

GIFTS: Introduction to Technical Graphics and Hand Sketching Using a Tablet and Stylus

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iPad Technical Sketching

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Introduction

As part of The Ohio State University's new Digital Flagship initiative, all incoming first year students at The Ohio State University are provided with the Apple iPad Pro and Apple Pencil stylus. In an effort to utilize this technology in an introductory technical graphics course, students were given the option to use the iPad and Apple Pencil for hand sketching assignments

Process

Students start by importing orthographic and isometric grid paper into Notability, a note taking app provided to students as part of this initiative. The app allows students to draw with their stylus directly on the imported grid paper. Additionally, students were able to export their drawings to digital files that could be directly submitted to the class's Learning Management System (LMS). During this trial, students provided comments through informal discussion on their experience using the iPad. An exam covering hand sketching was administered which was required to be drawn in the conventional manner using pencil on paper.

Topics for Further Study

As the data collected was from a small sample size during a short-time frame, there appears to a venue to study further.

- Collecting data and formally analyzing if orthographic and isometric sketching with the iPad and Apple pencil transfer to hand-sketching requirements in the long-term.
- Researching and utilizing iPad applications better suited for sketching.
- Exploring the possibilities using electronic tools built for collaboration for both the student-to-instructor and student-student.

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Student Feedback

Overall, many students showed enthusiasm to using the iPads vice paper to pencil. The ability to create straight lines and circles, set different line types and colors, and easily erase lines if an error was made, resulted in much neater, professional looking drawings. This allowed students to focus less on their dexterity and ability to draw, and more on overall spatial visualization and the concepts of the orthographic and isometric projections.

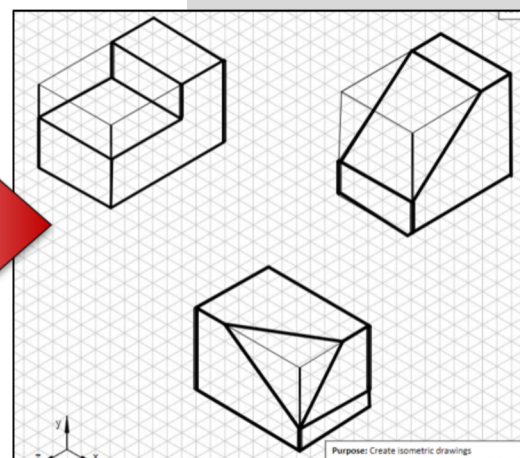
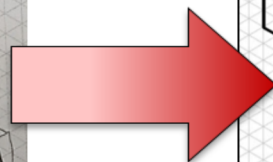
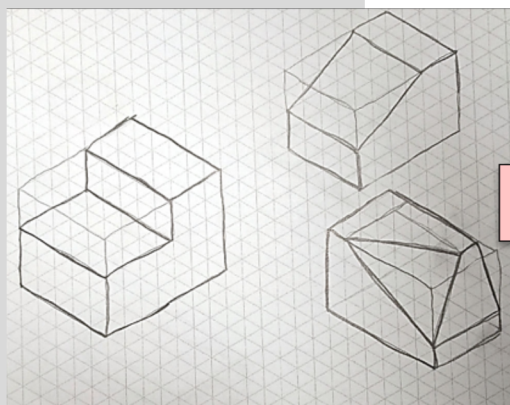
Observed Benefits

While no formal statistical analysis was performed, instructors observed no major difference in scores for those who utilized iPads and those who did not.

There are many additional benefits to working on these assignments through a digital platform. The ability to seamlessly submit assignments to the LMS reduced student stress levels and submission times, and allowed for faster and better feedback to the student. One instructor observed his teaching assistant (TA) using their own tablet to draw corrections and make notes directly on a student submission while grading.

Concern

A major concern was that students who elected to use the iPad, would lose the opportunity to refine the motor skills necessary to sketch technical drawings by hand.



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