

New Experimental Observations of Optical Characteristics of Transparent Media: Innovation in Curriculum Development for TVET

Olaifa Babatunde. A. & Jayeoba Babatunde. O.*

*Department of Science Laboratory Technology, Federal Polytechnic, Ilaro, Nigeria

*Corresponding author email: babatunde.jayeoba@federalpolyilaro.edu.ng;

Introduction

Among the most important observable phenomena is the interaction of light energy with matter, this field of study is termed optics in physics which has wide spread of applications in science and engineering. Matters respond differently to electromagnetic wave where this interaction from the outside of a system brings about multi-illusionary dimensions. The perceptible observations resulting from the interactions depend on: frame of reference or observation, resulting properties of wave-particle (light and matter) interaction, geometrical architecture of the incident ray, nature of incident ray, nature of matter (system). Everything is made observable through reflection because of energy; if light energy disappears then there is no more observable dimension. Electromagnetic waves are transverse and do not require material medium for their propagation but can interact with matter based on Maxwell's equation.

Methodology

This section of the study highlights the materials used for the experimental characterization of images formed by the different optically transparent medium and experimental procedure to generate image at different object distance from the medium. The materials used for investigating the nature image seen through different medium are adjustable optical bench with medium holder: optical transparent medium and object are mounted on this bench graduated in centimeter for variation; object/image screen: this is a white plate on which the objects are designed; markers: Different colors markers (Green, Black and Red) are used to design the objects in a vertical order; and optically Transparent Medium: The images of objects are observed and characterized through three optically transparent samples of plane glass, water sandwiched plane glass and convex lens. The object in this study is designed by drawing three arrows of same size and direction but different colours in vertical order on a plane white plate.

Results and discussion

Observed Image Characteristics with Plane Glass

Observed Image Characteristics with Plane Glass at different Object Distances, U_o (cm)

S/N	Image Distance from medium, V_m (cm)	Nature of Image Formed	
1.	5.00	- Erect - Diminished - No Lateral inversion	

Conclusions

Experimental characterization has been carried out with aid of optical bench where the nature of images formed by three transparent media have been observed and recorded. Three samples (Plane glass, water sandwiched glasses and convex lens) were mounted successively with spatial variation of object/medium at reference fixed observer's position from the medium, 20cm in order to study the longitudinal nature, magnification and transverse nature of the image formed. The results show that irrespective of object' distance, U_o from the medium, the image is always erect, diminished and no lateral inversion was observed. The degree diminishing of the image is inversely proportional to the magnification; therefore, this sample cannot be used to alter the perception of object.