

Chapter 22

Multisensory Digital Experiences: Integrating New Interactive Technologies With Human Senses

Sharafat Hussain

Baylor University, USA

ABSTRACT

Whether we go to a restaurant or jogging, almost all the experiences in our daily lives consist of what we see, hear, smell, taste, and feel. Lately, especially in the COVID-19-affected world, many of these multisensory experiences have been transformed and capitalized through inventions in technology. This chapter looks at the technological advancements in the area of new interactive technologies and multisensory experiences. This chapter describes the basics of multisensory experiences, the relationship between the human senses and technologies. It discusses the concepts that help analyze and explain how the senses interact with each other. Further, this chapter highlights the difference between virtual reality, augmented reality, and mixed reality using the reality-virtuality continuum. In the end, this chapter underscores some ethical concerns, our responsibility towards it, and what the future of those multisensory experiences may hold for us.

INTRODUCTION

Do you have the memory of touching a leaf, eating your favorite ice cream, or smelling those flowers from your flower pot for the first time? You may not remember the specifics but you can recall how it felt, tasted, or smelt, or at least a general sense of overall experience. The human brain is amazing, it stores the memory as our body experiences the surroundings. These are the incidents that explain when it comes to exploration of our surroundings, the overall human of the world, and also how we will act in future to such incidents. But how do we form experience?

DOI: 10.4018/978-1-7998-8327-2.ch022

Our senses perceive the world around us through five senses, that is, see, hear, touch, taste, and smell. By these senses, we have hundreds, if not thousands, of experiences in our daily lives. Multisensory experiences are the everyday part of our life. Take an example of eating at a restaurant. We don't just eat through our mouth it involves first eating through our eyes when we look at our food, then the smell of the food adds to its taste, and when we chew and feel the food feel the taste and we also feel the texture of the food. Not only that, but the sound of the silverware also adds to the experience of eating. Imagine if these senses were not working in tandem or interplay with each other. We will not be able to form a complete experience of dining. In this chapter, we go deep into that crafting experiences by carefully considering the senses which is something that can be done with any human experience. Current technological inventions allow us to go further and better control sensory stimulation and delivery. With the use of technology-specific sensory signals, e.g. light, sounds, smells can be designed to attain the experiences that we want to create.

A plethora of research has been done in the past decade on the role of the human senses in the formation and development of our experiences. Researchers have also studied and run experiments about multisensory technologies. These multisensory technologies are helping us become an extension of ourselves, giving us new and enhanced experiences. For instance, many people now have smart devices like Google Home or Alexa to control both lighting settings and music systems in their own homes through these devices. Some are even more experimental with the use of multisensory virtual reality (VR) and augmented reality (AR) or both as Mixed Reality (MR). These devices also have started to integrate other senses such as smell and touch inputs through the VR headset on top of graphics and sounds that were already there. These technological inventions not only allow us to recreate an experience that we already know through our past experience but also allow us to recreate completely new experiences that we had before.

Multisensory experiences is distinct from the experiences of our daily lives such as walking in the street or hiking a mountain. While these activities are multisensory in nature, because they involve different sensory cues like the traffic, the breeze, the budlings, the smells coming out of the bakery, they are not multisensory experiences as we understand them in this chapter. A multisensory experience is carefully designed by someone, like a walk in the woods that has been designed by a landscape architect in order to evoke specific impressions of the walk (Hill et al., 2019). Hence, in this chapter, we will discuss multisensory experiences created by humans with the help of technology.

Multisensory experiences using new technology have been studied and practiced in both academia and industry. In the academic world, researchers from fields as diverse as computer science, engineering, especially human-computer interaction (HCI), psychology, marketing, and the arts have become increasingly interested in understanding, explaining, and creating guidelines for multisensory experiences (Milgram et al., 1994). Within the computing and engineering fields, scientists are working towards developing an understanding of the human senses as means for interaction. For example, researchers are asking how we can use tactile and olfactory cues in a Virtual Reality environment to create more realistic and immersive experiences (Flavián et al., 2021). By answering this and other questions, and by developing new multisensory technologies, people may be able to see, e.g. a flower in a virtual world, but also to touch it and smell it. New haptic and smell VR technologies increasingly enable the creation of those experiences (de Groot et al., 2020).

In marketing, researchers are trying to understand how consumers perceive and interact with brands and brand packaging and ads, which are multisensory devices capable of transforming consumer experiences (Alcañiz et al., 2019). Different senses are considered in order to facilitate the formation of specific

14 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/multisensory-digital-experiences/285379

Related Content

Skill Space Mission India 2025

Y. P. Chawla and R. S. P. Singh (2017). *Technical Education and Vocational Training in Developing Nations* (pp. 214-235).

www.irma-international.org/chapter/skill-space-mission-india-2025/176894

Teaching Human Resources Management Using SAP

Satish P. Deshpande and Andrew Targowski (2007). *Enterprise Systems Education in the 21st Century* (pp. 129-137).

www.irma-international.org/chapter/teaching-human-resources-management-using/18498

ZatLab: Programming a Framework for Gesture Recognition and Performance Interaction

André Baltazar and Luís Gustavo Martins (2015). *Innovative Teaching Strategies and New Learning Paradigms in Computer Programming* (pp. 224-254).

www.irma-international.org/chapter/zatlab/122205

Job Satisfaction and Teachers Retention: Critical Review of Indian Management Education

Rupali Singh, Ginni Chawla and Avani Desai (2017). *Management Education for Global Leadership* (pp. 137-157).

www.irma-international.org/chapter/job-satisfaction-and-teachers-retention/170290

Career and Technical Education's Role in Alternative Teacher Licensure

Edward C. Fletcher and Chris Zirkle (2011). *Definitive Readings in the History, Philosophy, Theories and Practice of Career and Technical Education* (pp. 84-102).

www.irma-international.org/chapter/career-technical-education-role-alternative/46700