

# **JOB SHEET DEVELOPMENT FOR INTEGRATED LEARNING DESIGN BASED ON INDUSTRIAL PRODUCTS**

**by Sudiyatno, Jarwopuspito, Bayu Rahmat Setiadi**

## **ABSTRACT**

Development of jobsheets for courses related to product design based on industrial products that are integrated with each other. Design integration is a collaborative effort between study programs and industry to increase competence in the field of industrial product design. This research aims to: 1) analyze student learning outcomes who use industrial product-based design learning jobsheets; 2) analyze the differences in the design results of students who use industrial product-based design learning jobsheets between machine design lectures and jig and fixture design; and 3) analyzing the principle weaknesses in design lectures by applying a design learning jobsheet based on industrial product design. The research phase was carried out in three stages. The first stage is that researchers want to comprehensively explore industrial products that are feasible and in accordance with the learning outcomes of each course with the support of appropriate assessment instruments. The second stage is the development of jobs in the first year which are packaged in a collection of design learning job sheets and tested on a small scale. The third stage is testing the effectiveness and impact analysis on the integration of various jobs in each design course. The results of the research are students' ability to design in general only at the basic and global stages, such as the ability to abstract construction tools/machines and engineering information as well as understanding the strength of materials (material mechanics). Students have the ability to compile working drawings, such as incomplete working drawings of elements/components of tools/machines, only getting to the perspective drawings of the components of each machine, not yet including working drawing components. Students are generally still pragmatic or instantaneous and do not follow scientific design procedures. Students tend to adopt the images available on YouTube videos, copy and paste them and redraw them with the help of the Inventor or AutoCAD application. Both PKM and PJF students have not mastered the application of geometric tolerances and workmanship markings on working drawings.

Kata Kunci: *evaluation, design, machine, jig and fixture*