
Analyzing Reasons for Non-adoption of Distance Delivery Formats in Occupational Therapy Assistant (OTA) Education

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Abstract

Though distance education formats could help address an urgent need for growth in the occupational therapy assistant (OTA) workforce, distance methods are not as accepted in these programs as they are in other professional and clinical programs. This study investigated whether beliefs and levels of experience of OTA program directors shaped their views about whether OTA knowledge and skills can effectively be taught at a distance. Results suggested that directors believe cognitive skills can be more effectively taught at a distance than can psychomotor skills, but directors' levels of experience with distance education did not influence their views. Implications for future research and professional development in OTA are discussed.

Purpose of the Study

Need for Distance Education in OTA

Current shortages of OT practitioners have been documented and are projected to increase in the future (Fisher & Keehn, 2007; Powell, Kanny, & Ciol, 2008). Between 1990 and 2006, an aging trend was observed for both OTs and OTAs, with an increase in median age from 36 to 42 and from 33 to 45, respectively (Metzler & Thomas, 2006). In 2006, the time of the last Occupational Therapy Workforce and Compensation Report, the 50- to 59-year-old age group had reached an all-time high (Metzler & Thomas, 2006). Metzler and Thomas concluded that a significant shortage of OT practitioners would be imminent without a reversal in this trend, due, in large part, to the expected retirement of aging therapists.

After a study of workforce needs and issues in occupational and physical therapy, Fisher and Keehn (2007) concluded that a shortage of OT and physical-therapy practitioners did exist and that the shortage was not solely a function of a reduction in supply of providers but also due to an increase in demand for OT and physical-therapy services. In a statement presented to the U.S. Senate Committee on Health, Education, Labor and Pensions, representatives of the AOTA (2008) reiterated concerns about future shortages of OT practitioners as they lobbied for support of higher education.

Distance education has been identified as a way to address the shortage of practitioners in OT and other health-related professions (Talbert, 2009). In the Fisher and Keehn (2007) survey, respondents perceived the shortage of occupational and physical therapists to be more severe in rural than in suburban or urban areas. Lack of accessibility to educational programs was offered as an explanation for this finding. The geographical distribution of existing OTA programs appears to support this premise; in 2010–2011, of the 160 existing OTA programs, only 13% were located in the Southwest and 7% in the West (AOTA, 2011). Expansion of existing, high-quality programs was deemed a more efficient means of increasing

numbers of therapists in comparison to the development of new programs, according to the respondents in the Fisher and Keehn survey.

Unclear Reasons for Nonadoption of Distance Formats

Enrollment in OT and OTA programs is often restricted by student-to-faculty ratio, availability of physical classroom and laboratory space, and availability of clinical fieldwork placements. Expansion of traditional face-to-face educational programs would require additional faculty and physical, material, and clinical resources, which might be impractical, if not impossible. Distance education has been widely used in curricula for orientation and mobility specialists, medical students, pharmacists, physician's assistants, nurses, radiological technologists, social workers, and other members of the health-care team (Ajuwon & Craig, 2007; King, Smith, & Mathews., 2006; Legg, Adelman, & Levitt, 2009; Perlman, Weston, & Gisel, 2008; Richardson, MacRae, Schwartz, Bankston, & Kosten, 2008; Rosenkoetter, 2007; Siebert, Siebert, & Spaulding-Givens, 2006). Though distance education would seem to be a logical option to meet the workforce demands for therapy personnel, survey results and observations from professionals in the occupational therapy (OT) field indicate that OT educators do not accept the viability of distance education (DE) to the same extent as other professional programs.

Data from the most recent annual survey by the American Occupational Therapy Association (AOTA, 2011) of accredited OT and OTA programs accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) showed that adoption of distance education in OT and OTA programs has been limited and sporadic. According to the most recent *Academic Program Annual Data Report* (AOTA, 2011), 0–10% of course work was offered in an online format for 81% of all master's degree programs for OTs and 76% of the accredited OTA programs. Forty-three percent of OTA programs had no distance-delivery component (AOTA, 2011). Of those programs reporting a distance-education component, less than 15% offered more than 20% of instruction from a distance (AOTA, 2011). Therefore, 85% of the OTA programs that used distance-delivery methods were doing so for 20% or less of their course offerings. It is apparent that OTA educators are not embracing distance options with the same enthusiasm as educators in other professional programs. The professional literature has provided no thorough description of current practice regarding the use of distance formats for content delivery in OTA education, and available information lacks sufficient detail to describe adequately how OTA programs are using distance formats or why such formats might not be as popular as in other clinical programs.

Study Focuses

Since reasons for lack of distance learning acceptance in OTA were unclear, the purpose of this study was to identify and explain the reasons that program directors either embrace or reject distance delivery formats for OTA education. It was hypothesized that adoption or non-adoption might be explained by differences in belief systems about the ability of distance methods to be applied equally well to teaching cognitive vs. psychomotor content. To ascertain reasons for adoption or non-adoption of distance delivery in OTA programs, the study focused on the following questions:

- To what extent are OTA programs using various distance delivery formats?
- Do OTA directors beliefs reflect significant differences as to the types of skills (cognitive vs. psychomotor) that can be effectively taught using an online delivery format?
- Are beliefs about the effectiveness of online delivery formats for OTA course content related to amount of directors' experience with online teaching and learning?

Which distance delivery formats are used in OTA programs? Although AOTA surveys provide a general overview of distance formats used in OTA education, results do not differentiate between the type of distance formats used; also, the data lack sufficient detail to describe the type of course content that is taught at a distance. In light of the absence of information on the extent and type of distance formats currently used in OTA education, it was deemed important to ascertain more detailed baseline data in this area.

What types of skills can be taught at a distance? While many educators agree that skills in the cognitive learning domain can be effectively taught from a distance, a more controversial issue is whether

affective, psychomotor, or interpersonal skills can be effectively taught equally well from a distance (Bernard et al., 2004; Hollis & Madill, 2006; Mawn, Varrico, Charuk, Stote, & Lawrence, 2011; Miller, 2010; Mosalanejad, Shahsavari, Sobhanian, Dastpak, 2012; Rosenkoetter, 2007; Simonson, Smaldino, Albright, & Zvacek, 2009; Williams, 2006; Zhao, Lei, Lai, & Tan, 2005). It is possible that it is this controversy that is influencing program directors to avoid distance formats.

What factors shape directors' beliefs about distance education? Diffusion of innovation research has suggested that perceptions about attributes of innovations can predict adoption behavior (Rogers, 2003). These perceived attributes are “relative advantage, compatibility, complexity, trialability, and observability” (p. 221). Trialability is the ability of the potential adopter to observe the innovation and experience the innovation first-hand, and observability is the degree to which innovation results are visible to others. Both these aspects have been associated with increased adoption rates. Directors of OTA programs may be hesitant to incorporate distance formats into their educational programs if they have not personally experienced or witnessed the effectiveness of appropriately-designed distance courses.

Background and Theoretical Framework

Background

Research findings support the effectiveness of DE methods for both academic and clinical education components in allied health and social work (Coe Regan & Youn, 2008; Jedlicka, Brown, Bunch, & Jaffe, 2002; King, Smith, & Mathews, 2006; Siebert, Siebert, & Spaulding-Givens, 2006; Williams, 2006). Numerous studies have documented the use and effectiveness of DE for many professional degrees, including those in OT (Jedlicka et al., 2002; King et al., 2006; Simonson et al., 2009; Trujillo, 2007). However, some professionals in the allied health sciences and related disciplines have questioned whether DE is appropriate in courses with clinical education components (Coe Regan & Youn, 2008; Rosenkoetter, 2007). Data from the most recent Accreditation Council for Occupational Therapy Education (ACOTE) annual survey of accredited OT and OTA programs by the show that adoption of DE in OT and OTA programs is limited and sporadic (AOTA, 2009). Since the literature reflects opinions that at least some clinical content cannot or should not be taught at a distance, more needs to be known about why program directors have adopted these beliefs.

Theoretical Framework

This study hypothesized that there may be differences in the beliefs and perceptions of adopters versus non-adopters of DE methods as to what can be effectively taught at a distance. This hypothesis attends to three prominent education theories: those of Bloom (1956), Clark (1983, 2001), and Rogers (2003). Bloom (1956) categorized learning domains as cognitive, affective, and psychomotor (Krathwohl, Bloom, & Masia, 1971; Simpson, 1972). The cognitive domain has been sub-classified into lower levels (knowledge, comprehension, and application) and higher levels (analysis, synthesis, and evaluation) (Bloom, 1956). The affective domain includes the values, attitudes, and beliefs shared by members of a profession (Hollis & Madill, 2006; Odhabi, 2007). Hands-on laboratory experience is the standard method of providing learning activities that address psychomotor skill development. The psychomotor learning domain involves action of a neuromuscular nature (Simpson, 1972). Psychomotor skills, such as those required for patient assessment or training, are especially critical in the fields of nursing and allied health science disciplines (Nottingham & Verscheure, 2010). In allied health science educational programs, these types of skills have traditionally been taught through face-to-face interaction between the instructor and the student.

If, as Clark (1983, 2001) maintains, it is the instructional design rather than the medium that determines teaching and learning effectiveness, there should be no difference in the potential for students to learn cognitive, affective, psychomotor, and interpersonal skills needed for their chosen profession through web-based instruction. Furthermore, given the pervasive findings of no significant difference among learning outcomes for distance versus face-to-face students, the apparent bias among educators against DE seems unfounded. However, program directors' lack of experience with these technologies through what Rogers (2003) referred to as “trialability and observability” may shape perceptions of the benefits (termed “relative advantage” by Rogers) of DE methods.

Study Methods

Setting and Participants

The target population for this study was OTA program directors throughout the U.S. There were 145 accredited OTA programs in the U.S. as of the spring 2011 meeting of the ACOTE (A. Grigsby, personal communication, April 25, 2011). All program directors were invited to participate in the study, and nearly 75% chose to do so. The unusually high response rate indicated that the topic was of special interest to OTA directors.

Materials and Instruments

Since no existing instrument covered the content of interest in this study, a survey was designed to obtain information about directors' perceptions about using distance delivery formats for OTA education. In addition to collecting demographic data, the instrument was designed to identify potential differences in beliefs about teaching content that is cognitive-based versus content with psychomotor qualities. Therefore, 40 statements of skills (20 cognitive and 20 psychomotor) selected by OTA experts were presented to participants. Each item had a 5-point Likert-type scale with response options of *strongly disagree*, *disagree*, *uncertain*, *agree*, and *strongly agree*. OTA directors were asked to respond by selecting how much they agreed each skill could be effectively taught at a distance. The instrument was posted on an online site for easy access by OTA directors.

Procedures

Steps to carry out the study included survey development and validation, field testing, and data collection and analysis. Survey development and validation procedures included establishing content validity by subject matter experts who evaluate the extent to which survey items accurately represent the area under investigation (Creswell, 2008; Litwin, 2003). For the purposes of this study, valid items had to describe skills that OTA directors would see as (a) necessary to teach in OTA programs and (b) clearly representing cognitive and psychomotor domains. Expert opinions were solicited to identify the types of psychomotor and cognitive skills required of entry-level OTAs in common practice settings. First, practicing OT and OTAs were given Krathwohl et al.'s (1971) definition of psychomotor skills and asked to cite 5-10 examples of psychomotor skills required by OTAs in practice settings. The resulting list contained 40 psychomotor skills associated with the following activities: (a) measurements (n=17), (b) management of equipment or the environment (n=8), (c) patient handling and transfers (n=9), and (d) fabrication of equipment or devices (n=6). The same procedure was followed to derive cognitive skill examples. The resulting 40 cognitive skills were associated with the following activities: (a) measurements and assessments (n=11), (b) treatment and interventions (n=20), and (c) professional behaviors (n=9).

Therapists were again given definitions for psychomotor and cognitive skills and asked to label the domain of learning represented by each of the randomly-ordered and unlabeled lists of 80 OTA skills. Those with agreement from all or nearly all therapists were selected for inclusion on the survey. After validated items were selected, the study instrument (including appropriate demographic questions) was created with an online survey site's template and field-tested with four OTA educators. In addition to review for content validity, the educators were asked to provide feedback about the length of time to complete the survey and the presence of confusing or ambiguous survey items. Appropriate revisions were made to the instrument on the basis of their feedback. Finally, OTA directors were solicited via the AOTA program directors electronic listserv. The organization sent follow-up emails until the completion rate exceeded 70%. Response rates over 70% are considered to be representative of the population (Wiersma & Jurs, 2008).

Study Findings

Results on Delivery Formats Used in OTA Programs

Of the 107 program-director participants, 59 (55%) reported using some type of distance learning in the program. The most frequently-used distance format used in OTA education is blended/hybrid (32.2%)

followed by web-facilitated (22%). Only one respondent reported using a completely-online delivery format. The remaining 26 programs (44%) use a combination of DE formats. Use of multiple types of DE formats that included blended/hybrid formats were reported by 40 directors (67.8%). Thirty-five directors (59.3%) reported use of multiple DE formats that included web-facilitated formats. Directors from 15 programs (25.4%) reported use of multiple DE formats, including asynchronous or synchronous technologies. Blended/hybrid formats, used alone or in combination with another format, are the most common method for teaching OTA students at a distance in programs that incorporate DE technologies.

Results on Beliefs About Types of Skills That Can be Taught at a Distance

A related-samples Wilcoxon signed-rank test was used to test the null hypothesis that there were no differences between median values for the sums of Likert response scores related to beliefs about the type of skills (cognitive and psychomotor) that can effectively be taught at a distance. Significant differences in the median ranks for cognitive and psychomotor skills were identified ($p = .00$). Mean scores for cognitive ($M = 69.9$, $SD = 15.4$) and psychomotor ($M = 51.8$, $SD = 19.9$) skills suggests that program directors are significantly more likely to agree that cognitive skills can be effectively taught at a distance than can psychomotor skills.

Results on Impact of Distance Learning Experience on Beliefs

A Kruskal-Wallis test for independent samples was used to determine whether or not level of experience with DE influenced beliefs about the effectiveness of DE with cognitive and psychomotor skills. Scores across each of the two types of items were summed, and Kruskal-Wallis tests were done to test the null hypothesis that there were no significant differences in median scores among groups with three levels of DE experience (low, moderate, and high). Results for cognitive skills, $X^2(2, N = 107) p = .52$ and psychomotor skills, $X^2(2, N = 107) p = 1.509$ indicated no link between DE experience and beliefs about teaching either kind of OTA skills at a distance. Since 63% of directors had little or no DE experience, lack of variability within the group might have contributed to this finding.

Discussion of Findings

Use of DE Formats in OTA Education

Only 55% of survey respondents reported using some type of online format for OTA education. If this percentage is accurate, it represents about the same results as those reported in the *Academic Program Annual Data Report* for 2010–2011 (AOTA, 2009). The AOTA (2011) report from 2010–2011 indicated that about 57% of OTA programs used some degree of distance learning, which was up slightly from the 51% found in the 2008-2009 report. The annual survey of accredited OT and OTA programs requests estimates of the amount of programming that is offered at a distance but is not designed to gather information about the specific types of online formats used. Furthermore, the accuracy of findings from the AOTA (2009, 2011) annual reports and this survey is dependent upon shared agreement and understanding of the definitions of DE as well as the specific delivery formats. Comments from participants suggested that the terms are not universally understood, even when accompanied by operational definitions. If the findings are viewed as accurate, it would appear that the study's findings are in keeping with those of the AOTA's most recent report.

One reason for the expanded use of online delivery formats since 2009 could be related to the "innovation-decision process" described by Rogers (2003, p. 168). Although the impetus for adoption of online formats in OTA education is unclear, at least some directors seem to possess the decision-making authority within their institutions to implement distance-education initiatives. If the assumption that decisions to incorporate online formats are made by the directors of OTA programs is valid, it is important to explore the factors that influence adoption and nonadoption. The number of programs reporting DE use is still somewhat low when compared to nursing and many other clinical programs.

Beliefs about Effectiveness of DE for Teaching Cognitive and Psychomotor Skills

Faculty perceptions, attitudes, and beliefs have been shown to impact adoption of online delivery methods for education (Dillon & Walsh, 1992; Schulte, 2010). Attitudes and beliefs may be made on

misconceptions about the quality or effectiveness of DE (Ulmer, Watson, & Derby, 2007) and are perpetuated by those who equate media with instructional method. Responses from directors alluded to the impact of personal beliefs on adoption.

Data indicated that directors believed cognitive skills can be taught more effectively at a distance than psychomotor skills. Although the survey instrument was designed to contain an equal number of skills experts labeled as cognitive or psychomotor, the instrument did not explicitly label them as such. Directors were asked only to report their beliefs about whether or not each skill could be effectively taught at a distance. One factor that might have influenced results for this research question was an apparent difficulty considering teaching effectiveness in isolation from the assessment of learned skills and the belief that, although skills can be taught and learned at a distance, they cannot be assessed that way. Results supported previous findings of bias against teaching (or assessing) psychomotor skills at a distance (Coe Regan & Youn, 2008; Rosenkoetter, 2007).

The literature from nursing and allied health science has described traditional methods for teaching clinical skills in the psychomotor domain of learning. These instructional methods typically consist of preparatory readings, skill demonstration, criterion-based checklists for individual skill components, supervised and unsupervised practice, and feedback. There appears to be consensus that acquisition of psychomotor skills cannot occur in the absence of practice and feedback (Bertoti, 2004; Dick, Carey, & Carey, 2009; Gagné, 1985; Winters, Hauck, Riggs, Clawson, & Collins, 2003). There is also evidence from the literature that a bias exists against the teaching of psychomotor skills at a distance (Rosenkoetter, 2007). It is, therefore, relevant to consider whether each of the traditional instructional methods for the teaching of psychomotor skills could be adapted for delivery to students at a distance.

The first of the traditional methods, preparatory readings, does not require the physical presence of an instructor. Preparatory readings often occur in solitude prior to a face-to-face meeting between instructor and students and are therefore not dependent on the instructional delivery system. The second method, skill demonstration, may be performed by any experienced practitioner. Videos are often used to illustrate clinical skills, have been shown to be an effective method of instruction (Baldwin, Hill, & Hanson, 1991; Lashley, 2005; Winters et al., 2003), and may be viewed synchronously or asynchronously at a distance. The third instructional method, provision of criterion-based checklists for competent skill performance, can be distributed electronically as attachments, embedded into a course website, or accessed through an active hyperlink.

Practice is the fourth component of instructional design for psychomotor skills. Practice of psychomotor skills can occur in isolation or in group settings. The literature has suggested that skill practice generally occurs in the presence of other students and an instructor. Two-way audio-video technology can connect individual or groups of students with an instructor for synchronous practice sessions (Simonson et al., 2009). Feedback is the final component of teaching and learning of psychomotor skills. Two sources of feedback provide learners with knowledge of performance and results (Bertoti, 2004). Intrinsic feedback is learner generated, whereas the source for extrinsic feedback is external to the learner. Because intrinsic feedback arises from learners' sensory systems and internal cognitive processes, it is not influenced by distance. Extrinsic feedback associated with psychomotor-skill development is commonly given by an instructor or lab assistant but also may be given by peers. Distance communication between instructor and students for provision of extrinsic feedback is possible through two-way audio-video technology but may lack the spatial detail necessary for complex analyses of psychomotor skill performance. To address this challenge, White (2010) developed a "low-cost stereographic video capture and viewing solution" (p. 420). However, further research is needed in this area.

Relationship between DE Experience and Beliefs

A comparison of overall perceptions of groups with varying amounts of distance-education experience did not reveal significant differences about skills that can effectively be taught at a distance. The research by Tabata and Johnsrud (2008) and Ulmer et al. (2007) provided support for the positive influence of Rogers's (2003) attribute of trialability on adoption of distance-education technologies. In consideration of these studies, the finding of no relationship between distance-education experience and beliefs about effectiveness in the OTA directors was unexpected. The finding could be explained by the relative

homogeneity of the target population. Whereas previous investigations of the relationship between faculty experience with DE and attitudes toward DE drew from multiple disciplines, the current study looked at attitudes of directors of OTA programs. Openness to DE may be less influenced by trialability and more influenced by the attribute of compatibility, the extent to which an innovation is viewed as consistent with values and pedagogical beliefs of the members of the professional.

Conclusion

Study results indicate that much work must be done before distance methods are as accepted in OTA programs as they are in other professional and clinical programs. Parker and Burkhardt (2010) recently challenged educators to evaluate and modify instructional methods to address the needs of online learners. However, no published literature has been identified providing guidelines for directors who have implemented or wish to implement distance-education technologies within OTA programs, and current study results indicate that many OTA directors lack experience that would help them identify distance-education best practices.

More Professional Development in Distance Education Capabilities

Curriculum delivered in a traditional face-to-face format has been characterized by discrete courses within an organizing “conceptual framework” (Ryan, Carlton, & Ali, 2004, p. 74). Curriculum in the context of DE has been redefined as “interactions among students and between student and faculty with the purpose of learning” (Shovein, Huston, Fox, & Damazo, 2005, p. 342). This shift necessitates a reconsideration of the role of faculty in the teaching-and-learning process. In the new paradigm, instructors are coaches or facilitators rather than authority figures or knowledge dispensers (McGee & Begg, 2008; Ryan et al., 2004).

The Commission on Education, a standing commission of the Representative Assembly of the AOTA, drafts policies and other official documents related to education. While existing Commission on Education documents address the “philosophy of occupational therapy education” (Haynes & Jones, 2007, p. 678) and “specialized knowledge and skills of occupational therapy educators of the future” (Commission on Education, 2009, p. 281), there are no position papers or publications to guide best practice for face-to-face, blended, or online teaching of future OT practitioners. The Education Special Interest Section of AOTA did publish a newsletter in 2010 that featured three articles relevant to online teaching (Burkhardt & Parker, 2010). The AOTA’s Future of Education ad hoc committee recently established a research agenda that includes pedagogy, capacity, competency, resources, professional socialization, instructional methods, and conceptual frameworks. The Commission on Education, the Education Special Interest Section, and the Future of Education committee are well positioned to further evidence-based practice in the use of DE in OTA education and thus could play a key role in filling this knowledge gap. These groups could seek to identify faculty who are currently using DE delivery, actively solicit participation of these educators to engage in research, and disseminate findings to ensure and improve the quality of online instruction in OTA.

Results of this study also indicated that many OTA personnel were unaware of instructional and assessment practices that could make DE useful for teaching any kind of OTA skills. Targeted professional development in distance-education best practices would promote informed use of DE throughout the field. Professional development that focuses on knowledge of current and effective educational practices in OTA education can place directors in a position to engage in informed dialogue with administration and to guide decision-making about the use of distance-education delivery formats within their programs.

Concerns about obstacles associated with DE must be addressed if educators are to adopt the use of distance delivery formats. It is understood that some faculty will resist and may even refuse to teach in an online environment. For educators who are simply reluctant, incentives such as release time or stipends may prompt them to explore distance-delivery formats. Mentoring relationships could be established between experienced and novice distance-education faculty. Hands-on training workshops followed by real-time technical support are recommended to provide faculty with foundation skills in the use of distance-education tools.

Directions for Future Research

Results of the study pointed to the need for additional research in six specific areas: (a) descriptive studies of the use of DE and online delivery formats in OTA education; (b) the impact of faculty attitudes, values, skills, and knowledge on adoption of DE; (c) aspects of instructional design and assessment of distance-education courses; (d) beliefs of educators about teaching content representative of the affective and interpersonal domains of learning; (e) the use of distance-education formats to teach psychomotor skills in allied-health-science disciplines; and (f) other influences on adoption behavior for the use of DE in OTA education.

The field of OT has been and will continue to be affected by trends in higher education. There is a clear shift toward web-based learning environments as technology becomes more sophisticated (Coe Regan & Youn, 2008; Joosten, 2012; Means, Toyama, Murphy, Bakia, & Jones, 2010; Radford & Weko, 2011). These trends extend to the delivery of health care in the form of telehealth and telemedicine (King et al., 2006). It is imperative that educators of OTA and other allied-health-science students recognize and adapt to trends in DE afforded by rapidly-evolving technologies.

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