

# Chapter 17

## Silent Observation

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### ABSTRACT

*With the growth of information communication technology, new technologies are emerging, and their applications in learning are increasing. Emerging technologies that may produce effective learning outcomes include 5G technology to have efficient and effective learning, artificial intelligence – imitating human-like behaviour, voice searches, augmented reality (AR), virtual reality (VR), and mixed reality (MR). Research in the field of emerging technologies reflects that they are able to engage learners and grab their attention. Learners must be assessed to measure learning gains. Learner assessment using Bloom's taxonomy has been proved effective. Algorithm "Silent Observation," proposed to assess learners, is found to be effective in its idea of conception stage. The algorithm has sound footing in micro-research findings on formative assessment and emerging technologies. Assessment using this algorithm will be an iterative process and will refine itself using AI techniques. "Silent Observation" has a strong pedagogical framework interweaving emerging technologies.*

### INTRODUCTION

Information communication technology (ICT) came into existence around 1980. As research in ICT evolved, it led to the improvement of old technology and the birth of new technology. These technologies are used in primary, secondary, tertiary and quaternary industries. Technologies based on ICT endorse unified communication. Unified communication is possible by building a robust computer network by storing, retrieving, manipulating, transmitting or receiving information in digital form and merging it with the telecommunication network. Transfer of information in digital form has been possible with the introduction of the internet in 1960 (Bill Stewart, 2000). With the horizontal and vertical growth of research in the domain of computer network and telecommunication technology, the internet improved its capability to support a more robust network that can support high-speed data transfer. As the network became capable of transferring high-speed data, emerging technologies came into existence.

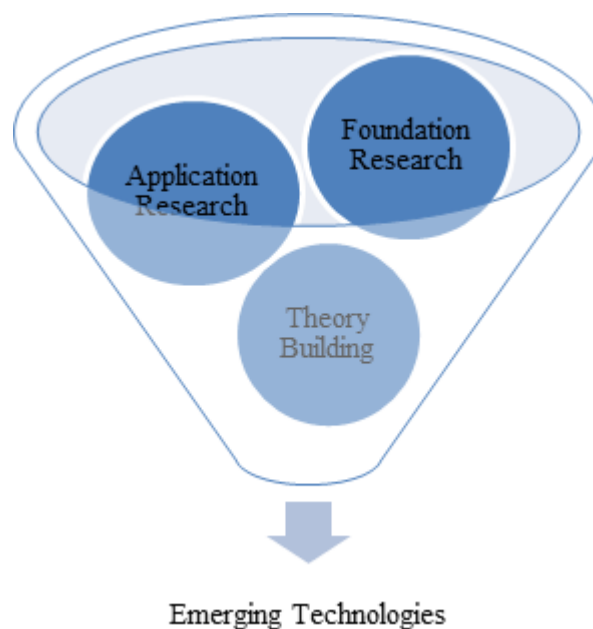
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## Silent Observation

Research can be categorized into Foundation research, Application research and Theory Building research (Spector, Merrill, Merrienboer, & Driscoll, 2008). *Foundation research* is carried-out in Psychology, Computer Science, Information Management and Engineering; *Application research* is carried-out in Education Technology and Instructional Design; and *Theory Building research* is carried-out in learning sciences. Foundation research often focuses on developing a fundamental understanding of the affective aspects of technology in use and motivates its users during its use to achieve the desired objective effectively (Spector et al., 2008). To measure the degree of effectiveness of achieved desired objectives, Application research is carried out.

Application research explores user interaction with innovative research. Users carry out procedures to find the effectiveness of innovative research using different state of variables. This process is known as Theory Building. Theory Building develops an understanding of innovative research and lays the foundation for Emerging Technologies (Spector et al., 2008). Thus, Foundation Research, Application Research, and Theory Building develop Emerging Technologies (*see* Figure 1).

Figure 1. Researches and Theory Building



Emerging technologies are used to develop tools of personalized inquiry from typed text to computer-aided virtual environments. Learners of today at the tertiary level must be aware of the potential effectiveness of these new technologies and their use in learning. Emerging technology that may produce effective learning outcome includes 5G technology to have efficient and effective learning, Artificial Intelligence (AI) – imitating human-like behaviour, Voice Searches, and Augmented Reality (AR), Virtual Reality (VR) and Mixed Reality (MR) (Hogle, 2019).

Furthermore, tertiary learners must develop a fundamental understanding of emerging technologies. They must know how to interact with them and how to use them to achieve learning gains and develop an understanding of known principles and processes of emerging technology for decision making. Also,

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