

Project

Digital Skills Essential (DSE) Implementation Analysis

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01

Introduction



Digital Skills Essential or known as **DSE**, is a set of subjects that provide the digital skills and knowledge necessary in the work and daily life of people, benefit from personal and organizational work, as well as be ready to step in the direction of digital evolution, increase efficiency and efficiency to keep up with the digital economy and the fourth generation of industry, especially to contribute to the implementation of digital government policies and economic policy framework, and digital society.

Objectives

- **Passing score:** The passing score for the DSE is currently 60%.
- **Preparation Courses:** The DSE preparation course is a 88-hours course that covers 12 subjects.
- **Level of Difficulty** of question for exam: DSE exam questions are divided into three levels of difficulty: easy (L1), medium (L2), and hard (L3). It is not clear at which level of difficulty examiners score the highest.



02

Scope

Scope

Scope of this project is to analyze to give insight, suggestion and recommendation to the problem that we have related to DSE.

We want to achieve our goals and objectives throughout the analysis by using all data that we obtain within the project timeline.

Project Timeline

Tasks	Duration		
	July and August	September	October
Define Problem			
Data Collection			
Study about Data			
Data Preparation			
Exploratory Data Analysis			
Report+Presentation			

Project Gantt Chart

03

Methodology and Analysis

The Data

Practically, we have 4 main types of data that we get them from Institute of Digital Governance (IDG) for analysis.

There are :

- **Certified Test Result**
- **Pre-test Result**
- **Question design in XML format**
- **Course Completion**



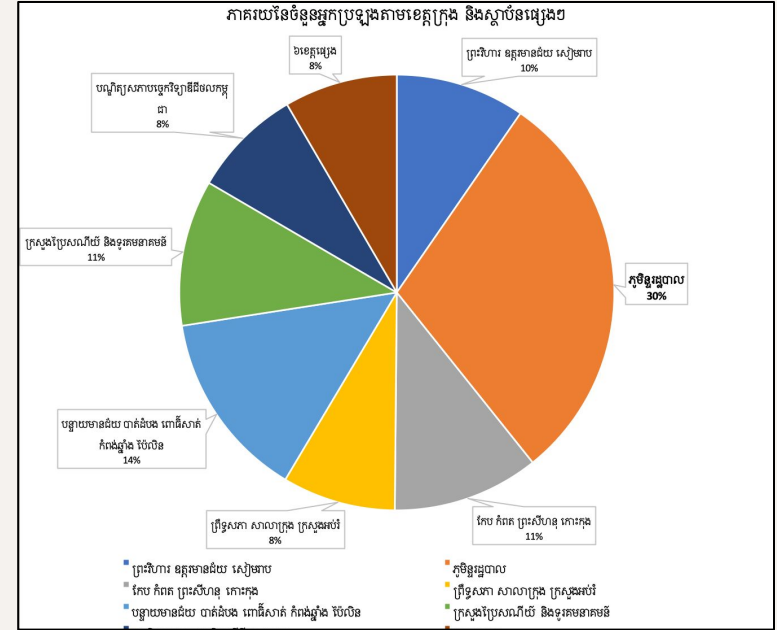
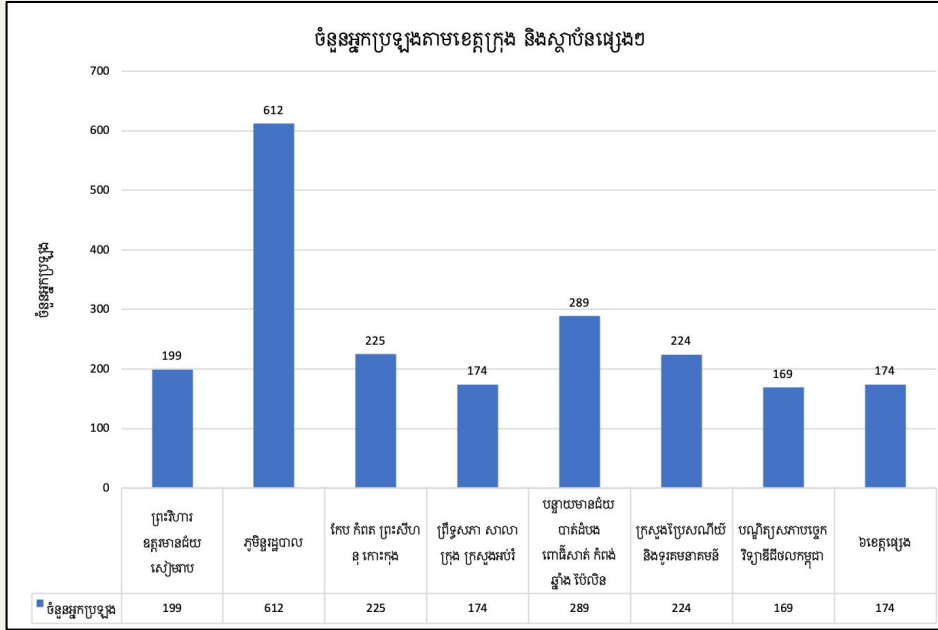
3.1 Passing Score (Examination Performance)

Data that we get from - **Certified Test Result Data:**

- ព្រះវិហារ ឧត្តរមានជ័យ សៀមរាប
- កែប កំពត ព្រះសីហនុ កោះកុង
- ប៉ៃលិន បន្ទាយមានជ័យ បាត់ដំបង ពោធិ៍សាត់ កំពង់ឆ្នាំង
- ភូមិន្ទរដ្ឋបាល
- ព្រឹទ្ធសភា សាលាក្រុង ក្រសួងអប់រំ
- ក្រសួងប្រៃសណីយ៍ និងទូរគមនាគមន៍
- បណ្ឌិតសភាបច្ចេកវិទ្យាឌីជីថលកម្ពុជា
- ៦ ខេត្តផ្សេង

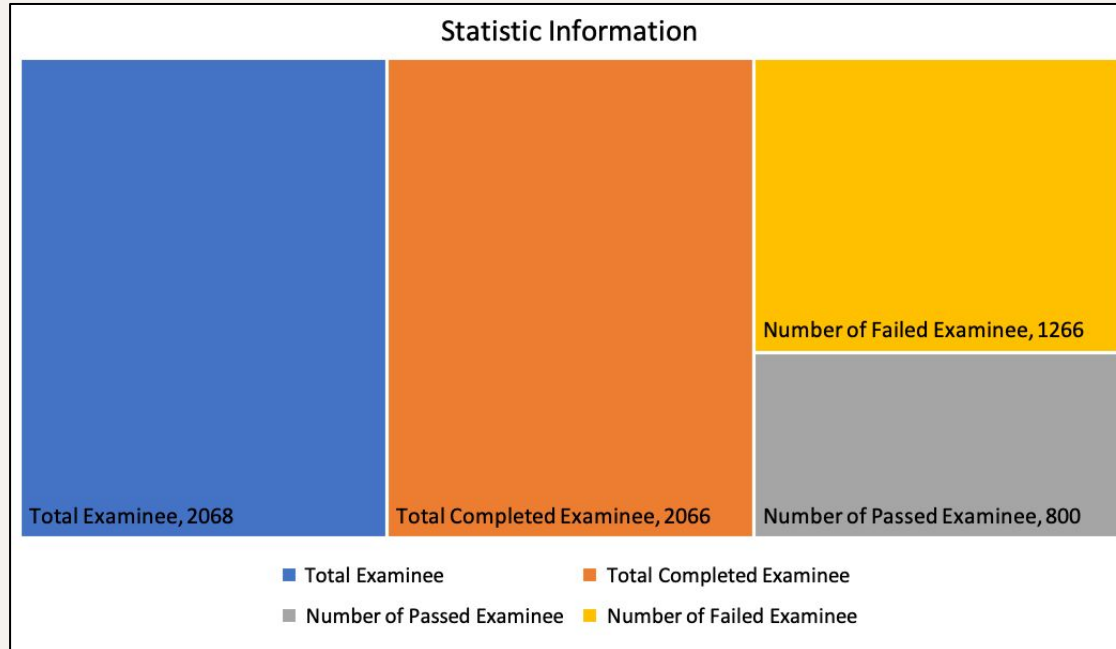


Date between **15th February 2022** and **08th August 2023**



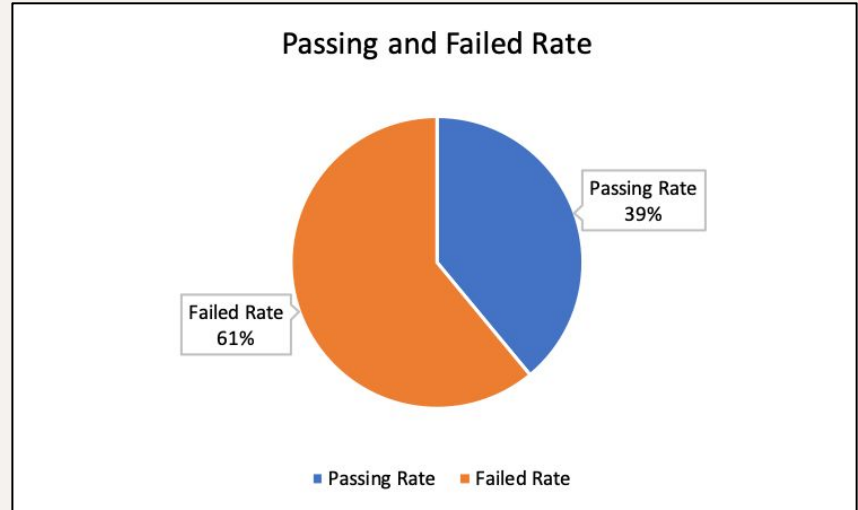
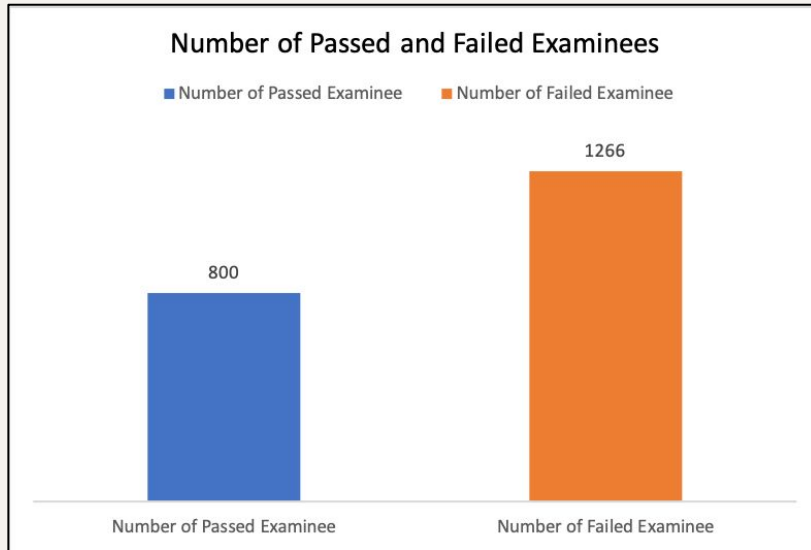
Out of the **8 province, city, and other institutes**:

- Most examinees from ភូមិន្ទរដ្ឋបាល with a total number of **612** and the least examinees of the exam are from បណ្ឌិត្យសភាបច្ចេកវិទ្យាឌីជីថលកម្ពុជា with a number of **169**.
- Pie chart shows that number of examinees from ភូមិន្ទរដ្ឋបាល is **30%** of total examinees.



Statistic information from the combined data of all province, city and other institutions,

- Total examinees of **2068**
- Completed examinees of **2066**



Amongst the total number of **2066**,

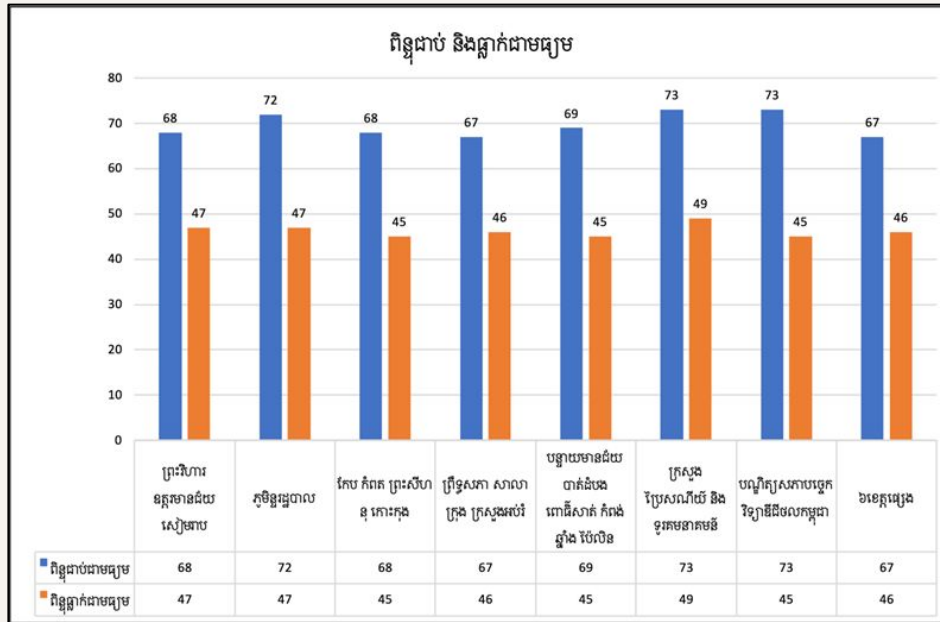
- **800** candidates passed
- Those who failed is almost twice more than passed candidate, **1266**

In this study, the passing score was set to **60**:

- passing rate of the examination is only **39%** while the failed rate is **61%**.

Description	Data
Maximum Score	94.18
Minimum Score	3
Average Score	55.45
Median	55.14

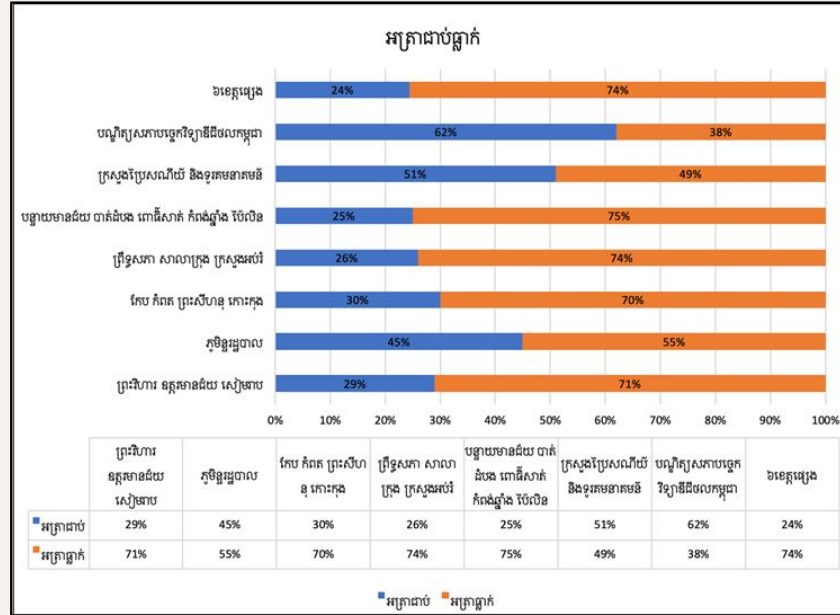
The maximum score across all examinees is **94.18** while the minimum score is only **3**. What is more, the average score is **55.45** which is around **5 points below the passing score**.



Description	Data
Average Score of Passed Examinees	~ 70
Average Score of Failed Examinees	~ 46

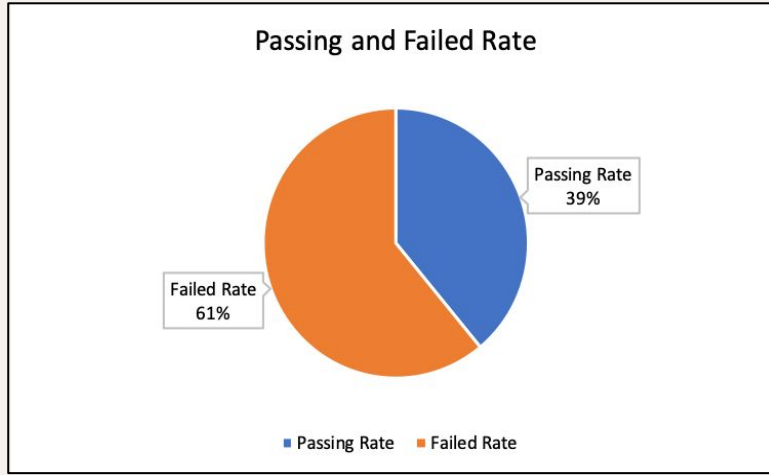
Bar chart shows the average passing and failed scores

- failed average scores, they are more or less the same, which range **between 45 to 47**
- passing average score from ក្រសួងប្រៃសណីយ៍ និងទូរគមនាគមន៍ and បណ្ឌិត្យសភាបច្ចេកវិទ្យា ខ្ពស់ជាងគេ **is the highest, 73.**

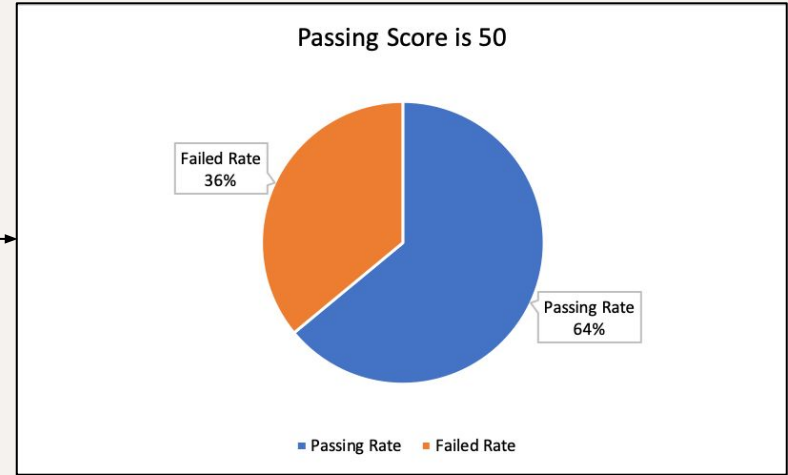


Stacked bar chart shows the passing and failed rates from each province, city, and other institutions.

- **ក្រសួងប្រៃសណីយ៍ និងទូរគមនាគមន៍ and បណ្ឌិត្យសភាបច្ចេកវិទ្យាឌីជីថលកម្ពុជា**, their passing rate is **above 50%**, which means that more examinees passed the DSE test.
- In contrast, the passing rate in others is **below 30%**.



Passing Score = 60



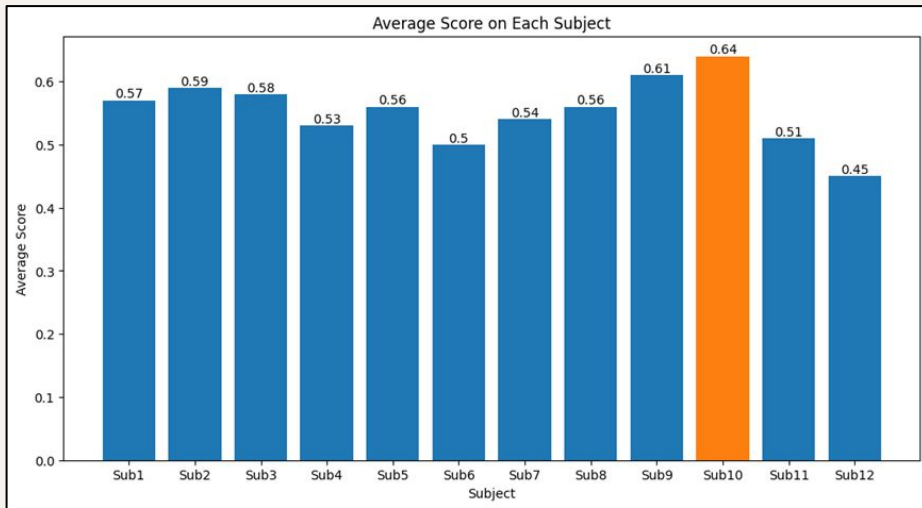
Passing Score = 50

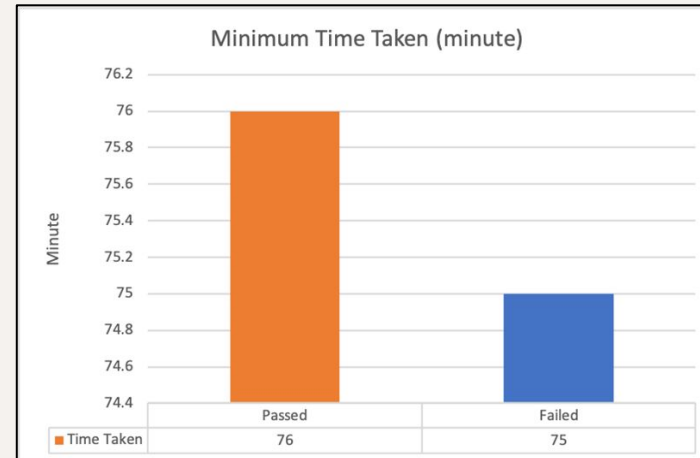
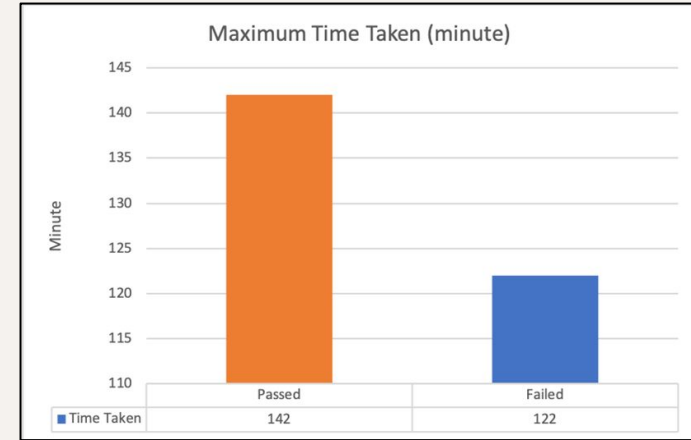
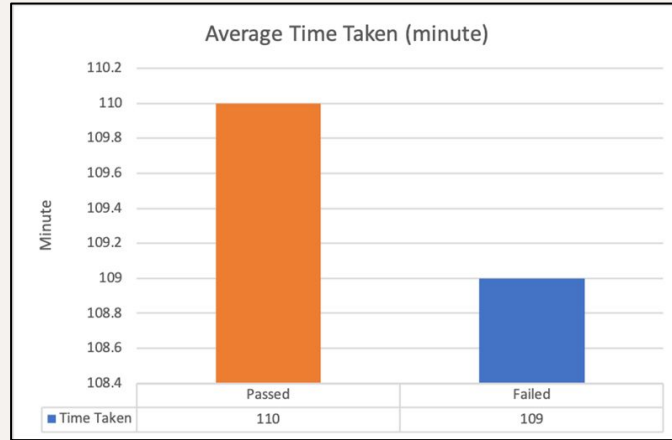
We have been analyzing data and information when the passing is set to **60**, and this pie chart shows the passing rate and failed in case the score is set to **50**. As a result of setting the passing score to 50, we can see that we increase passing **from 39% to 64%**.

Student Behaviour on Examination

Bar chart shows the average correct rate that examinees score during the exam. We can see that the average correct rate in the 10th Subject, “កម្មវិធីផលិតភាពលើទូរសព្ទឆ្លាតវៃ Productivity Apps on Smartphone” is the highest, **0.64**. It means that examinees perform well in this subject.

១. កុំព្យូទ័រចាំបាច់ Computer Essentials
២. អនឡាញចាំបាច់ Online Essentials
៣. អក្ខរកម្មព័ត៌មាន Information Literacy
៤. ឯកជនភាពទិន្នន័យ និងការការពារ Data Privacy and Protection
៥. បង្កើតឯកសាររដ្ឋបាល Word Processing
៦. កម្មវិធីបង្កើតតារាង និងវិភាគទិន្នន័យ Spreadsheets
៧. បង្កើតមាតិកាឌីជីថល Digital Content Creation
៨. អក្ខរកម្មទិន្នន័យ Data Literacy
៩. កម្មវិធីសហការតាមអនឡាញ Online Collaboration Tools
១០. កម្មវិធីផលិតភាពលើទូរសព្ទឆ្លាតវៃ **Productivity Apps on Smartphone**
១១. បរិវត្តកម្ម និងសេដ្ឋកិច្ចឌីជីថល Digital Economy and Transformation
១២. អភិបាលកិច្ចឌីជីថល Digital Governance

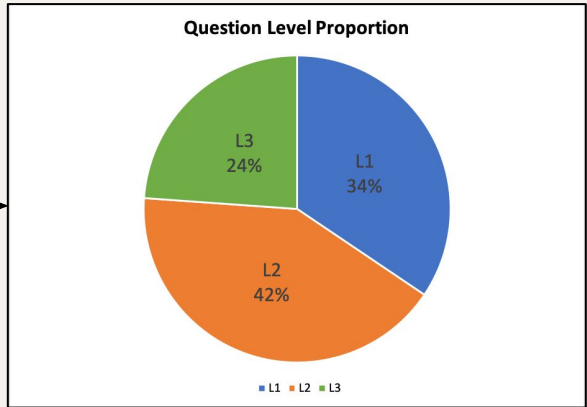
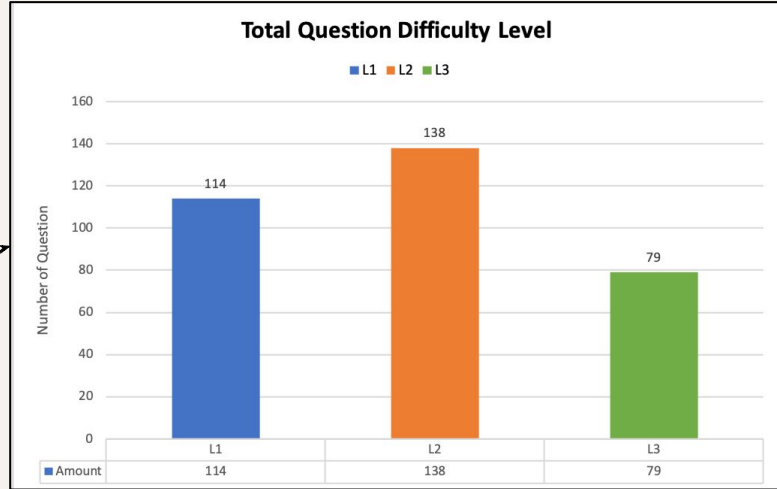
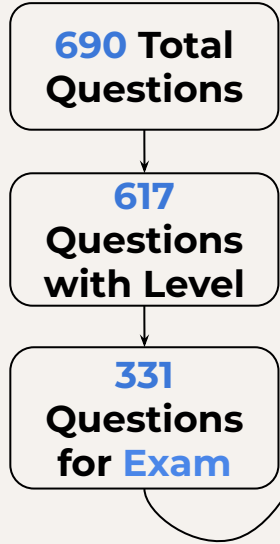




3.2 Question Difficulty Level Analysis

Difficult level from Question Pool sets and Question Statistical Result

- Firstly, take a look at the question level status in each of the subjects
- There are 3 levels of difficulty.
 - L1 is an “**easy**” level. L2 is the “**medium**” level. L3 is the “**hard**” level.
- Some questions in some question pools that are not set level yet.
 - They are still in the status of either “**pending**” or “**reviewing**”.



- There are **690** questions in total.
 - There are **617** questions are defined level.
 - **331** questions for certified test.
- There are **114 L1** questions, **138 L2** questions, and **79 L3** questions.

QuestionStats After Exam

After we studied the difficulty level of question pools from each subject, we studied question statistical information from each of our datasets, each province, city, and institution.

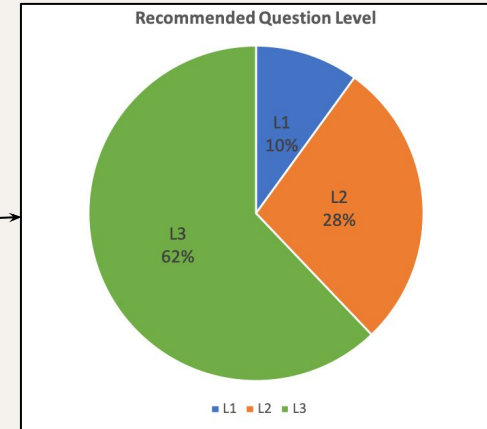
- In this section, we study the difficulty level based on the passing score of **60** that was set.
- Because the passing score is **60**, we decided to set the:
 - **L3** level, correct rate ranges from **1 to 59**
 - **L2** level if the correct rate ranges from **60 to 79**
 - **L1** level base correct rate range from **80 to 100**

Recommended Question Level

After we study on correct rate of each question, we recommend level as following:



Q_Name	Level	Q_Type	Subject_th	Attempt	Correct_Rate	Recommended_Level
Mainboard-003	L2	Exam	1	633	32.56%	L3
jc-q18	L1	Exam	1	508	41.20%	L3
File Extensions-001	L3	Exam	1	741	75.35%	L2
Hardware-001	L2	Exam	1	697	58.70%	L3
.....

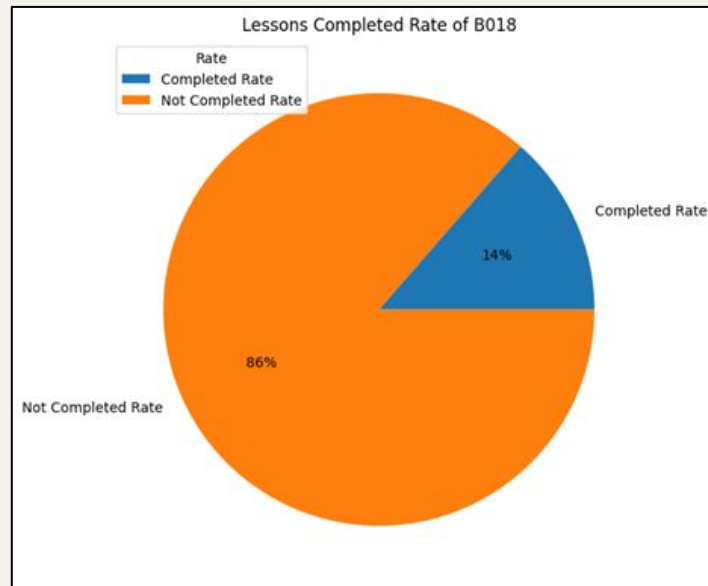
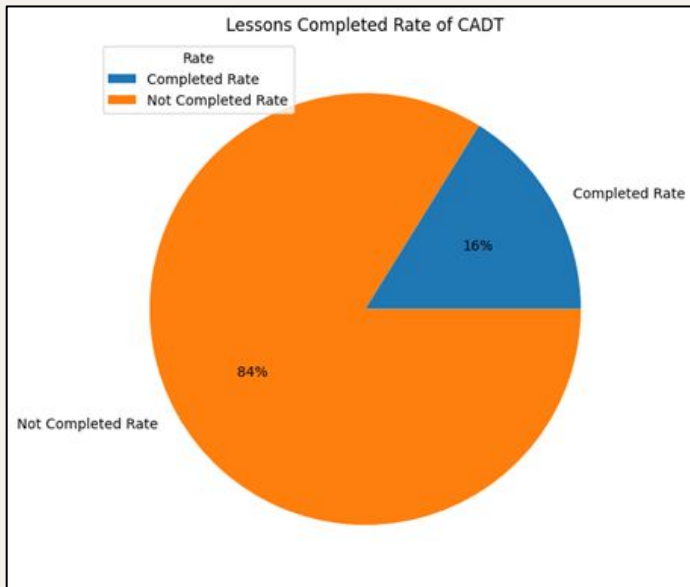


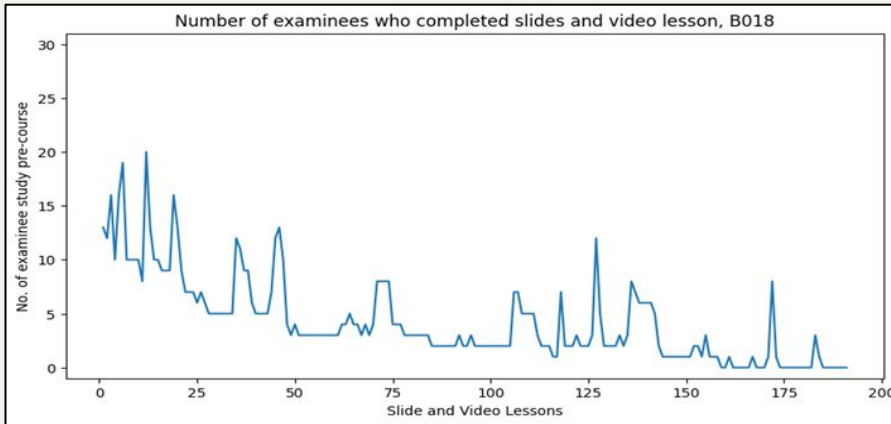
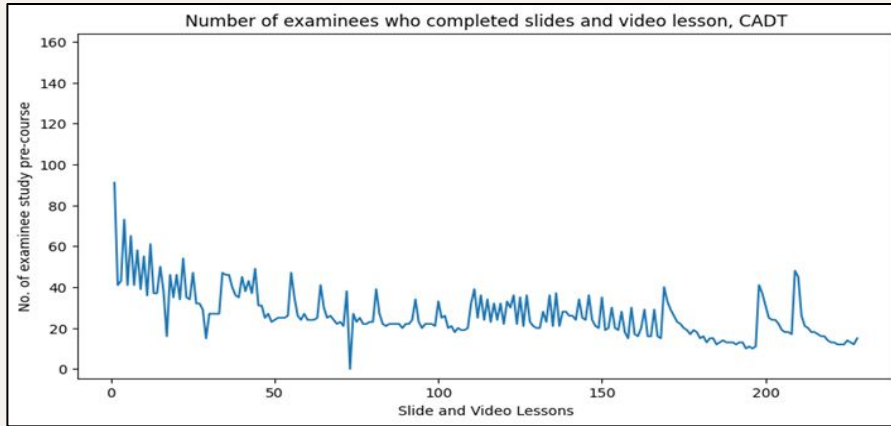
We can see that **62%** of the questions are Hard, then **28%** are Medium level and only **10%** are Easy for them.

3.3 Course Preparation Analysis

Student Engagement

Case Study: for the study of the preparation course, we analyze the data from **CADT** and បាត់ដំបង.



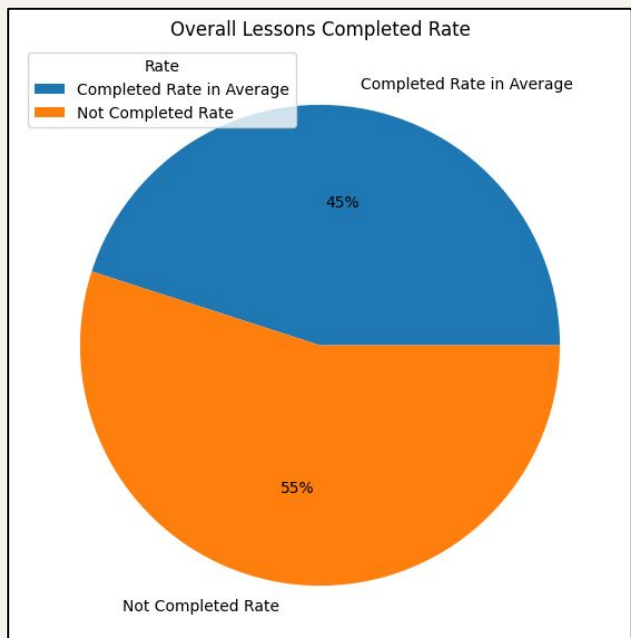


Line graphs shows the trend that examinees spend some time completing the online slide and video lessons.

Most of the examinees spend most of the time on the first 50 lessons then less time on other lessons.

Explanation: that there seem to be many lessons to complete and examinees tend not to do so. The number of slides and videos should be reduced to attract learner to spend time on the provided lessons.

Overall Lessons Completion

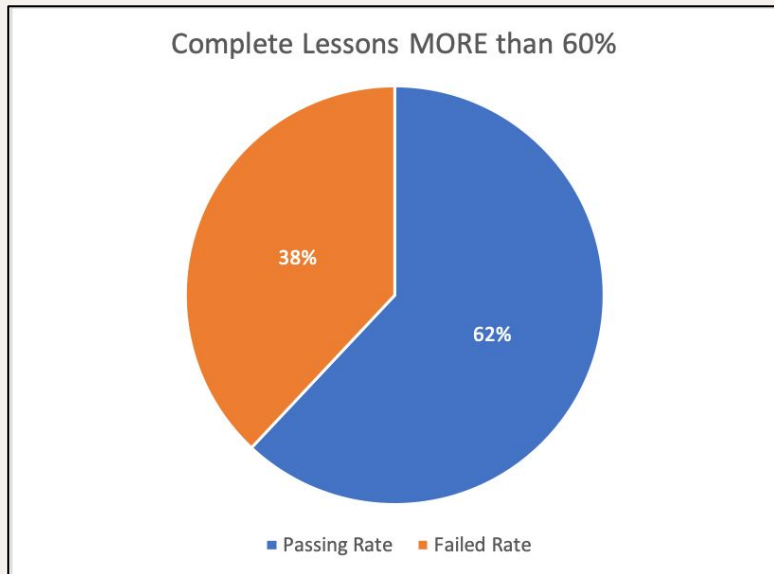


In overall lesson completion:

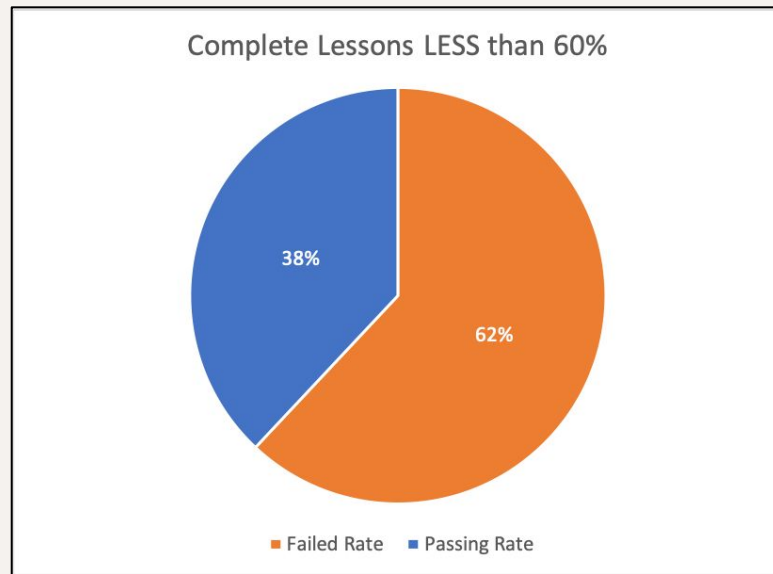
- Student complete **45%** of the lesson in average

Lessons Completion

Information of student who complete MORE and LESS than 60% of the lessons.



VS



We can see that those who:

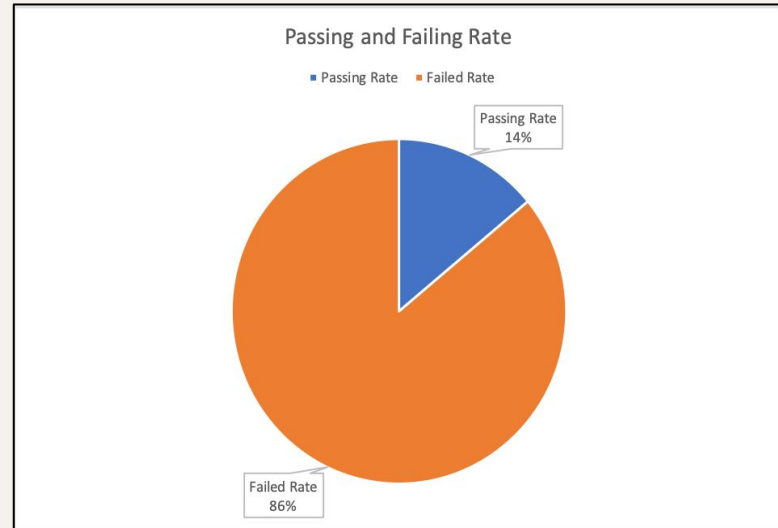
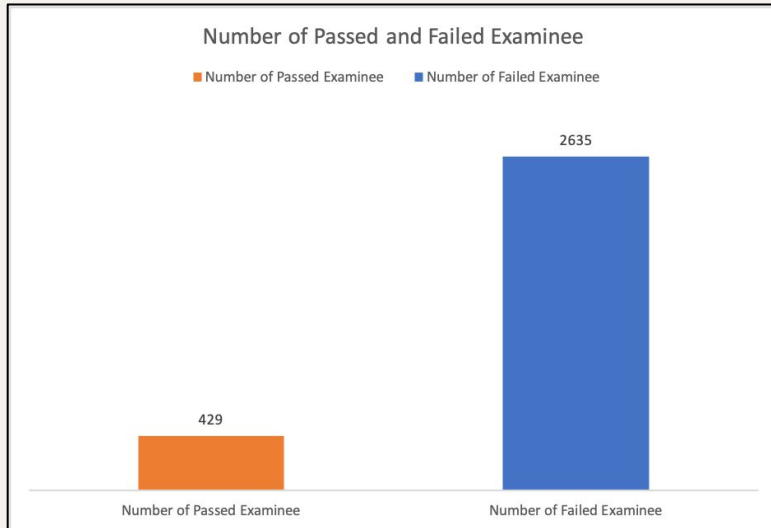
- Completed more than 60% of the lessons are around **62%** likely to **pass** the certified exam.
- Completed less than 60% of the lessons are around **62%** to **fail** the certified exam.

Pre-Test

Result from the pre-test shows that amongst **3064** examinees,

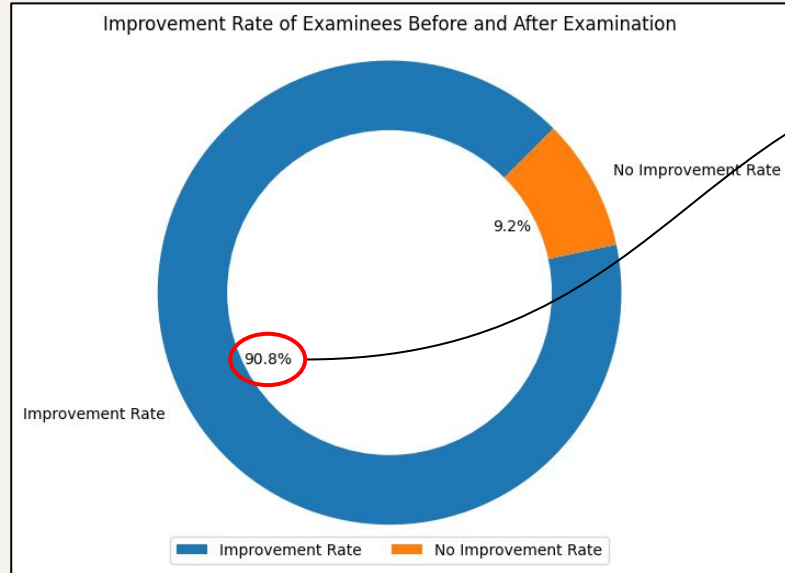
- Only **429** passed the test and **2635** failed
- Passing rate is only **14%** while the failing rate is around **6 times more than** the passing rate which is **86%**

There is a correlation between the result from the pretest and the real test that the less the passing rate in the pre-test it makes less passing rate in the real test.



Performance Improvement Analysis

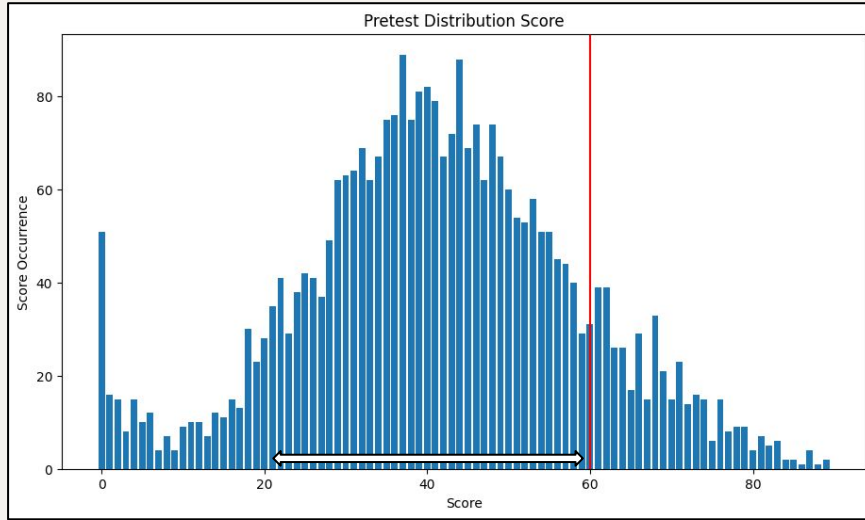
Improvement **before** and **after** DSE training.



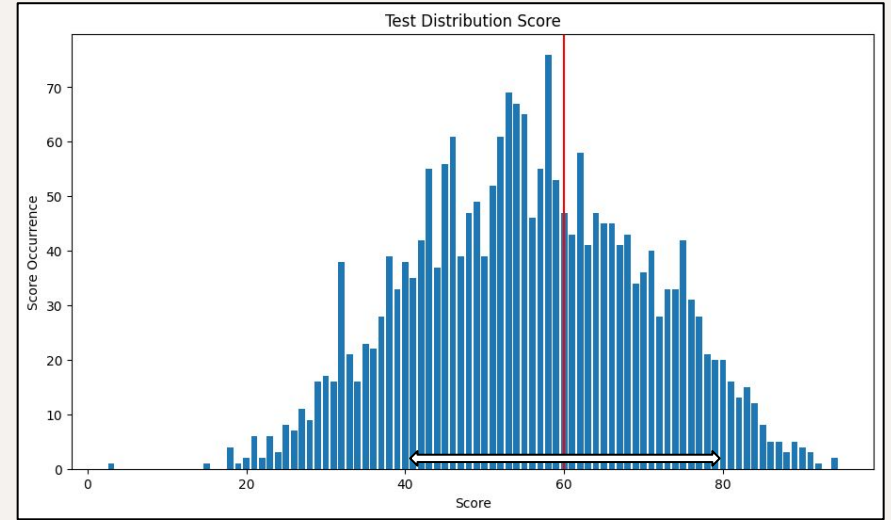
29.12% of 90.8%

Failed in
Pre-test

Passed in
Certified Test



Pre-Test



Certified Test

- Vertical **red line** that indicates the passing score (60).
- It's a **normal distribution** like the distribution score of the real examination but the difference is that this distribution score is getting close to the score range **between 20 and 60** while the certified test's is getting close to the score range **between 40 and 80**.
 - Average Score Improvement: **16 points**

04

Recommendation and Conclusion

Recommendation

Based on the result, here are what we suggestion:

- The passing score of 60 is a bit high for examinees without ICT background.
 - A passing score of 50 might be more reasonable, no gap of ITC background.
- On course preparation:
 - Encourage examinees to take spend more time on the provided lessons (online lessons)
- The question difficulty level is not quite well balanced yet.

Most questions are too hard for examinees.

 - Take consideration on our recommended levels on those questions.



Conclusion

We completed analysis and answer the questions that were raised related to the Digital Skills Essential (DSE).

Study Inference:

- **Gap between those who have an ICT background and those who do not.**
- **Students tend not to spend time on provided slides and videos.**
- **Most of the questions seem to be difficult for examinees.**

Thank You !!!

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