

Applied Learning Conference: Interdisciplinary learning

An Online Finance-Based Self-Learning Tool: Comparative Study Between Business and Non- Business Students

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Outline

- Introduction
- Design and development of finance-based self-learning online platform
- Implementation and evaluation
- Results
- Conclusion

Introduction

Introduction

What is 'A Finance-Based Self-Learning Online Platform'?

- Website and mobile application which offer self-learning finance concepts
- Target users are business and non-business undergraduate students who are taking project-based modules

Objectives of this platform

- To enable students to learn and apply finance concepts in their projects
- To increase efficiency in teaching
- Given limited resources
 - During Covid19 and online learning



Overview of Design Thinking (DT) Innovation Module

- DT is a method and mindset of problem solving that can be carried out by anyone in any profession
- The end goal of a DT work process is to create a solution that is desirable, feasible, and viable
- DT is taught across all clusters at SIT



Overview of Lean Management (LM) Module

- LM enhances the productivity of any business process
- This involves identification and elimination of inefficiencies that do not add value to the creation of the final product
- LM is taught in selected UG programmes in ENG cluster



Why finance concepts are important for non-business students?

Prior to the implementation of a commercially viable solution, The important questions are

- Whether it adds value to develop this new solution?
- How should the firm fund these investment?
- Which commercially viable solution should the firm pursue if there are numerous options?
- Is it feasible to delay a solution by a quarter to add a feature to increase sales?

Accountancy

Subject guide for accounting related resources

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- Financial Project Evaluation
- FAQ



The world of finance is huge!

How can you make the right investments and what tools are available to help you decide?

Let's embark on this journey to learn more of financial evaluation through design thinking and lean management case studies.

▷ WATCH & LEARN!

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Design and development of finance-based self-learning online platform

- Animation video clips**
- Conceptualized case studies**
- Financial calculators for project evaluation**

Design and development of Finance-based self-learning online platform

- The website was made available through SIT library portal.
<https://libguides.singaporetech.edu.sg/accounts/fpe>
- The website and mobile application were developed in house by SIT staff and interdisciplinary students
 - ICT
 - Accountancy
 - Communication Design
 - SIT media producer

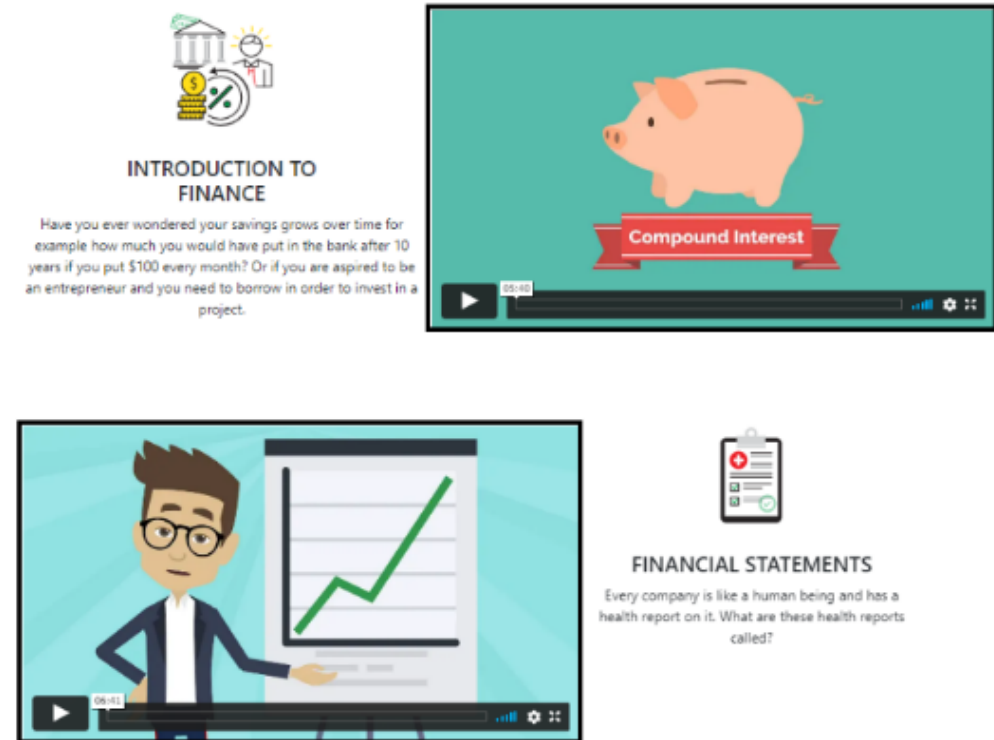
Design and development of Finance-based self-learning online platform

Animation video clips (4 - 5 mins)

1. Introduction to Finance
2. Financial Statements
3. Funding Options
4. Introduction to Investment Decision
5. Net Present Value (NPV)
6. Internal Rate of Return (IRR)
7. Profitability Index (PI)
8. Accounting Rate of Return (ARR)
9. Payback Period (PP)
10. Summary of Project Evaluation tools
11. Overall summary

[Items 1-4 are basic finance concepts]

[Items 5-9 are project evaluation tools]



Design and development of Finance-based self-learning online platform

Conceptualized Case Studies

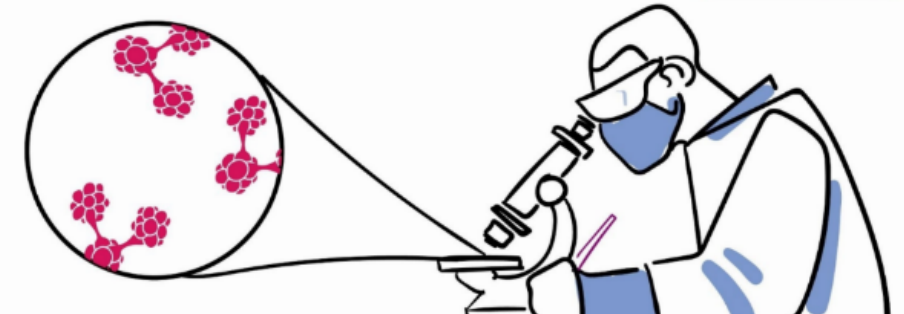
1. Development and manufacturing of breast cancer detection technology
2. Development of Just-In-Time (JIT) production strategy for Japanese car manufacturer
 - Cases inputs: Initial investment, cost of fund, cash flows etc.
 - Case outputs: decision to proceed with the development of technology

DESIGN THINKING CASE STUDY

You are a researcher in a diagnostic imaging device manufacturing, **Wellness4Life**, and have developed a new technology called **EasyTech** that detects breast cancer at a very early stage in 2018.

This technology is going to be the fastest and most accurate detection technology for breast cancer that is out there today in the market.

Wellness4Life



LEAN MANAGEMENT CASE STUDY

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HA KKA I

HAKKAI is a Japanese multinational automotive manufacturer that is headquartered in Tokyo.

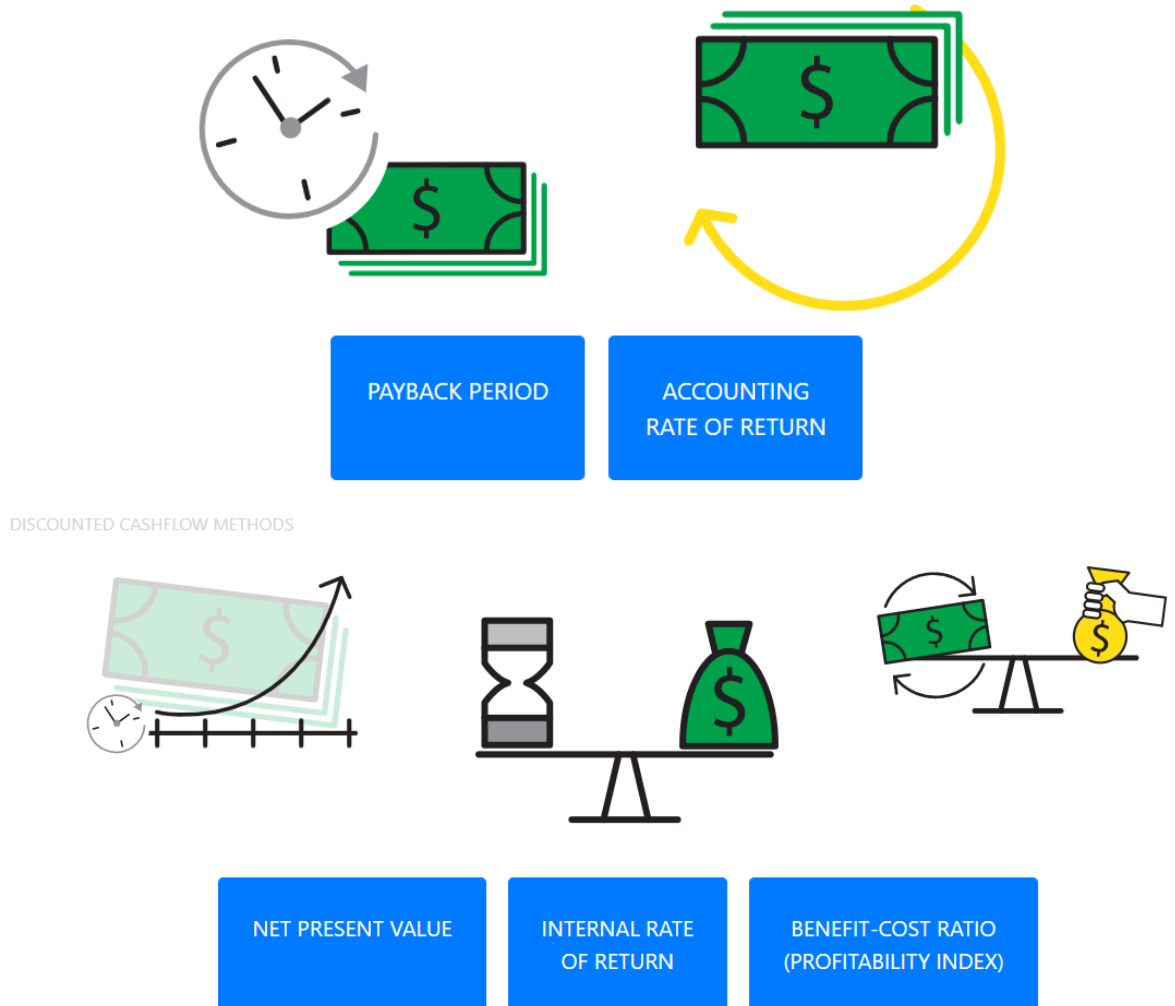
Currently, they have some issues on not being able to fully utilise their excess unused inventory. They recently invested \$1,000,000 to develop a **Just-In-Time (JIT)** production strategy where it helps to keep a minimum amount of inventory in their warehouse and helps to minimise cost. This philosophy helps HAKKAI to adapt quickly with the changes of demand without the worry of disposing excess unused and expensive inventory.



DESIGN AND DEVELOPMENT OF FINANCE-BASED SELF-LEARNING ONLINE PLATFORM

Financial calculators for project evaluation

- There are 5 financial calculators for project evaluation
- Students can use the financial calculators for case studies, or as a stand-alone for their future projects



Implementation and evaluation

- Methodology
- Implementation on Design thinking modules and Lean management

Implementation

	Non-business students	Business students
Student population	DT & LM modules in ENG and HSS clusters in AY2020 and AY2021	Foundation of Finance (ACC1005) in DSB in tri 1 AY2021
Sample size	228	57
Module learning outcomes	does not include project evaluation	includes project evaluation
Formal assessment on financial aspects	No	Yes
Concepts taught in class	No	Yes

Implementation of Finance-based self-learning online platform for non-business students



DT modules:

- Total of 77 DT students
- OTY3916 Healthcare Design Thinking running in Trimester 2 AY2019/2020
- NUR3006 Health Innovation and Informatics running in Trimester 2 AY2020/2021



LM modules:

- Total of 151 LM students
- SIE3007 Lean and Quick Response Repair running in Trimester 3 AY2019/2020
- MME2161 Lean Manufacturing and Six Sigma in Trimester 3 AY2020/2021
- SIE3007 Lean and Quick Response Repair running in Trimester 3 AY2020/2021

Methodology

- Pre and post quizzes are used to assess the knowledge gained from the self-learning platform
 - 10 True/False questions for both pre and post quizzes
 - Quizzes are conducted and auto mark on SIT learning platform
 - The statistical t-test is used to test the significance of improvement in the post-quiz score.

Implementation and evaluation

Methodology

Students interests and usefulness of the platform in helping them study finance concepts, was determined by

- The video viewership
- Student feedback online survey after the post-quiz
 - 8 survey questions
 - Free text responses

No.	Survey Questions
1	The design of the 'online financial tool' was appealing and highly motivating to use
2	The 'online financial tool' was engaging
3	The 'online financial tool' challenged me intellectually
4	The content in 'online financial tool' was easy to follow and understand
5	The 'online financial tool' was intuitive, easy and free from excessive delay
6	I would recommend the 'online financial tool' to my peers
7	The 'online financial tool' should be continued for all future trimesters
8	Overall, I am satisfied with 'the online financial tool'

Results & Conclusion

Results and Discussion

Overall pre and post quizzes results, and the knowledge gained from the platform

Non-business students

- Improvement in post quiz mean score
- Significant differences between the pre- and post-quiz scores
- The platform facilitates to enhance students' learning of the Finance concepts

Business students

- Smaller improvement
- Insignificant differences between the pre- and post-quiz scores.
- Students have prior knowledge on project evaluation before using the platform, hence, pre-quiz score is high

	N	Pre-quiz score	Post-quiz score	Mean difference	Paired t-test			Results
		Mean(SD)	Mean (SD)		t	df	p	
Non-Business students	228	5.7 (2.0)	7.3 (1.5)	1.6	10.7	227	< 0.001	Difference is significant
Business students	57	7.5 (1.4)	7.7 (1.3)	0.2	1.1	56	0.27	Difference is not significant

Results and Discussion

Individual pre and post question results

Non-business students

9 out of 10 questions show significant improvement in post quiz mean score



■ Significant improvement ■ Not significant

Business students

2 out of 10 questions show significant improvement in post quiz mean score

- Concepts were taught in class. Pre-quiz score is already high. Hence, small incremental in post quiz.



■ Significant improvement ■ Not significant

Results and Discussion

Video viewership results

Non-business students

46% of the non-business students watched the videos.

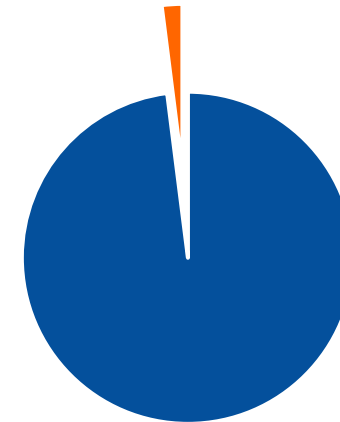


■ Watched video ■ Did not watch video

Business students

98% of the business students watched the videos.

- Formal assessment on financial aspects



■ Watched video ■ Did not watch video

	# of students	average # of unique viewers (per video)	% unique viewer to students (per video)
Non-Business students	228	104	45.61
Business students	47	46	97.87

* Viewership is calculate using # of unique viewers divide by total number of students

Results

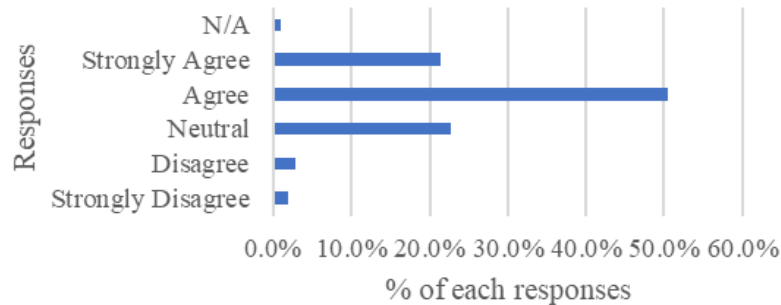
Student feedback results

Overall, students' feedback for both business and non-business show that our platform has enhanced students learning experience.

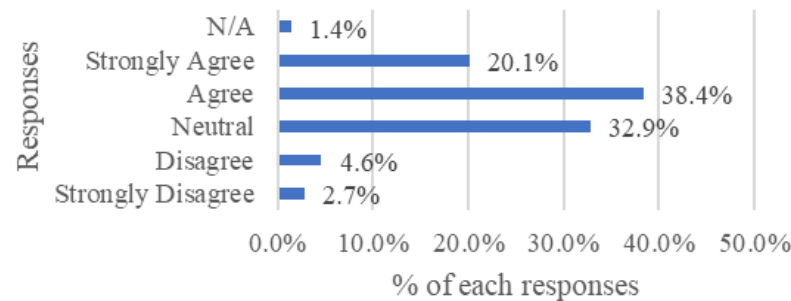
- Only 2 business students submitted feedback. Hence, their results are omitted for comparison.

For non-business students:

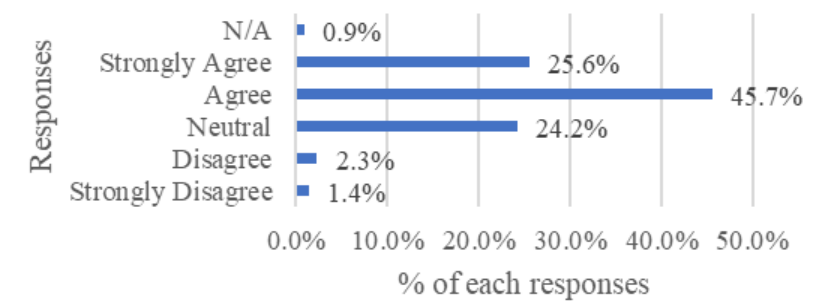
Q: Overall, I am satisfied with the 'online financial tool'.



Q: The 'online financial tool' should be continued for all future trimesters.



Q: The content in 'online financial tool' was easy to follow and understand.



Results

Student feedback results (cont.)

Examples of positive feedback:

- *“It was simple enough to understand, even for someone who does not have background financial knowledge”*
- *“I learnt that the world of finance has many different aspects to explore and there are many different financial tools to guide in making the right decisions on different aspects.”*
- *“The graphics in the video makes it more engaging”*
- *“As a visual learner, having short videos where key pointers and formulas show up within the video makes us understand the concept better”*
- *“The most engaging part of the online financial tool would be the terminology that was used. It is something that I can relate to the real-world aspect”*

Examples of constructive feedback and points for improvements:

- *“To include online interactive assessment and financial games to test our understanding”*
- *“Include real-life examples or start-up stories”*
- *“More exercises after every topic to make students understand the concept better”*
- *“Have more practice questions”*
- *“Show more examples of applying the financial tool for real-life applications”*

Conclusion

- Our project provides online self-learning financial platform that aims to empower business and non-business students to self-study finance concepts and enhance their project work.
- Overall, the results demonstrate the effectiveness of the implemented self-learning platform for non-business students.
 - Quantitative data obtained from the pre- and post-quizzes demonstrated that there was significant improvement in the post-quiz scores,
 - while qualitative data showed that students appreciated the tool and agreed that the usage of the tool improved their learning.



Thank you