

TRENDS + TENSIONS

INTEGRATING
PEDAGOGY, SPACE,
AND TECHNOLOGY
FOR OPTIMAL
CLASSROOM DESIGN

BHDP





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Introduction

On May 6, 2024, BHDP Architecture hosted a Higher Education Thought Leadership Roundtable of leading experts on integrating pedagogy, space, and technology for optimal classroom design. Participants included Joshua Kim, Ph.D.- Director of Online Programs and Strategy at Dartmouth College, Sam Elkington, Ph.D.- Professor of Learning and Teaching at Teesside University, UK, Jamie Caridi, Ph.D.- President of Bethany College, Lauren Barbeau, Ph.D.- Assistant Director for Learning and Technology Initiatives at Georgia Tech- Center for Teaching and Learning, Steven Butschi- Director of Education, North America Google Education Go-to-market and Partnerships team, and Kyle Bowen- Deputy Chief Information Officer, Arizona State University.

These experts were asked a series of questions to solicit insights on various topics, including their perspectives on the most effective pedagogical approaches for student learning, engagement, and satisfaction, and how emerging technologies—such as artificial intelligence, augmented reality, and virtual reality—affect pedagogical delivery and classroom design. The conversation also addressed the challenges of integrating technology throughout the campus ecosystem, the value and future of liberal arts programs, and the importance of collaborative evaluation of instructional spaces and technologies. BHDP validated emerging themes identified throughout the roundtable discussion by surveying chief academic officers on the subject of pedagogy, technology, and space design, the results of which are included in this report.



Hybrid Learning is Here to Stay

Participants discussed the practice and efficacy of hybrid learning, as well as the circumstances wherein hybrid learning may take precedence over in-person learning. As students today seek more autonomy and flexibility throughout their educational journey, it was noted that academic leaders and faculty must sufficiently answer the question, “Is it essential this curriculum or course content requires 100% in-seat participation to master and learn?” In other words, as future learners seek convenience in their academic pursuits and the culture of work in general shifts toward a flexible work environment, academic leaders must clearly articulate the need for and value of in-person classes, which they agree often exists. However, the choice and autonomy of learning and giving more flexibility to the learner to understand how to accomplish their goals is increasing. It was noted that the system of learning and the system of working are co-developing at the same time around the idea of choice with connectedness, where both environments contribute to the individual.

The Traditional Lecture Hall: Prevalent But Not Productive

Participants interrogated traditional assumptions and orthodoxies related to in-person learning. In particular, they discussed the traditional, commonplace circumstance of a faculty member meeting with students at a specific place and time for all course engagement in a lecture-style format. Our roundtable of experts, while acknowledging the value of face-to-face learning environments, suggests it may be flawed thinking to assume the traditional classroom experience, where learning is measured by “butts in seats” and the “sage on the stage” is ideal. BHDP’s recent survey of Chief Academic Officers in July 2024 validates this concern and supports the idea of challenging traditional assumptions about postsecondary learning environments. In fact, of the 78 respondents, 64% of Chief Academic Officers stated their classrooms were mostly set up for traditional lecture hall pedagogy (Table 1). Yet these same respondents consider the traditional lecture hall format to be the least effective pedagogical practice (See Table 2). 35 percent of Chief Academic Officers are dissatisfied that their classrooms do not accommodate diverse pedagogical practices (Table 3).

Sixty-four (64) percent of Chief Academic Officers stated their classrooms were mostly set up for traditional lecture hall pedagogy, yet these same respondents consider the traditional lecture hall format as the least effective pedagogical practice.

TABLE 1

FOR WHICH PEDAGOGICAL PRACTICES ARE YOUR CLASSROOMS MOSTLY SET UP?

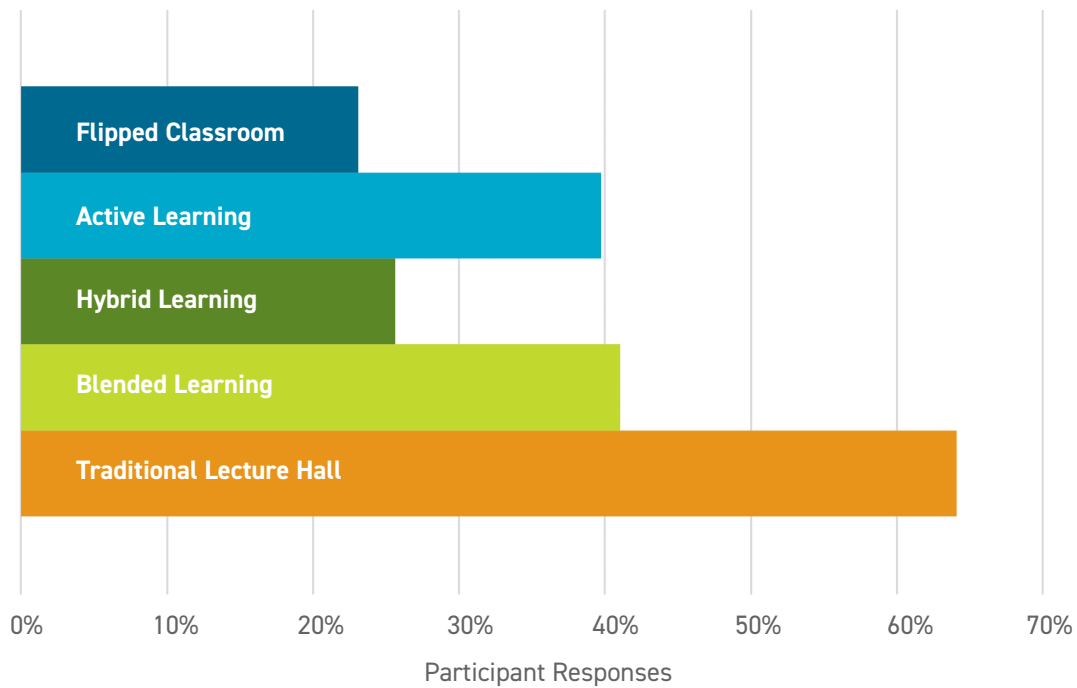


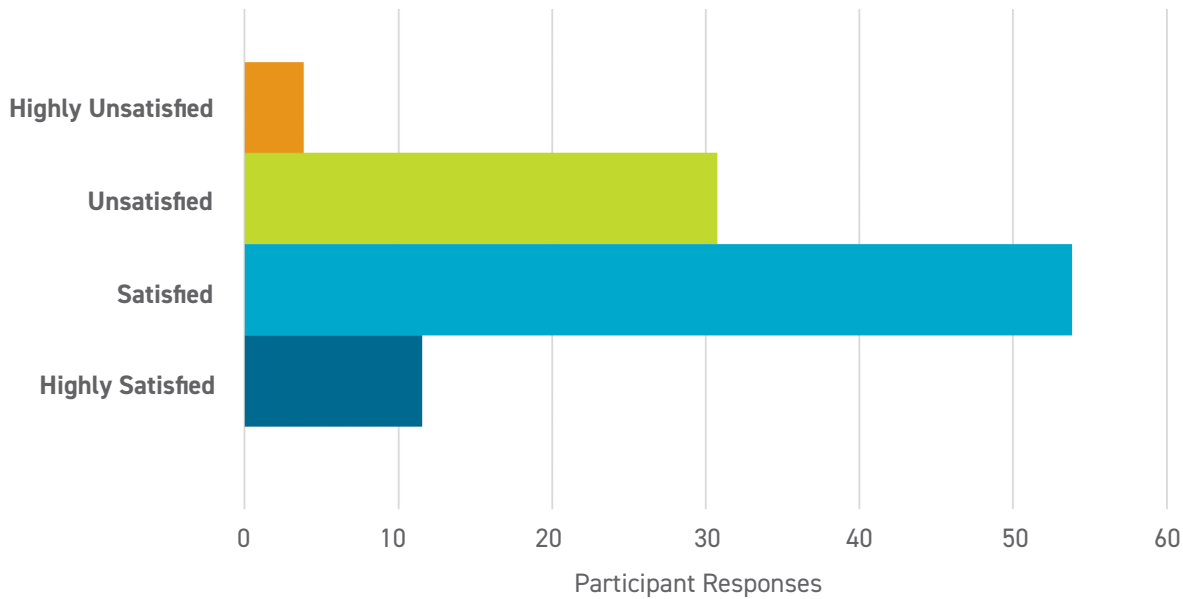
TABLE 2

A RANKING OF EFFECTIVE PEDAGOGICAL PRACTICES AS REPORTED BY CHIEF ACADEMIC OFFICERS

PEDAGOGICAL STYLE	DEFINITION	PERCENT OF CHIEF ACADEMIC OFFICERS WHO DEEM EFFECTIVE	CURRENT CLASSROOM DESIGN AS REPORTED BY CHIEF ACADEMIC OFFICERS
ACTIVE LEARNING	Uses student engagement to guide their learning and requires that students do something to enhance their understanding.	100%	40%
BLENDED LEARNING	Students learn via electronic and online media as well as traditional face-to-face teaching.	79%	41%
FLIPPED CLASSROOM	Provides opportunities to offer synchronous and asynchronous online learning.	78%	23%
HYBRID LEARNING	Presents the components of hybrid or blended learning in a flexible course structure that gives students the option of attending sessions in the classroom, participating online, or doing both.	59%	26%
TRADITIONAL	The teachers impart knowledge to students through oral language.	32%	64%

TABLE 3

HOW SATISFIED ARE YOU WITH HOW YOUR CURRENT LEARNING ENVIRONMENTS SUPPORT DIVERSE PEDAGOGICAL PRACTICES?



Notably, 100% of Chief Academic Officers who responded identified Active Learning as an effective pedagogical practice, yet only 41% of respondents reported that their classrooms accommodate such a pedagogical approach. This suggests Chief Academic Officers believe a “guide on the side” worldview of the professoriate is more fitting and appealing in the common era, leaving behind the “sage on the stage” mentality of yesteryear.

Given this, our roundtable of experts appears justified in their concern, and they emphasized how important it is for academic leaders and faculty to articulate the value of a learning format in relation to its propensity to achieve specific learning outcomes. Moreover, they generally

agreed that within a particular course of study, a student may be best served by encountering various pedagogies in diverse classroom settings and formats. A compelling analogy compared classroom design and student learning to airport flight schedules rather than train schedules. Unlike trains that stop at the same stations daily, flights can change gates, terminals, and aircraft sizes based on need. This metaphor challenges traditional assumptions about classrooms and suggests the space and place where faculty and students teach and learn throughout an educational journey or course may be best if it is dynamic, fostering various forms of collaboration and pedagogical styles. Adopting the theme of “better space,” not “more space,” can help shift the vision for effective classroom design.

Classroom Design Considerations



Discussion among the participants underscored a shared vision of a flexible, inclusive, and technologically enriched educational landscape. By redefining the value of in-person engagement, incorporating advanced technologies, and reimagining space design, educational institutions can better meet the evolving needs of learners and educators. The integration of hybrid models in both education and the corporate world reflects a broader trend towards autonomy and connectedness, paving the way for innovative, effective learning and working environments.

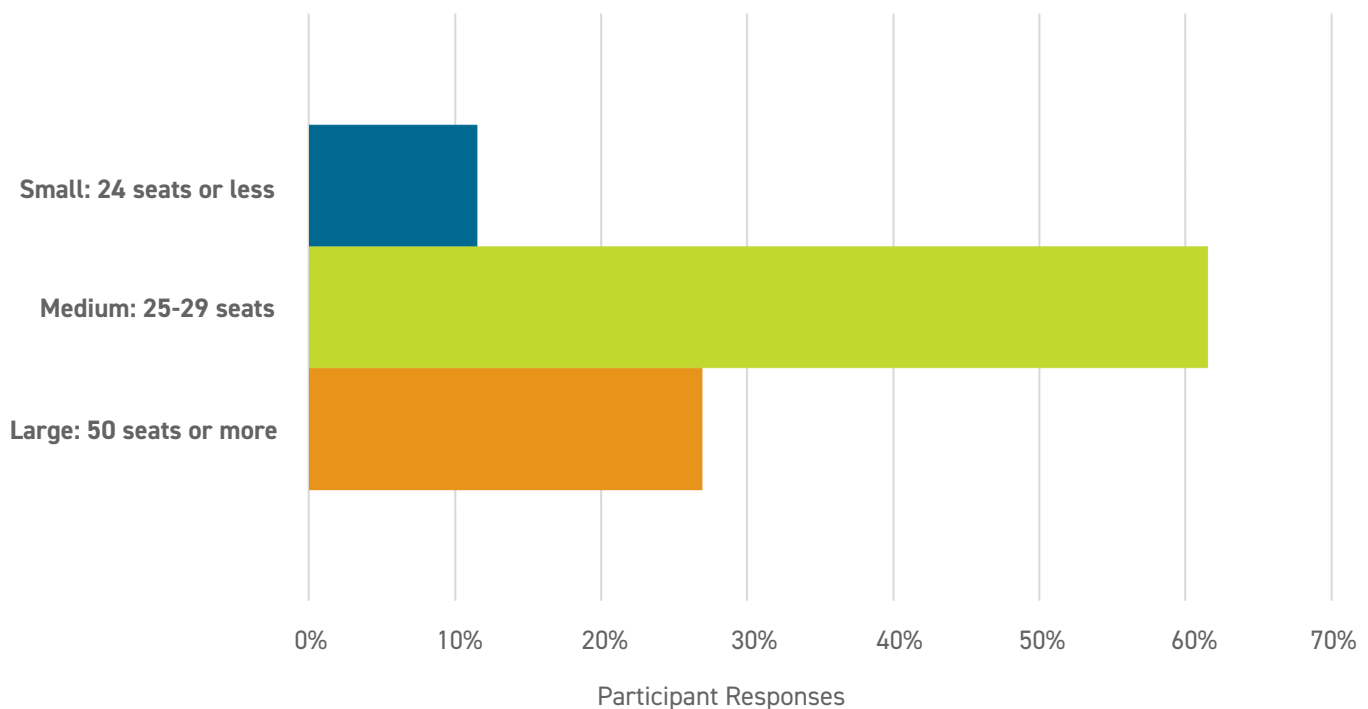
So, what does all this mean for classroom design? Given that our research of Chief Academic Officers illustrates strong support for active learning and given the efficacy and adoption of simulation technologies such as XR, AR, VR, and other technologies to support such, campus planners and academic leaders should reevaluate their classrooms and consider implications for each discipline. Our roundtable participants, for example, discussed how the use of XR with biology, chemistry, art, astronomy, and history courses can be effective, how hybrid labs, holodecks, and augmented reality suites provide a modern space for scientific education, and how generative AI in the hands of faculty can encourage exploration and investigation into effective teaching practices.



Additionally, size matters. In our survey of Chief Academic Officers, 62% of respondents stated they need more classrooms that accommodate between 25-49 students (See Table 4).

TABLE 4

WHAT SIZE CLASSROOMS DO YOU NEED MORE OF ON CAMPUS?





Our roundtable of experts noted how it is essential that instructors be involved in the design of learning spaces, with an emphasis on creating efficient, flexible, accessible, and sustainable environments. Though meant to be tongue-in-cheek, one participant's comment that the campus electrician often has more influence on classroom design than the faculty was profound. Hybrid classrooms, in particular, demand intentional space design, where using multiple camera angles was suggested to enhance communication and active learning. BHDP classroom design guidelines demonstrate the need to provide additional square feet per learner for active, flexible classroom designs.

BHDP CLASSROOM DESIGN GUIDELINES

TYPE	24 SEATS	36 SEATS	48 SEATS
Lecture Style - Individual Tablet-arm Chairs (20 SF/ Seat)	480 SF +30%	720 SF +30%	960 SF +30%
Lecture Style - Tables & Chairs (26 SF/Seat)	624 SF +23%	936 SF +23%	1,248 SF +23%
Active Team Based Pods - mobile Tables and Chairs (32 SF/Seat)	768 SF	1,152 SF	1,536 SF

The limitations of traditional large lecture-style seating were acknowledged, and technologies like NearPods were proposed as potential solutions to these challenges.

Overall, the discussion underscored the necessity of a balanced approach, integrating advanced technological tools with thoughtfully designed physical spaces to create learning environments that are inclusive, adaptable, and conducive to both teaching and learning.

College leaders should consider conducting a space audit to assess the degree and extent to which its classroom inventory accommodates these findings related to size, flexibility, technological integration, active learning, and hybrid design. BHDP's experience in analyzing campus classroom utilization has shown that many administrators do not know how much

academic space they truly have, as well as the extent to which it is scheduled on a given week. It is entirely possible that with some minor adjustments and renovations, an institution can dramatically increase the quality of its classroom inventory. How? BHDP's research also showed that among survey respondents, only 26% stated their classrooms are utilized more than 75% between 8 a.m. and 5 p.m. (See Table 5).

This suggests that institutions may have an excess of inventory and can modify classrooms to increase both the quality and utilization of space without exorbitant investment. BHDP offers a space utilization assessment that can quickly reveal opportunities for optimization. BHDP has discovered during these assessments and focus groups with faculty that the request for additional classrooms is actually a need for "better" classrooms, not more.

BETWEEN THE HOURS OF 8:00 A.M. AND 5:00 P.M., HOW MUCH OF YOUR EXISTING CLASSROOM SPACE IS BEING UTILIZED?

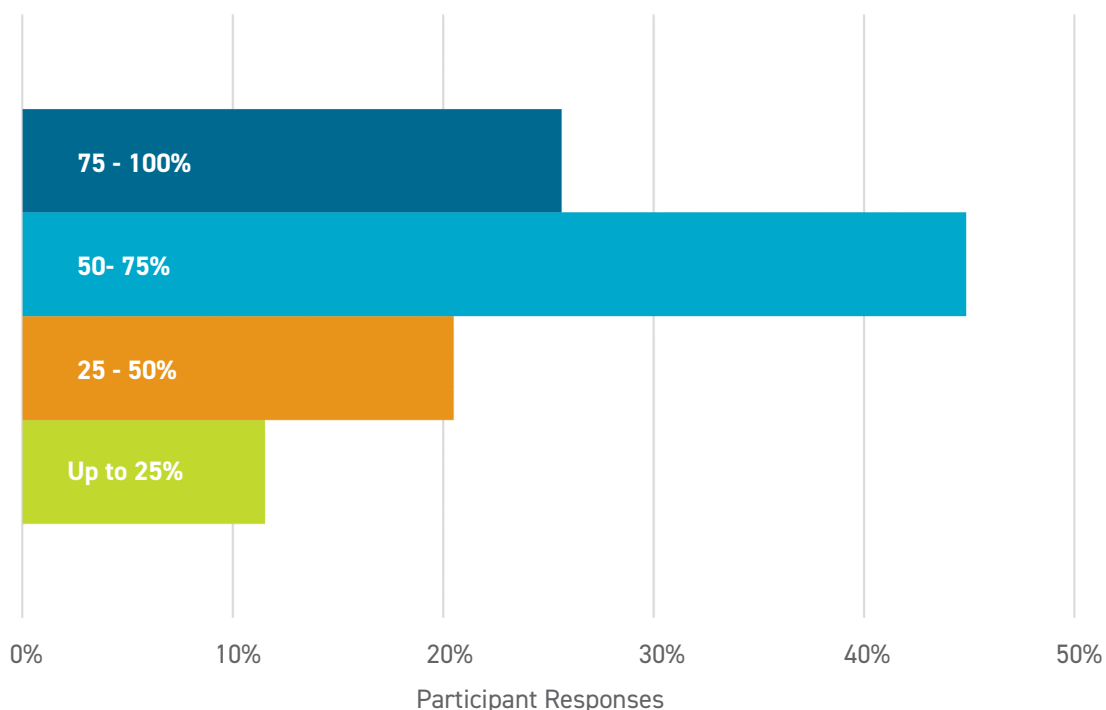


TABLE 5

Focus on Simple and Scalable Technology that Keeps People Connected to Each Other

As educational institutions increasingly adopt online, hybrid, and high-flex teaching environments, the demands on technology evolve. A pertinent question arose: “As we move more and more to supporting multiple modalities of online, hybrid, and high-flex teaching environments, how does that demand affect the technology that we use? What do we need to maintain or improve the teaching and learning experiences?”

User-Friendly and Innovative Educational Technologies Using Collaborative and Interdisciplinary Approaches

Roundtable participants highlighted the need for technologies that are easy to use and applicable across different teaching modalities. It was acknowledged that campus IT offices are heavily invested in an overwhelming number of software and technological solutions that are often underutilized and that college administrators and their faculty would be well-served to audit and evaluate the relative return on investment of each

solution. Unfortunately, as educational technology companies pursue sales and profits, educators cannot exclusively rely upon such partners to evaluate and optimize the most prudent solutions. This must be done by academic leaders in consultation with their faculty and IT departments. More often than not, these professionals will find they can achieve similar or better outcomes by leveraging fewer solutions and spending far less. During faculty focus group interviews, BHDP has uncovered that effective technology investments must include investments in faculty training.

Beyond the financial burden, using too many educational technologies presents additional challenges. Students and faculty who must adapt to multiple learning platforms and software experience a cognitive burden that hampers the achievement of learning outcomes. Interactions with faculty have also shown that the difference in AV controls across multiple classrooms can lead to additional stress on both faculty and students.

Roundtable participants agreed on the importance and value of collaborative and interdisciplinary approaches to education and how technological solutions should support such principles. Investing in solutions that encourage social presence and connectedness provides for an enriched learning experience.



Participants emphasized the transformative potential of enabling technologies such as Zoom and interactive whiteboards. The concept of the “digital backpack” was also discussed, wherein all students are provided access and training to a suite of enterprise technologies, thereby empowering their individual learning journeys across a shared set of resources. This can allow updates or additional software to be “pushed out” to spaces as needs evolve, even for limited periods of time.



Implications for Small Colleges

Participants discussed the value and challenges facing small liberal arts institutions in the current postsecondary environment. In particular, as new technologies accelerate the means and methods by which student learners achieve their academic pursuits, there is some concern that small colleges won't be able to keep pace. However, participants equally acknowledged the unique value proposition small liberal arts colleges can offer in promoting the importance of human connections and breadth of knowledge across disciplines. These institutions are also known for helping students develop transferable skills, such as communication and critical thinking, which were highlighted as key to building a career.

What Does the Classroom of the Future Look Like?

BHDP asked our Chief Academic Officers what the classroom of the future would look like. Certain themes emerged that we thought you'd find interesting.

- Technology will be integrated into the design from the bottom up.
- Physical barriers will be removed to allow for optimal active learning.
- Flexible seating will accommodate both individual and team-based learning.
- Modular desks will be used for easy reconfiguration.
- Lighting (both natural and infused) will support learning.
- Classrooms will be hybrid designed to allow for in-person or online learning, which includes high-quality and well-positioned cameras and microphones.
- Studio and simulation spaces will accommodate active learning technologies.
- Smart TVs, whiteboards, and interactive AV will be essential.
- Classrooms will accommodate a diversity of pedagogical styles.
- Students will be equipped and empowered, and faculty will be trained on a digital backpack that facilitates learning across the curriculum.

Key Takeaways

BHDP's roundtable of experts and survey of Chief Academic Officers identified several takeaways that academic leaders can consider as they seek to achieve optimal teaching and learning outcomes. These include:

1. Academic leaders must be responsive to the market demand for more autonomy and choice in the educational journey. This response likely includes accommodating in-person, hybrid, and online learning.
2. Classrooms need to be redesigned to accommodate various pedagogical styles that leverage the latest technological advances for active learning.
3. Embracing technology within the classroom cannot mean learning in isolation. In fact, all technological integration should be rooted in a desire to have human interaction and connectedness between and among students and faculty.
4. Conducting a classroom space utilization assessment and technology audit simultaneously may identify ways to reduce costs, increase utilization, and achieve better learning outcomes while also controlling the campus space footprint. A "less is more" approach may be optimal.
5. Investment in integrating technology in pedagogy development is critical to the student experience.



Contact BHDP today to learn more, and to schedule an audit of your classrooms!

ABOUT THE PARTICIPANTS



JOSHUA KIM, PH.D.

Director of Online Programs and Strategy at Dartmouth College and a Senior Fellow for Academic Transformation, Learning, and Design at the Center for New Designs in Learning & Scholarship (CNDLS) at Georgetown University

Josh has a Ph.D. in sociology and demography from Brown University. He is best known for his daily blog on Technology and Learning on InsideHigherEd.com, a website that receives over 2.25 million unique monthly visitors. In 2020, JHU Press released Josh's first book, *Learning Innovation and the Future of Higher Education*, co-authored with Georgetown's Eddie Maloney. Josh's second co-authored book, *The Low-Density University: 15 Scenarios for Higher Education* (JHU Press) was also released in 2020 and is [available for download on Project Muse](#).



SAM ELKINGTON, PH.D.

Professor of Learning and Teaching at Teesside University, UK

Sam has published several case studies and reports on future learning spaces, space technology and pedagogy, and inter-professional collaboration and development. Sam Elkington joined Teesside University in September 2018 where he leads the University's learning and teaching enhancement portfolio. Sam is a PFHEA and National Teaching Fellow (NTF, 2021) and has worked in Higher Education for over 15 years and has extensive experience working across teaching, research and academic leadership, and policy domains. Most recently, Sam worked for Advance HE (formerly the Higher Education Academy), where he was the national lead for Assessment and Feedback and Flexible Learning in Higher Education. Sam maintains a diverse range of research interests with a track record in developing high-impact pedagogic research work in the areas of assessment and feedback, student engagement, learning spaces, and creativity in higher education. Sam's latest book (Irons and Elkington, 2021) showcases the latest thinking in Enhancing Student Learning through Formative Assessment and Feedback.



LAUREN BARBEAU PH.D.

Assistant Director for Learning and Technology Initiatives at Georgia Tech Center for Teaching and Learning

In this role, she coordinates the Teaching with Technology partnerships and assists faculty in finding the right technology tools to meet their pedagogical needs. Her co-authored book project, *Critical Teaching Behaviors: Defining, Documenting, and Discussing Good Teaching* (Stylus Publishing, 2023), offers instructors a framework for identifying, implementing, and documenting effective teaching behaviors as well as aligned peer observation and student feedback instruments to help them gather external perspectives on their teaching. Lauren earned her Ph.D. in English, specializing in 19th century American Literature with a certificate in American Culture Studies from Washington University in St. Louis.



STEVEN BUTSCHI

Director of Education at North America Google Education Go-to-market and Partnerships team

He works with school districts, universities, and colleges to leverage Google's Workspace and Chromebook products to personalize learning. After working in IT consulting and volunteering as an adult English Language Learner (ELL) teacher, Steven combined his interests in education and technology by joining the Google Education team in 2009. During his 14+ years at Google, he has helped universities migrate to Google Workspace for Education; worked on the founding team to bring Chromebooks to the education market, which have become the #1 device in K-12 education in the US; and launched Google's efforts to bring Google Cloud Platform to researchers, universities and EdTech companies. Steven holds a BA from Brown University in International Relations and French and an Honorary Doctorate in Education from Bethany College.

ABOUT THE PARTICIPANTS



JAMIE CARIDI, PH.D

President at Bethany College

For the past 25 years, Dr. Caridi has served as both a higher education and corporate executive. Dr. Caridi holds two degrees in higher education, including a Ph.D. in Educational Leadership and Higher Education. He has held corporate leadership jobs with IMG in service to The Ohio State University and served on the cabinet of three faith-based institutions, including his current service as Interim President of Bethany College. Dr. Caridi is a Certified Turnaround Analyst with the Turnaround Management Association, a Black Belt in Lean Six Sigma, and a member of the Society of College and University Planners and the Association for Strategic Planning.



KYLE BOWEN

Deputy Chief Information Officer, Office of the CIO at Arizona State University

He leads strategic university efforts for effective uses of technology to advance institutional growth. Kyle guides a portfolio of disciplines such as AI acceleration, learning experience, and disruptive innovation, in addition to supporting internal operations for Enterprise Technology, including creative and communications, human resources, community partnerships, and alignment with budget and finance. Formerly the director of Teaching and Learning with Technology at Penn State and director of informatics at Purdue University, he is experienced in shaping institutional strategies that help students meet their learning goals through innovative technologies. Kyle is an experienced entrepreneur and frequent speaker on the role of technology in changing education. He has co-authored and edited more than 20 books in the areas of design, online development, and usability, and his work has appeared in the New York Times, USA Today, and the Chronicle of Higher Education.



PAUL ORBAN

BHDP | Partner

Paul is a partner at BHDP and the Higher Education Market Leader. For the past 60 years, BHDP's comprehensive suite of higher education services has advanced the mission at hundreds of postsecondary institutions. Its team of strategists, architects, designers, and higher education specialists is relied upon by postsecondary leaders across all institutional types. BHDP's expertise in the planning and design of academic and student facilities, teaching and research laboratories, and administration and student support spaces is founded upon its knowledge of the business of higher education and a passion for improving student and faculty experiences.



KEVIN DENMAN

BHDP | AIA, Lead Architect, Associate

Within his 28 years of experience, Kevin has served as the Project Architect and Project Manager for a diverse range of higher education projects, including libraries, classroom buildings, laboratories, and student centers. Kevin currently focuses on guiding colleges and universities through the development of comprehensive campus master plans by leveraging BHDP's data-driven design process. In addition to campus planning, Kevin applies his expertise in the design of environments for healthcare education across the United States

ABOUT BHDP

BHDP, an award-winning international architectural firm, is recognized for innovative and inspiring solutions in architecture, planning, interior design, experiential graphic design, project management, and strategic consulting. BHDP serves seven markets: Workplace, Higher Education, Industrial, Discovery & Science, Healthcare, Government, and Retail from its offices in Cincinnati and Columbus, OH, and Charlotte and Raleigh, NC. For information, visit www.bhdp.com.