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Interpersonal Experiential Learning and Cancer Research Training Designed to Enhance the Motivation of Participating Interns Utilizing Self-Determination Theory: A Longitudinal Study with Photovoice Methodology

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Vazquez-Cortes, Alex; McKay, Dierdre; Tran, Connie; Bugla, Bridget; Bui, Tiffany; Holt, Kaisa; Phan, Anthony; Bennett, Clage; On, Aditya; Braley, Amanda; and Marriott, Lisa PhD, "Interpersonal Experiential Learning and Cancer Research Training Designed to Enhance the Motivation of Participating Interns Utilizing Self-Determination Theory: A Longitudinal Study with Photovoice Methodology" (2024). *Student Research Symposium*. 56.

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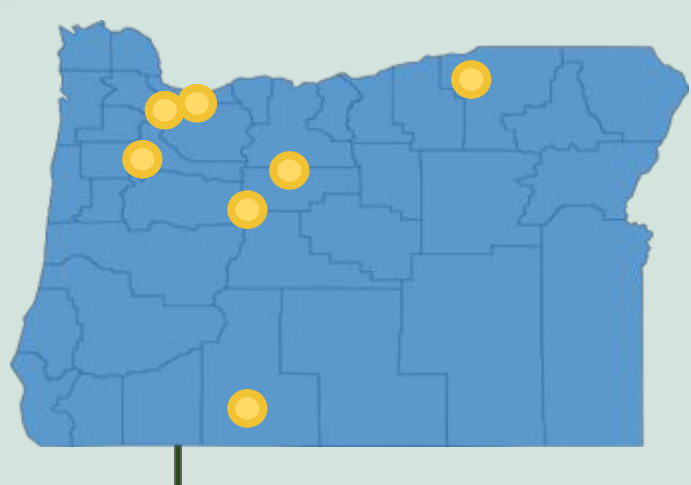
Presenter Information

Alex Vazquez-Cortes, Dierdre McKay, Connie Tran, Bridget Bugla, Tiffany Bui, Kaisa Holt, Anthony Phan, Clare Hansen, Amy Lin, Amanda Braley, and Lisa Marriott PhD

Interpersonal experiential learning and cancer research training designed to enhance the motivation of participating interns utilizing self-determination theory: a longitudinal study with photovoice methodology



Alex Vazquez-Cortes^{1,3}, Dierdre McKay^{1,2}, Connie Tran^{1,3}, Bridget Bugla^{1,3}, Tiffany Bui^{1,3}, Kaisa Holt^{1,3}, Anthony Phan^{1,3}, Clare Hansen^{1,3}, Amy Lin^{1,3}, Amanda Braley¹, Lisa Marriott Ph.D.^{1,3}
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Oregon high school students train in cancer research over 3 years

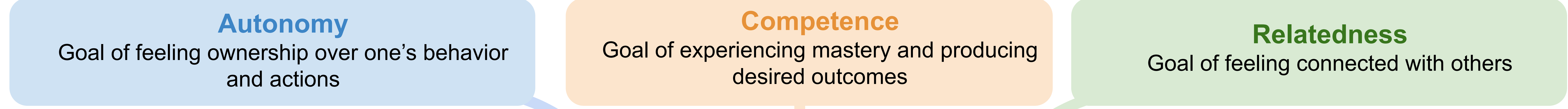
- 1 **Introduction (7 days)**
n=35
- 2 **Immersion (10 weeks)**
n=25; Photovoice (n=20) of:
 - ★ Clinical shadow
 - ★ Public health shadow
 - ★ Research rotations
 - ★ Outreach shadow
 - ★ **Most significant experience overall**
- 3 **Intensive (10 weeks)**
n=14; Photovoice (n=12) of:
 - ★ Community engagement
 - ★ Start of research placement
 - ★ Growth at end of research
 - ★ **Most significant experience overall**

- Synthesis of Photovoice**
- Cancer research training has **strong impacts** for Oregon high school students
 - Trainees describe interrelated impacts on their professional development aligning with **Self Determination Theory**
- Funding**
This project is supported by National Cancer Institute Youth Enjoy Science (YES) grant (R25CA221741).
- Other grants also support this work:
- Kumi Foundation - supports additional students and training activities
 - NIGMS CTSA (1UL1TR002369) for REDCap database & evaluation support
 - NIGMS BUILD (5RL5GM118963) - 75% of peer mentors are current/former trainees in NIH-funded BUILD or URISE programs

Published Results
Marriott, L.K., Shagerman, S.R., Chavez, A., Crocker-Daniel, L., Martinez, A., Zebroski, D.J., Mahalanis, S., Zell, A., Dest, A., Pochidayeva, D., Wenzel, E.S., Omotoy, H.L., Druker, B.J., and Shannon, J. (2022). Knight Scholars Program: A tiered three-year mentored training program for urban and rural high school high school students increases interest and self-efficacy in interprofessional cancer research. *Journal of STEM Outreach*, 5(2), 1-16. <https://doi.org/10.15695/jstemv5i2.66>

Huerta, J.J., Figueroa, M.T., Vazquez-Cortes, A., Hanna, R.R., Hernandez, A.C., Benitez, S.B., Sipelli, M.N., Brooks, T., Zuzero, D.T., Iopu, F.M.R.V., Romero, C.R., Chavez, A., Zell, A., Shagerman, S.R., Shannon, J.S., and Marriott, L.K. (2022). Interprofessional near-peer mentoring teams enhance cancer research training: sustainable approaches for biomedical workforce development of historically underrepresented students. *Journal of STEM Outreach*, 5(2), 1-14. DOI: <https://doi.org/10.15695/jstemv5i2.19>

The Knight Scholars Program was designed using **Self-Determination Theory of Motivation**, which describes goals towards:



Photovoice

Core themes that emerged for the SAME trainees over TWO YEARS of cancer research training

Opportunities		Impact of Research			Career Interests			Networking		Connection with Peers			Personal Growth	
34%, n=22/64*		11%, n=7/64*			28%, n=18/64*			38%, n=24/64*		33%, n=21/64*			39%, n=25/64*	
Appreciation for self	Interest for others	Benefits	Humanity	Community	Career Types	Exploration	Self-Efficacy	Support	Professional Development	Relatedness	Relaxation	Collaborative Learning	Adaptability	Future Success
50% n=11/22^	59% n=13/22^	86% n=6/7	86% n=6/7^	43% n=3/7^	94% n=17/18^	28% n=5/18^	22% n=4/18^	67% n=16/24^	54% n=13/24^	71% n=15/21^	57% n=12/21^	43% n=9/21^	64% n=16/25^	52% n=13/25^
★	★	★	★	★	★	★	★	★	★	★	★	★	★	★

*The n refers to the number of quotes coded as that primary code (numerator) divided by the total number of primary code quotes (n=64) extracted from the photovoice prompt.
^The n refers to the number of quotes within that secondary code (numerator) divided by the total number of quotes within that primary code. Multiple codes applied to some quotes.

Opportunities	Impact of Research	Career Interests	Networking	Connection with Peers	Personal Growth
Learning	External impact of trainee's work	Next Steps	Exploration	Connections	Emotional Support
68% n=19/22*	22% n=6/27°	41% n=11/27°	33% n=9/27°	54% n=7/13^	31% n=4/13^
★	★	★	★	★	★

Analyzing photovoice narratives using Self-Determination Theory applied primary codes of **autonomy**° (68%, n = 27/40), **competence*** (55%, n=22/40), and **relatedness**^ (33%, n=13/40), with multiple codes applied to some quotes. **Bold text** denotes thematic codes observed for Intensive trainees (shown in context of Immersion codes, light grey text). The n refers to the number of quotes within that code (numerator) divided by the total number of quotes in that primary code (denominator, reflected by color).

Autonomy

Scholars report feeling ownership over their actions after KSP training. They:

- Actively **explore areas of interest**
- Explore **next steps** to achieve their goals and discover **career paths** of interest
- Describe the **impact of their work** in cancer research

"This experience with the Knight Scholars Program has got me so involved with research and I never thought that would have affect on my life but it has and it's already impacting my future. This personal experience of mine just goes to show even if your head driven, and you know exactly what you want, what you wanna do there's so much more you don't even know about and it might be perfect for you."

Photovoice cropped for privacy

Competence

Scholars report feeling growth in their learning and able to produce desired outcomes. They:

- Grow **confidence in learning** (e.g., skill development, learning challenging content)
- Develop **perseverance** for challenges and the unknown within science and academia
- Document **professional development** in portfolios (e.g., CV, ORCID)

"Troubleshooting will always be a part of researchers because it is needed to be able to make conclusive statements."

Relatedness

Scholars report feeling growth in their learning and able to produce desired outcomes. They:

- Build **connections** with others pursuing cancer research
- Share their **growth** as they pursue academics and research
- Develop mature interpersonal relationships that provide **emotional support** to each other when studying challenging topics.

"We grow by the connections we makes, and we make those connections by showing up and putting our best foot forward everyday."

Scholars built relationships that helped them persevere as they developed independence for cancer research training