Chapter 14
Nanotechnology for Sustainability

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ABSTRACT

Nanotechnology is one of the most relevant technical factors that have applications in different types of industrial sectors, and it seems to have a consistent scope of technical innovation that focuses on technical derivation with sustainable outcomes. In this study, the perception of nanotechnology and its prominent usage with potential outcomes in different industrial activities has been derived. In addition to this, the study has also reflected on the advantages along with some of the negative factors that come with nanotechnology and its integration. The study helps to evaluate the perception of understanding nanotechnology along with the purpose of evaluating the correlation between the social specifications and commercial attributes.

INTRODUCTION

The perception of nanotechnology is eventually regarded as the branch of science that helps to focus on the purpose of producing design along with the derivation of structural factors that helps to evaluate systems by manipulating the atoms and molecules. The process of manipulation incorporated in nanotechnology is more derived at a nanoscale level. Nanotechnology is often regarded as a small solution to different and big problems that help to derive the perception of producing nanoparticles that can be of great use

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in different industrial sectors (Kirtane *et al.* 2021). Nanotechnology is heavily used in different types of industrial activities and it is extremely beneficial in terms of improving the manufacturing process and it supports the development and infrastructure revaluation of the production process. This helps to make the use of nanotechnology highly prominent in different industrial areas such as the engineering sector, medical sector, food industry, Information technology and communication sector, electricity industry and so on. The specification of nanotechnology is the branch that helps to manipulate the structure of the molecules related to different materials that have a revolutionary application with positive outcomes that makes the purpose of various industrial

activities and infrastructural factors even more sustainable (Sahoo *et al.* 2021). It is important to specify that the economic group and consistent competition easily achieved with nanotechnology in different

ways seem to have a positive impact. It is important to realise that nanotechnology comes at a cost of certain negative attributes that are also important to evaluate in the fields where it is typically used.

LITERATURE REVIEW

The prominent use of quantum nanoscience is one of the theoretical factors that has typically been incorporated in deriving man of science development and its technical specifications that help to focus on the quantum mechanism and the use of the coherent quantum effects that helps to focus nanostructure development. In addition to this, the nanotechnology theory is also specific with the conceptualisation of bottom-up and top-down approaches that helps to focus on nano-objects and their construction which is eventually helpful for deriving the purpose of nanotechnology (Heinrich *et al.* 2021). Therefore, it can be easily derived that the quantum science theory is one of the prominent theories that are incorporated in the field of nanotechnology that helps to understand its mechanism and approach of deriving the quantum development that helps to understand the purpose of using nanotechnology as a whole (Shen and Dierking, 2019). Nanotechnology also focuses on the approach of engineering specifications that helps to derive structurization, production process and designing of attributes that help to focus on atom manipulation at the nanoscale level.

BENEFITS

The worldwide market of nanotechnology is one of the major markets that seem to have prominent aspects and consistent commercial usage. It is important to specify that there are some consistent advantages that come with nanotechnology. It has been found that the use of nanotechnology has consistently changed the electronic goods and their development which is creating more opportunities for commercialisation and human access with sustainable outcomes (Weiss *et al.* 2020). Nanotechnology is one of those technical frameworks that is constantly being used in the medical field work and the healthcare sector is heavily facilitated by the potential uses of nanotechnology. Nanotechnology is making benefits for the medical industry as it is affecting the process of diagnosis and medication evaluation following a treatment process that remains extremely beneficial for focusing on patient care specifications. Nanotechnology in the medical field is also helping to eliminate the trial and error method in terms of drug prescription to the patients which is making healthcare services even more sustainable and accurate (Zhou *et al.* 2020). Nanotechnology has even more advantages as it helps to focus on the feasibility to