

## Peer Teaching as a Strategy to Promote 21<sup>st</sup> Century Skills in Apparel Technology Courses

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This pedagogical study aimed to investigate the efficacy of peer teaching to enhance undergraduate college student's professional development and learning experiences in computer-based apparel and textile design courses. Peer teaching is a strategy where students take on a teaching role in the classroom (Boud, Cohen, & Sampson, 2014). In this study, the Framework for 21<sup>st</sup> Century Learning, commonly referred to as the "P21 framework" for brevity, was used to draw insights regarding peer teaching for student's professional development.

The P21 framework is a model for incorporating 21st-century skills into learning and was developed through a coalition comprised of the US Department of Education, technology businesses (i.e., Apple, Microsoft, Cisco), and other education organizations such as the NEA (Battelle for Kids, 2019). The term "21<sup>st</sup>-century skills" generally refers to core competencies students need to master to succeed in a rapidly changing, digital society (Dede, 2009; Graham, 2015; Cuban, 2015). Table 1 outlines the P21 framework skillset. These skills are thought to be associated with deep learning, analytic reasoning, complex problem solving, and teamwork (Battelle for Kids, 2019). The P21 framework is a tool that can support the acquisition and assessment of these skills (Voogt & Roblin, 2010). This theory is primarily explored in K-12 educational settings and could also help organize pedagogical experiences in higher education.

In 2018, Wang & Ha-Brookshire used the P21 framework to frame apparel workers' professional skill development. Their study put forth a call to action to use the P21 framework for further research on professional development skills of future professionals. Aside from this study, no apparel scholars have published work with this framework. Likewise, peer teaching as a pedagogical concept is not a novel concept, but the novelty lies therein assessing peer teaching effectiveness through the P21 framework.

### Methods

The peer teaching strategy was implemented in three apparel technology courses at a large Midwestern university over three semesters. All courses were 200-level courses and focused on learning Adobe Creative Cloud software to create fashion illustrations, textile designs, and presentations. Students were required to give peer teaching demonstrations as part of the assignment. The assignment instructions stated, "Peer teaching is an opportunity for you to teach us a new technique in Illustrator or Photoshop. You will develop a short demonstration (5-7 minutes) that enhances what we have learned in the classroom. Develop a one-page handout to accompany your tutorial so that your peers can reference your tutorial and apply what they learned from you."

To measure the peer teaching intervention's effectiveness, the researchers collected data

through a survey consisting of open-ended questions about their thoughts regarding the peer teaching activity. The post-survey was completed by students in two courses across three semesters at the end of the respective semesters. The qualitative data analysis progressed in two stages, open coding using *a priori* codes (third-order skills from the P21 framework) followed by selective coding, which included coding for the final themes listed in this analysis (Saldana, 2016).

**Table 1**

*P21 framework with first-order, second-order, and third-order skills*

Information, Media, and Technology Skills		Learning and Innovation Skills		Life and Career Skills	
Second-order skills	Third-order skills	Second-order skills	Third-order skills	Second-order skills	Third-order skills
Information Literacy	Assess & evaluate information*	Communication & Collaboration	Communicate clearly	Flexibility & Adaptability	Adapt to change*
	Use & manage information*		Work creatively with others		Be flexible*
Media Literacy*	Analyze media*	Creativity & Innovation	I think creatively	Initiative & Self-Direction	Work independently
	Create media products		Implement innovations*		Manage goals & time
Information, Communication, & Tech (ICT) Literacy	Apply technology effectively	Critical Thinking & Problem Solving	Reason effectively	Social & Cross-Cultural Skills	interact effectively with others
			Solve problems		Work effectively in diverse teams*
					Guide & lead others
					Be responsible to others
				Leadership & Responsibility	Manage projects
				Productivity & Accountability	

Note. An \* indicates a skill that did NOT emerge from the data.

## Results and Discussion

The sample was 41 students, 17 juniors, 16 seniors, eight sophomores, and no freshmen across the three courses. The participants largely identified as female ( $n = 28$ ), male ( $n = 3$ ), and undisclosed ( $n = 10$ ). Gender identity was not a required question in the survey to protect the participant's anonymity. The topics ranged from using the clone stamp, warping text, clipping masks, and image trace, among others. The peer teaching strategy was effective in soliciting skills from all three first-order categories of the P21 framework from the data analysis. First-order skills promote an understanding of academic content at much higher levels by weaving 21st century interdisciplinary themes into key subjects (Battelle for Kids, 2019). At the most granular level, the peer teaching strategy addressed 13 of 20 third-order skills in the P21 framework. The third-order skills that did *not* emerge from the data are indicated with an asterisk in Table 1. As devised in this study, peer teaching did engender learning and innovation skills and life and career skills. For example, Students enhanced their critical thinking and problem-solving skills (second-order) by learning to reason effectively (third-order) through the demands peer teaching technique. This is evidenced by this student's reflection on what a benefit of peer teaching looked like for them,

It has affected my personal and professional development by reminding me to take

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some of my free time to explore techniques that are not being taught in the class, but that are related to the content that we are learning in class. (Participant 39)

This teaching strategy also promoted independent work habits, managing goals and time, and leadership skills. Students took on roles of leadership and increased responsibility through peer teaching and had a need to be responsible to others. The increased focus on responsibility to their peers was evidenced through the following quotes, “When I [taught], I felt a responsibility for delivering my point to my peers” (Participant 40). The missing skills, particularly those from the Career Skills category, are related to teamwork and would have been unlikely to emerge by nature of the activity being individual-based and a one-time event in the curriculum.

### Conclusion

In this study, the researchers explored peer teaching to promote 21<sup>st</sup> Century skill development among undergraduate college students in apparel design and product development concentrations. Overall, the P21 framework provided a theory-based way to systematically analyze the pedagogical teaching strategy's learning outcomes, particularly related to assessing the effectiveness of advancing 21st-century skills. And, peer teaching, as developed in this study, was able to engender student's professional development skills. This study's findings provide strong evidence of using peer teaching in future courses where the goal is to promote 21st-century skill development in future professionals.

### References

- Battelle for Kids (2019). P21 Partnership for 21st Century Learning Frameworks and Resources. <https://www.battelleforkids.org/networks/p21/frameworks-resources>
- Boud, D., Cohen, R., & Sampson, J. (Eds.). (2014). *Peer learning in higher education: Learning from and with each other*. Routledge.
- Cuban, L. (2015). *Content vs. Skills in High Schools: 21<sup>st</sup> Century Arguments Echo 19<sup>th</sup> Century Conflicts*. Larry Cuban on School Reform and Classroom Practice. <https://larrycuban.wordpress.com/2015/11/03/content-vs-skills-in-high-schools-21st-century-arguments-echo-19th-century-conflicts/>
- Dede, C. (2010). Comparing frameworks for 21st century skills. *21st century skills: Rethinking how students learn*, 20(2010), 51-76.
- Graham, S. (2015, April 26). *Preparing for the 21<sup>st</sup> Century: Soft Skills Matter*. Huffington Post. [https://www.huffpost.com/entry/preparing-for-the-21st-ce\\_b\\_6738538](https://www.huffpost.com/entry/preparing-for-the-21st-ce_b_6738538)
- Saldaña, J. (2014). Coding and analysis strategies. In *The Oxford handbook of qualitative research*.
- Voogt, J. & Roblin, N. P. (2010). *21<sup>st</sup> Century Skills Discussion Paper*. Kinnisnet. [http://opite.pbworks.com/w/file/61995295/White%20Paper%2021stCS\\_Final\\_ENG\\_def2.pdf](http://opite.pbworks.com/w/file/61995295/White%20Paper%2021stCS_Final_ENG_def2.pdf)
- Wang, B., & Ha-Brookshire, J. E. (2018). Exploration of digital competency requirements within the fashion supply chain with an anticipation of industry 4.0. *International Journal of Fashion Design, Technology and Education*, 11(3), 333-342.