

**ICT AND INNOVATION IN  
TEACHING LEARNING METHODS  
IN HIGHER EDUCATION**

# INNOVATIONS IN HIGHER EDUCATION TEACHING AND LEARNING

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INNOVATIONS IN HIGHER EDUCATION TEACHING  
AND LEARNING VOLUME 45

**ICT AND INNOVATION IN TEACHING  
LEARNING METHODS IN HIGHER  
EDUCATION**

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INVESTOR IN PEOPLE

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# **SERIES EDITORS' INTRODUCTION**

## **INNOVATIONS IN HIGHER EDUCATION TEACHING AND LEARNING**

The purpose of this series is to publish current research and scholarship on innovative teaching and learning practices in higher education. The series is developed around the premise that teaching and learning is more effective when instructors and students are actively and meaningfully engaged in the teaching–learning process.

The main objectives of this series are to:

- (1) present how innovative teaching and learning practices are being used in higher education institutions around the world across a wide variety of disciplines and countries,
- (2) present the latest models, theories, concepts, paradigms, and frameworks that educators should consider when adopting, implementing, assessing, and evaluating innovative teaching and learning practices, and
- (3) consider the implications of theory and practice on policy, strategy, and leadership.

This series will appeal to anyone in higher education who is involved in the teaching and learning process from any discipline, institutional type, or nationality. The volumes in this series will focus on a variety of authentic case studies and other empirical research that illustrates how educators from around the world are using innovative approaches to create more effective and meaningful learning environments.

Innovation teaching and learning is any approach, strategy, method, practice, or means that has been shown to improve, enhance, or transform the teaching–learning environment. Innovation involves doing things differently or in a novel way in order to improve outcomes. In short, innovation is positive change. With respect to teaching and learning, innovation is the implementation of new or improved educational practices that result in improved educational and learning outcomes. This innovation can be any positive change related to teaching, curriculum, assessment, technology, or other tools, programs, policies, or processes that leads to improved educational and learning outcomes. Innovation can occur in institutional development, program development, professional development, or learning development.

The volumes in this series will not only highlight the benefits and theoretical frameworks of such innovations through authentic case studies and other empirical research but also look at the challenges and contexts associated with

implementing and assessing innovative teaching and learning practices. The volumes represent all disciplines from a wide range of national, cultural, and organizational contexts. The volumes in this series will explore a wide variety of teaching and learning topics such as active learning, integrative learning, transformative learning, inquiry-based learning, problem-based learning, meaningful learning, blended learning, creative learning, experiential learning, lifelong and lifewide learning, global learning, learning assessment and analytics, student research, faculty and student learning communities, as well as other topics.

This series brings together distinguished scholars and educational practitioners from around the world to disseminate the latest knowledge on innovative teaching and learning scholarship and practices. The authors offer a range of disciplinary perspectives from different cultural contexts. This series provides a unique and valuable resource for instructors, administrators, and anyone interested in improving and transforming teaching and learning.

Patrick Blessinger  
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International HETL Association*

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*Chair of the Business Department and Director-  
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PART I

INTEGRATIVE LEARNING

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# CHAPTER 1

## INTRODUCTION TO ICT AND INNOVATION IN TEACHING– LEARNING METHODS IN HIGHER EDUCATION

Enakshi Sengupta and Patrick Blessinger

### ABSTRACT

*The role of information and communication technology (ICT) in education is increasingly gaining importance in institutions of higher education. Operationally, ICT has helped to cut costs and speed up transactions by streamlining and automating processes. Pedagogically, it has enabled online, hybrid, and technology enhanced learning as well as a host of other capabilities, from learning management systems to student information system, and from student affairs to academic affairs. ICT is now embedded in every aspect of university life. The role of ICT is found to increase the value of classroom delivery, it has helped in the growth of research, expanding horizons for students mainly with limited accessibility to education and it has created an overall positive impact in the teaching–learning environment in general. There are always two sides to the coin and in this case inaccessibility, economic disparity, and ineffective implementation of ICT has also created impediments for effectively adopting and diffusing integration of ICT into pedagogy. This volume is a collection of interventions and collaborative practices across the world that showcases the multifaceted ways of how various institutions have been engaged in supporting teaching and learning with the use of technology*

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*and how it is equipping our future generation with the skills required to face a changing job market.*

**Keywords:** ICT; pedagogy; enhanced learning environment; teaching and learning; social mobility; accessibility; integrative learning

## INTRODUCTION

The development and contribution of information and communication technology (ICT) has impacted nearly every facet of human life in the past half century, such as healthcare, transportation, business, infrastructure, finance, and every other industry, including education. There has been a radical change in the way these areas operated before and now. However, the impact of ICT in the field of education, for example, has been relatively gradual and the impact has not been as overwhelming as some other industries. This has caused some educators to explore the nature and effect of ICT (Collis, 2002; Soloway & Pryor, 1996).

These educators conducted research and came up with various reasons that has hampered the growth of ICT in the field of education. Some of the pertinent factors include: lack of funds to support the integration of technology in daily teaching methods, lack of training among instructors, and lack of motivation to learn how to adopt and implement technology in the teaching–learning process (Starr, 2001).

In recent years, especially due to the global COVID pandemic, there has been a gradual and slow pick up of ICT to strengthen and encourage the adaptation of ICT in classroom settings. Educators are trying to explore the usage of ICT in terms of program delivery, how ICT can enhance the concept of flexible delivery (Oliver & Short, 1996), the capability of ICT to help provide customized educational programs for individual learners (Kennedy & McNaught, 1997), and usage of the internet for implementing open educational resources (Oliver & Towers, 2000). In recent years, there has been an explosion of new ICT tools and programs for educator to use to enhance teaching and learning, many of them free to use, such as Google Classroom, open courseware, and open textbooks.

Jacobsen (1998) reported that “faculty comments provide evidence that the integration of technology supports a shift from a primarily ‘knowledge-transfer’ mode of content delivery to a more ‘knowledge-construction’ type of teacher–student interaction” (p. 172). This shift from teacher-centered to learner-centered represents a paradigm shift in how teaching is conducted and how learning is facilitated. Now the focus at many universities is on what the student is learning and how best to facilitate that learning process, rather than relying on just what the instructor knows. This rightly puts the focus of education on student learning and on learning outcomes. It not only puts more responsibility on the student to take charge of his/her own learning but it also puts more responsibility on the instructor to design a course based on research-based learning principles and effective teaching strategies that are in alignment with those principles as well as how best to utilize ICT to facilitate learning.

The ever-changing dynamic environment of higher education warrants an adoption to contemporary trends in education of which ICT is a vital component. ICT is a powerful change agent which has the potential to impact what is learned, when, where, and how learning is going to take place. The definitions and terminologies are undergoing a paradigm shift to a student-centered activity facilitating the growth and construction of new knowledge, not just the consumption of existing/prior knowledge.

There are factors, as mentioned before, which have been inhibiting the growth of ICT and one such belief is that student-centered teaching strategies are more effective as far as learning is concerned. Some academics believe that the experience of educators surpasses all forms of technology. Innovation and the willingness of educators to learn to imbibe new modes of technology remains an important factor. Beliefs, values, skills, knowledge, and the individual characteristics of faculty members also play a vital role (Rogers, 2003). In addition, failing to create that willingness and compatibility will result in zero tolerance and adoption of technology in the teaching–learning methods (Samarawickrema & Stacey, 2007).

Higher education is also moving toward a performance-based curricula and its effectiveness can be supported by emerging technologies (Stephenson, 2001). The competency and performance-based curricula requires the help of ICT to access various sources, access to data, a student-centered learning experience, problem and inquiry-based activities, and teachers as mentors rather than merely delivering the content. As such, the role of instructors has expanded and become more demanding, just as the role of students has expanded and become more rigorous.

Contemporary innovative usage of ICT can help facilitate these requirements and make robust use of these technologies (Oliver, 2000). ICT has helped remove many of the impediments toward accessibility and facilitated prolific use of open sources as a vital repository of knowledge. Students are now able to gain better bandwidth and more direct forms of communication and access to shared resources that is ultimately helping improve the overall quality of education.

Education and relevant curricula have impacted the life and work of students and young graduates are expected to have required levels of knowledge in information literacy, “the capacity to identify and issue and then to identify, locate and evaluate relevant information in order to engage with it or to solve a problem arising from it” (McCausland, Wache, & Berk, 1999, p. 2). Institutions are expected to motivate their students to have a curious and creative mind as well as the skills and knowledge required for life and for the job market. In addition, students are expected to be able to adapt to the ever-changing world wherein they are able to create their own marketability and help enhance the economic and social progress of their society. Skills such as problem-solving ability, means to communicate effectively, manage time, negotiate outcomes, and manage projects and work as a team has become essential for young learners. ICT has helped facilitate the growth of these skills and the potential to expand the horizons even further.

Imbibing ICT in the teaching–learning process requires a greater level of engagement from the traditional method of learning, as students have to be motivated sufficiently to remain engaged in the content in a nonjudgmental and safe

learning environment (Sengupta & Blessinger, 2021). Students remain accountable for their performance and their inclination to learn with the usage of modern technologies balancing the role of active participation and self-directed process of learning. Along with motivation one requires a collaborative learning space, timely feedback, and a proactive learning environment (Rogo & Portillo, 2015).

## CHAPTER OVERVIEWS

“Teaching Through Collaborative Problem Solving to Make Teaching More Interactive, Student-based and Future-proof. A Teacher–Researcher Collaboration in Medicine Education” authored by Annelies Raes, Marieke Pieters, and Celine Vens reports on the design-based research study aimed at the re- and co-design of the third-year course “Introduction to Biostatistics,” part of the Bachelor program in Medicine. The authors aim to make teaching more interactive, student-based, and future-proof by empirically testing theoretical assumptions during iterative studies, including both quantitative and qualitative results from the perspective of the students and the teacher. Their conclusion is that teacher–researcher collaboration can be an effective approach for professional development and improving innovative practices. At the same time, it allows them to get a better theoretical understanding of effective teaching and learning practices. The authors hope that this chapter can inspire others to transform toward a progressive institution and looking for concrete innovative classroom practices in the context of innovative learning spaces.

“Innovative Teaching and Learning Methods at the University of Mauritius” written by Fareeda Khodabocus, Bahadur Goonesh Kumar, and Sheeba Armoogum provides the multifaceted ways of how the institution has been supporting teaching and learning (T&L) with the use of technology and how it is equipping the younger generation with the skills required to face a changing job market. The prevailing status of use of 4th Industrial Revolution in T&L was evaluated through (i) outcomes of a survey approved by the institution undertaken with academics and students for its external audit in 2018; (ii) the continuous support being provided by the Centre for Lifelong Learning (CILL) for fully online Programs through the Moodle Platform; and (iii) use of Google Classroom, Smartphones, and Tablets in faculty-based teaching by the ICT department. This study aimed to identify gaps with a view to enhance the quality of blended/online learning. Findings of the survey reveal that 59.2% of academics who responded were satisfied with the applications of ICT in their teaching, with 42% indicating that there is a need for improvement. Similarly, 55.1% of students who responded indicated that they were satisfied with the use of technology in the classroom. The case studies support the surveys and provide indications of ongoing advancement in the use of ICT following the external audit. The advent of the pandemic has further accelerated our plans in the digital transformation process, leaving us with no choice but to innovate with the use of ICT in the classroom.

“Implementing an Innovative Curriculum Across a College” by Jennifer W. Shewmaker and Stephen Baldrige reports about the spring of 2018, Abilene

Christian University's College of Education and Human Services created a task force to explore opportunities for an integrated program of interprofessional education through both curriculum and experiential learning. In the fall of 2019, the program was launched with a shared case study assignment and simulation across 13 courses from all 5 departments within the college and the School of Nursing, allowing students to develop important interdisciplinary practice skills. Over 400 students were involved in the experiential learning activity across two years. In the spring of 2020, the program launched three interdisciplinary courses, focused on developing interdisciplinary skills and knowledge in the areas of ethics, vocation, and practice skills through further simulation. In this chapter the authors will describe the development, implementation, and outcomes of this innovative curriculum, along with the challenges and benefits of implementing an innovative curriculum across a college. Challenges discussed will include consideration of traditional higher education structures and the need for flexibility and adjustment to allow for innovation.

"Implementing Affective Learning Outcomes Through a Meaning-centered Curriculum" by Vincent Nix, Kaye Shelton, and Misty Song reports about meaning-centered education situates meaning at the center of teaching and learning (Kovbasyuk & Blessinger, 2013). By incorporating learning objectives from additional learning domains – namely the affective domain – meaning-centered learning should enhance students' personal and professional identities, as they reinforce existing knowledge through the continuous conscious acquisition of knowledge across learning domains. For this study, instructors integrated the human resource development constructs of Level 1 and Level 2 evaluations into an online doctoral strategic planning course to achieve three goals: (A) increase student engagement, (B) assess affective domain learning outcomes, and (C) practice innovative teaching to reinforce creative meaning-centered learning. Infusing an online curriculum with affective learning domain outcomes and weekly formative assessment activities allowed instructors to monitor and address affective attributes. Results suggest that the implementation of Level 1 and Level 2 evaluations as weekly formative assessments increased student engagement. Extended analysis promoted a deeper understanding of the roles that emotions and attitudes play in online learning. Affective learning outcomes were attained as these additional weekly exercises promoted meaning-centered collaboration with students while decreasing the power-related distance between learners and instructors.

"Launching into Life after College" by Leonard Shedletsy, Jeanette Andonian, David Bantz, and Dennis Gilbert reports on a course that is designed to facilitate the students' transition out of college and into life after graduation. It describes how the course foregrounds the problems students face, both the technical aspects of the transition and the emotional experience, unthought out ideas about what the students want, their goals, and how they might go about achieving their goals. The authors report on the course culture, assignments, observations from teaching the course, student feedback from focus groups, surveys, behavior, as well as summaries of data on the student's experience. The need for this course is supported by the research literature on emerging adulthood. In addition, the authors report on focus group and survey data that they gathered. The modern discourse

on the post-college transition commonly emphasizes economic and practical hurdles, such as educational loan debt, student employability, skill transferability, career networking, and job interviewing. Receiving far less attention are the psychosocial and developmental dimensions that color the student experience of the graduation transition. Yet very few colleges and universities have paid attention to this glaring need, especially public institutions with many first-generation college students. This chapter describes a college course dealing with the problem of transitioning to life after college taught in an intellectual, communal, and personal atmosphere.

“Fostering Creativity Through the Integration of Classroom Technologies: A Digital Storyboarding Case Study Example” by Samantha Read reports about higher education which has seen an unprecedented amount of change in recent decades, with technological advancements impacting on the very essence of teaching and learning. As there are an abundance of digital tools available to educators, it can be a challenge to select the most appropriate online platforms to incorporate into the classroom. This chapter discusses the topic of digital storyboarding by providing a case study of how the author adopted the online platform Storyboard to enhance student engagement and co-creativity within a UK Higher Education institution. The chapter debates the benefits and challenges of technology-enhanced learning as part of a blended approach, and concludes with advice for educators wishing to adopt digital storyboarding within their own educational context.

“Group-based Learning: An Innovative Practice for Engaged Learning in an Online Environment” by Amar Kanekar explores the concept of online learning as it continues to grow year after year and majority of the growth are seen in public institutions of higher education. The purpose of this book chapter is to acquaint the readers to group-based learning in an online environment as an innovative practice for engaged learning. Diverse facets of group-based learning are discussed such as role of instructors, role of learners, challenges of group-based learning, and finally role of social media in designing such group-based learning projects. A comprehensive prototype application of a group-based learning project walks the readers through applying group-based learning in their respective courses at the undergraduate and/or graduate level. Finally, some instructor designed rubrics for assessing group-based learning are shared for effective assessment of a group-based learning project.

“Using Cloud-based Collaborative Office Productivity Tools (Google Workspace) to Engage Students in Their Learning and Prepare Them for the Workplace” by Jonathan Maurice Lake explores how cloud-based office productivity suite(s) such as Google Workspace have been used to engage students in their learning while also preparing them for the workplace. Using these types of tools can make group-based in-class activities, assignments, and projects highly engaging for a diverse student body while also developing skills valued in the workplace. Practical examples are shared regarding how the tools have been used with accounting and business students in courses such as communications and computing, introduction to business, sustainability, and leadership. Some examples include how students can use the tools to collaboratively: provide feedback