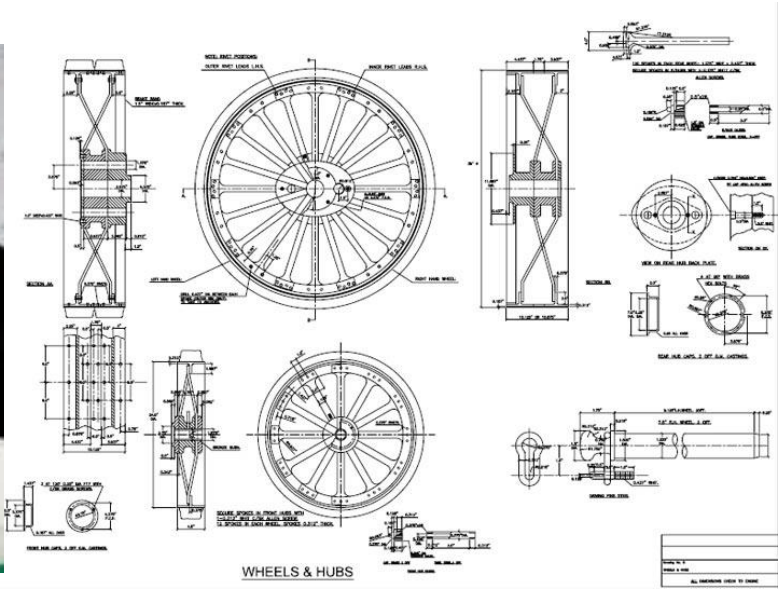
Topic

A CASE STUDY OF AUTOCAD 2D ENGINEERING DRAWING PERFORMANCE AMONG FURNITURE AND PRODUCT DESIGN (BFPD) STUDENTS



Introduction

AutoCAD

•AutoCAD is a software application for 2D and 3D drafting or engineering drawing
•The software designed by the Autodesk
(Luke Kennedy, 2014**)**

2d Engineering Drawing

•Designed by Gaspard Monge (1746-1818), expertise on mathematic and geometric
•Work plan drawing/ orthographic drawing
•Scientific drawing

1. Luke Kennedy,(2014), http://www.scan2cad.com/tips/autocad-brief-history/
2. W. W. Rouse Ball, (2010), A Short Account of the History of Mathematics 4th Edititon, Dover Books on Mathematics.

BFPD

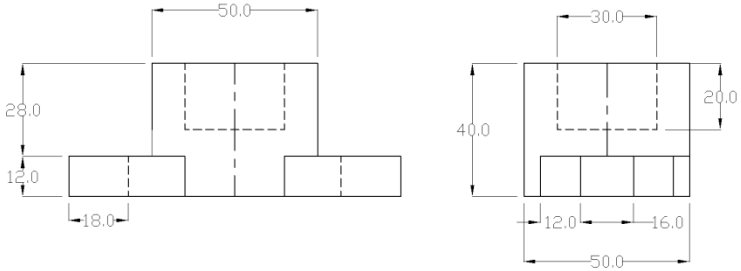
•BA Furniture and Product Design
•Industrial Design
•Creative and innovation.
•Develop the concepts for manufactured products, such as cars, home appliances, and toys.
•Combine art, business, and engineering to make products that people use every day

Sampling

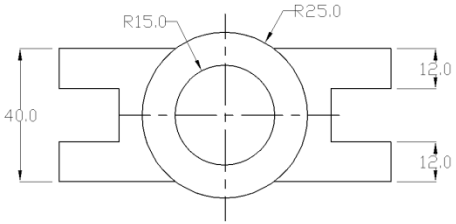
- BFPD students FCUC
- New design courses at FCUC
- Phase 1 (Quantitative): 18 students
- Phase 2 (Qualitative): 11 students

1. Nichols, B. (2013). Valuing the Art of Industrial Design. Washington, D.C
2. BFPD,(2016),Faculty of Design and Built Evinronment,First City UC, Sel,M'sia.

Furniture



Product



Transport

1. Magnaparthi (2010). Product Design, Product development, http://magnaparthi.blogspot.my/

Research background

- Poor performance AutoCAD 2D engineering drawing
- Effects to the prototype making process and overall project progressions especially in Design Project
- Concern about student's competency in the AutoCAD 2D drafting
- Graduates finding jobs in technical fields has already been affected (Diraso et al, 2013).
- Graduates also can’t interpret and reading the engineering drawing and this reported from the supervising managers in Malaysian industries (Z. Abdullah, 2015)

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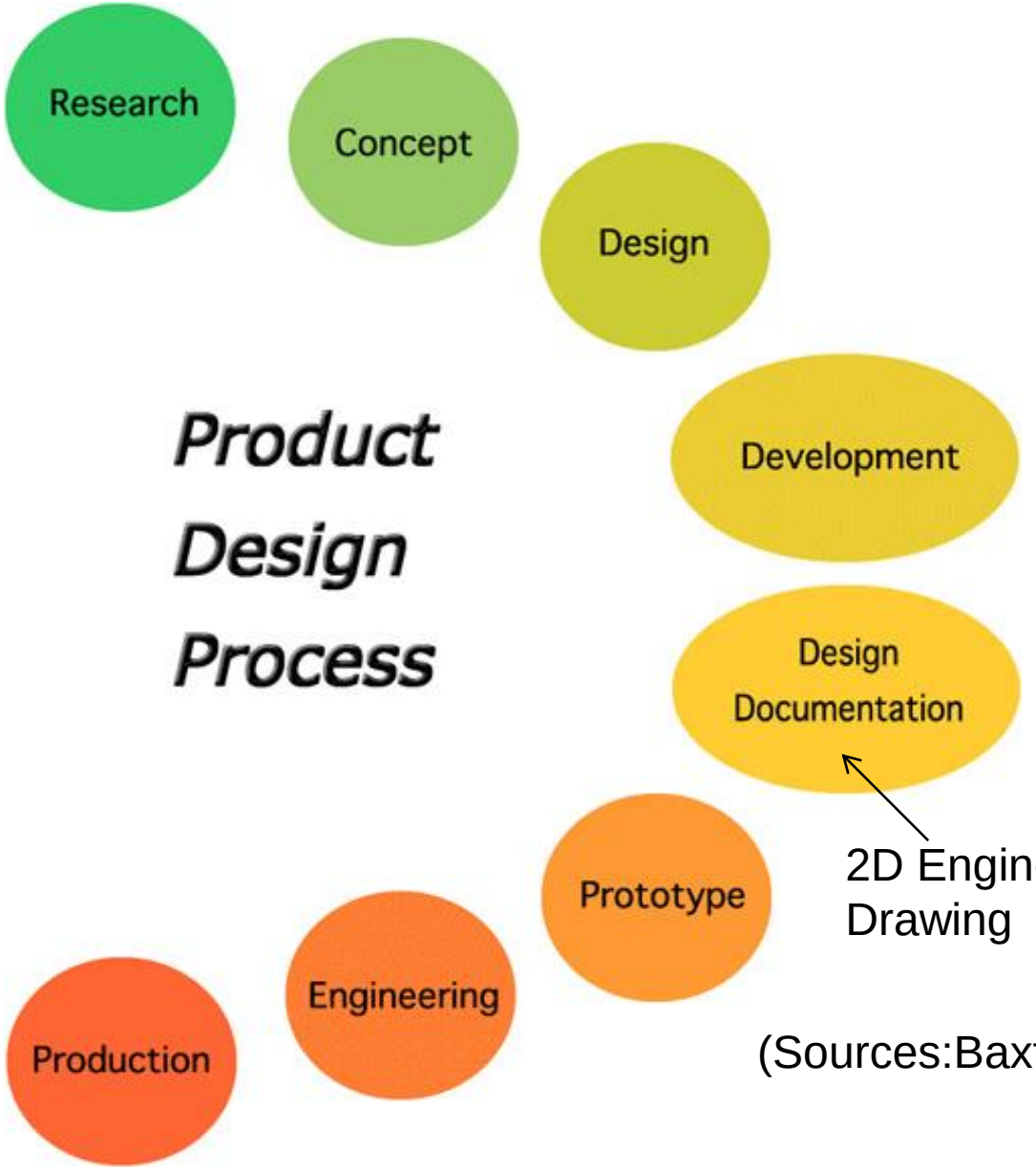
1. Diraso, D. K., Manabete, S. S., Amalo, K., Mbudai, Y. D., Arabi, A. S., & Jaoji, A. A. (2013). Evalua Tion Of Students ’ Performance In Technical And Engineering Drawing Towards An Effective Career Choice In Engineering And Technical And Vocational Education. International Journal Of Educational Research And Development, 2(April), 89–97.
2. Abdullah, Z. (2015). Improving Malaysian Engineering Graduate Ability To Read And Interpret Engineering Drawings. Utem.



2D Engineering Drawing

(Sources:Baxter,2013)

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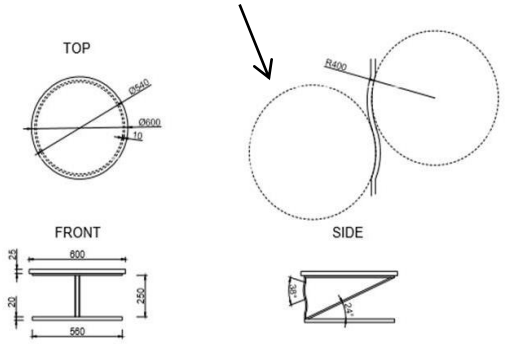

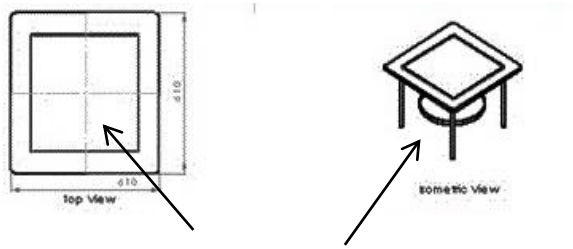

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Methodology

- Sequential explanatory design
- Analysis result or students grade in AutoCAD module and Design Project (quantitative approach)
- Semi structure interview (qualitative approach)

1. Arkkelin, D. (2014). Using Spss To Understand Research And Data Analysis. Psychology Curricular Materials Psychology Curricular Materials, 194.
2. Opdenakker, R. (2006). Advantages And Disadvantages Of Four Interview Techniques In Qualitative Research. Forum Qualitative Sozialforschung, 7(4). Https://Doi.Org/10.1177/1468794107085298

Result and finding

Quantitative approach

Statistics

		Design Project	AutoCAD
N	Valid	18	18
	Missing	0	0
Mean		2.6667	3.6667
Std. Deviation		.97014	1.23669
Variance		.941	1.529

Table 1: Descriptive Statistic Design Project and AutoCAD marks result

AutoCAD class scored a higher mean of 3.6667 as compared to Design Project 1 at 2.6667. This concluded that students scores better in AutoCAD class syllabus

1. BFPD,(2016),Faculty of Design and Built Evironment,First City UC, Sel,M'sia.

Design Project

		Frequency	Percent
Valid	F	2	11.1
	D	5	27.8
	C	9	50.0
	B	1	5.6
	A	1	5.6
	Total	18	100.0

Table 2: Percentage scores AutoCAD 2D Engineering Drawing result grade (Design Project module)

In table 2 show details about students' scores for 2D engineering drawing in Design Project modules. Only 5.6% scores A and it also same result to B scores. There are 50% of C scores. 27.8% scores D and 11.1% scores F. This table concludes that there were poor performances AutoCAD 2D engineering drawing in Design Project.

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AutoCAD

		Frequency	Percent
Valid	F	1	5.6
	D	2	11.1
	C	5	27.8
	B	4	22.2
	A	6	33.3
	Total	18	100.0

Table 3: Percentage Scores AutoCAD Module

Show detail about student's result in AutoCAD module. There were 33.3% scores A, 22.2% scores B, 27.8% C, 11.1% scores D and 5.6% scores F. This concludes, students do better in AutoCAD modules.

Qualitative approach

•The semi structured interviews were conducted with the students to explore the factors contribute poor performance in AutoCAD 2D engineering drawing. The purpose of the this approach is to clarify of the problem encounter in quantitative approach

•.All the interviews were conducted face to face. There were 3 main questions and each main question have 2 or 3 sub question which it will give contains information.

•Define the theme/coding

Question 1 is to explore and identify level of knowledge of students about the AutoCAD 2D engineering drawing.

Question 1	Theme
How would you describe AutoCAD 2D engineering drawing and do you know about the AutoCAD 2D engineering drawing?	Difficult, interface design boring, weak on mathematics **(Skills)**

1. BFPD,(2016),Faculty of Design and Built Evironment,First City UC, Sel,M'sia.

Question 2 is about defining in depth why and what they feel difficult about the AutoCAD 2 engineering drawings.

Question 2	Theme
Why and what do you feel difficult about the AutoCAD 2D engineering drawing? Is it because of the interface design, lecturer, timetable, lecture notes, assignments or lab facility or anything that I'm not mentioning here?	1.Forget, not practice, late attendance, spoon-feeding. **(Attitude)** 2.Interface design **(Skill)** **3.** Short time **(Not enough time)**

Notes: There is no issues on lecturer, computer lab and timetable.

1. BFPD,(2016),Faculty of Design and Built Evironment,First City UC, Sel,M'sia.

Question 3 is more practicing AutoCAD 2D in design project module which most of them weak to apply AutoCAD 2D in their own design.

Question 3	Theme
How frequent you apply AutoCAD 2D engineering drawing in the Design Project module? Why you do better in AutoCAD class, but not in Design Project? Is it because of your design is complicated to draw? How about the Design Project lecturer?	1. Sometimes,, not interested to study , prefer shortcut way.**(Attitude)** 2. weak on technical thinking, mathematics **(Skills)** **3.** Short learning period **(Not enough time)**

Notes: There is no issues on lecturer and facillity

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	Attitudes	Not enough time	Skill	Totals
Q1	2	0	9	11
Q2	10	2	5	17
Q3	12	1	19	32
Totals	**24**	3	**33**	60

Conclusion

- Performance in AutoCAD 2D Engineering Drawing is not necessarily affected by the software itself. Not enough time or short learning period not main factors. No issues on teaching team or lecturer and facility.

- There were more to the student

1. **Skill**
2. **Attitudes**

Recommendation

- Develop the module become interesting and easy to the students in their learning process.

- Develop on AutoCAD 2D engineering drawing to increasing the students skill

The following others recommendations were made as instruments for enhancing students' performance in AutoCAD 2D Engineering.

1. The faculty and departmental libraries should be equipped with current textbooks to encourage good reading culture in 2D engineering drawing and AutoCAD for students.
2. More should be done to help students in the BFPD courses in the area of tutorials and extra lectures to help improve their understanding of the engineering drawing. The teaching method should be changed.
3. Students should show their high class-attendance with good performance in AutoCAD class by cultivating the right attitude towards the course.
4. Students in the BFPD should spend more time on their engineering drawing in order to measure up to expectation.
5. The faculty also should send the lecturers for AutoCAD and Engineering Drawing training for improving the teaching method.
6. Design multimedia or apps specialist on BFPD 2D AutoCAD engineering drawing references

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4. **Arkkelin, D. (2014). Using Spss To Understand Research And Data Analysis. Psychology Curricular Materialssychology Curricular Materials, 194.**
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13. **Rambaree, K. (2012). Three Methods Of Qualitative Data Analysis Using Atlas . Ti : " A Posse Ad Esse ." Atlas.Ti User Conference 2013, 1–15. Https://Doi.Org/Http://Dx.Doi.Org/10.14279/Depositonce-4840**
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