

BACKGROUND

- Mezirow's Transformative Learning Theory (TLT) is a framework developed for adult learners to build meaning through self-reflection. The foundation of TLT is to expand the learner's consciousness through a disorienting dilemma that challenges their feelings and assumptions, leading to the development of new perspectives and purpose.
- Professional identity formation (PIF) is the active process of integrating the knowledge, skills, values, and behaviors necessary to become a proficient professional.
- TLT has been utilized in medical literature to facilitate the development of students' professional identity (PI) by encouraging critical reflection, fostering self-awareness, and promoting the integration of personal and professional values through experiential learning and disorienting dilemmas.
- The Professional Self Identity Questionnaire (PSIQ-9) and the Macleod Clark Professional Identity Scale (MCPIS-9) are validated tools used to assess students' self-evaluation of PI.
- While TLT's application to PIF is well-documented in medical training, its use in pharmacy training lacks literature.

TLT-BASED TOOLKIT

- The lead investigator, in collaboration with the Office of Experiential Education at the University of Illinois Chicago, curated real-life disorienting dilemma case vignettes.
- Through iterative focus sessions, case vignettes were aligned with the 2016 Pharmacist's Entrustable Professional Activity domains.

Figure 1. Case Vignette Mapping to the 2016 Pharmacist's Entrustable Professional Activity Domains

Entrustable Professional Activity Domains	Case Vignette Title
Patient Care Provider	1. Improving Medication Adherence 2. Helping While Learning
Interprofessional Team Member	3. Diverse Team Perspectives 4. Responsible but No Authority
Population Health Promoter	5. When You Cannot Treat Everyone
Information Master	6. Patient Advocacy Amidst Tension
Practice Manager	7. Managing a Challenging Team Member
Self-Developer	8. When Things Don't Go as Planned 9. What Now?

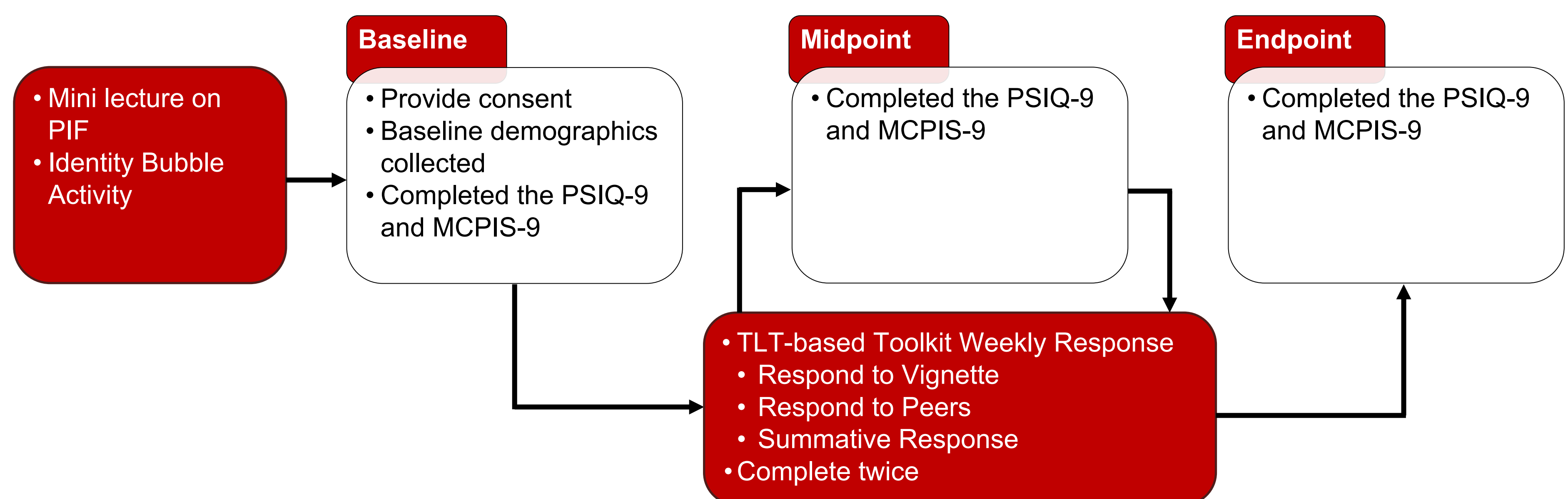
OBJECTIVE

To analyze the impact of a TLT-based toolkit on pharmacy students' PI self-evaluation using the PSIQ-9 and MCPIS-9 questionnaires.

METHODS

Study Design: Single-center, prospective, interventional-cohort study

Figure 2. Methodology



Inclusion Criteria:

- Second-year pharmacy students at the University of Illinois Chicago enrolled in a 15-week hospital skills-based course in the Fall 2023 semester were eligible to participate.
- Completed the PSIQ-9 and MCPIS-9 questionnaires given at baseline, midpoint, and endpoint, or baseline and midpoint.

Primary Outcomes:

- Assess the mean difference in scores in student pharmacists' questionnaire responses from baseline to endpoint regarding their PI after completing the TLT-based PIF toolkit.

Data Analysis:

- **Demographics:** descriptive statistics
- **Questionnaire data:** Wilcoxon signed-rank test

Exclusion Criteria:

- No additional exclusion criteria

Secondary Outcomes:

- Assess the mean difference in scores from baseline to midpoint and midpoint to endpoint.

RESULTS

- The number of students completing both the PSIQ-9 and MCPIS-9 questionnaires at each time point were as follows: baseline ($n=49$), midpoint ($n=75$), and endpoint ($n=25$).
- A total of 11 students completed both questionnaires at all timepoints; these 11 students were included in the primary outcome analysis.

Table 1. Baseline Characteristics (n = 11)

	No. (%) of students
Gender	
Female	8 (72.7)
Male	3 (27.3)
Age	
Less than or equal to 21 years old	1 (9.1)
22-24 years old	5 (45.5)
25-27 years old	5 (45.5)
Ethnicity	
African-American	N/A
Asian	3 (27.3)
Caucasian	5 (45.5)
Latino or Hispanic	1 (9.1)
Two or more	2 (18.2)
Highest degree or level of education completed	
Pre-pharmacy requisites	2 (18.2)
Bachelor's degree	9 (81.8)
Pharmacy experience before entering pharmacy school	
Yes	9 (81.8)
No	2 (18.2)
Number of years of pharmacy experience before entering pharmacy school	
< 1 year	1 (9.1)
1 year	4 (36.4)
1-2 years	4 (36.4)
N/A	2 (18.2)
Currently working in a pharmacy	
Yes	9 (81.8)
No	2 (18.2)
Number of hours of pharmacy work per week	
< 10 hours/week	6 (54.5)
10-20 hours/week	2 (18.2)
N/A	3 (27.3)

Table 2. Primary Outcome from Baseline to Endpoint (n = 11)

	Mean Change (\pm SE)	P value
PSIQ-9: I feel like a ___ when:		
P1. I am working with other health and social care professionals	0.27 (0.79)	.35
P2. I am communicating with patients	0.36 (1.29)	.25
P3. Assessing a patient	0.18 (1.17)	.37
P4. Engaging with others in a culturally diverse health care environment	0.55 (0.93)	.11
P5. I am considering ethical or moral issues	0.18 (1.17)	.66
P6. Consulting/using patient records	0.00 (1.00)	1.00
P7. I find myself in an emergency involving a patient	0.09 (0.83)	.85
P8. Reflecting on my practice (experiences) to identify my learning needs	0.27 (0.91)	.37
P9. Teaching others	0.64 (0.67)	.03
MCPIS-9: I feel:		
M1. Like I am a member of the pharmacy profession	0.00 (0.63)	1.00
M2. I have strong ties with members of the pharmacy profession	-0.27 (0.65)	.23
M3. Often ashamed to admit that I am studying for the pharmacy profession	-1.27 (1.68)*	.05
M4. I find myself making excuses for belonging to the pharmacy profession	-0.82 (1.47)*	.11
M5. I try to hide that I am studying to be part of the pharmacy profession	-0.82 (1.25)*	.09
M6. Pleased to belong to the pharmacy profession	-0.09 (0.70)	.77
M7. I can identify positively with members of the pharmacy profession	-0.09 (0.70)	.77
M8. Being a member of the pharmacy profession is important to me	-0.27 (0.47)	.15
M9. I share characteristics with other members of the pharmacy profession	-0.46 (0.69)	.09

*reverse scored: a negative mean change indicates a decrease in PI from baseline to endpoint

Table 3. Secondary Outcome from Baseline to Midpoint (n = 39)

PSIQ-9	Mean Change (\pm SE)	P value	MCPIS-9	Mean Change (\pm SE)	P value
P1.	0.33 (1.01)	.05	M1.	0.05 (0.69)	.66
P2.	0.46 (1.05)	.01	M2.	-0.05 (0.65)	.64
P3.	0.31 (1.10)	.11	M3.	-0.18 (1.23)*	.25
P4.	0.46 (1.48)	.08	M4.	-0.23 (1.31)*	.23
P5.	0.10 (1.79)	.78	M5.	-0.28 (1.32)*	.22
P6.	0.49 (1.37)	.04	M6.	0.03 (0.74)	.83
P7.	0.26 (0.85)	.07	M7.	0.05 (0.83)	.69
P8.	0.28 (1.23)	.11	M8.	-0.05 (0.46)	.53
P9.	0.44 (1.21)	.02	M9.	-0.18 (0.76)	.18

*reverse scored: a negative mean change indicates a decrease in PI from baseline to midpoint

DISCUSSION

- The TLT-based PIF toolkit did not significantly alter professional identity, as indicated by the PSIQ-9 and MCPIS-9 questionnaires from baseline to endpoint.
- Descriptive analysis showed stasis in professional identity for most participants, though some questions in the PSIQ-9 indicated progression, such as in teaching others.
- PI regression was noted in the MCPIS-9, particularly regarding feelings of shame related to studying pharmacy.
- The Dunning-Kruger effect may explain observed PI stasis and regression, suggesting students' misjudgment of their professional identity development.
- The study had several limitations, including a low participation rate (14%), short duration, the inclusion of "N/A" responses affecting data accuracy, and potential confusion from negatively phrased questions.
- Future studies should include the following: mandatory completion of the questionnaires, expansion of the sample to cover multiple pharmacy curriculum years, statistical analysis of baseline characteristics, and exclusion of the "N/A" option from the PSIQ-9.

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