

Towards Green Consumption of Electronic Devices: Using Augmented Reality to Improve Awareness

Girish Bekaroo¹, Priscilla Ramsamy¹, Alexander Okolo¹, Roopesh Sungkur², Waseemah Moedeen¹

¹Middlesex University (Mauritius Branch Campus)

²University of Mauritius

Synopsis:

During the past few decades, the adoption of electric and electronic devices (e.g. television sets, computers and refrigerators, among others) in both households and businesses has brought immense benefits to human beings, such as increased productivity, improved entertainment and communication, and much more. However, their increasing utilization has proved to adversely impact the environment and human health. This is principally because these devices are power-dependent and the generation of electricity is known as a key cause of climate change due to the use of non-renewable sources (e.g. coal or oil) that releases carbon dioxide, pollutants and Sulphur into the atmosphere. Furthermore, growth in the consumption of electronic devices also contributes to the growing e-waste problems, especially after the usage lifetime of these devices (Widmer, et al., 2005) and e-waste is known to contain hazardous constituents which can harm both the environment and human health if not managed properly. As such, it is essential that human beings undertake actions to reduce the risks and damages to the environment caused by electronic devices. Concurrently, studies have revealed that a lack of knowledge is often considered as a key barrier to the adoption of environmentally sustainable actions.

One emerging technology that has shown to foster engagement, improve understanding and provide a unique learning experience is Augmented Reality (AR). Even though this technology is increasingly being adopted within educational systems, it has not yet been exploited to improve awareness on environmentally sustainable use of electronic devices. This study therefore aimed to assess the effectiveness of using AR to improve awareness on green consumption of electronic devices. To achieve this, an AR-based mobile application named ARGY was developed to help individuals learn and understand energy consumption from various electronic devices being used at home and offices. The application also provides a means for end users to track the amount of energy consumed by various devices, and provide appropriate tips and best practices to educate users on green practices. Additionally, the application contains a quiz feature to assess the knowledge of the users.

In order to evaluate the application of ARGY, an experiment was conducted focusing on two aspects, namely, technological acceptance and knowledge gains on the participants. For assessing technological acceptance, the Technology Acceptance Model (TAM) was utilized and for the evaluation of knowledge gains, pre-utilization and post-utilization tests were conducted involving 40 participants from Middlesex University (Mauritius Branch Campus). Following evaluation of the mobile application, the hypothesis of the research project has been confirmed and indicated a positive correlation between AR and learning enhancement on green practices.