Book review

Minds Online: Teaching effectively with technology

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Abstract

This article reviews the book titled, "Minds Online: teaching effectively with technology", by Michelle D. Miller. This review gives an introduction, summarizes the book's contents, analyses the book, and ends with conclusions. Through the nine chapters in this book, Miller explores the cognitive principles that enable better learning using technology. She invokes several cognitive psychological aspects, like attention, memory, thinking, and motivation, essential for learning that could be corroborated with technology. This book is recommended both for online and offline instructors at college as well as higher secondary level.

Keywords: Online learning, technology, cognitive principles, college level

Introduction

The use of technology for instructions at the college level, in the last few decades, have been through fully offline, fully online or blended mode using various modes of teaching such as PowerPoint presentations, live streaming of videos, animations etc. Teachers and instructors usually give higher merit to fully offline methods as compared to blended or fully online forms of instructions, because of the greater chances of face-to-face interactions and discussions in offline classes. It is important therefore, to understand the processes of cognition in learning by students, so that they can be applied for maximum learning through the online modes, in this era of COVID-19 pandemic. Although Michelle Miller (2014) wrote the book during non-COVID times, her book, "Minds online: teaching effectively with technology", is more relevant now because of the higher demands for the online modes of instructions at college and school levels. This book explores and expands on the use of technology to enhance the process of learning while understanding the role of cognitive psychology in the learning process. As the Co-Director of the First Year Learning Initiative and Professor of Psychology at Northern Arizona University, Miller elaborates upon the use of cognitive psychology and technology to enhance learning in online and blended classes through course design and strategies. She explores several opportunities for enhancement of course design through the use of technologies empowered by the knowledge of cognition in terms of attention, memory, thinking and

motivation, as the essential elements of learning.

Since it incorporates the concepts of cognitive psychology, viz., attention, thinking and motivation etc., in the process of learning by students, this book is useful for all teachers and instructors, whether they use online or offline modes of instructions. Certain parts of the book like, the need for detailed codified instructions to use technology in online mode might sound redundant to some of the seasoned professors, the book is essential for new teachers, especially the ones that teach first-year students. The author uses her experiences as a lecturer at different stages of her career to inform the discussions in this book. These experiences enrich the discourse on the use of technologies in the field of teaching.

Miller's use of cognitive principals in the learning process separates this book out of other books on online learning, that mostly focus on explaining the array of technologies and online tools are available to the instructors. Rather than directly jumping to what new technologies could be used to impart knowledge, she goes into understanding the process of learning to acknowledge how already existing technologies could be used to impart knowledge. In doing so, she talks about blending of both, the offline and online modes of instructions by using MOOCs as building blocks "to complement rather than replace traditional courses" (p. 6). Basics could be taught through MOOCs using standardized instructions, followed by discussions in physical classrooms. This blended mode of instructions using technology to complement the process of teaching is agreeable.

Summary of the contents

The book is divided into 9 chapters. The first three chapters traverse the importance and impact of technology in higher education while focusing on the common principles of good online and offline teaching, and the major concerns related to online teaching. Next three chapters focus on the cognitive principles of attention (chapter 4), memory (chapter 5) and thinking (chapter 6) that are most relevant to the process of learning and teaching. The last three chapters deal with the practical aspects of integrating these concepts in online education and teaching methods.

In the first chapter Miller deals with the need for technology in learning, such as economics, demand from students, need for measurable evidence of student success, availability of new technologies, curiosity and drive to innovate. She stresses the importance of developing proper course designs that incorporate various learning modes that "increase learning and success while simultaneously controlling or reducing costs" (p. 13). Therefore, teachers and instructors need to know to use it well. The second chapter compares the quality of learning in offline and online modes of instructions, and finds that there is not much difference in learning achieved by students in both these modes, as expressed by "good teaching is good teaching, regardless of technology" (p. 24). The points of differences between the offline and online modes lie in the timing and

synchronization of coursework, need to educate students about the use of technology, reliance on the text, social distance (lack of discussions) and other technical issues in online learning. She engages with cheating during online tests and agrees that there is no way to find whether it happens more in online or offline tests. She stresses on maximizing the quality of online teaching. Chapter three deals with how computing influences our minds. The author believes that the paranoia against the use of the internet for education is not real. She dispels several myths related to online education modes like, brain's rewiring due to the internet. "Technically speaking, computing experience does alter our brains at a neural level, but so does just about anything else that we remember" (p. 45). She agrees that online tools alter us. Still, when we use them mindfully, "we can remain in control of those changes, shaping them to benefit our students" (p. 63).

Chapter four investigates the concept of attention in the context of learning in class and then extrapolates it to online learning. Engagement is limited; therefore, the ideas of working memory, automaticity and voluntary control, are essential for learning in the classroom. She provides specific strategies to increase attention in online classes, such as asking students to respond, taking advantage of automaticity, assessing cognitive loads, discouraging distractions, and even walking in nature. She concludes that a suitable learning mechanism will work for all students, including those with certain limitations to learning like students with ADHD. Chapter five details the tool of memory, which is at the center of teaching and learning. Old and contemporary memory theories are elaborated to understand how short and long-term memories are created, retained and retrieved. Attention is significant for creating a memory. Therefore, for maximum learning the students should be as less distracted as possible in the class. Emotions also tend to heighten the process of retention of memory. They could be used carefully and prudently by experienced instructors to put their points across in a class. In online teaching, testing, spacing and interleaving are described as useful tools to enhance memory. Use of previous knowledge as a base for introducing newer concepts is seen as a good approach to enhance learning. Online tools work best when deployed "in sync with the operating principles of memory" (p. 116). Effective thinking strategies by differentiating between the novice and expert thinking are elaborated in chapter six. This chapter focuses on the structural components of problems and utilization of analogical reasoning, to stress that beginners could become experts through practice. It also addresses how online course activities can increase critical thinking among college students.

The use of sensory modes, multimedia theory, animations, and simulations, in online teaching could achieve educational mileage over offline teaching. Making education inclusive, to a greater extent, is discussed in chapter seven. The nuances of students' motivations are discussed in chapter eight. Motivation forms one of the

most important reasons behind the success of any learning process. This chapter elaborates in various ways that motivations could hinder learning and the ways to overcome those challenges. The theories of self-determination, intrinsic/extrinsic motivation and growth mindsets are explored along with self-efficacy, anxiety and procrastination to understand the challenge. The theories of gaming or gamification could also be used in devising course structure to motivate students. Finally, chapter nine culminates all the concepts from previous chapters and uses them to create specific course structures and instruction guides for teachers to get inspiration from.

Analysis and remarks

Using cognitive principles to explain the use of technology in teaching makes this book different from other books that focus mostly on the various kinds of technologies used to impart instructions in a classroom offline or online. This book concentrates on using the existing technologies to impart instructions to lead to maximum learning. The book is useful for instructors who are not aware of these cognitive principles or are new to teaching. It is also useful for people who are researching in the field of education. As we move down the chapters, it gives useful insights and justifications for the online modes of instructions and useful tips for seasoned instructors. She debunked several myths, such as online teaching is not up to the mark or cheating is more prevalent in online learning. She starts by pointing towards the issues of online teaching and then suggests several ways

in which those issues could be dealt with. The book seems highly useful for a teacher and helps in learning several tips to use in online classes, as it ceaselessly alternated between theoretical and practical aspects of teaching.

The language used in the book is simple, and the technicalities are clearly explained, making it easier for a wider audience to benefit from the book. The practical and workable elaborations of the author's theories and experiences make it a valuable book for all teachers worldwide. The book rests a lot on cognitive psychology; still, people without any knowledge of psychology could easily read the book and benefit from it. Although the book centers around learning in college-level students, its more profound engagement with learning cognition make it indispensable for teaching at all stages. The replicable strategies, ideas and online tools enrich teachers and students' learning experience. Still, this book is not a 'problem fixing' kind of book for issues faced during online teaching. Instead, it is a book to understand the concepts relevant to learning and using them to learn in a better way. The author agrees that any new experience impacts the brain in the same way as technology does. Therefore, unlike what the author believes, excessive use of technology also can alter the human brain at the neurological level. "It's also unclear whether the changes in brain function associated with web browsing impact activities other than web browsing in any meaningful way" (p. 47).

The book lists online tools and websites on several occasions; however, it does not provide clear benefits or dis-benefits

of those tools over each other. The book's scope might not have permitted the author to elaborate on them; still, readers might feel the need to learn them then and there.

Conclusions

The failure of technology, like the lack of electricity and proper equipment, could lead to the collapse of the online education system, as is the case in several parts of India. All the examples discussed were from the USA therefore, the need for such analytical work in the Indian context is essential.

The author agreed that the cognitive theories discussed in this book were mostly for people with "typical range of sensory functions" (p. 160). However, she pointed out that "many of the same best practices that benefit typically abled students such as sticking to germane graphics, providing clear organization and offering materials in multiple modalities also ease accessibility" (p. 164). Therefore, the book is useful for all kinds of instructors, offline, online, college level, school level and special educators.

References

Miller, M. (2014). *Minds* Online: *Teaching effectively with technology*. Cambridge, MA: Harvard University Press.