

## Self-directed Learning: Looking at Outcomes With Medical Students

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**Background and Objectives:** *Self-directed learning (SDL) skills are thought to be associated with lifelong learning. This study assessed the degree of readiness for SDL in third-year medical students who participated in a problem-based learning (PBL) curriculum during the first 2 years of medical school. Methods:* A total of 182 third-year medical students at the University of Texas Medical Branch at Galveston were given the Self-directed Learning Readiness Scale (SDLRS). **Results:** *The observed mean (235.81 [range 183–284]) for the combined group was significantly higher than the mean reported for general adult learners (214), though slightly lower than scores reported in studies of other medical students and professionals. Ratings of students by clinical preceptors correlated with SDLRS scores. Conclusions:* *Students in our integrated medical curriculum had scores on the SDLRS that correlated with clinical performance and probably represented a readiness for SDL.*

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Self-directed learning (SDL) has become a central theme in adult education, as evidenced by meta-analyses, critical reviews of research, and an annual international symposium devoted solely to research on SDL, along with millions of “hits” on this topic on Internet sites.<sup>1</sup> In the medical profession, the ability to direct and regulate one’s own learning experience is crucial to success.<sup>2</sup> SDL skills, which are associated with lifelong learning,<sup>3</sup> are particularly important in the medical field, where knowledge is continuously changing and advancing, and dealing with novelty is an important aspect of patient encounters.

Research evidence indicates that student participation in problem-based learning (PBL) curricula leads to use of SDL skills,<sup>4</sup> and some medical schools have designated specific desired outcomes of SDL to their curriculum in an effort to capture this concept of lifelong learning. The ACME-TRI Report<sup>6</sup> included reference to skills associated with SDL as it identified the following: “Faculty members’ first goal should be to

foster their students’ lifelong learning by helping them develop their learning skills.”

In 1998, The University of Texas Medical Branch at Galveston (UTMB) moved away from teaching medical students with a traditional lecture-based approach to an integrated medical curriculum (IMC) that emphasized interdisciplinary, small-group SDL. The overall goals for the IMC, based on those promulgated by the Association of American Medical Colleges (AAMC), have been adopted by the UTMB School of Medicine faculty: (1) to produce knowledgeable physicians, (2) to produce skillful physicians, (3) to produce physicians possessing professional attitudes, and (4) to produce physicians committed to lifelong learning.

The intent of the IMC is to provide a student-centered, self-directed learning environment with an emphasis on linking learning to clinical cases. The IMC organizes students into small, problem-based learning groups of six to eight students; a physician is assigned as a facilitator. Subsequently, as students enter their third and fourth years of medical school and focus more on clinical training, they are introduced to new approaches to learning; students learn from direct observation of their preceptors and through one-to-one teaching in clinical settings. Even though SDL is an expected

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outcome of PBL in the first 2 years of medical school, loss of a group facilitator (and the group itself) changes the dynamics of learning during the third- and fourth-year clinical rotations. Consequently, experiential learning at a preceptor's office or clinic is only one aspect of the clinical rotation—textbooks, journals, and Web-based cases and other Internet resources are other kinds of opportunities for learning the curriculum. During these third- and fourth-year rotations, where clinical experiences are the dominant learning model, any one experiential learning opportunity will infrequently be duplicated for subsequent learners. All medical students, therefore, need to proactively take control of their own learning to enhance weak areas of content knowledge, self-identified through individual reflection and in dialogue with clinical faculty/practitioners.

According to the theoretical underpinnings of PBL and the IMC, students will achieve the best educational outcomes from the clinical opportunities in the third and fourth years of medical school if they are prepared to be self-directed learners during their clinical rotations. Consequently, this study was undertaken to determine if there is a correlation between the grades received on various performance indicators at the conclusion of their third-year rotation and scores on a Self-directed Learning Readiness Scale (SDLRS)<sup>5</sup> and to identify correlations between SDLRS scores and third-year medical students' clinical evaluations.

## Methods

### *Study Purpose*

The overall purpose of this study was to establish if third-year medical students at UTMB are more self-directed than average in their approach to learning, as measured by Guglielmino's SDLRS<sup>5</sup> using the national mean score of general adult learners (214) for that instrument as the reference average score. The second purpose was to see if there were any correlations between student scores on the SDLRS and measures of performance while on two of the students' required third-year rotations: family medicine (FM) and the multidisciplinary ambulatory clerkship (MAC). MAC is a 12-week outpatient experience for third-year medical students that involves family medicine, internal medicine, and pediatrics at community sites throughout the state.

### *The Instrument*

The SDLRS, a self-report instrument, is a Likert-style scale with five response options. It has become the most widely used instrument for the assessment of readiness for SDL and is now translated into several foreign languages.<sup>7</sup> In a factor analysis, Guglielmino reported that eight constructs are measured in the SDLRS: (1) openness to learning opportunities, (2) self-concept as an effective learner, (3) initiative and

independence in learning, (4) informed acceptance of responsibility for one's own learning, (5) love of learning, (6) creativity, (7) positive orientation to the future, and (8) ability to use basic study and problem-solving skills. In developing the instrument, Guglielmino used a three-round Delphi technique to obtain a consensus on the characteristics of the self-directed learner from 14 leaders in adult education. The instrument is reported to have a .94 Pearson split-half reliability<sup>8</sup> and a Cronbach-alpha reliability coefficient of .87.<sup>5</sup> Many validation studies of the SDLRS can be found in the literature.<sup>9</sup>

Most researchers who use the SDLRS report a range of scores with distributions that approximate the bell-shaped curve. McCune, Guglielmino, and Garcia conducted a meta-analytic investigation of 10 years of research using the SDLRS on various adult learner populations and found a mean of 227.7 and range of 62 points from low to high scores (n=4,596).<sup>9</sup> When the SDLRS was used in adult professional education programs, the results were slightly higher. A study in 1999 reported a mean score of 244.16 for third-year medical students (n=75) at a school of osteopathic medicine.<sup>10</sup> Scores on the SDLRS for mid-level business managers in Illinois (n=607) and Florida (n=36) had reported group means of 234 and 235, respectively.<sup>11</sup> Scores reported for nursing students also have a group mean (234.77) higher than the general adult learner population on which the instrument was normed.<sup>12</sup>

### *The Sample*

To answer the research question posed in this study, the SDLRS was administered monthly to students as they participated in the orientation to their third-year FM clerkship. The FM clerkship is a 4-week, community-based learning experience and is one of seven required courses in the third year of medical school. Twelve groups (n=182) of approximately 13–18 students begin the clerkship each month. Over the course of 1 year, we administered the SDLRS to 12 groups of students. Students arrive on Monday morning for a half-day orientation and are then sent out to their various clinical assignments across the state.

### *Data Collection and Analysis*

The group's mean score on the SDLRS was compared to the obtained mean of 214 for general adult learners, and a *t* test was performed.

Scores from the two clerkships included the FM grade, which is composed of a preceptor evaluation and the clinical performance exam, and the MAC grade, which is composed of a preceptor grade (a composite of the three separate specialty evaluations), an objective structured clinical exam (OSCE), and a written exam score.

The FM preceptors used a standard evaluation form,<sup>13</sup> which was a 26-item Likert scale covering the areas of patient evaluation, patient management, communication skills, learning skills, and professionalism. The MAC preceptors used a 28-item standard evaluation form<sup>14</sup> covering the areas of clinical skills, knowledge, and attitudes/professionalism.

The relationship between the SDLRS score and the five constituent scores and final grades was examined by performing a Pearson correlation.

**Results**

The results of the SDLRS for all third-year medical students indicated that, as a group, they are more self-directed than the general adult learner population.

Using an  $\alpha$  of .01, the observed mean for the combined group of 235.81 (SD=19.99) was significantly higher than the obtained mean for general adult learners of 214,  $t(166)=14.1$  ( $P<.001$ ). The scores for this study ranged from 183 to 284, with 19 students (11%) scoring lower than the national norm of 214 for the SDLRS. There was no significant difference in the SDLRS scores of students who completed the SDLRS early in their third year of training, compared with those who did so later in the year (Table 1).

There was a positive correlation among the SDLRS score and the final clerkship grades and each of its constituent components. However, it was the clinical preceptor score for both the FM clerkship and the MAC that yielded the most impressive correlation, a coefficient of .26 and .24, respectively, that reached statistical significance ( $P<.01$ ). The results are summarized in Table 2.

**Discussion**

The main findings of our study were that our IMC students scored higher as a measurement of readiness for self-directed learning and that this readiness is associated with clinical clerkship scores. It appears to be the rating by the FM and MAC clinical preceptor that is most discriminating of students who have higher or lower SDLRS scores. Traditional assessment methods (written and clinical exams) measure only a snapshot of content knowledge, whereas the SDLRS predominantly looks at the learning process—and the preceptor grade may reflect a combination of both a student’s content knowledge and learning process and, therefore, be a more-reliable indicator of the students’ readiness to learn and of future quality patient care.

Curry’s concerns about SDL focus on what she calls learning style “outliers.”<sup>15</sup> Students who appear to fall short of program expectations may be experiencing a mismatch between their learning style and the instructor’s teaching style.<sup>15</sup> In the SDLRS survey results presented above, there were 30 student scores below the 10th and above the 90th percentile—these out-

Table 1

SDLRS Scores: Third-year Medical Students, by Period

	#	Mean
Period 1	18	233.89
Period 2	18	231.61
Period 3	16	244.19
Period 4	14	233.93
Period 5	15	245.40
Period 6	13	228.00
Period 7	15	239.60
Period 8	17	244.06
Period 9	14	236.64
Period 10	14	223.64
Period 11	13	229.85
Period 12	15	231.07
Totals	182	235.42

SDLRS—Self-directed Learning Readiness Scale

lier scores represent a potential mismatch between student learning style and instructor teaching style. We anticipate that the majority of students near the group mean (or the center of the bell-shaped curve) will adapt to a range of teaching styles. However, students with scores at either extreme may find adjusting to certain learning environments more problematic.

A number of years ago, Grow argued that SDL skills could be purposely integrated into the curriculum through a staged planning model.<sup>16</sup> Likewise, Candy notes that “. . . self-directed learning—especially of discipline-based knowledge—calls on attitudes, skills, and knowledge that can be intentionally developed through planned educational interventions.”<sup>3</sup> Diaz and Berk have also argued that learners who seem to be lacking in SDL skills are not innately unable to exhibit or master these behaviors; rather, they are

Table 2

Pearson Correlation With SDLRS Score

FM SCORES			MAC SCORES			
Clinical Exam	Preceptor Evaluation	Final Grade	Written	OSCE	Preceptor Evaluation	Final Grade
.084	.251**	.092	.074	.07	.242**	.173*

SDLRS—Self-directed Learning Readiness Scale  
 FM—family medicine  
 MAC—multidisciplinary ambulatory clerkship  
 OSCE—objective structured clinical exam

\*  $P<.05$   
 \*\*  $P<.01$

simply not given the opportunity to do so.<sup>17</sup> Similarly, Fitzgerald said that technical skills and knowledge can be taught within a context that encourages critical thinking and self-directed learning.<sup>18</sup>

In addition to our research, it is our personal observation and experience that students exposed to a PBL curriculum exhibited SDL skills by taking greater initiative and control of their learning activities during the third-year family medicine clerkship. Additionally, they displayed a greater enthusiasm at the start of the clinical rotation and were often quick to inform their preceptors of the type of cases that they had or had not seen within the clinic, thereby identifying learning issues and learning needs more efficiently and effectively. They asked more questions, and they were more likely to spontaneously read extra material or look up resources while in the clinic, thus proactively enhancing their own learning process. They were also more likely to arrange the requisite home visit using the personnel and resources available. It is also our observation and experience that these students and clinical preceptors had a more enjoyable interaction over the duration of the rotation.

It is not possible at this stage to accurately define the value of SDLRS for predicting the success of our students or the outcome of the IMC. Therefore, further research and more data are needed over subsequent years. Indeed, our students, while scoring higher than the average population of adult learners, did not score as high as medical students in other studies.<sup>10</sup> It will be necessary to study the correlation of SDLRS scores with both the US Medical Licensure Examination step 1 and 2 scores and with other medical school clerkship evaluations before definitive major conclusions can be drawn. It will also be necessary to study learners' performance through residency training and future clinical practice to see if any predictive value of the SDLRS can be established.

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