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RESEARCH ARTICLES

Development and Validation of the Pharmacists' Inventory of Learning Styles (PILS)

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Objectives. To develop and establish the validity and reliability of a learning styles instrument specific to pharmacy practice and education.

Methods. Focus group workshops of 40 practicing pharmacists were held to determine the core constructs of a pharmacy-specific learning style tool. Both a theoretical model and 18-item inventory of learning styles were developed, validated and field-tested. Instrument reliability and validity were assessed.

Results. The Pharmacists' Inventory of Learning Styles (PILS) demonstrated a high degree of reliability (Cronbach's alpha 0.85–0.90). Validity of the descriptors and adjectives used in defining learning styles was demonstrated as consistent with participants' self-assessments.

Conclusions. The PILS provides a unique pharmacist-specific model for defining, describing, and measuring learning styles. The development process modeled for this particular tool is broadly applicable to other situations in educational research and can be readily applied.

Keywords: Pharmacy education, learning styles, learning preferences, teaching and learning

BACKGROUND

Learning and development are a central part of the human experience, yet professional educators often stumble when asked the seemingly straightforward question, "how do people learn?"[1] Sociologists, developmentalists, psychologists, and economists will all offer differing explanations about the process of learning. Indeed, no standard definition of "learning" even exists. As one author pointed out:

> We use the same word 'learning' for simple association, or classical conditioning (which almost all animals can do), for learning by trial and error (which many animals can do) and for learning by imitation (which almost none [other than humans] can do).[2]

That individual differences regarding learning processes exist is self-evident and a source of curiosity, frustration, and interest for most people. Learning by doing, learning by seeing, auditory learning, visual learning, and a host of other terms have been introduced to encapsulate the complexity of this phenomenon. The ways in which learning occurs have spawned significant interest in a wide variety of disciplines and generated numerous theories and models.[3] Various perspectives have been put forth that alternatively emphasize social structures, classroom dynamics, individual psychological factors, and power dimensions.[4]

An important stream of inquiry in learning theory is the notion of learning styles. Litzinger and Osif have described learning styles as "…the different ways in which children and adults think and learn."[5] Critical to their construct is the notion that individual psychological factors play a predominant role in governing an individual's learning. While these factors are subject to and shaped by a variety of other social influences, the individual's psycho-affective responses to learning stimuli primarily govern learning processes. This model is developmental in that it views the evolution of learning styles over time as a "…consistent set of behaviors or approaches to learning."[5] This consistent, predictable response pattern is based upon 3 major pillars:

- Cognition (the acquisition of information)
- Conceptualization (the processing of information)
- Motivation (the affective (ie, emotional, and values-based) component of learning)

Carl Jung is generally credited with the establishment of a distinct field of personality research in psy-

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chology.[6] His initial theories explored numerous aspects of human development and personality. A leading exponent of personality theory, Jung introduced the notions of intraversion and extraversion as one axis upon which personality formation occurs. Subsequently, his work evolved to introduce additional axes, such as thinking and feeling, and intuition and sensation.[7] Initially developed in the context of psychological and personality theory, this work has been widely accepted among educators. Best known among currently available instruments that utilize this theoretical framework is the Myers-Briggs Type Indicator (MBTI).[8] Though frequently used in managerial training as a tool for understanding and explaining individual differences in the workplace, it has also been used in educational settings to provide an opportunity for self-reflection regarding personal learning styles.[9-11] With a decades-long track record in a variety of settings, the MBTI is a reliable, valid, effective, generic tool for the identification of personality factors that may impact learning, work, and other interpersonal relationships.

Felder and Silverman have written on learning styles as they relate to students in technical disciplines such as engineering.[12] Pivotal to their work is the notion that students take in and process information in a variety of ways: seeing and hearing, reflecting and acting, reasoning logically and intuitively, analyzing and visualizing, consistently and periodically. Individual students will vary across these dimensions, and as they mature and develop, they will express more fixed preferences for specific modes of information intake and processing.

A critical insight of Felder and Silverman is the notion that, as learning styles vary, so too do teaching styles. While some instructors may demonstrate preferences for lecturing, others may prefer self-discovery techniques, discussion-based methods, or application activities. When mismatches exist between students' learning styles and instructors' teaching styles, boredom and disengagement may occur, which may lead to discouragement, poor classroom performance, and disciplinary issues. For instructors, unresponsive or hostile students coupled with poor attendance or other issues may result in alienation and an unusually critical attitude towards students, education, or young people in general.

The value of aligning learning and teaching styles has been discussed widely. Felder[13] (among others) has noted that such alignment does not imply that each student is to be taught exclusively to their personal learning preference; rather instructors must work towards balancing numerous teaching styles. When this balance is optimized, students will have an opportunity to learn in a style that they find most comfortable, thereby optimizing their willingness to learn.[14] Equally important, an opportunity to learn in a manner or style that may be somewhat less familiar or comfortable provides a platform for feedback, self-reflection, and personal growth. Such a balanced approach also engenders a willingness to "learn how to learn," a critical competency for fully effective professionals.

Gardner has approached the issue of learning styles and preferences from a behavioral perspective, focusing on the ways in which children (and adults) chose to participate in interpersonal and learning situations.[15] This "Multiple Intelligences" approach posits 7 primary ways in which environmental interaction and individual learning occur:

- Verbally/linguistically (through words)
- Logically/mathematically (through propositions and questions)
- Visual-Spatially (through images and pictures)
- Aurally/Rhythmically (through music)
- Kinesthetically (through movement and physical activity)
- Interpersonally (through social interaction)
- Intrapersonally (through independence or self-interaction)

The Multiple Intelligences approach provides a basis for explaining individual differences across a variety of dimensions and has been used extensively in managerial and educational sectors, particularly in the context of team-building activities.

A well-recognized and widely used tool, Kolb's Learning Style Inventory (LSI),[16] builds upon a broad theoretical foundation in learning sciences and psychology. Kolb's theory of learning styles posits 2 major axes or dimensions upon which learning preferences are constructed.[17] The horizontal axis is based on performance (or action) in relation to tasks, with anchors of "Doing" or "Reflecting." These anchors describe a person's immediate response to a new task or uncertain situation. The vertical axis is based on emotion and thought processes in relation to tasks, with anchors of "Experiencing" and "Thinking." Significantly, Kolb's focuses learning on the individual side of an individual-environment continuum. The intersection of these 2 axes produces 4 quadrants, each corresponding to a distinct, unique learning style (or learning preference):

1. concrete experience: being involved in a new experience
2. reflective observation: watching others or devel-

oping observations about one's own experience
3. abstract conceptualization: creating theories to explain observations
4. active experimentation: using theories to solve problems, make decisions

Initially, Kolb described these learning styles as a continuum, one that evolves over time until a stage where people come to rely upon (or "prefer") one style above all others. Kolb did not conceive of these learning styles as mutually exclusive or isolated. In different circumstances, people may demonstrate different learning styles; however, most people tend towards a stable, predictable approach to learning in new situations. Understanding one's preferences provides a basis for self-reflection and personal and/or professional development.

Kolb's model was developed and validated using comparative ratings across these domains, calculated using a sample of 1,446 adults (aged 18 to 60 years) with an average of 2 years beyond high school in formal education.[16] As such, the LSI is considered a generic tool with widespread applicability. Building upon Kolb's work, Hartman,[18] developed examples of how one might best align learning and teaching styles to optimize learning:

1. for the concrete experiencer, offer laboratories, field work, observations, or trigger films
2. for the reflective observer, use logs, journals, or brainstorming
3. for the abstract conceptualizer, lectures, papers, and analogies work well
4. for the active experimenter, offer simulations, case studies and homework

Work such as this has been widely cited in faculty development as an important reason for including a variety of methods in large-group teaching settings. By balancing various teaching methods, instructors may simultaneously play to learners' strengths, while encouraging them to broaden their repertoire of learning strategies.

Learning styles theory has been used both rigorously and casually in a variety of settings. Though different theories and models have been developed (a very small sample of which have been described above), the fundamental tenet of most learning styles theories is the notion that individuals differ in their approach to learning tasks and their responses to them. Specific axes and anchors are defined by specific theoretical frameworks, often derived from Jung's seminal work in personality psychology, but also from emerging areas of cognitive and behavioral research.

Applications of learning styles theory have been widely described, from use as a tool for structuring teams and study or work groups, to promotion of self-reflection. Within pharmacy education and practice, learning styles tools have been used as a vehicle to promote self-reflection among faculty members, instructors, preceptors, and students, to engineer small groups for problem-based learning tutorials, and to provide a basis for discussing interpersonal situations.[19,20]

Most frequently, commercially available tools (such as the LSI or the MBTI) are used by instructors interested in introducing learning styles theory to groups of students or instructors. These tools have the advantage of being rigorously developed and tested with demonstrable and acceptable validity and reliability. They also provide background information in an informative and accessible manner to participants without extensive backgrounds in education or psychology. As commercially available tools, there may be costs (ranging from $5 to $150 per person, depending upon the complexity of the tool and range of assessment services provided) associated with administration, as well as copyright issues. Consequently, such tools are particularly popular in private industry and in management and quality improvement circles. As a result of cost and copyright issues, they may be somewhat less accessible or available in not-for-profit, public sector, or education settings.

There is no unique learning-styles instrument that is available for pharmacists and pharmacy students. Tools currently used in pharmacy practice and education are generic and not specifically aimed at health care providers or pharmacists, or others with many years of post-high school education. In addition, some inventories used may require individuals to speculate about their own internal thoughts and emotions, rather than describe specific behaviors in specific circumstances. As generic tools, such inventories may provide a useful and interesting introduction to learning styles theories, but may not be as applicable or relevant due to their lack of grounding in a specific professional context.

To develop and establish the validity and reliability of learning styles instrument specific to pharmacy practice and education. As part of the development process, a construct-valid model of learning styles relevant to pharmacy practice was developed building on the psychological theories of Kolb and the work of Merritt and Marshall[21] in evaluating the reliability and construct validity of an inventory instrument.

Table 1. Relative Ranking of Learning Styles Dimensions for Pharmacists

Axial Dimension	Description of Continuum Extent to which…	Relative Ranking Index Score ($1/\Sigma_{(n)}$ x n)
Structured - Unstructured	environment in which learning occurs has clear outcomes and processes defined	0.62
Doing - Reflecting	individual prefers "trial and error"	0.57
Thinking - Acting	individual demonstrates bias to action	0.42
Observing - Trying	individual prefers first-hand vs. second-hand knowledge	0.42
Risk Averse - Risk Taking	individual is willing to act with incomplete information	0.40
Logic - Intuition	individual can work with ambiguity	0.39

METHODS

A multistage development process was used to optimize the integrity of the instrument. Stages in this process included:

- Recruitment of study participants;
- Focus groups to identify core constructs;
- Development and validation of theoretical model;
- Development and validation of instrument;
- Field testing of instrument and revisions; and
- Reliability and validity assessment of instrument.

Recruitment of Study Participants

A purposeful sample of 40 practicing pharmacists was recruited to participate in this study. These pharmacists were all involved in either clinical or university-based education of pharmacy students, and were all in active patient-care practice (in either community or hospital pharmacy). Participants were recruited based on their interest in pharmacy practice and education, their willingness to participate in educational research, and their ability to participate in this study on 3 separate occasions over a period of 12 to 18 mo. All participants had previously completed a learning styles workshop utilizing either the Kolb LSI instrument or a similar commercially available instrument (most frequently, the MBTI), to ensure previous exposure to and experience with basic notions of learning styles.

Focus Groups to Identify Core Constructs for Validity Testing

As described previously, learning styles tools may be premised on a variety of core constructs; for example, the Kolb LSI tool is based on 2 axes: performance (doing vs reflecting) and emotional/thought processes (experiencing vs thinking). To determine the core constructs of a pharmacy-specific learning styles tool, 3 focus group workshops were held with 10 to 15 participants in each group. Within each workshop, small groups worked together to review descriptions of learning style types provided in the LSI. Specifically, lists of adjectives and descriptors for each type were provided, and groups were asked to determine (through a consensual rather than majoritarian process) the extent to which these terms corresponded to their own performance and own emotions or thoughts. Next, participants were asked to examine adjectives and descriptors of all other learning style types provided in the LSI, and identify which adjectives and descriptors were applicable. Through a consensual process, each small group was asked to determine the 5 most relevant descriptors (adjectives), and the 5 least relevant descriptors (adjectives).

Following completion of the 3 focus group workshops, data was coded and categorized to develop alternative theoretical models for a learning styles structure for pharmacists. Based on this review, 6 independent axes (or dimensions) were identified as having saliency for pharmacists involved in education and practice. Each axis represents a continuum of thought or behavior. Of the 6 axes, only one (structured-unstructured) represented an environmental (ie, external, not internal) dimension of learning. The remaining 5 axes all represented internal (eg, personal or psychological) dimensions. A relative ranking index score was calculated as the reciprocal of the sum of individual rankings multiplied by the number of participants; scores closer to 1 indicated a higher relative importance for this dimension vis-à-vis the other dimensions. Of interest, this relative ranking index score indicated that participants felt the most significant determinant of learning style in pharmacy practice and education was the external dimension, with the remaining internal dimensions clustered together. Relative ranking of learning styles dimensions for pharmacists are presented in Table 1.

Following completion of the 3 focus group workshops, a fourth focus group consisting of 8 participants (all of whom had been participants in 1 of the previous 3 groups) was convened. This group reviewed the lists generated by the previous focus groups and consensual-

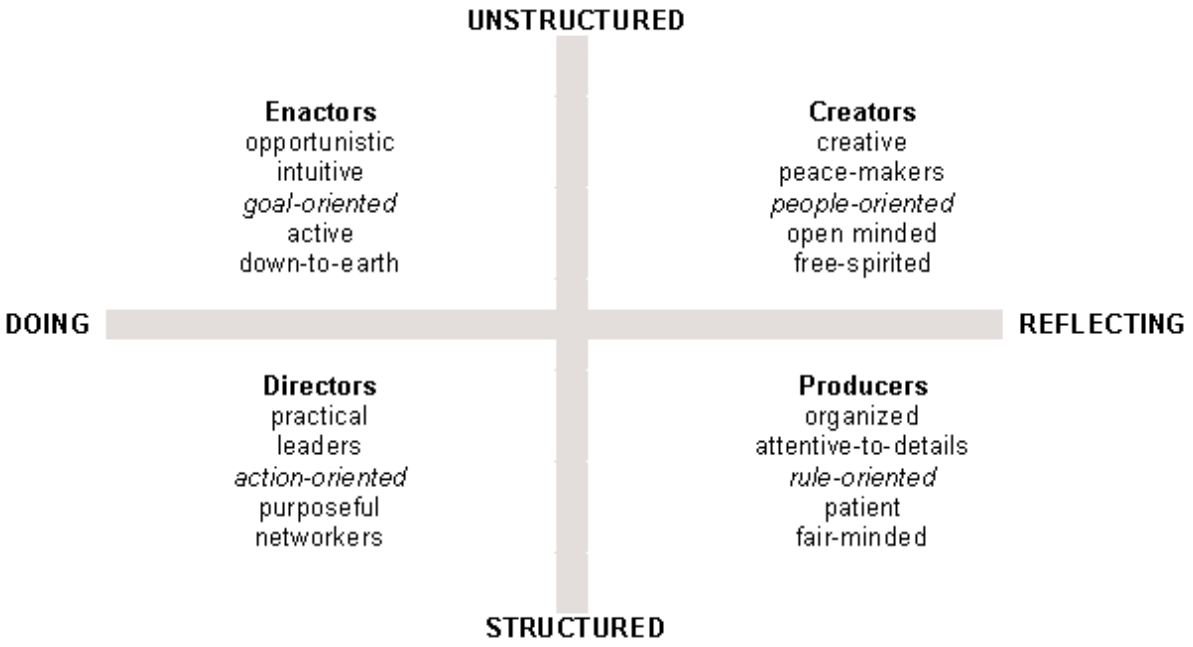

Figure 1. Typology for Pharmacists' Inventory of Learning Styles (PILS)

ly developed a final list of the 5 most relevant and 5 least relevant descriptors (adjectives) for each learning style type identified in the LSI. In addition, this focus group discussed the 6 axes generated from the previous focus groups to assess their relevance to pharmacy practice and education. From this discussion, the group was asked to consensually rank the 6 in descending order of importance (to confirm findings of the relative ranking index score).

Development and Validation of a Theoretical Model

Based on the results of the focus groups, 2 dimensions emerged with most significance for pharmacists: *Unstructured vs Structured* and *Doing vs Reflecting*. While the 4 other dimensions were ranked with some importance, they failed to reach the level of significance (defined as >0.50 on the index score) necessary for inclusion in this theoretical model of learning styles. No specific attempt was made to ensure a biaxial model would emerge (ie, 2 dimensions only). For the purposes of model building, an index-linked threshold of 0.50 was established *a priori* as a cutoff for inclusion as a dimension. This threshold was selected in order to ensure that identified dimensions were significantly important to study participants. Establishing alternative thresholds would result in different models; for example, a threshold of >0.40 would have resulted in a quadraxial model (similar to the MBTI).

Qualitative analysis of the comments of focus group workshop participants' comments resulted in identification of key themes and ideas associated with each dimension. From these, more fulsome behavioral descriptors for the 2 primary axes were developed:

Unstructured vs Structured

Unstructured environments are those in which expectations for outcomes, timelines, or processes are not completely defined or assessed externally, but in which expectations for performance are defined individually or personally. Structured environments are those in which expectations for outcomes, timelines, and processes are defined and assessed externally.

Doing vs Reflecting

Doing individuals are those who prefer the opportunity to experiment, try, and undertake trial and error. Reflecting individuals are those who prefer to observe, mentally rehearse, and practice before trying.

The intersection of these 2 axes yields 4 quadrants, similar to the LSI learning style types. Descriptors and behavioral anchors for these types were developed as a result of focus group deliberations (Figure 1).

Development and Validation of Inventory Instrument

Traditionally, determination of learning styles is undertaken through completion of an inventory of questions in which an individual is asked to rate, rank, or respond to a series of questions or prompts. These questions or prompts are based on the construct of learning

styles previously defined. Each item in the inventory is crafted to optimize readability, understandability, reliability, and validity.

For this study, a bank of 30 items were developed, based on the ranking of adjectives and descriptors undertaken in steps 1 and 2 above. These items were circulated via e-mail survey to all 40 study participants, who then were asked to read, rank, and respond to each item. Participants were also asked to provide constructive feedback regarding the readability and understandability of each item. In particular, redundancies and unclear items were specifically identified by participants.

A total of 29 participants responded to the survey (response rate of 72.5%). Items were considered redundant or unclear if greater than 50% of respondents indicated so. Of the 30 items developed, 12 were eliminated based on this criteria, leaving a total of 18 items in the inventory.

Scaling for this inventory was based on a 4-point model. Since items were specifically developed based on observable behaviors rather than on reflection or speculation on motivation, point scaling was behaviorally oriented; participants were asked to describe their behavior in terms of "usually," "sometimes," "rarely," or "hardly." A 4-point scale was specifically selected in order to avoid a middle-road possibility.

A specific and unique feature of this inventory vis-à-vis other similar inventories is the notion of "dominant" and "secondary" learning styles. This construct was based on focus group discussions with pharmacists in which a consistent theme of inadequacy of rating using the LSI tool emerged. In brief, pharmacists commented that, with the LSI tool, the determination of a learning style type appeared too finite and fixed. Pharmacists commented that the inventory tool itself was problematic insofar as it required too much speculation on internal motivation or emotional factors, rather than (what they believed to be) more objective, observable behaviors. Further, the notion of learning preference was seen by some as being an attempt to stereotype or pigeonhole individuals, rather than recognize a broader heterogeneity of learning within specific environments. The concept of dominant and secondary typing was introduced as a way of broadening acceptability of learning styles typing and providing a more robust description of an individual's preferences.

Field Testing of the Instrument and Revisions

Following finalization of an 18-item inventory and accompanying descriptors, field-testing was undertaken with a purposeful sample of 12 pharmacy students, all of whom were volunteers. In field-testing, specific attention was paid to the readability and understandability of the instrument and the ease of use of the inventory. Based on field-testing, minor rewording of instructions and descriptors was undertaken, and one of the 18 items was dropped from the inventory due to redundancy with other similar items. During field-testing, participants required an average of 9.25 minutes (± 2.75 minutes) to read the instructions, complete the inventory, and compile results. Overall agreement with results was high (average of 8.12/10), as was satisfaction with the instrument (average 7.89/10).

Reliability and Validity Assessment of the Instrument

The measurement properties of this instrument were evaluated in 3 different settings at 3 different times. Two sample frames of hospital pharmacists ($n_1 = 12$ and $n_2 = 15$) and one frame of community pharmacists ($n_3 = 21$). All participants were volunteers recruited from local continuing education events and not necessarily involved with university-based pharmacy education.

The inventory's face validity and comprehensibility were evaluated through postinventory feedback provided by individuals. The homogeneity of items was measured by calculating the Pearson correlation coefficients between each item, and a final score calculated by removal of that specific item from the total summary score and ranking. Items with correlation coefficients of less than 0.2 were defined as outliers.

The reliability of the inventory was evaluated using Cronbach's alpha, calculated for each of the 3 subgroups and for the combined sample in total. Construct validity of the inventory was determined by calculating Spearman's correlation coefficients between the final score and 2 posttest satisfaction items. The first item asked participants to rank the accuracy of the statements regarding their dominant and secondary learning styles, and the second item asked participants to rank the degree to which the remaining 2 statements were accurate reflections of their self-assessed learning style. An ordinal scale (1–7) was used for these items. Summary statistics descriptive statistics were also prepared.

RESULTS

A total of 103 pharmacists and pharmacy students participated in this study at various stages: 40 pharmacists participated in the initial development and validation of the model and inventory, 15 participated in the field testing, and 48 participated in the evaluation of reli-

ability and validity.

The Pharmacists' Inventory of Learning Styles (PILS) is presented in Appendix 1. Cronbach's alpha for the 3 subgroups involved in reliability assessment indicated a high degree of reliability (Cronbach's alpha between 0.847 and 0.898 for each group). Mean alpha calculated across all 48 samples was 0.88 (95% CI = 0.85 to 0.90).

Spearman's correlation coefficients for the 3 subgroups across the 2 satisfaction items involved in construct validity assessment indicated a moderate to high degree of validity. For Item #1, correlation coefficients were strong and positive (ranging from 0.68 to 0.70 for the various subgroups, and 0.69 for the combined sample), indicating agreement between and satisfaction with the descriptors and adjectives used in defining dominant and secondary learning styles. For Item #2, correlation coefficients were moderate and negative (ranging from -0.50 to –0.52 for the various subgroups, and -0.51 for the combined sample), indicating the descriptors and adjectives used to define the remaining 2 learning style types was consistent with participants' self-assessment. The magnitude of these coefficients for Item #2 were somewhat weaker, suggesting the instrument was better able to identify dominant and secondary learning styles, and less able to identify the 2 nondominant styles.

DISCUSSION

This study demonstrated that the Pharmacists Inventory of Learning Styles is an acceptable tool for assessing learning styles of pharmacists. Though reliability and validity assessment is based on relatively small numbers (n = 48), the strength of coefficients calculated suggests there is sufficient confidence that the tool possesses adequate reliability and validity for use within the context of pharmacy education for the purpose of stimulating discussion and reflection upon learning and teaching styles.

The value of this tool is 3-fold. First, it provides a unique pharmacist-specific model for defining, describing, and measuring learning styles. Traditional learning styles inventories and tools are generic, and validation is often based on a broad and heterogenous cohort of individuals who may or may not be university-educated professionals. Through a methodical developmental process, core constructs of relevance for pharmacists were identified and validated, increasing both the face validity of the instrument and its utility in pharmacy-specific circumstances. Second, this tool introduces the notion of dominant and secondary learning styles, reflecting pharmacists' perceptions that commercially available tools may appear to stereotype or pigeonhole individuals rather than provide a full indication of learning preferences. Dominant and secondary preferences appear to resonate with users of this instrument. Few if any commercially available inventory instruments actually do attempt to stereotype or pigeonhole, and most accompanying manuals or texts strenuously emphasize the need to avoid such generalizations. Nonetheless, the perception of users suggests there is a greater value of a result that identifies dominant and secondary learning styles, rather than a single learning preference. Third, the development process modeled for this particular tool is broadly applicable to other situations in educational research and can be readily applied.

Since development, the Pharmacists Inventory of Learning Styles (PILS) has been utilized in a variety of settings, ranging from a mentorship experience for high school students considering pharmacy as a career, to practicing pharmacists involved in pharmacy education and with pharmacy students. Importantly, this tool was neither designed nor meant to be used in isolation as a diagnostic instrument. Though preliminary measurement data have been collected and analyzed, there are insufficient data to make broad psychometric pronouncements. Nonetheless, the most significant role for use of this tool is its ability to promote self-reflection among students and practitioners. Similar to other commercially available instruments (eg, the MBTI or the LSI), the PILS can be an effective tool for promoting discussion about teaching, learning, and personal and professional development.

As such, the PILS provides another complementary vehicle for educators interested in promoting discussions around learning and teaching styles. Experience to date suggests the most effective use of the PILS tool is within a facilitated workshop session, as a prompt for discussions regarding learning and teaching styles. An example of a 90-minute workshop configuration/agenda using this tool is presented in Table 2.

Time permitting, additional activities may be incorporated, including individual or group-based problem-solving or patient-care simulations, or reflective journaling.

Further work in validation and assessment of the measurement properties of this tool are being undertaken. Overall, the development of this tool has addressed a specific need for a reliable, valid, and cost-effective tool for promoting reflection and discussion on educational issues within pharmacy. Free use of this tool within the pharmacy education and practice community is encour-

Table 2. 90-minute Pharmacists' Inventory of Learning Styles (PILS) Workshop Agenda

Activity	Time Required
Welcome and Introduction	5 min
Background and Introduction to Learning Styles Theory	15 min
Individual Participants complete PILS	10 min
Individuals group together based on dominant learning style	5 min
Groups discuss PILS prompt questions	15 min
Each group presents responses to prompts to large group	20 min
General discussion regarding implications of PILS for group	15 min
Take-home messages, conclusions	5 min
Total	*90 min*

aged, provided appropriate acknowledgment of the source (including the author) is made. Educators using this tool are also encouraged to disseminate and report results or modifications that have been undertaken.

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Appendix 1. The Pharmacists' Inventory of Learning Styles (PILS)

Think about a few recent situations where you had to learn something new to solve a problem. This could be any kind of situation: while you were taking a course at school, learning to use new software, or figuring out how to assemble a barbecue.

Now, circle the letter in the column that best characterizes what works best for you in situations like the ones you've thought about.

When I'm trying to learn something new…	**Usually**	**Some-times**	**Rarely**	**Hardly**
1. I like to watch others before trying it for myself.	B	D	C	A
2. I like to consult a manual, textbook, or instruction guide first.	B	C	D	A
3. I like to work by myself, rather than with other people.	A	C	B	D
4. I like to take notes, or write things down as I'm going along.	B	C	D	A
5. I'm critical of myself if things don't work out as I hoped.	B	C	D	A
6. I usually compare myself to other people just so I know I'm keeping up.	B	D	C	A
7. I like to examine things closely instead of jumping right in.	B	D	C	A
8. I rise to the occasion if I'm under pressure.	C	A	B	D
9. I like to have plenty of time to think about something new before trying it.	D	B	C	A
10. I pay a lot of attention to the details.	B	C	A	D
11. I concentrate on improving the things I did wrong in the past.	C	A	D	B
12. I focus on reinforcing the things I got right in the past.	B	D	A	C
13. I like to please the person teaching me.	D	B	A	C
14. I trust my hunches.	D	C	A	B
15. In a group, I'm usually the first one to finish whatever we're doing.	A	C	D	B
16. I like to take charge of a situation.	C	A	B	D
17. I'm well-organized.	B	A	C	D

Now, add up the number of times you circled each letter:

A = **B =** **C =** **D =**

Your DOMINANT learning style is the letter you circled most frequently.
Your SECONDARY learning style is the next most-frequently circled letter.

A= Enactor
You enjoy dealing directly with people, and have little time or patience for indirect or soft-sell jobs. You enjoy looking for, and exploiting, opportunities as they arrive, and have an entrepreneurial spirit. You learn best in a hands-on, unencumbered manner, not in a traditional lecture style format. Though you don't take any particular pleasure in leading others, you do so because you sense you are best-suited for the job. You are confident, have strong opinions, and value efficiency. You are concerned about time, and like to see a job get done. Sometimes, however, your concern with efficiency means the quality of your work may suffer, and that you may not be paying as much attention to others' feelings and desires as you ought to.

B= Producer
You generally prefer working by yourself, at your own pace, and in your own time, or with a very small group of like-minded people. You tend to avoid situations where you are the center of attention, or you are constantly be watched - you prefer to be the one observing (and learning) from others. You have an ability to learn from your own - and other peoples' - mistakes. You place a high priority on getting things done properly, according to the rules, but at times, you can be your own worst critic. You value organization, and attentiveness to detail.

C= Director
You are focused, practical, and to the point. You usually find yourself in a leadership role, and enjoy this challenge. You have little time or patience for those who dither or are indecisive, or who spend too much time on impractical, theoretical matters.

You are good at coming to quick, decisive conclusions, but recognize that at times your speed may result in less than perfect results. You would rather get a good job done on time, than get an excellent job delivered late. You like being in a high-performance, high-energy, fast-paced environment.

D = Creator
You enjoy out-of-the-box environments where time and resources are not particularly constrained. You have a flair for keeping others entertained and engaged, and sincerely believe this is the way to motivate others and get the best out of everyone. You are most concerned - sometimes too concerned - about how others perceive you, and you place a high priority on harmony. You find little difficulty dealing with complex, ambiguous, theoretical situations (provided there is not a lot of pressure to perform), but sometimes have a hard time dealing with the practical, day-to-day issues.

Now, as a group of individuals with the same dominant learning style, think about the following questions and share your opinions:

1) What professional, social, or personal characteristics do you have in common?
2) What teaching and learning methods work best for you?
3) What teaching and learning methods do not work well for you?
4) Give some examples of the type of feedback that motivates you.
5) Give some examples of the type of feedback that discourages you.

Now, share your group's discussion with members of the other learning styles' groups.