

Traditional and Technology-Enhanced Learning: Faculty Perspectives and Student Experiences and Satisfaction of the Art and Design Program during the COVID-19 Pandemic

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Abstract:

Digital skills are essential in today's digital age, which means that students must gain technology-enhanced skills from higher education for their future careers. Studies in Art & Design (A&D) programs in this university surveyed three faculties' perspectives and nineteen students' experiences. During the COVID-19 pandemic, this university changed its teaching and learning strategies by offering courses online during autumn 2020 and spring 2021 on the mandatory quarantine. However, the A&D program was not entirely based online. As a result, it is important to take a closer look at the A&D programs offered in order to assess the faculties' perspectives and students' experiences during the two online semesters. The study included online surveys from instructors' perspectives and with regard to students' experiences about the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities via either live (on-campus) or online studios. Using relationship-based research design, the posttest data surveys were collected to ascertain the differences in the mean scores, standard deviations, and percentage of some form of agreement between faculties' perspectives and students' experiences of the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities in these Art & Design (A&D) programs. This quantitative research aimed to develop formative assessments and suggestions while establishing whether it would be possible to hold all A&D courses online in a higher education setting.

Keywords: COVID-19, Art & Design, hybrid education, online education, technology-enhanced learning

1. Introduction

Higher Education for A&D Studio Education will never be the same as before the Coronavirus (COVID-19) pandemic (Marshaley and Schlater, 2020). Since the pandemic COVID-19 outbreak began, education in general changed to remote teaching and learning with

ever-evolving technologies (Marshaley and Schlater, 2020). Before remote teaching and learning, A&D was preferably taught to students in live studios located on their institutions' campuses. Live studios are referred to as conventional physical learning spaces where students experiment with A&D (Marshaley and Schlater, 2020). Students learned A&D via traditional methods in live studios for A&D education. Traditional methods can be classified as hands-on experience, problem-solving, using traditional hands-on (nontechnological) equipment, working with appropriate traditional hand tools, etc.

Throughout the pandemic, instructors had to reconstruct their teaching and learning methods to become remote via online platforms (Jankowski, 2020; Marshaley and Schlater, 2020). At the same time, academic institutions experienced closures in all fifty U.S. states, which prevented students from being on campus to limit any potential spread of the epidemic (Reich et al., 2020; Sahu, 2020). Specific A&D courses such as drawing, painting, photography can easily be taught online. However, specific challenging techniques in A&D courses such as printmaking, metalsmithing, sculpture, and ceramics as examples that use appropriate traditional hand tools and traditional hands-on equipment for traditional methods faced some complications in this transition.

With A&D's traditional methods, appropriate traditional hand tools, and hands-on equipment in mind, my goal is to find ways to add digital technologies such as technology-enhanced tools for transformation to all A&D programs. All A&D programs need to adopt digital technologies with traditional methods for future hybrid education and future careers for digital skills. It is essential to determine how best to attain a hybrid education of live studio and online studio courses using technology-enhanced tools and to enhance digital skills for future higher education in every A&D program. It is ideal for this university to provide hybrid education (synchronous and asynchronous delivery methods) to all A&D programs. Specific A&D programs teach students from live studios (face-to-face) and in an online delivery format.

However, not all A&D programs can meet the need for an online delivery format (Dilmac, 2020). Not all faculties in A&D programs can adopt the online delivery format or teach students using technology-enhanced tools for their A&D courses if they are not tech-savvy (Dilmac, 2020). A&D students usually interact closely with instructors for guidance in live studios, mainly using traditional hands-on equipment or appropriate traditional hand tools. Nevertheless, this quickly changed following the COVID-19 pandemic in March 2020 toward online education without traditional equipment and tools (Marshaley and Schlater, 2020; Reich et al., 2020; Sahu, 2020). Online education subsequently continued throughout autumn 2020 into spring 2021 during the pandemic.

Since the pandemic forced closures of educational institutions and a transition to online education, it is unknown whether it was beneficial for institutions to accept technology-enhanced tools and digital resources for both live studio (on-campus) and online studio learning in A&D programs. It would be interesting to compare those institutions that chose not to accept technology-enhanced tools and digital resources for live studio learning in their A&D programs. However, there are gaps in the literature with limited studies to compare traditional versus technology-enhanced tools for traditional studio learning (Souleles, 2016).

Additionally, this study sought to explore alternatives for faculty and students to experiment with technology-enhanced tools, especially in a challenging medium requiring traditional hands-on equipment and appropriate traditional hand tools in live studios on campus. Could instructors and students in this university considering technology-enhanced tools with

appropriate traditional hand tools for all A&D programs to maintain the need for digital skills in this post-COVID-19 era?

Even before the COVID-19 era began, for over two decades, the usage of technology-enhanced tools has gradually increased for A&D (Souleles, 2016). In today's higher education, universities must formulate assessments to include technology-enhanced tools in A&D and traditional methods. It is significant to include technology-enhanced tools in A&D programs for a high quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities. These technology-enhanced tools for a hybrid education can enhance digital skills for potential careers in future generations. Instructors and students need stability and development in using technology-enhanced tools during their higher education learning from the live studio and online studio environments in the same context with similar validity, especially in the digital age (Barone and Eisner, 2012).

What is not known with regard to A&D programs teaching students technology-enhanced tools with traditional hand tools is whether online studio learning will ever duplicate face-to-face live studio learning. Indeed, online studio learning may never be identical to face-to-face live studio learning. Nevertheless, the challenge is to make the studio learning equal or meaningful, considering the fact that instructors do not always engage online students without direct face-to-face communication/interaction (Marshaley and Schlater, 2020; Prater, 2001). Online students may not engage in the dialogue and process creativity in the same way as students in a face-to-face live studio or sitting around with a group of people (Marshaley and Schlater, 2020; Prater, 2001). Therefore, instructors must provide teaching and learning techniques differently for future online studio learning in A&D programs (Marshaley and Schlater, 2020; Prater, 2001).

In other words, there have been few studies on adopting effective teaching and learning techniques from the live studio for online studio learning, and there is a need for more studies on A&D in the era of advancing technology (Marshaley and Schlater, 2020). In this case, the online studio learning is designed to maintain the importance of creativity for A&D enrolled students in both a live studio and an online studio. At the beginning of this study, higher education inevitably shifted to remote learning; however, some A&D programs did not transition online due to the course specifics (Sahu, 2020). The overarching research question considered was as follows: "What were the differences between instructors' perspectives and students' experiences with regard to the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities in university A&D programs with or without online education during the COVID-19 pandemic in 2020 and 2021?"

The purpose of this research was to identify the perspectives of A&D faculties and the experiences of students enrolled in A&D courses in terms of the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities in universities with or without online education during the pandemic. Was the quality equal or different to studio learning according to instructors and students participating in any A&D programs? This study investigated possible recommendations for assessments of any A&D programs working with challenging art mediums. To keep up with the digital age, A&D courses involving any art medium could accept newer teaching and learning techniques with technology-enhanced tools and traditional methods.

This study aimed to determine the perspectives of A&D faculties and the experiences of students enrolled in the A&D programs from a live studio (face-to-face) with regard to a future hybrid education using advancing technology-enhanced tools and digital resources in a

Midwestern research university in the United States. The study aims to support A&D in new ways for the transition to live studio-based teaching to online platforms while emphasizing methods related to appropriate traditional hand tools and technology-enhanced tools in challenging mediums (Marshaley and Schlater, 2020). On the basis of the accumulated information and findings, the data highlight recommendations in the digital age for assessments of excellent studio learning, traditional studio learning opportunities, and online studio learning opportunities for future hybrid A&D education to work with traditional hands-on and technology-enhanced tools. This research provides helpful insights for any institution or program involving futuristic technology-enhanced teaching and technology-enhanced learning in A&D programs, especially for online studios.

The overarching research question was as follows: “What were the differences between instructors’ perspectives and students’ experiences in terms of the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities in A&D programs with or without online education during the COVID-19 pandemic in 2020 and 2021?” These participants answered Qualtrics surveys online based to describe their perspectives and experiences, thereby addressing the following research questions:

1. What are the faculties’ perspectives on the digital age for Art & Design education constructs in terms of the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities?
2. What are the students’ experiences and how satisfied are they with the digital age for Art & Design education constructs in terms of the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities?
3. Is there a difference between the faculty and student perspectives with regard to the digital age for Art & Design education in terms of the constructs of quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities?
4. Is there a difference between the faculty and student perspectives regarding the need to increase online techniques for technology-enhanced studio learning with respect to traditional studio learning in an Art & Design program?

The investigation considered the faculty perspectives and student experiences with their A&D programs for an assessment of future online studio learning. Within the constructs of quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities, these students were likely to gain more experience with digital skills from A&D programs via a combination of traditional methods and educational technology-enhanced tools. The data from other research studies revealed an enhancement of the overall effectiveness of student learning when using technology-enhanced tools during learning activities (Miller and Smith, 2009; Quinn, 2011; Sclater and Lally, 2018; Saykili, 2019).

I measured the effectiveness from the faculty perspectives of the digital age for A&D education in terms of the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities. A previous study found significant confidence in the increased impact of technology-enhanced tools in higher education (Saykili, 2019). Institutions have acknowledged that the traditional methods should include more teaching and learning using technology-enhanced tools in the era of advancing technology and ever-changing higher education (Marshaley and Schlater, 2020; Saykili, 2019).

2. Associations Between Faculty and Students

There were positive associations and low differences between faculty perspectives and student experiences with regard to the digital age for A&D programs in terms of the constructs of traditional studio learning opportunities and online studio learning opportunities. Despite a positive association related to the construct of studio learning, the differences were more significant between the groups. According to the data collected, 55.57% of the faculty were in agreement, in contrast to 77.2% of students. Any higher education program experiencing technology advances will want to fully train faculty with new skills for students to learn technology-enhanced tools using appropriate traditional hand tools or hands-on equipment, especially considering online students in their online studios (Quinn, 2011; Saykili, 2019; Sclater and Lally, 2018).

This study found no statistically significant difference in the two groups with regard to their perspectives on traditional and technology-enhanced learning for A&D program constructs in terms of quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities. According to a one-tailed independent-sample *t*-test, the variables and ratings of participants revealed no statistically significant difference in terms of the survey questions related to studio learning.

However, it is unknown whether the students truthfully expressed their confidence in the A&D education program for any subject, whether learning in a live studio or online. As technology advances, higher education programs will want to fully train their faculty with new skills to teach students new experiences and techniques in all modern A&D programs during the transition to the digital age of education with technology-enhanced learning (Dilmac, 2020; Quinn, 2011; Sclater and Lally, 2018).

This research study cultivated quantitative information about studio learning from surveys for A&D program outcomes to determine relationships between instructor and student perspectives in terms of the quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities to gain a holistic perspective (Creswell, 2012; Creswell and Creswell, 2018; Creswell and Poth, 2018). A quantitative research method was implemented to investigate the possibility of expanding each A&D program to incorporate an online element with formative assessments across live and online studios for hybrid education.

3. Method

Qualtrics survey links were provided through university email addresses to nine faculty members, whereas the university's registrar sent out to 241 students for autumn 2020 and spring 2021. Percentage response rates of 7.88% and 33.33% were obtained for students and faculty, respectively. The 22 responses analyzed in this study were approved by the Institutional Review Board (IRB) for data collection.

3.1 Participants

Participants included faculty teaching A&D programs and the students enrolled in these A&D programs. There were both male ($n=7$) and female ($n=12$) student participants. There were 3 faculty members and 14 students (73.68%) for A&D non-major courses, 4 students (21.05%) for A&D major courses, and 1 student (3.26%) for A&D minor courses. All participants fully completed the survey, with the exception of one student who did not answer the construct related

to online studio learning opportunities.

3.2 Instrumentation

The instrument focused on faculty perspectives and student experiences and satisfaction with traditional and technology-enhanced learning in A&D programs, according to their level of agreement with nine questions by using a six-point Likert-type scale (1 = strongly agree, 2 = agree, 3 = somewhat agree, 4 = somewhat disagree, 5 = disagree, and 6 = strongly disagree).

3.3 Analysis/Research Design

The analysis posttest design used one-tailed independent-sample *t*-tests. The independent variable was the participant's level of agreement or disagreement with traditional and technology-enhanced learning in A&D programs during the COVID-19 pandemic in autumn 2020 and spring 2021. The dependent variables were the constructs of faculty perspectives on and student experiences and satisfaction with the A&D programs. Overall, the faculty agreed with Q4, Q5, and Q6 related to studio learning, as well as Q7, Q8, and Q9 related to traditional studio learning, whereas they did not agree Q10, Q11, and Q12 related to online studio learning. On the other hand, students agreed with Q4, Q5, and Q6 related to studio learning, as well as Q7, Q8, and Q9 related to traditional studio learning, whereas they also did not agree with Q10, Q11, and Q12 related to online studio learning opportunities. One faculty member (33.33%) somewhat disagreed with the quality of online studio learning opportunities available to students.

Descriptive statistics were used to analyze differences in agreement between both groups using SPSS software. A one-tailed independent-sample *t*-test was implemented to analyze these variables, revealing no statistically significant differences in the survey responses.

4. Results

The quantitative data regarding faculty member perspectives and student experiences in terms of quality of studio learning, traditional studio learning opportunities, and online studio learning opportunities are presented in this section. The participants contributed their views on any in-class instructions related to instructional videos, online resources, and more online digital skills for any A&D course.

As shown in Table 1, the highest agreement among faculty members was obtained for Q6-Q12 at 66.7%, whereas the lowest was obtained for Q4 and Q5 at 33.3%.

According to the faculty posttest survey data, with the mean (*M*) scores were ranged from 1.67 to 2.67 on the six-point scale across all survey questions.

Table 1. Percentage agreement with survey among faculty members, along with mean scores and standard deviation.

		% Some Form of Agreement	<i>M</i>	<i>SD</i>
C1 Studio Learning in Art and Design				
Q4	I am confident in my ability to teach studio learning in art and design using traditional and modern methods in digital age	33.3	1.67	0.58
Q5	I am confident in my ability to teach studio learning in art and design using an online or hybrid delivery mode.	33.3	2.33	1.16

Q6	I am confident with my ability to teach studio learning in art and design to students at this university.	66.7	1.67	1.16
C2 Traditional Studio Learning Opportunities				
Q7	I am pleased with the quality of the traditional studio learning opportunities afforded to students in my course that are transferable and applicable to today's real-world settings.	66.7	2.00	1.00
Q8	I am pleased with the quality of the traditional studio learning opportunities afforded to students in my course that broaden their expertise and art and design skills.	66.7	1.67	1.16
Q9	I am pleased with the quality of the traditional studio learning opportunities afforded to students in my course that prepare them for a future career in this area.	66.7	2.00	1.00
C3 Online Studio Learning Opportunities				
Q10	I am pleased with the quality of the online studio learning opportunities afforded to students in my course that are transferable and applicable to today's real-world settings.	66.7	2.67	1.53
Q11	I am pleased with the quality of the online studio learning opportunities afforded to students in my course that broaden their expertise and art and design skills.	66.7	2.67	1.53
Q12	I am pleased with the quality of the online studio learning opportunities afforded to students in my course that prepare them for a future career in this area.	66.7	2.67	1.53

As shown in Table 2, the highest agreement among students was obtained for Q4 and Q5, whereas the lowest was obtained for Q11. Overall, the agreement was considered high across the nine survey questions.

According to the student posttest survey data, the mean scores ranged from 2.32 to 2.63 on the six-point scale across all survey questions. The large SD values suggest that these data cannot be considered highly reliable.

Table 2. Percentage agreement with survey among students, along with mean scores and standard deviation.

		% Some Form of Agreement	M	SD
C 1 Studio Learning in Art and Design				
Q4	I am satisfied with my art and design program in terms of studio learning using traditional methods in the digital age.	89.5	2.42	1.26
Q5	I am satisfied with my art and design program in terms of studio learning using face-to-face, online, or hybrid courses.	84.2	2.58	1.31
Q6	I am satisfied with my art and design program in terms of the overall experience with studio learning at this university.	89.5	2.32	1.20
C2 Traditional Studio Learning Opportunities				
Q7	I am satisfied with my art and design program in terms of	84.2	2.53	1.35

	traditional studio learning opportunities that are applicable to today's real-world settings.			
Q8	I am satisfied with my art and design program in terms of traditional studio learning opportunities that broaden my expertise and skills for a future career in this area.	84.2	2.37	1.54
Q9	I am satisfied with my art and design program in terms of traditional studio learning opportunities at this university.	84.2	2.42	1.50
C3 Online Studio Learning Opportunities				
Q10	I am pleased with my art and design education in terms of technology-enhanced studio learning and experimentation with new technology and materials.	63.2	2.58	1.74
Q11	I am pleased with my art and design education in terms of technology-enhanced studio learning that promotes the development of better analytical, communication, and artistic skills.	52.6	2.63	1.67
Q12	I am pleased with my art and design education in terms of technology-enhanced studio learning at this university.	63.2	2.37	1.54

According to Table 3, the greatest difference between faculty and student perspectives was obtained for C3 construct (Q10, Q11, and Q12), whereas the highest agreement was obtained for the construct of C1 construct (Q4, Q5, and Q6). The greatest negative disparity (greater agreement among faculty vs. students) was obtained for Q11 (-14.1 %), whereas the greatest positive disparity (greater agreement among students vs. faculty) was obtained for Q4 and Q6 (56.2%). Overall, the agreement between both cohorts was not high, with students answering more favorably than faculty. The rationale for any higher-education program experiencing technology advances is to thoroughly train each student using digital technology-enhanced learning tools, instructional videos (such as on YouTube videos) and online resources (Burke et al., 2009; Quinn, 2011).

Table 3. Percentage agreement among faculty versus students.

Question	Faculty % Some Form of Agreement	Students % Some Form of Agreement	Difference % Some Form of Agreement	
C1 Studio Learning in Art and Design				
Q4	I am satisfied and confident with the studio learning in art and design using traditional and modern methods in the digital age.	33.3	89.5	56.2
Q5	I am satisfied and confident with the studio learning in art and design using face-to-face, online, or hybrid courses.	33.3	84.2	50.9
Q6	I am satisfied and confident with the studio learning in art and design at this university.	33.3	89.5	56.2
C2 Traditional Studio Learning Opportunities				
Q7	I am satisfied and pleased with the traditional studio learning opportunities that are transferable and applicable to today's real-world settings.	66.7	84.2	17.5
Q8	I am satisfied and pleased with the traditional studio learning opportunities that broaden my expertise and skills.	66.7	84.2	17.5
Q9	I am satisfied and pleased with the traditional studio learning	66.7	84.2	17.5

opportunities at this university for a future career in this area.				
C3 Online Studio Learning Opportunities				
Q10	I am satisfied and pleased with the online studio learning opportunities and experimentation with new technology and materials that are applicable in today's real-world settings.	66.7	63.2	-3.5
Q11	I am satisfied and pleased with the online studio learning opportunities that broaden my expertise and promoted better analytic, communication, and artistic skills.	66.7	52.6	-14.1
Q12	I am satisfied and pleased with the online studio learning opportunities at this university for a future career in this area.	66.7	63.2	-3.5

According to this survey, both faculty and students agreed on using digital resources and technology-enhanced tools for online learning as an alternative to improve course quality with respect to traditional A&D programs (Quinn, 2011; Saykili, 2019; Sclater and Lally, 2018).

5. Discussion

According to the literature, researchers have argued that there are not enough studies comparing the use of traditional hands-on tools and technology-enhanced tools in art and design courses. In my opinion, digital skills would make a difference, especially in the post-pandemic era considering the transition of higher education to online classes regardless of the subject. Furthermore, there are knowledge gaps related to digital skills and technology-enhanced tools in contrast to traditional methods. For instance, Souleles (2016) compared the contribution of digital tools in art and design education with traditional hand tools. It was claimed that using devices such as an iPad can enhance and support art and design learning (Souleles, 2016). However, limited studies have compared traditional and technology-enhanced learning (Souleles, 2016). Furthermore, Saykili (2019), explained that higher education has constantly experienced advancing digital technologies throughout the years, whereas all learners need digital skills for future career jobs that do not exist today.

6. Conclusion

In conclusion, A&D programs were evaluated in terms of studio learning, traditional studio learning opportunities, and online studio learning opportunities. Overall, students were satisfied with the A&D programs during the pandemic in terms of traditional studio learning with traditional hands-on tools. However, live studios must explore alternatives such as digital resources and technology-enhanced tools to determine what is feasible for online studios. A&D outcomes may be influenced by the differences in artistic projects upon incorporating appropriate digital technology-enhanced learning and digital resources (Quinn, 2011; Souleles, 2016; Sclater and Lally, 2018). Furthermore, according to the survey results, regarding students' low satisfaction on the online studio learning opportunities and a desire for digital skills in studio learning, higher education in the 21st century should continue to strive for improvement and address the need for better distance teaching and learning experiences in art and design (Munson et al. 2016).

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Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki and was approved by the Institutional Review Board of the

University of North Dakota, Division of Research & Economic Development Office of Research Compliance & Ethics (protocol code: IRB0003465; approval date: 07/09/2021) for studies involving humans.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data that support the findings of this study are available in the supporting information provided alongside this article.

Conflicts of Interest: The author declares no conflict of interest.

REFERENCES

- (Barone and Eisner 2012) Tom Barone, and Elliot W. Eisner, 2012. *Arts Based Research*. Sage Publication.
- (Burke et al. 2009) Sloane Burke, Shoana Snyder, and Robin C. Rager. 2009. An assessment of faculty usage of YouTube as a teaching resource. *The Internet Journal of Allied Health Sciences and Practice* 7: 8.
https://nsuworks.nova.edu/cgi/viewcontent.cgi?referer=https://scholar.google.com/scholar?hl=en&as_sdt=0%2C35&q=faculty+using+instructional+videos&btnG=&oq=faculty+using+instructional+vide&httpsredir=1&article=1227&context=ijahsp/
- (Creswell 2012) John W. Creswell. 2012. *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Pearson.
- (Creswell and Poth 2018) John W. Creswell, and Cheryl N. Poth. 2018. *Qualitative Inquiry & Research Design: Choosing among Five Approaches*. Sage Publications.
- (Creswell and Creswell 2018) John W. Creswell and J. David Creswell. 2018. *Research Design: Qualitative, Quantitative, and Mixed Methods*. Sage Publications.
- (Dilmac 2020) Sehran Dilmac. 2020. Students' opinions about the distance education to art and design courses in the pandemic process. *World Journal of Education* 10: 113.
<https://10.5430/wje.v10n3p113>.
- (Jankowski 2020) Natasha A. Jankowski. 2020. Assessment during a crisis: Responding to a global pandemic. *National Institute for Learning Outcomes Assessment*.
<https://files.eric.ed.gov/fulltext/ED608798.pdf>
- (Marshaley and Sclater 2020) Lorraine Marshaley and Madeline Sclater. 2020. Together but apart: Creating and supporting online learning communities in an era of distributed studio education. *The International Journal of Arts & Design Education* 39: 826–40.
<https://doi.org/10.1111/jade.12331>.
- (Miller and Smith 2009) Susan Miller and Linda Smith. 2009 Distance learning in the visual arts. *Journal of Online Learning and Teaching* 5: 1–11.
<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.597.7502&rep=rep1&type=pdf>
- (Munson et al. 2016) April Munson, Lindsey Archer, Edward Eanes, Dori Garziano, and Deborah Hutchinson. 2016. Shifting directions in the arts: Building quality online courses and degree programs. *International Journal of Information and Education Technology* 6: 162–65. <http://www.ijiet.org/vol6/678-DL0022.pdf>

- (Prater 2001) Michael Prater. 2001. Constructivism and technology in art education. *Art Education* 54: 43–48. <https://www.jstor.org/stable/3193914>
- (Quinn 2011) Quinn, Robert D. 2011. E-Learning in art education: Collaborative meaning making through digital art production. *Art Education* 64: 18–24. <https://doi.org/10.1080/00043125.2011.11519132>
- (Reich et al. 2020) Reich, Justin, Buttimer, Christopher J., Fang, Allison, Hillaire, Garron, Hirsch, Kelley, Larke, Laura, Littenberg-Tobias, Joshua, Moussapour, Roya, Napier, Allysa, Thompson, Meredith, and Slama, Rachel, 2020. Remote learning guidance from state education agencies during the COVID-19 pandemic: A First Look. *EdArXiv*, April 2. <https://doi.org/10.35542/osf.io/437e2>.
- (Sahu 2020) Sahu, Pradeep. 2020. Closure of universities due to coronavirus disease 2019 (COVID-19): Impact on education and mental health of students and academic staff. *Cureus* 12: e7541. <https://doi.org/10.7759/cureus.7541>.
- (Saykili 2019) Saykili, Abdullah. 2019. Higher education in the digital age: The impact of digital connective technologies. *Journal of Educational Technology & Online Learning* 2: 1–15.
- (Sclater and Lally 2018) Sclater, Madeleine, and Lally, Vic. 2018. Interdisciplinarity and technology-enhanced learning: Reflections from art and design and education perspectives. *Research in Comparative and International Education* 13: 46–69. <https://10.1177/1745499918768111>.
- (Souleles 2016) Souleles, Nicos. 2016. iPad versus traditional tools in art and design: A complementary association. *British Journal of Educational Technology* 48: 586–97. <https://bera-journals.onlinelibrary.wiley.com/doi/abs/10.1111/bjet.12446>