. They suggest an evolutionary flow where innovation can be conceptualized as emerging from a black box model in which only the input and output are of concern to a linear progression of development where the process is precious. The interactive approach suggests a synthesis position where both process and product are valued.

Finally, a systems approach to innovation provides more permeability. This evolution parallels various approaches to innovation in classroom management where the behavioral approach underscores conditioned stimuli and response, problem solving highlights a linear approach to solution generation, psychodynamic perspective exemplifies the interactive innovation, and systemic innovation for management would be consistent with the assertive discipline school-wide approach to management. The role of an "innovative milieu" is emphasized, as well, where general knowledge is coupled with specific competencies. This seems to encapsulate the progression of preservice to inservice programs in teacher education wherein general knowledge serves as a co-requisite to practice teaching. Once independence is achieved, further specific competencies are needed to address the diverse learning needs of students.

Hajimanolis (2003) identified barriers to innovation from external, internal, and structural forces. External barriers may include a lack of immediate interest in topic or shifting priorities. The National Science Foundation and Office of Special Education, for example, have shifted priorities for funding innovative responses to national significance areas. Internal barriers can include competing organizational needs or lack of alignment with the mission of the organization. Finally, structural forces may create barriers through bureaucratic quagmires.

The Assessment of Innovation

Once an innovation has been identified by definition or through the process of its creation, a process for assessment can be proposed; Goldsmith and Foxall (2003) forward such a process when they note, "the way in which innovation is measured depends upon the intentions of the researcher and the conception of

innovativeness that is driving his/her work" (p. 321). In essence, Goldsmith and Foxall suggest that a reason for assessment would be to acquire a greater understanding of the innovation, perhaps in a metacognitive fashion. Teacher educators and teacher practitioners engage in this form of reflective assessment through informal and formal appraisal of innovative teaching and learning practices.

There is the problem of designing studies that assess or measure the impact of the innovation on the faculty and teachers as well as on the k-12 students who are involved in implementing the innovation. The researchers featured in this themed issue incorporated various levels of analysis in the method to document the impact of the innovation. In this issue, a macro level review of research and practice is emphasized by Sindelar, Bishop, Brownell, Roenberg, and Connelly, whereas Teemant evaluates innovative theoretical framework of socio-cultural pedagogy. Program units of analysis are represented by Wong and Glass as well as Karayan and Gathercoal. Evaluating the impact of the innovation at the professor or course level are Donnell and Harper; McClintock, O'Brien, and Jiang; Olafson, Quinn, and Hall; Sandholtz; Whittaker, McDonald, and Markowitz.

A review of the tables of contents of *Teacher Education Quarterly* from 1990 to the present was conducted to determine the number of publications that addressed "assessment of innovation." The authors found that there were no articles with titles that indicated an emphasis on assessing innovation. Assessment appeared frequently related to program evaluation, student teaching, and student achievement, course evaluation and faculty evaluations, to mention a few. When the word "innovation" was searched alone, the review revealed no articles with the word innovation in the title. There were, to be sure, articles that implied innovation through similar words, such as "reform," "revolution," "reconstruction," "new approach," "a fresh look," that might presumably match Rogers' (1995) definition of innovation or align with one of Sternberg's (2003) categories of innovation.

Implications for Teacher Educators

The thrust of the articles included in this special issue coincidentally address recent concerns about the nature of educational research that echo the concerns about assessment of innovation in teacher education. Burkhardt and Schoenfeld (2003) noted that "educational research does not often lead directly to practical advances, although it provides useful information, insights, and ideas for improvement" (p. 3). In this issue, Sandholtz speaks to this through her analysis of teaching and teacher education through the documented work of students, whereas Hall et al. and Sindelar et al. focus on improvement through their insights from assessment of their studies.

Burkhardt and Schoenfeld (2003) raised another concern that emphasized the notion that "research could be more useful if its structure and organization were better linked to the practical needs of the educational system" (p. 3). In this issue,

Hall, Nowinski, and Smith and Teemant discuss system-wide implications of innovations in teacher education; Sindelar, Bishop, Brownell, Rosenberg, and Connelly illuminate the special problems that special education teacher educators face when implementing and assessing innovations. Innovations such as Professional Development Schools, voluntary school field experiences, and service-learning are represented in this issue in the work by Wong and Glass, McClintock, O'Brien, and Jiang, and Karayan and Gathercoal, respectively. Olafson, Quinn, and Hall, also in this issue, utilized a concerns-theory framework for assessment that provides feedback to the organization and therefore can lead to organizational changes, while Donnell and Harper conducted an inquiry into the competing tensions within the multiple organizations of teacher education. All of these researchers reported how their findings informed revisions or modifications to their respective preservice teacher education programs.

Burkhardt and Schoenfeld (2003) claim that "the research-based development of tools and processes for use by practitioners is largely missing in education. This is essential to building strong linkages between research-based insights and improved practices" (p. 3). In this themed issue, however, many researchers provide evidence that there *is* a healthy and thriving connection between practitioners who implement research-based insights to improve their practice. Karayan and Gathercoal describe an assessment practice that utilizes a technology-based system to monitor and evaluate service-learning outcomes. Teemant assesses the impact of socio-cultural components embedded in distance learning activities. Sandholtz; Donnell and Harper; and Whittaker, McDonald, and Markowitz all describe how critical analyses of student work can serve as a tool for analyzing the effectiveness of university pedagogy as well as teacher candidates. In terms of a process for assessing innovation, King (2003) advises that "the question of 'what is innovation?' is not one to be answered in the abstract prior to commencing research, but should itself be a key focus of innovation research" (p. 620).

Burkhardt and Schoenfeld (2003) imply that "educational research does not often lead directly to practical advances, although it provides useful information, insights, and ideas for improvement. There must be much closer coordination of effort between research, design, development, policy, and practice" (p. 3). With a template established for identifying innovation and corresponding taxonomies for assessment, these linkages can be fortified for individual and community innovations.

The assessment of innovation appears to be a novel, or can it be said, an innovative notion. The entire empirical enterprise includes both a product and process and a proximal-distal orientation. The notion incorporates a singular yet unique definition for the purpose of delineating both assessment and innovation. Once the definition is solidified, it will serve as the product. Further, the process must include a conceptual framework to serve as a template against which to measure curricular and programmatic outcomes. This process continues to rejuvenate it through the various and innovative iterations of new educational researchers

entering the process. Thus, the challenge is available to all teacher educators in all venues of education to assess their practices according to a defensible rubric that will determine its innovativeness.

The results of this themed issue can lead to the formulation of a robust mechanism to move from research to practice, for example, by establishing rigorous and consistent norms for research methods to assess innovation in teacher education as well as for reporting results. Finally, Goldsmith and Foxall (2003) suggest that the purpose of measuring the impact of an innovation is "to enlist the cooperation of innovators in redefining and improving new products" (p. 323). To that end, this issue of *Teacher Education Quarterly* challenges innovators and assessors to cooperate in reorganizing the landscape of teacher education.

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