

Evaluating professional growth in undergraduate internships: An analysis of confidence, preparedness, and career potential through the Science Influencers program

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Introduction

Reflection is a critical component of experiential learning processes (Kolb, 1984). Reflection practices are described as the “connective tissue” that supports students’ abilities to self-assess (Woodley & Beattie, 2011). Reflection is critical to professional practice and applied learning (Plack et al., 2005). However, it can be easily overlooked or undervalued in internship programs because the focus on technical skill development (Schön, 1987). Internships help students apply learning to test understanding of concepts through hands-on experiences (Kuh, 2008). Experiential learning is enhanced through meaningful reflection that helps students become critics of their own learning (Leggette et al., 2019).

Our study was grounded in Kolb’s (1984) model of experiential learning. Kolb (1984) noted that experience without reflection often returns void of learning. Thus, experience must be coupled with reflection for learning in an academic program. We applied reflection work of Boud et al. (1985), Plack et al. (2005), and Schön (1987) through the lens of Kolb’s model of experiential learning (1984) to Science Influencers program at Texas A&M University. The research- and extension-focused internship program prepares undergraduates to become effective communicators of science, technology, engineering, or math in the public domain (Wingenbach et al., 2021) through applied research in their respective fields.

The purpose of our study was to examine changes in students’ reflective self-assessments changed through participating in the Science Influencers program. Specifically, we were interested in changes in students’ perceived career potential, career preparedness, and confidence in performing daily internship activities as indicators of professional growth. Our study evaluates outcomes from internships in the summers of 2022 - 2025 and the fall 2025. We sought to understand how participation in the program influenced students’ (a) perceived career potential, (b) perceived internship preparedness, and (c) confidence in performing daily internship activities.

Methods

Science Influencers was designed as a year-long program that included a science communications course in the spring semester, a 10-week, 40-hour/week internship in the summer, and a research symposium in the fall. The Science Influencers program was offered in four year-long programs and one mini program, which consisted of online learning modules (Norris et al., 2020), a 10-week, 10-hour/week internship, and a research symposium completed in one semester. Students submitted three reflections (pre, during, post) in the summer internship program. The reflections followed Plack et al.’s (2005) method for assessing reflective journal writing with reflection in action, on action, and for action. At all three points, students reflected on their perceived career potential, career preparedness, and confidence in performing internship activities (Rook et al., 2025). We collected qualitative and quantitative data as part of the larger project. Data reported herein are focused on students’ quantitative (descriptive) reflection of their career preparedness offered through the Science Influencers internship experience.

Forty-one students completed reflections between 2022 and 2025 with 20 completing the year-long program and 21 completing a mini program in fall 2025. Because the *n* in each group was small and we lacked enough data to compare groups; we collapsed and analyzed groups as one. Across data collection points, 41 students completed the pre-internship reflective survey, 41 completed it during the internship, and 37 completed the post-internship reflective survey. We retained all responses because descriptive statistics were analyzed for each reflection point. The self-assessment measured perceived career potential using a 4-point scale (1=below average, 2=average, 3=above average, 4=exceptional). Level of perceived preparedness to fulfill daily internship activities and confidence in abilities to perform internship activities, was measured with a 10-point scale (0=not at all confident/prepared; 10=extremely confident/prepared). To analyze the data, we ran descriptive statistics (*M*, *SD*).

Results

We found changes in student's levels of perceived career potential, internship preparedness, and confidence (Table 1). Students' career potential ratings increased from pre (*M* = 2.73, *SD* = 0.74), during (*M* = 2.90, *SD* = 0.74), to post (*M* = 3.43, *SD* = 0.60). Levels of preparedness to fulfill daily internship activities increased from pre (*M* = 7.61, *SD* = 1.38), during (*M* = 8.41, *SD* = 1.00), to post (*M* = 8.95, *SD* = 1.10). Levels of confidence in performing daily internship activities increased from pre (*M* = 7.83, *SD* = 1.41), during (*M* = 8.46, *SD* = 1.19), to post (*M* = 9.24, *SD* = 1.06).

Table 1. Students' Perceived Career Potential, Preparedness, and Confidence in Performing Internship Activities Pre, During, and Post Internship Experience

Perceptions	Pre (<i>n</i> =41)		During (<i>n</i> =41)		Post (<i>n</i> =37)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Career Potential	2.73	0.74	2.90	0.74	3.43	0.60
Preparedness	7.61	1.38	8.41	1.00	8.95	1.10
Confidence	7.83	1.41	8.46	1.19	9.24	1.06

Conclusions and Recommendations

Relevant changes in students' levels of perceived career potential, career preparedness, and confidence in performing daily internship activities increased from pre- to post-internship experiences. These results suggest that participation in the Science Influencers program and use of reflective journals to monitor professional development throughout the internship program may have the potential to strengthen students' long-term career prospects, congruent with prior works on the importance of reflection in the learning process (e.g., Kolb, 1984, Plack et al., 2005). A limitation is findings are based on self-reported data, which prohibit causal conclusions about the effects of internships or reflective journaling activities. Incorporating applied research internships into undergraduate degrees strength has potential to strengthen students' career preparedness and confidence. Internship reflection can be beneficial for tracking students' professional development in experiential learning programs.

References

- Ahmed, A. H. (2024). *Reflective practices and teacher professional identity: A study of pre-service teachers*. https://ijirt.org/publishedpaper/IJIRT183504_PAPER.pdf
- Kolb D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.
- Kuh G. D. (2008). *Excerpt from high-impact educational practices: What they are, who has access to them, and why they matter*. Association of American Colleges & Universities. Retrieved from <https://www.aacu.org/leap/hips>
- Leggette, H. R., Redwine, T., & Busick, B. (2019). Through reflective lenses: Enhancing students' perceptions of their media writing skills. *Journalism and Mass Communications Educator*, 75(1). <https://doi.org/10.1177/1077695819852256>.
- Norris, S. L., Leggette, H. R., Murphrey, T. P., Richburg, A., & Bush, M. (2020). Science communication: Context-specific reusable learning modules for strengthening students' communications skills. *NACTA Journal*, Teaching Tip. http://nactaarchives.org/images/TeachingTips/TT_2020-0248.pdf.
- Plack, M. M., Driscoll, M., Blissett, S., McKenna, R., & Plack, T. P. (2005). A method for assessing reflective journal writing. *Journal of Allied Health*, 34(4), 199–208. JSTOR. <https://doi.org/10.2307/48721325>
- Rook, L., Dean, B. A., Tofa, M., Ellmers, G., Villeneuve-Smith, S., Kennedy, M., Twyford, E., Eady, M. J., Heath, A., Moores, M., & Wakefield, B. (2025). Student feedback for integrating reflection into the higher education curriculum: A cross disciplinary study. *Higher Education Research & Development*, 1–15. <https://doi.org/10.1080/07294360.2025.2548274>
- Schön, D. A., (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books, Inc.
- Wingenbach, G., Leggette, H., Gastel, B., & Kainer, M. (2021). *Science Influencers: About the program* [Website]. <https://scienceinfluencers.org/about>.
- Woodley, C., & Beattie, S. (2011). *Communal reflections on the workplace: Locating learning for the legal professional*. https://vuir.vu.edu.au/9454/6/APJCE_12_1_19_30.pdf