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Quality in Online Project Learning

An analysis of engagement, satisfaction and outcomes at scale

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Abstract

To equip students with the skills and capabilities they need to succeed in the future of work, educators seek to deliver a range of experiential learning programs in and around the theoretical curriculum.

Employers are overwhelmingly more likely to hire a candidate who has completed active and applied learning experiences in college. However, experiential learning with high proportions of in person engagement can be complex and costly for education program managers to deliver at scale, as well as limited in scope and accessibility.

Team based student-industry projects where students apply their knowledge to address real problems posed by employers are a significant and fast growing part of the equation. Increasingly institutions are building consistent project programs to engage industry and build student skills.

Online student-industry projects offer educators and students substantial benefits, including preparing students for ever more prevalent hybrid and global work, equity & inclusion, broader geographic access, lower cost and enhanced scalability. However - these benefits can only be realised if learning quality is assured.

This analysis set out to test the nature and degree of **quality variation** in team based student-industry projects with higher proportions of online engagement, as measured against in-person and hybrid control programs with similar characteristics.

Active since 2018, this study now analyses a sample of **13,390 participants** from 26 universities, across 218 cohorts and 4 types of programs supported by the Practera platform. The programs exhibit similar instructional design, but different levels of duration and online intensity.

This analysis tests 6 hypotheses using a range of input, satisfaction and outcome measures. Study design and findings have remained broadly consistent from an initial study with 519 participants.

Summary Findings

1. 100% online programs produced equivalent or better output quality to mostly offline or hybrid models

2. 100% online programs produced equivalent or better Participant (student & industry) satisfaction to mostly offline or hybrid models

3. Under appropriate conditions and with appropriate learning design, online project learning models can deliver comparable quality outcomes to mostly offline models at up to 90% lower costs

Background

To equip students with the skills and capabilities they need to succeed in the future of work, educators and institutions seek to deliver a range of experiential learning programs around theoretical curricula.

These programs or 'High Impact Practices'(1) are designed to engage students in a structured way with real world activities and challenges - and include:

- ✓ Networking
- ✓ Accelerators
- ✓ Industry projects
- ✓ Internships
- ✓ Volunteering
- ✓ Mentoring
- ✓ Placements
- ✓ Study abroad

These programs might be formally embedded in the educational curriculum, be available around the curriculum, or be created by students through extracurricular activity and recognised by the institution.

Team projects where students apply their knowledge to solve real problems posed by employers are a significant and fast growing part of the mix to develop top rated employability skills.

A 2021 employer study by the American Association of Colleges and Universities identifies an ability to work in teams, critical thinking, application of knowledge in real world settings and digital literacy to be among the top 5 learning outcomes of a college education valued by employers. The study found that up to **90% of employers are more likely to hire a candidate who has completed active and applied learning experiences in college** (2)

The World Economic Forum cites skills in self-management under conditions of ambiguity such as active learning, resilience, stress tolerance and flexibility as increasingly critical to the future of work. These join skills such as critical thinking, problem-solving and digital literacy topping the list of skills that employers believe will grow in prominence and be critical to the reskilling required for >50% of the workforce by 2025 (3)

A Northeastern University survey found that employers' top priority recommendation for colleges and universities was to "include real-world projects and engagements with employers and the world of work" in their programmes (4)

(1) https://powrra.aacu.org/trending-topics/high-impact
(2) https://www.aacu.org/research/how-college-contributes-to-workforce-success
(3) https://www.weforum.org/agenda/2020/10/top-10-work-skills-of-tomorrow-how-long-it-takes-to-learn-them/
(4) Gallagher, Sean et al, Northeastern University's Center for the Future of Higher Education and Talent Strategy, 2018

However, high quality and inclusive experiential learning can be **complex** and **costly** for **education program managers** to deliver at scale. Challenges include designing effective & efficient programs, engaging students, mentors and educators, and monitoring and quality assurance.

'**Quality**' experiential learning can traditionally be conflated with face to face physical interaction, like the traditional in-office summer internship. However - the Covid-19 pandemic has changed the worlds of work and learning forever, massively accelerating a pre-existing shift in work to be much more virtual and hybrid.

Learning the skills to rapidly form teams online and across borders to solve problems will be far more important to future workplaces than in the past.

While many jobs will be face to face first, global companies like 3M, Dell Technologies, CVS Health, AT&T, Siemens, Atlassian, Ford, Salesforce and Adobe are among those offering fully remote work options, while most employers will offer hybrid work (5). A 2022 Study by Stanford Economist Nick Bloom found remote work is now 6x as prevalent as before the pandemic (6). Remote work further promotes diversity, equity & inclusion - under-represented groups felt the strongest desire for flexibility and can feel more comfortable making contributions (6).

Benefits of online project learning

1 More equitable access for students unable to participate in face to face learning

2 Helps overcome barriers to employer participation

3 Allows broader geographic engagement of students and employers

4 Builds digital, teamwork and remote work skills

5 Reduced costs and increased scalability

6 Improves consistency, quality assurance & research insights through data

(5) https://www.Forbes.com/sites/jenamcgregor/2022/01/10/the-top-100-companies-for-remote-jobs-in-2022/?sh=125a79ce6901,
(6) https://www.jdsupra.com/legalnews/stanford-economist-nick-bloom-shares-8661165/

The Research

One of the key questions we are asked by our Education partners, is whether online experiential learning can be as high quality as a mostly in person experience, and this was the question we set out to test in this research.

Six hypotheses for the research were developed

1 Higher % online would strongly correlate with a lower completion rate

2 Higher % online would strongly correlate with a higher team dissonance

3 Higher team dissonance would strongly correlate with lower output quality

4 Higher % online would moderately correlate with lower student satisfaction

5 Higher % online would moderately correlate with lower output quality

6 Higher program cost to deliver would moderately correlate with lower output quality

Sample & Metrics

Practera selected four types of team based project programs delivered by Practera for this research. These programs were selected for similar characteristics except for markedly different levels of online vs 'face to face' learning & activity in the delivery model. Programs;

✓ have consistent learning designs, content, workflows, teamwork and feedback structures

✓ were delivered by the Practera Programs team using the Practera platform

✓ are undertaken by multi-disciplinary student teams engaging with employers

✓ are undertaken by culturally & linguistically diverse student teams with >50% non-anglo / english language backgrounds

✓ are 'extra' curricular in nature and standalone; not paired with pre- or post- project learning elements

Two types of Programs form a **'mostly offline'** and **'hybrid'** control to the fully online programs.

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Program Summary

1 The Nano Projects Program (Nano) is a 100% online project program which connects teams of students with employers to undertake 2 week research projects with approximately 25 hours of learning & work and three feedback loops with an industry client.

2 The Micro Projects Online Program (Micro Online) connects teams of students with employers to work on a real world 3 week team based project with approximately 50 hours of learning & work. Students have a client and a professional mentor, completing at least 7 interaction / feedback loops with them. Participants work and interact 100% online.

3 Control Micro Projects Program (Micro) was (prior to Covid-19) a hybrid program, connecting teams of students with employers to work on a real world 3 week team based project with approximately 50 hours of learning & work. Students have a client and a professional mentor, completing at least 7 interaction / feedback loops with them. Students worked together online and in-person, and attended in person orientation, meetings and final presentations.

4 Control Program; is a 12 week project program where students were working in co-located teams and engaging with clients, mentors and facilitators in 5 half day workshops. Some content and collaboration occurred online.

	CONTROL PROGRAM	CONTROL MICRO	MICRO ONLINE	NANO
	12 week workshop based industry innovation project program	3 week industry projects program for students with business, government & community organisations	3 week online industry projects program for students with business, government & community organisations	2 week online industry research project program
Scalability	Low-Medium	Medium	High	High
Cost / student	$1000	$500	$500	$150
Duration	12 weeks	3 weeks	3 weeks	2 weeks
Work	120 hours	50 hours	50 hours	25 hours
% Online	25%	50%	100%	100%

Between 2018 and July 2022, a sample of 13,390 students spread across 218 selected cohorts has been analysed.

Program	Cohort	Student Numbers
CONTROL PROGRAM	4	125
CONTROL MICRO	28	2,363
MICRO ONLINE	46	2,726
NANO	140	8,910
TOTAL	218	**13,390**

Metrics Analyzed

7 key metrics were analyzed across three programs to identify differences potentially attributable to online penetration (full definitions available in appendix 2).

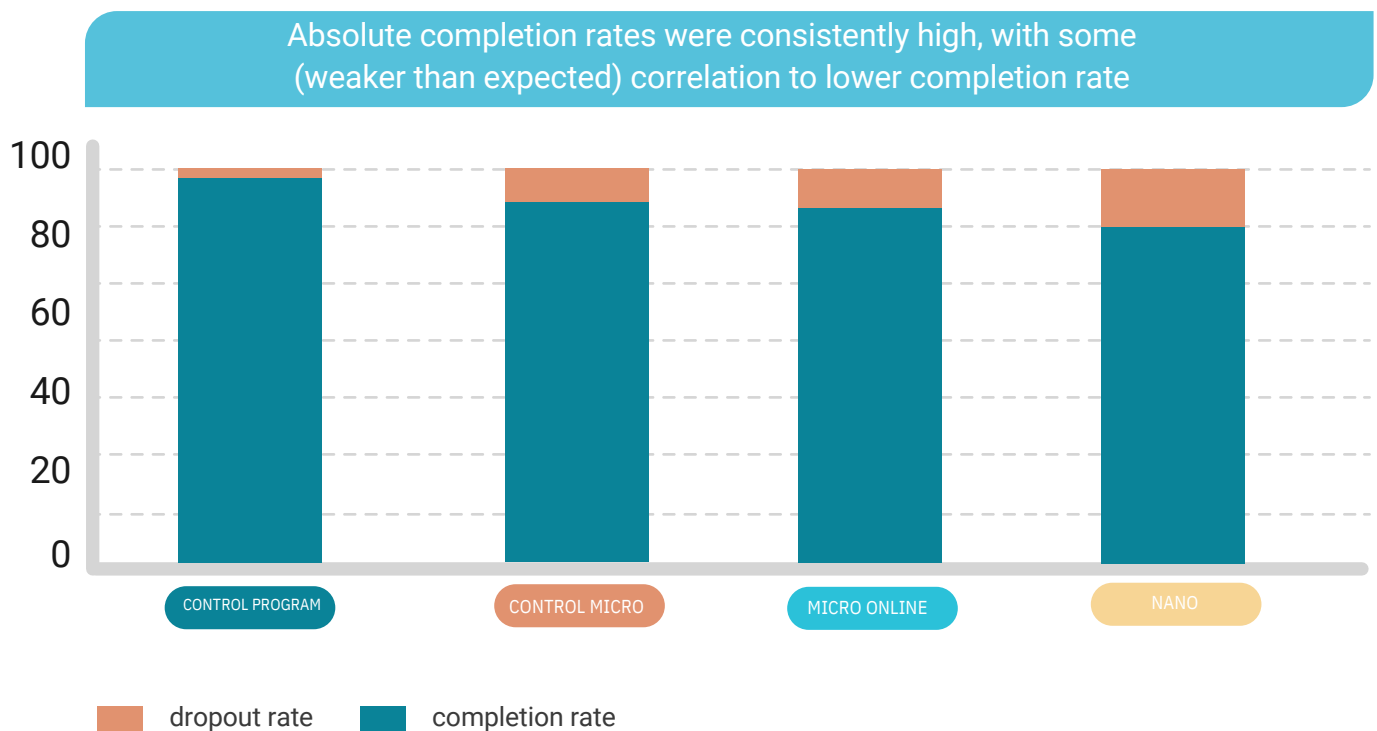| Dimension	Metric
Output quality	Willingness to recommend average (student)
	Willingness to recommend average (industry mentor)
	Moderated final assignment / deliverable score average (industry assessed, academic moderated)
Activity quality	Median difference in team 360 peer evaluations (as a measure of team dissonance)
	Student completion %
Inputs	Hours of work / student
	Cost / student

Summary Findings

1 Absolute completion rates were consistently high, with a weaker than expected correlation to lower completion rate

2 Intra-team dissonance was not asignificant predictor of team performance

3 Team dissonance increases with higher levels of online

4 Higher levels of online engagement did not reduce output quality

5 Higher levels of online engagement did not reduce participant (student or industry mentor) satisfaction

6 Under appropriate conditions and with appropriate learning design, online experiential learning can deliver comparable quality outcomes at up to 90% lower costs

Analysis

Partly Against hypothesis

1. Some correlation between % online and lower completion rate

Absolute completion rates were consistently high, with some (weaker than expected) correlation to lower completion rate

Legend: dropout rate, completion rate

X-axis categories: CONTROL PROGRAM, CONTROL MICRO, MICRO ONLINE, NANO

2. Some correlation between increased team dissonance and a higher level of online

ON hypothesis

Team dissonance increases with higher levels of online

CONTROL PROGRAM | CONTROL MICRO | MICRO ONLINE | NANO
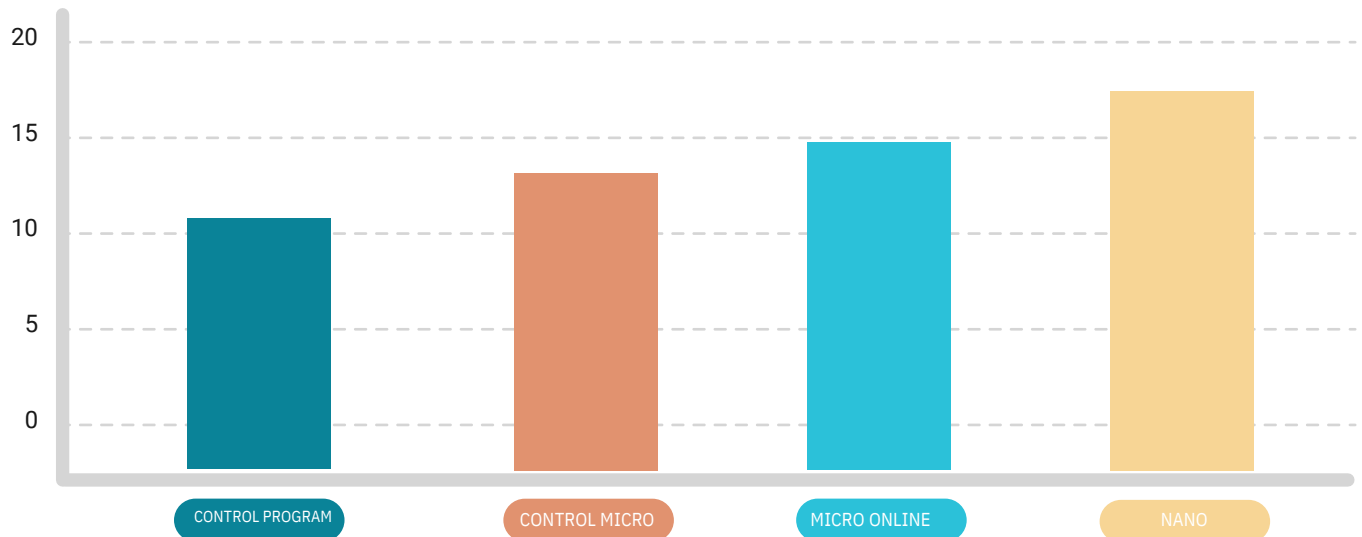
3. No correlation between lower team dissonance and higher output quality

Against hypothesis

Output Quality

Team Dissonance
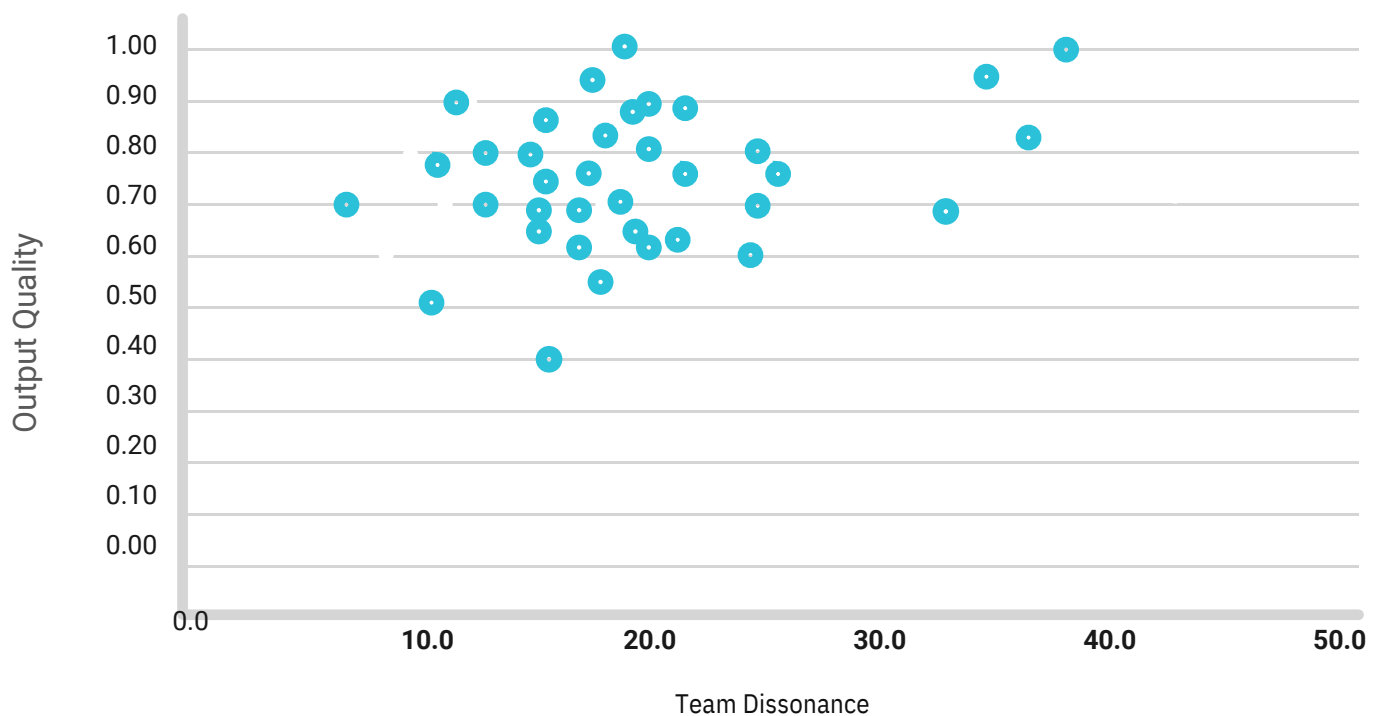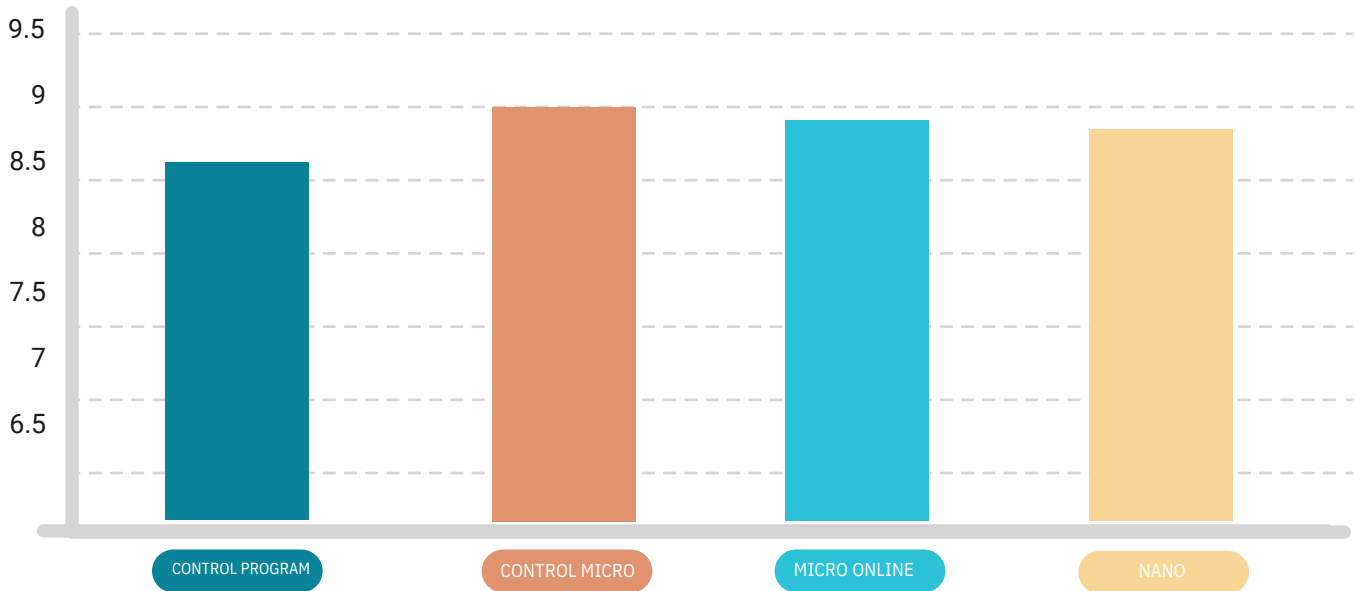
4. No strong correlation between higher % online and lower student satisfaction

Against hypothesis

Online can deliver as high or higher student satisfaction than in person models

CONTROL PROGRAM	CONTROL MICRO
MICRO ONLINE	NANO

5.No correlation between higher % online and lower output quality

Against hypothesis

Online can deliver as high or higher output quality in person models

CONTROL PROGRAM	CONTROL MICRO
MICRO ONLINE	NANO
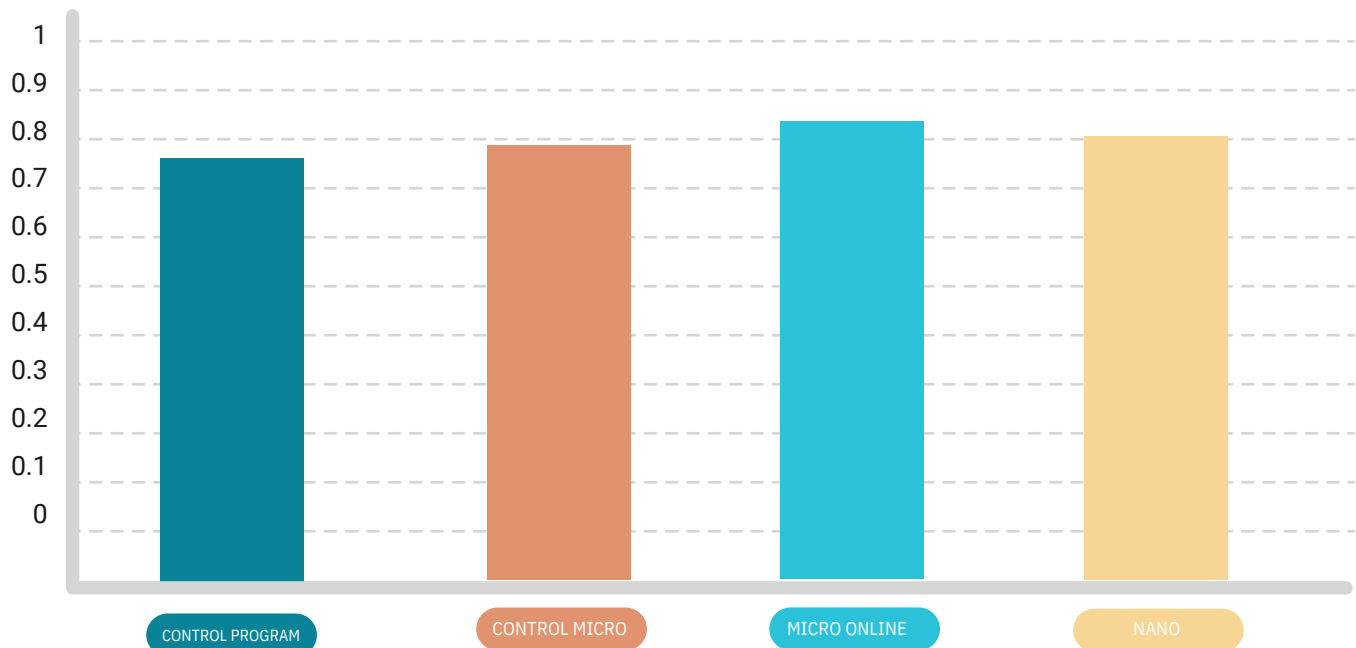
6. The correlation between higher program cost to deliver & lower output quality was weaker than expected

Moderately against hypothesis

Online only programs exhibited similar output quality at up to 90% lower cost
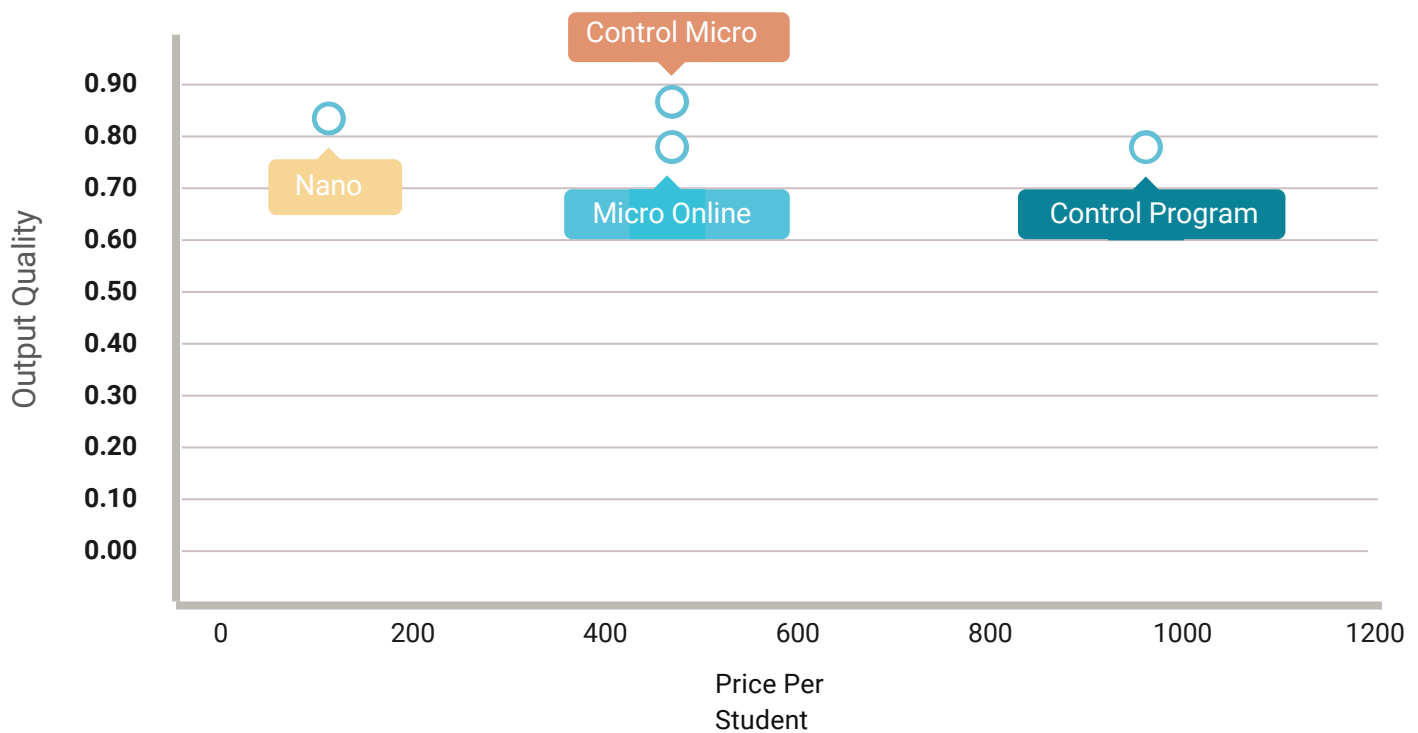
Causal Factors

We attribute the primary causal factor for the better than anticipated results to be effective experiential learning design & support, with the following specific features which were intentional (but previously untested) elements of the design of the programs;

✓ Effective expectations management

✓ Shared, valuable objectives, expectations and a common framework for student, mentor and educator collaboration

✓ Support for learners to apply knowledge to new settings and complex problems

✓ Meaningful engagement between students and experienced practitioners aligned with program learning outcomes

✓ Facilitation of the critically reflective learning process that is required for social & emotional competency development

✓ Practera platform
  - Structures project learning workflow for students & mentors
  - Effective issue detection, & quality assurance

Caveats & Potential Issues

It is important to note some potential caveats with the samples and research findings. Future extensions of the research will attempt to reduce any potential effect from these.

- ✅ Expectations management with participants means that quality scores are not absolutes; they take into account objectives, duration and support levels. An industry mentor assessing a nano program knows the students have done a 2 week online program. A student who was expecting a 12 week workshop based would not be satisfied with a nano program

- ✅ No 'zero online' baseline model was compared

- ✅ Higher online models were more extra-curricular, and also much shorter in duration than the control program

- ✅ There are some natural differences in participant populations (demographics, year of study, field of study) between programs and cohorts

- ✅ Dissonance measure selected may not have been most appropriate

- ✅ % of online measures are approximation

Appendix 1 Data Table

Program	Cohort	Student numbers	% online	Dissonance	Deliverable quality	Willingness to recommend	Cost to deliver
CONTROL PROGRAM	4,198	1,050	25%	11.6	0.77	7.74	1000
CONTROL MICRO	34,692	1,239	50%	13.7	0.79	8.88	500
MICRO ONLINE	101,823	2,214	100%	16.6	0.82	9.23	100
NANO	282,109	2,030	100%	17.4	0.82	8.59	150

Appendix 2 - Metrics definitions

Metric	Description
Output quality – perception, deliverable scores	
Willingness to recommend average (student)	Average student willingness to recommend the experience to a peer – survey at close of program
Willingness to recommend average (industry mentor)	Average industry participant willingness to recommend the experience to a peer – survey at close of program
Moderated score average (industry)	Average moderated score of all assessable deliverables – industry scored and program manager / academic moderated (light moderation)
Activity quality - teamwork	
Team 360 peer median	Average scores team members have rated self and each other on weekly team 360 evaluations of key attributes – communication, collaboration, work ethic, work quality etc
Dissonance	Average variance across team 360 scores, representing divergent views on team member performance within the team
Dropout %	Average completion of the program by participants
Inputs	
Hours of work	Approximate / recommended hours of work required from students to complete the program
Cost / student %	Approximate average retail price of the program incorporating all cost elements – eg; project sourcing, workshop facilitation, participant support, platform licensing

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About Practera

Practera is an edtech company which helps education providers in Universities, Governments, and Employers deliver
experiential learning & employability programs that equip students & professionals for the future of work. These are programs like team projects, skills credentialing, work simulations, global mobility, accelerators, mentoring networks, and internships.

Through our technology & programs, we have helped leading Universities improve employability outcomes, student & industry engagement, increase scale, and reduce costs.

Customers include more than half of Australian Universities, 5 State Governments, Boston University, Northeastern University, MIT, UC Davis, and thousands of employers engaging with students through the platform.

Beau Leese
Co-Founder/Co-CEO

Beau Leese works with a range of Higher Education, Government and Business partners globally on experiential learning innovation. He is a former Head of Strategy for Australia's national Science Agency and Director with Deloitte Consulting.

Dr. Djazia Ladjal
Senior Data Scientist

Dr Ladjal has a PhD in Astrophysics with 10+ years of experience in research and data modelling. She has also worked in Media and Marketing developing machine learning algorithms for various industries before pivoting to EdTech.

Alison Li
Senior Experiential Learning Specialists

She is an experienced researcher, statistician and experiential learning specialists with proficient skills and knowledge in data science, education and IT sectors. Alison has 5+ years of experience with Practera.

Practera Platform

Practera is a platform designed to support educators delivering experiential learning programs.

The system aims to overcome some of the specific challenges inherent in experiential learning through three key mechanisms;
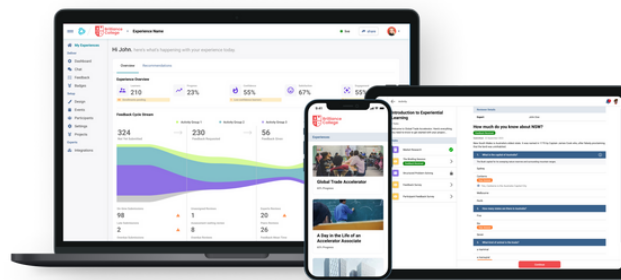
Project library

Build a consistent library of project models of varying themes, durations & intensities.

Engaging apps

Engage learners & employers online systematically in delivery and feedback loops.

Time saving analytics

AI powered analytics & intervention tools help deliver outcomes at low cost.

Practera supports a wide range of experiential learning programs with different degrees of 'online' vs 'offline' activity.

These can range from simple use of fast feedback tools to capture data about real world experiences, up to entirely online collaborative programs between learners and mentors in different countries. Practera essentially systematises and captures data from the repeatable learning at the core of experiential learning, adapted from the Kolb Cycle(5) .

[5] Kolb, D. (1984). Experiential Learning: experience as the source of learning and development.

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