

# Design and Development of Kenaf Fiber-Reinforced Polymer Composite Polytechnic Chairs

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## Abstract

This study is carried out for the design and development of a kenaf fiber-reinforced polymer composite for chairs used in polytechnic institution of higher learning. Development of the furniture industry in the field of education has been increasing recently. This is due to the gained attention in composite materials for implementations in the field such as medical, industries, sports, aerospace, , and education such as polytechnic furniture. A systematic approach of a total design process is utilised for a better undertaking towards achieving the best conceptual design for the Polytechnic Chairs. The best conceptual design of the composite polytechnic chair was then selected where the design utilises kenaf fiber-reinforced polymer composite which is also described in this paper. The usage of kenaf fiber-reinforced polymer composite helps in reducing global warming

**Keywords:** Design and Development, Kenaf Fiber-Reinforced Polymer Composite, Polytechnic Chairs

## Introduction

One of the most commonly used items in our daily lives are chairs. Chairs are an important product or item used in a variety of settings and situations in most work, study, and play situations. When designing chairs, designers and industrial engineers should ensure that chairs are designed by utilizing the correct anthropometric information (Castellucci et al., 2015). In a polytechnic institution of learning, classrooms, lecture halls and workshops, chairs and tables are widely used. The anthropometrics dimensions of a polytechnic student and the measurements are important design features of polytechnic furniture (Jung, 2005). A chair has an significant role in maintaining a good sitting posture (Panagiotopoulou

et al., 2004). Ergonomic design of polytechnic chairs in classroom are closely tied to the anthropometric features of the students' population (Aminian and Romli, 2012). According to the guidelines provided by the Department of Safety and Health Malaysia, the Hazard Identification Risk Assessment and Risk Control (HIRARC) states that general factors that determine the occurrence of musculoskeletal pain includes a furniture design that does not fit the dimensions of the human body, and imprecise sitting posture on the part of the students themselves (Syazwan et al., 2011). Anthropometry is now an important factor in the design and development process when creating an ergonomics product. Measurement size reference is inseparable from the human body based on the furniture design, in order to

