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SELF-DIRECTED LEARNING READINESS AND SELF-DETERMINATION FOR SELECTED REHABILITATION PROFESSIONAL STUDENTS: THE IMPACT OF CLINICAL EDUCATION

Shelley S. Payne, Peter Rundquist, William V. Harper, Julie Gahimer

In a time of rapidly changing medical information, practitioners must have learning skills that enable them to be effective life-long learners. A part of an examination of a final clinical internship for rehabilitation professionals was a pre-post measure of learner self-direction and self-determination. Two instruments, the Self-Directed Learning Readiness Scale (SDLRS) and the Academic Motivation Scale (AMS- reported as Self-Determination Index (SDI) were used with a sample of Doctorate of Physical Therapy (DPT) and Master of Occupational Therapy (MOT) students. Pre-testing occurred just prior to and post-testing just after the subjects' final clinical assignments. Both groups increased mean scores from pre- to post-test for the SDLRS ($p = .01$, mean increase 7.29) and the SDI ($p = .01$, mean increase 0.91). Results of this study support the use of the SDLRS and AMS as means to evaluate self-directed learning readiness and self-determination in rehabilitation professional students.

In the world of higher education, it is commonplace to find lifelong learning within the mission statements of the institution. Additionally, in the ever-changing world of healthcare, it is imperative the education of medical professionals prepare these students with the ability to be self-directed in their learning (Simon & Aschenbrener, 2005). The American Physical Therapy Association's (APTA) Vision 2020 states in part: "Guided by integrity, life-long learning, and a commitment to comprehensive and accessible health programs for all people, physical therapists and physical therapist assistants will render evidence-based services throughout the continuum of care and improve quality of life for society" (APTA, 2012). The American Occupational Therapy Association (AOTA) as part of their accreditation standards for entry-level occupational therapists states, "A graduate from an ACOTE-accredited master's-degree-level occupational therapy program must be prepared to be a lifelong learner and keep current with evidence-based professional practice (AOTA, 2011, p. 2).

Background

Clearly, the focus of both professional organizations is to develop practitioners who are well suited to practice evidence-based care, deliver the highest quality of care to

those in their service, and are prepared to be lifelong learners. The physical therapy and occupational therapy professions have lobbied for and achieved increased autonomy for practitioners within the healthcare arena. However, with this autonomy comes an increased responsibility to consumers that these practitioners will adapt their practice to constantly changing evidence and standards of care as they are established.

Self-Directed Learning Readiness

Professionals who are charged with making autonomous healthcare decisions must be armed with the skills to formulate their own professional learning goals, assess their knowledge needs, and carry out a learning plan to achieve the desired outcomes (Healy, 2008; Huynh et al., 2009; Shokar, Shokar, Romero, & Bulik, 2002). This skill set is often described as self-directed learning readiness (SDLR) (Guglielmino, 1978; Huynh et al., 2009; Kell, 2006; O'Shea, 2003). Knowles (1975) performed much of the early work in adult learning theory; he defined self-directed learning (SDL) as "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (p. 18). The skills associated with the concept of self-directed learning will enable students armed with those skills to successfully meet the demands of a constantly changing profession (Healey, 2008). The instrument that has been used most widely in medical and educational research to measure SDLR is Guglielmino's (1978) Self-Directed Learning Readiness Scale (SDLRS) (Linares, 1999; Merriam, Caffarella, & Baumgartner, 2007; Shokar et al., 2002).

Huynh et al. (2009) used a self-directed learning readiness tool developed for nursing students to evaluate the SDLR of doctor of pharmacy (PharmD) students before and after their advanced pharmacy practice experiences (APPEs). Although 74% of the PharmD students in the study achieved a score that indicated a high level of readiness for self-directed learning, no significant difference was found between the mean scores of the students for SDLR prior to and after completing their APPEs. Another study of PharmD students (Slaughter, 2009), using the original SDLRS (Guglielmino, 1978) found PharmD students with above average SDLRS scores to have higher on-time graduation rates and higher GPAs than students with Low/Below Average or High SDLRS scores (Slaughter, 2009). No studies were found that evaluated the impact of clinical education on the learner profile development of physical therapy or occupational therapy students.

Only one study was identified to examine the SDLR of PT and OT students. Linares compared the SDLR scores of students and faculty in nursing, physical therapy, occupational therapy, physician assistant, and medical technology programs (Linares, 1999). All students in the various programs were highly self-directed except the OT and PT students. Only 22.6% of the OT and 38.7% of the PT students had high SDLRS scores. The author did not specifically cite a rationale for this finding other than to say that the group with the highest level of self-directed learning readiness was the nursing group and they also had the highest mean age. In this study the subjects who were highly self-directed were older than those with an average or low level of self-directed learning readiness.

Academic Motivation

It has been established that students learn and more fully understand new information when their motivation for learning is intrinsic rather than extrinsic (Vanteenkiste, Simons, Lens, Sheldon, & Deci, 2004). Academic motivation is a psychological concept in education that relates to curiosity, persistence, learning, and performance (Vallerand, Pelletier, & Blais, 1992). Intrinsic motivation is the drive to pursue an activity for the pleasure or satisfaction derived from the activity itself. Extrinsic motivation, on the other hand, involves pursuing an activity out of a sense of obligation or as a means to an end (Fairchild, Horst, Finney, & Barron, 2005). Robert Vallerand developed the Academic Motivation Scale (AMS) in 1989 to establish whether individuals are driven by intrinsic or extrinsic motivation in their academic pursuits (Vallerand et al., 1992). The AMS was developed using the constructs surrounding the self-determination theory established by Deci and Ryan (2002).

Academic motivation is a learning variable that has been investigated as a construct relating to academic success and an aptitude for life-long learning (Vallerand et al., 1992). In a study that examined motivation and its relationship to learning with medical students, the AMS was administered to four consecutive classes of medical students. The medical students with a stronger intrinsic motivation for learning scored significantly higher during their clerkship assessment than did students with more extrinsic motivation (Sobral, 2004). Additionally, in a study investigating the various reasons allied health students believe they are attending college, Ballman and Mueller (2008) administered the AMS to 222 upperclassmen and graduate students. The most frequent motivational styles in these allied health students were extrinsic in nature. In order to represent the AMS scores as a mark on a continuum anchored by intrinsic motivation and extrinsic motivation, some researchers report the results as a single motivation index called the Self-Determination Index (SDI) (Deci & Ryan, 2002, p. 47). The range of scores on the SDI is from -18 to +18 with a mean score of 10 (Hegarty, 2010). The higher a participant scores, the more intrinsically motivated that individual is purported to be. A more recent study conducted with graduate education and business students reported results on the AMS using the Self-Determination Index and found the mean SDI score of these graduate students to be 7.30 (Hegarty, 2010).

Clinical Experiences in Medical Preparation Programs

The final clinical experiences that are a part of the entry-level PT and OT educational programs are meant to be the capstone experience for both PT and OT students. These clinical affiliations afford students the opportunity to work closely with a clinical instructor (CI) to formulate learning goals based upon the student's strengths and weaknesses as an emerging clinician. Clinical education is the time in which students are placed into a practice environment, supervised by professionals within their chosen field of study, and practice their evaluation and treatment skills on actual patients, in real settings. The clinical experience gives students the opportunity to receive critical feedback regarding their skills from a clinical instructor and is a time in the educational program rich in opportunities for the development of self-directed learning readiness. Although there has been a shift in healthcare education to strategies focused upon developing learning skills and strategies that promote deep levels of understanding and professional attitudes within students, there is a shortage of literature that examines the

impact of the clinical education on student learning and the development of self-directed learning readiness or self-determination (Healey, 2008; Linares, 1999; Shokar et al., 2002).

As part of the self-study and program evaluation required by accrediting bodies, academic programs may desire to measure whether professional schools of physical therapy (PT) and occupational therapy (OT) are adequately preparing students with regard to self-directed learning readiness (SDLR) and self-determination at different points within the professional curriculum. This study was designed to examine the self-directed learning readiness and self-determination of DPT and MOT students just prior to initiation of their final clinical experience and then again at the completion of the final clinical experience.

Purpose

The purposes of this study were to determine if there was a difference in the SDLRS or SDI scores of Doctorate of Physical Therapy (DPT) and Master of Occupational Therapy (MOT) students after the final clinical education experience and to determine if there was a difference in self-directed learning readiness and self-determination between DPT and MOT students. The primary hypothesis was that there would be a change in the SDLRS and SDI scores for DPT and/or MOT students after their final clinical education experience. A second hypothesis was that there would be no significant difference between DPT and MOT students in pre-test or post-test scores for the same variables.

Methods

Subjects

In order to be included in this prospective, longitudinal study, students had to be classified as third year DPT students or second year MOT students at the time of data collection at one of the two comparison institutions selected for this study. The entry-level degree for the PT students at each institution was the Doctorate of Physical Therapy (DPT) while the entry level degree for the OT students at both universities was the Master of Occupational Therapy (MOT). Internal Review Board approval was obtained from both universities. Informed consent was obtained from all participants.

Instruments

Self-Directed Learning Readiness Scale (SDLRS). The SDLRS is a 58 item self-report instrument that uses a 5 point Likert scale scoring for each item. When administered, this instrument is identified as the Learning Preference Assessment (Guglielmino, 2010). Many validation studies of the SDLRS can be found in the literature (Delayhay, 1995; Long & Agyekum, 1983). The maximum score for the SDLRS is 290. The average score for adults completing the SDLRS questionnaire is 214 and the standard deviation is 25.59. The SDLRS measures current level of readiness for self-directed learning. The extensive validation work that has been completed using this instrument has established a mean score of 227 on the SDLRS as the target for the individual being “highly self-directed” (Guglielmino, 2010).

Academic Motivation Scale (AMS). The Academic Motivation Scale is composed of 28 items assessed on a 7-point scale. Validation studies of the Academic Motivation Scale provide support for the distinction between the broader concepts of intrinsic and extrinsic motivation (Vallerand et al., 1992; Cokley, 2000). Reporting the results of the AMS as the Self-Determination Index (SDI) offers the advantage of “a significant reduction of variables needed to represent the different types of motivation at a given level” (Deci & Ryan, 2002, p. 47).

Procedure

Students who signed the informed consent document and agreed to participate in the study were given an assessment packet approximately one month prior to their final clinical experiences. The assessment packet contained a copy of the SDLRS and AMS, which required approximately 20 minutes to complete. All subjects were assigned a three-digit identification number for tracking at post-test. Subjects completed the post-test within one month of finishing their final clinical experiences.

Data Analysis

Data analysis was performed using the Statistical Package for the Social Sciences 17.0 (SPSS 17.0), Chicago, IL. In order to combine the institutions to evaluate the data by profession, it was necessary to establish that there was not a significant difference between DPT and MOT students for SDLRS mean scores and the SDI scores at the individual institutions. Dependent variables (SDLRS and SDI scores) were analyzed for significant differences between individual programs at both pre-test and post-test using an independent t-test and Kruskal-Wallis H test. Using the combined data from the institutions, a 2 group x 2 time mixed model ANOVA was used to analyze the dependent variables (SDLRS and SDI scores) between professions and for change across time. The alpha level was set at .05 for all statistical analyses.

Results

Out of a possible 140 potential participants, one hundred individuals agreed to participate in this study and completed the pre-test and post-test for a response rate of 71%. Subject information regarding profession and subject gender is provided in Table 1.

Table 1. *Demographics*

	Female	Male	Total
DPT	43	19	62
MOT	36	2	38
TOTAL	79	21	100

There was no significant difference between the SDLRS or SDI scores of the DPT students and MOT students at the individual institutions; therefore, the data were combined to allow for comparison of DPT and MOT students, regardless of institution. The combined data were analyzed to determine if a statistical difference existed between

MOT and DPT students for mean scores on the SDLRS or SDI at pre-test and post-test. Descriptive statistics for the mean scores of the SDLRS by profession are provided in Table 2.

Table 2. *Descriptive Statistics for the SDLRS and AMS (reported as the SDI) before and after the Final Clinical Experience for Physical Therapy (DPT) and Occupational Therapy (MOT) Students.*

	DPT Mean (SD)	MOT Mean (SD)
PreTest SDLRS ^a	224.29 (17.59)	220.60 (21.25)
PostTest SDLRS	231.58 (18.02)	225.08 (22.40)
PreTest SDI ^b	12.76 (2.01)	12.69 (2.01)
PostTest SDI	13.28 (1.97)	13.60 (1.76)
^a Self-Directed Learning Readiness Scale		
^b Self-Determination Index		

There was no group by time interaction ($p = .313$) in the SDLRS or SDI ($p = .330$) ANOVA (Table 3) indicating no significant change in the relationship between the scores of DPT and MOT students over time. There were no significant differences in self-directed learning or self-determination between DPT and MOT students at pre-test or post-test. However, results of the ANOVA did support a significant difference ($p < .001$) between the pre-test and post-test scores for both DPT and MOT students with each instrument (Table 3). The effect size for the SDLRS was $d = 0.022$ and the effect size for the SDI was $d = 0.032$. According to Cohen (1988), this is a small effect.

Table 3. *Results of the Mixed Model ANOVA*

	df	Mean Square	F	Significance
PrePost mean	1	1630.26	17.92	.001*
PrePost mean* by profession	1	93.46	1.03	.313
PrePost SDI mean	1	23.94	12.93	.001*
PrePost SDI* by profession	1	1.77	.96	.330
*Significant at $p \leq .05$				

The difference between groups for pre-test and post-test SDLRS sample mean scores was not significant. Both groups did demonstrate an increase in the SDLRS mean scores from pre-test to post-test (Fig. 1) and an increase in SDI scores from pre-test to post-test (Fig. 2).

Discussion

This study examined the impact of the final clinical experience and the self-directed learning readiness and self-determination for physical therapy and occupational

therapy students enrolled in an entry-level educational program. The hypothesis that there would be a significant difference in student scores on the SDLRS and the SDI

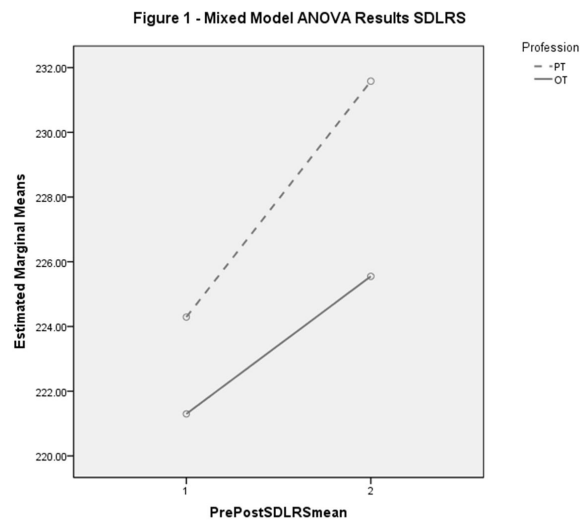


Figure 1. *Results of the mixed model ANOVA representing the SDLRS scores between groups and over time.*

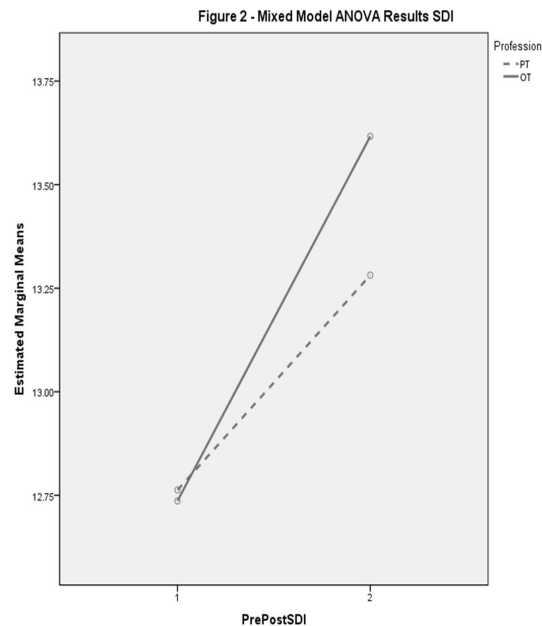


Figure 2. *Results of the mixed model ANOVA representing the SDI scores between groups and over time.*

before and after the students' final clinical experiences was supported. Both DPT and MOT students were found to have a statistically significant increase in their mean SDLRS and SDI scores following the completion of the final clinical affiliation or fieldwork. The results of this study are consistent with the null hypothesis of no statistical difference between DPT and MOT students for their mean SDLRS scores at

pre-test or post-test. No significant group by time interaction was revealed for this sample of professional students.

In order for educators to structure curricula to meet the entry-level educational standards set forth by accrediting bodies, they must evaluate students in a variety of ways. National certification exams ensure that students have obtained a satisfactory mastery of content knowledge to perform as safe and effective practitioners. Educational programs must show evidence that the students have achieved competence in performing the psychomotor skills necessary for their profession. Measures such as GPA, certification exams, and clinical performance tools represent a student's skill and knowledge at a given point in time. Measures that further describe the learning profile of young professionals can provide insight to the capacity that these students may have to continue to learn.

The final clinical experience represents the opportunity for entry-level DPT and MOT students to integrate their coursework and apply their skills in a real-life setting. The clinical environment also affords students the opportunity to self-evaluate their learning needs, and in conjunction with their clinical instructor, formulate learning goals, identify appropriate resources for learning, and evaluate their learning outcomes as related directly to the care of their patients. This is the very definition of self-directed learning. This study supported that the curricular programs at the entry-level DPT and MOT programs sampled are adequately preparing their students with regard to self-directed learning readiness. The pre-test SDLRS scores for the DPT and MOT students indicated that both groups were "average" in self-directed learning as compared to other adult learners. Both groups improved significantly for the SDLRS at post-test, indicating that the final clinical experience improves self-directed learning readiness for DPT and MOT students. The post-test mean values for the DPT group moved their level of self-directed learning readiness to "above average" (Guglielmino, 2010).

Linares (1999) surveyed nursing and other healthcare students using the SDLRS. This study included a sample of PT ($n = 31$) and OT ($n = 31$) students. Linares did not report mean values on the SDLRS, but the highest percentage of PT and OT students in that study were categorized as having average self-directed learning readiness. The mean SDLRS scores in the current study were lower at pre-test and post-test for both OT and PT students than the mean value of 235.81 reported for medical students (Shokar et al., 2002). However, the mean SDLRS scores in this study were higher than those reported by Kell and Van Deursen (2002) in their longitudinal analysis of one PT program. Huynh et al. (2009) utilized a modified version of the SDLRS previously used in the nursing literature to evaluate the impact of the advanced pharmacy practice experiences on self-directed learning readiness of 47 PharmD students. In contrast to the results of this study, Huynh and colleagues found no significant difference in the self-directed learning readiness of the pharmacy students after their clinical experiences.

The self-determination index (SDI) scores in this study increased from pre-test to post-test for both the DPT and MOT students. Improved SDI scores indicate that the students became more self-determined in their levels of academic motivation and thus progressed toward a higher level of intrinsic motivation. Once again, there was no significant difference between DPT and MOT students for levels of academic motivation. The mean values for the DPT and MOT students were higher than the mean value of 7.30 reported for graduate business and education students (Hegarty, 2010).

Overall, the results of this study support clinical education as a vital component to the development of self-directed learning readiness for entry-level DPT and MOT students. It appears that opportunities to identify what they did or did not know as the students evaluated and treated patients served to increase DPT and MOT student's readiness for self-directed learning. This study has relevance to physical therapy and occupational therapy educators for curriculum evaluation and for supportive data to accrediting bodies.

Perhaps the biggest limitation of this study is the reliance upon a self-report measure for data. The DPT group was also larger than the MOT group and this may have improved the chances of finding statistical significance within the DPT group for all variables. Data were collected from two institutions and therefore, the data may not be generalizable beyond these institutions. Also, as with any test-retest design, the improvement in SDLRS or SDI scores may have been due to time and maturity of the students rather than the influence of the clinical education experience.

A suggestion for future research is a longitudinal analysis of SDLRS or SDI scores at various points within the curriculum. It may also be useful to correlate the SDLRS or SDI score to student GPA or certification exam pass rates to provide educators with increased insight to areas that could be targeted for improvement with individual students. In addition, these measurement tools could be of value as a means to evaluate more student-centered pedagogies that mimic the clinical environment and the decision-making that appeared to improve the SDLR and SDI of subjects in this study.

This study supported the clinical education experience as a component of the curriculum that improves the self-directed learning readiness and self-determination of entry-level DPT and MOT students. Inventories such as the SDLRS and the AMS may provide educators with an improved perspective on the learning needs of their students and the methods best suited to developing lifelong learning skills within those students.

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