A SURVEY BASED STUDY ON SWAYAM AND PERFORMANCE LEVEL OF GRADUATE STUDENTS

Thesis submitted in

Partial Fulfillment of the Requirements for the

Degree of Master of Science (M.Sc.)

By

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DECLARATION

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I declare that the thesis entitled " **A Survey Based Study on SWAYAM and Performance Level of Graduate Students** " submitted by me for the degree of **Master of Science (M.Sc.)** is the record of work carried out by me during the period from December 2022 to May 2023 under the guidance of **Dr. J. Ebenesar Anna Bagyam, M.Sc., M.Phil., Ph.D.,** Assistant Professor, Department of Mathematics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, and has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship, Titles in this institute or any other University or other similar institution of Higher Learning.

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Signature of the Candidate

J. Ebenesar

Signature of the Supervisor

CERTIFICATE

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I certify that the thesis entitled " **A Survey Based Study on SWAYAM and Performance Level of Graduate Students** " submitted for the degree of **Master of Science (M.Sc.)** by Ms. Vincee Preetha J is the record of research work carried out by her during the period from December 2022 to May 2023 under my guidance and supervision, and that this work has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other Titles in this institute or any other University or institution of Higher Learning.

Signature of the
Head of the Department

Signature of the Supervisor
with designation

Signature of the Director

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SYNOPSIS

SYNOPSIS

Survey research collects information from a sample of individuals through their responses to questions. This type of research allows for various methods to recruit participants, collect data, and utilize various instrumentation methods.

Digital Education in India is an innovative and significant leap towards enhanced learning, structural development, and acquiring knowledge using digital services and technology. SWAYAM is an integrated platform providing online courses for free for everyone.

This study aims to use a survey to analyze and interpret awareness and competence level of SWAYAM among college students and to determine the correlation between Mathematics and English graduate students.

The basic definitions of Education, Digital Revolution in Education, Descriptive statistics tools and the literature review are outlined in Chapter 1.

SWAYAM is an effective Online E-Learning Platform that was valuable and effective during the pandemic. In Chapter 2, the awareness and the efficiency level of SWAYAM courses among college students are measured through the survey. The significance of the study is to promote and find the difficulties in using SWAYAM among college students.

Tests and measurements are essential tools for the evaluation of the performance of students. Chapter 3 used various descriptive statistics tools to evaluate the survey result. The significance of this study is to interpret the collected data into intellectual and understandable information, to find the correlation and regression between the Mathematics and English scores among Mathematics and English graduates, and to test the significance between scores among Mathematics and English graduates.

CHAPTER 1

CHAPTER - 1

INTRODUCTION

"A Good Education is a foundation for a Better Future"

- Elizabeth Warren

Education plays a vital role in the development of an individual and makes him a knowledgeable citizen. The education that makes an individual self-reliant helps suppress social evils and contributes to the development of society and the nation. Education helps in unravelling the mystery of nature. It enables us to understand and improve the working of our society. It creates conditions for a better life. Education brings out the capabilities to fight injustice happening in society. Every individual has the right to education.

Indian Education is one of the world's largest and most complex education systems. India is committed to providing primary education to its citizens, the framework of which is defined in the National Policy of Education. Elementary Education is now compulsory in India. Only 14% of India's population was literate at the time of Independence. Now after so many decades since Independence, the number of literates has increased by fivefold.

The outbreak of the COVID-19 pandemic resulted in tremendous change in the traditional educational system, wherein laptops and online classes replaced books and classrooms. It resulted in the digital revolution in the field of education. Digital education is the innovative use of technology and digital devices throughout the teaching and learning process and is also known as Technology Enhanced Learning (TEL) or e-learning. With the help of digital education, students can study from anywhere worldwide. Digital education is the innovative method of using modern digital applications to improve and enhance the process of teaching and learning.

1.1 Digital Revolution in Education

The Government of India has announced various initiatives in its Digital Education campaign. The Ministry of Human Resources Development (MHRD) initiated PM eVidya on May 17, 2020, aiming to bring together the efforts of digital, online, and on-air educational modes towards better access to education. It will benefit 25 crore schoolchildren in the country. Another initiative by MHRD is Digital Infrastructure for Knowledge Sharing (DIKSHA). DIKSHA, part of the PM eVidya initiative under the Atma Nirbhar Bharat programme, has been declared "One Nation, One Digital Platform" for school education in the country. Launched in 2017, DIKSHA is a national platform for schools across India.

SWAYAM Prabha has 34 direct-to-home (DTH) channels for telecasting educational content. These channels are provided free of cost. It has different channels for high-quality higher education and school education. The Department of School Education and Literacy has partnered with private DTH operators to telecast the educational video content to increase the reach of these educational channels.

SWAYAM (Study Webs of Active–Learning for Young Aspiring Minds) is a programme initiated by the Government of India and designed to achieve the three cardinal principles of Education Policy: access, equity, and quality. This effort aims to take all the best teaching and learning resources, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy, and this is possible through an indigenous developed IT platform that facilitates hosting of all the courses taught in classrooms to be accessed by anyone, anywhere at any time. All the courses are interactive, prepared by the best teachers in the country, and available free of cost to the residents of India.

Over 1.6 lakh students registered for four courses: Machine Learning, Programming, Data Science, Data Structures, and Algorithms.

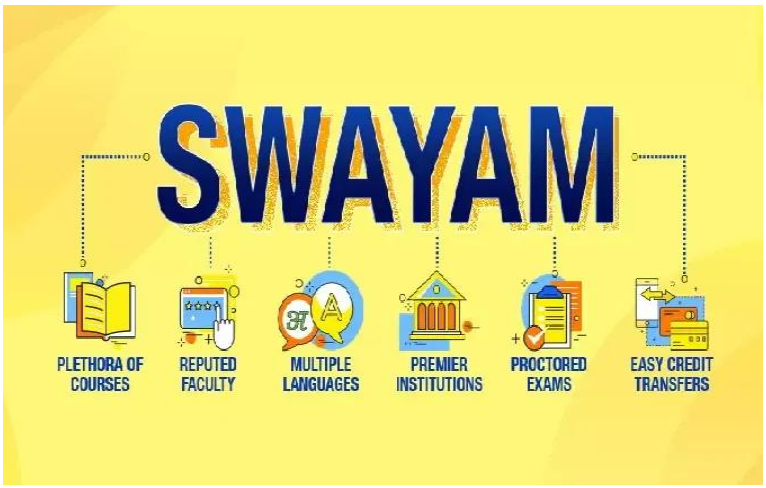

Fig 1.1 Characteristics of SWAYAM

1.2 Test and Measurement

Tests and measurements are standardized instruments, such as questionnaires, inventories, and scales, used to measure constructs in various social science disciplines. They are used for diagnosis, research, or assessment.

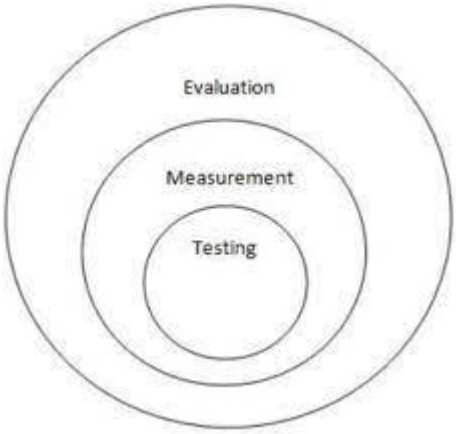

Fig 1.2 Representation of Test and Measurement

Data analysis is the most skilled task in educational research, which requires the researcher's judgment and skill. Data analysis is a procedure for performing various statistical operations. It is quantitative research, which seeks to quantify the data, and typically applies some form of statistical analysis. Quantitative data involves descriptive data, such as survey data and observational data.

1.3 Types of Statistical Methods

The two types of Statistical methods are

- Descriptive statistics
- Inferential statistics.

1.3.1 Descriptive Statistics

Without attempting to analyse or interpret the data, the primary objective of descriptive statistics is to describe and summarize a data set's characteristics. The methodologies used in descriptive statistics include graphical representations like bar charts, line graphs, and pie charts, as well as numerical measures like central tendency, dispersion, skewness, and kurtosis.

1.3.2 Inferential Statistics

Inferential statistics, on the other hand, refers to methods that make judgments about population characteristics based on sample results. These statistics, which concentrate on the generalisation process, are also known as sampling statistics. Additionally, it is isolated into parametric and non-parametric categories. Non-parametric statistics depend on data collected on a nominal or ordinal scale, whereas parametric statistics are entirely predicated on the assumption that the population is normally distributed.

The various descriptive statistics methods are summarised, primarily concerned with descriptive statistics.

1.4 Types of Descriptive Statistics

The first step in the data analysis process involves employing descriptive statistics. Descriptive statistics offer quick summaries of the sample rather than revealing the characteristics of the population that the sample was meant to represent. The researcher can also use a limited number of indices to describe many information points meaningfully. The four main types of descriptive statistics are measures of central tendency, measures of dispersion, measures of asymmetry, and measures of relationship.

Here a test was conducted for Mathematics and English students to analyze their scores and performance, and the following statistical tools were assessed for their scores.

1.5 Measures of Central Tendency

The middle of all observations is called the "Central Tendency." Most of the data set observations to exhibit a clear tendency to cluster on a value that falls in the middle of the observations, referred to as the central tendency. It offers a solitary value to stand in for the average qualities of its distribution. Measures of central tendency are also referred to as statistical averages.

By using central tendency measures, data complexity can be reduced. They determine the average, a solitary indicative value that describes the entire data collection. The "average" makes comparing two or more data sets easier because it includes the entire distribution data set. The goal of central tendency measures, which come in various forms, is to reduce all the data to a single representative figure by identifying the central location.

The following are the most widely used central tendency measures:

- Arithmetic Mean
- Median
- Mode

1.5.1 Arithmetic Mean

The most popular measure of central tendency is the arithmetic mean, also known as the arithmetic average. By dividing the total observational values by the total observational count, we can determine it. Symbolically,

For Ungrouped data, $\bar{X} = \frac{\sum X_i}{n}$

For Grouped data, $\bar{X} = \frac{\sum f X_i}{f_i}$

where,

n = total number of items.

f = frequency

X_i = i^{th} term of X

The arithmetic mean can be used as a trustworthy indicator of central tendency. When choosing a representative figure for the data set, all the data are considered, unlike with other measurements. Every data set can have only one mean, differentiating it from other measurements. It is the only standard measure in which each value is given the same weight. Any value that considerably deviates from other values will have a significant impact. Extreme values must be avoided to get a perfect mean for the given data set. Otherwise, extreme values create a mean, a consistently lousy indicator of central tendency.

1.5.2 Median

The median is the value of the middle or central item in a distribution that splits the distribution into two equal parts. Half of the sample consists of all values above or equal to the median, and the other half consists of all values below or equal to the median. To calculate the median, all values must be arranged in ascending or descending order of magnitude.

If the number of observations is odd when calculating a median from ungrouped data, the middle element of the array is the median. On the other hand, if the number of observations is equal, the median is determined by taking the average of the two middle observations. Symbolically,

For grouped data,

$$\text{Median} = l + \frac{\left(\frac{n}{2}\right) - cf}{f} h$$

where,

l = lower class limit of the median class interval

cf = cumulative frequency

f = frequency of the median class

n = total number of observations

c = size of the median class

For ungrouped data,

$$\text{Median} = \frac{\frac{n\,th}{2}\,observation + \left(\frac{n}{2}+1\right)th\,observation}{2}$$

where,

n = total number of observations

1.5.3 Mode

The most frequent observations in the data set are considered to be the mode. To determine the mode, one must count the occurrences of various values in the data set. The mode is unaffected by extreme values.

Symbolically,

$$\text{Mode} = l + \frac{f_m - f_{m-1}}{2f_{m-f_{m-1}-f_{m+1}}}\ h$$

where,

l = lower limit of mode class interval

f_{m-1} = frequency of the class preceeding the mode class interval

f_{m+1} = frequency of the class following the mode class interval

h = width of the mode class interval

1.6 Measures of Dispersion

The average of a data set is measured and represented by a single value in central tendency measures. These measurements are among the simplest to determine the middle distribution point.

Dispersion measurements are required to evaluate an average's dependability. By demonstrating high uniformity of values in the distribution, the data set with fewer variable values demonstrated the reliability of an average. In contrast, the data set's more variable values demonstrated the unreliability of an average in the distribution. Additionally, they aid in identifying the nature

and causes of variations, which is crucial for managing variations. They also support using other statistical tools like forecasting, hypothesis testing, correlation, and regression analysis. Among the essential dispersion, indicators are,

- Range
- Interquartile Range
- Mean Deviation
- Variance
- Standard Deviation

1.6.1 Range

The range differs between the distribution's observed maximum and minimum values. It is based on where the highest and lowest scores are in the data set. R stands for it.

Symbolically,

Range = (Maximum value – Minimum values) of an item in the data set

1.6.2 Interquartile Range

The difference between the first quartile Q1 and the third quartile Q3 is known as the interquartile range, which is a statistical measure of the dispersion of values in a data set.

Symbolically,

Interquartile Range = Q3 - Q1

where,

Q3 = third Quartile

Q1 = first Quartile

1.6.3 Average Deviation

The average deviation is also known as the mean deviation. The degree to which values within a data set deviate from the central values is known as mean deviation.

Symbolically,

$$\text{Average deviation} = \frac{\sum(f|m-a|)}{n}$$

where,

f = frequency

m = variable

a = mean

n = total number of items

1.6.4 Variance

It is possible to ignore the issue with mean deviations with negative signs by squaring them. Instead of computing the values of each deviation from the mean, the square of the deviations from the mean is computed. The variance of a data set is defined as the sum of such squared deviations divided by the total number of values.

Symbolically,

$$\text{Variance} = \frac{\sum\left(f(x_i-\bar{x})\right)^2}{n} \text{ or } \frac{\sum(fd)^2}{n}$$

where,

x_i = value of the observation

$\bar{x}$ = mean values of all observation

f = frequency

d = difference between x_i and $\bar{x}$

1.6.5 Standard Deviation

The term "standard deviation" refers to the square root of variance. It is always calculated from the arithmetic to mean because subtracting the deviations from it results in the least sum of squares of deviations.

Symbolically,

$$\text{Standard deviation} = \sqrt{\frac{\sum(\text{f}(x_i-\bar{x}))^2}{n}} \quad \text{or} \quad \sqrt{\frac{\sum(fd)^2}{n}}$$

where,

f = frequency

x_i = value of the observation

$\bar{x}$ = mean values of all observation

1.7 Measures of Asymmetry (Skewness)

Asymmetrical or skewed refers to a data set's non-symmetric value distribution. The degree to which the items are concentrated around the mean value and the direction of dispersion are specified by skewness. It is a measurement that explains how a distribution takes the shape it does.

$$\text{Skewness} = \frac{\sum_i^N (X_i-\bar{X})^3}{(N-1)*\sigma^3}$$

where,

X_i = i^{th} random variable

$\bar{X}$ = Mean deviation

N = Number of variables in the distribution

σ = Standard deviation

There are three types of skewness namely positive skewness, negative skewness and zero skewness. In positive skewness the distribution is longer on the right side of the peak. In negative skewness the distribution is longer on the left side of the peak while in zero skewness the distribution is symmetrical on both left and right sides of the peak.

1.8 Scatter Diagram

A graph used to represent a scatter diagram aids the researcher in understanding the relationship between two variables. On a graph piece of paper,

plot the observed values of the two variables, x, and y, with the values of the independent variable on the x-axis and the values of the dependent variable on the y-axis. A line must be drawn through the data points to ensure that an equal number of points are on both sides of the line. This line is used to show the type of correlation that existed between the x and y variables. While the curve line depicts non-linear correlation, the straight line represents linear correlation.

1.9 Spearman's Rank Correlation Coefficient

This method was created in 1904 by British psychologist Charles Edward Spearman to assess the degree of correlation between two variables that only contain ordinal data. Rankings are assigned to the various values of variables in ascending or descending order to compare the rank of two sets.

Symbolically,

$$r_s = 1 - \left\{\frac{6 \sum {d_i}^2}{n(n^2-1)}\right\}$$

where,

r_s = Spearman's rank correlation coefficient

d_i = Difference between the pair of ranks

n = Number of paired observations

1.10 Regression

Regression is a statistical method that identifies the functional relationship between two variables. Simple regression describes the relationship between two variables, the independent variable and the dependent variable, which is expressed as a linear function or straight line.

Symbolically, Y = a + Bx

From the above equation Y is the dependent variable whose value is estimated from the independent variable X.

1.11 Literature Review

Hodgen and Marshall (2005) analysed English and Mathematics are often considered contrasting disciplines, typifying the Arts/Sciences split in Education. Significant differences exist in the social norms and knowledge structure in each subject. This article compares the lessons to understand better how these significant differences affect the realization of formative assessment in the classroom.

Yacob et al., (2012) conducted a study on students' awareness of E-learning where the researcher surveyed 200 respondents, and multiple regression was done to analyse the data. The study revealed that males and females have significant awareness of E-learning.

Massis (2013) reported that MOOCs might give colleges a chance to embrace the democratisation of Education for all participants. Since they are an essential part of this new model, librarians have the opportunity to further their influence on the creation of MOOCs. In addressing this matter, it is essential to highlight the advantages the library can provide for this developing area of online education.

Abeer and Miri (2014) investigated student preferences and opinions about learning through MOOCs and identified the factors that make MOOCs an effective learning environment. It also investigated how the design of MOOC features and students' competencies can affect their participation in MOOCs. The findings showed that various learning competencies, including English proficiency, prior knowledge of the subject matter, communication skills, and self-control, may impact participation and continuity in MOOCs. The design elements of MOOCs also have an impact on student engagement. One crucial finding was that even if students failed the course, they dropped out if they lacked fundamental skills.

Henry et al., (2014) examined the relationship between English proficiency and Mathematics scores. This study indicates that English proficiency predicted ELLs' mathematics scores and that grade level moderated

the influence of English proficiency in predicting those mathematics scores using multiple linear regression analyses. The study supports the notion that ELL students who read well perform better on mathematics assessments than those who do not. Teachers must recognise the differences between BICS and CALP to avoid erroneously diagnosing ELLs' proficiency levels and abilities. Teachers do not control students' SES, gender, or grade level, but they do control how they teach mathematics. Targeting deficiencies with positive instruction could subsequently improve student comprehension, which is critical to ELLs acquiring the requisite English proficiency for academic success.

Baturay (2015) provided a review of the literature on the characteristics of MOOCs, the timeline of their development, as well as relevant issues and the experiences of MOOC providers.

Vanlalhriati and Singh (2015) discussed different statistical techniques to enrich the researcher's decision. The research design, the hypotheses, and the kind of data collection significantly determined the choices of appropriate statistical techniques. These techniques were categorised into descriptive and inferential statistics. This paper focuses only on descriptive statistics, summarising a large mass of data into understandable and meaningful forms.

Liu et al., (2015) looked at participants' motivations for participating in a MOOC and also wanted to learn how they considered the course's value. Of the 4078 participants in a journalism MOOC, 320 responded, making up the sample. The findings showed that professionals made up the majority of participants. These participants were looking for opportunities and resources to advance their careers without regard to time or location restrictions. For these people, the course's flexible schedule, the instructor's credibility, and the calibre of the materials were all crucial elements.

Kumar (2015) investigated the different research designs made possible by qualitative and quantitative forms of educational research, which researchers can use as a guide when deciding how to conduct their studies. These models include exploratory and descriptive research designs, content analysis, case studies, survey studies, and experimental research designs. The study is a descriptive work investigating these research designs to comprehend their

primary characteristics. Finding out what kind of research design will work best for digging into the effectiveness of computer-assisted learning, specifically in the area of alternative frameworks emerging among science learners, was one of the main goals of this study. According to the study, exploratory and descriptive research is the most effective working method in research analysis.

Adham and Lundqvist (2015) concluded that most Arabic MOOCs are launched by private companies, which limits the course's quality and content. There is a low participation rate due to a lack of awareness in the Arab world.

Yushau and Omar (2015) investigated the effect of student proficiency levels of bilingual Arab students in English on their performance in mathematics at KFUPM. In addition, the study examines the students' perceptions of the effect of a lack of proficiency in English on their mathematics understanding and performance. Comparing the students dichotomously as either proficient or not proficient in English did not show any statistically significant difference between students regarding their mathematics performance.

Dhanani et al., (2016) concluded that there needed to be more knowledge of educational video series, online learning tools, and MOOCs among faculty members based on a survey of 108 medical faculty members. To encourage medical faculty members to use MOOCs and other online learning resources for self-learning, a need for awareness of MOOCs and other online learning resources was identified.

Calvo Salvador and Rodríguez-Hoyos (2016) conducted a study at the University of Cantabria in Spain to raise awareness of MOOCs and evaluate them with specific degree programmes. The findings of their study showed the necessity of integrating MOOCs into degree programmes in education to modernise higher education studies. They highlighted the potential of MOOCs to deliver practical knowledge through online training.

Fesol et al., (2017) evaluated engineering students' perceptions based on a technical MOOC made available to them. Student perception results were analysed based on six key components of the MOOC instructional design elements model: course information, course resources, monitoring learning,

active learning, meaningful connections, interaction, and intended perception. The findings showed that since all variables had a favourable relationship with overall perception, students had a favourable perception of their online learning experiences.

Li (2017) compared MOOC characteristics in China, India, and the United States. It was noted that MOOCs are not cross-border and that there are significant differences between MOOCs in these three nations. The author concluded that the development of MOOCs would vary in these countries due to differences in social needs, cultural background, economic development, and participant characteristics.

Nagasampige and Subbaiah (2017) examined how graduates and postgraduate students enrolled in humanities, science, engineering, and management programmes at Indian universities in Tier 1 and Tier 2 cities in Karnataka, India, were aware of, engaged with, and successful with Massive Open Online Courses (MOOCs) offered by edX, Coursera, Udacity, and Udemy. Forty graduates, 40 postgraduates, and 20 teachers made up the initial sample. Fifteen students and five teachers were chosen based on their familiarity with MOOCs, and semi-structured interviews were conducted with them. The participants were asked about awareness, content, usage, and learning outcomes. Based on the study, awareness of MOOCs was higher among postgraduate students than among graduate students, engineering and management students, and teachers in Tier I cities. It was discovered that people joined MOOCs to satisfy their immediate needs, their needs for future preparation, or just their curiosity.

Providing a theoretical background on utilising ICTs for efficient knowledge creation, Gupta and Jain (2017) presented training. According to the study, MOOCs offer enormous educational opportunities, and their presence in education must be considered.

Hiremath (2017) explains that MOOCs are the best educational instrument available today for educating the masses with the least money and effort. The Government of India (MHRD) is working to create SWAYAM, an online national gateway for high-quality education. SWAYAM uses ICT and

the edX platform to provide online courses at no or low cost to any learner in the country. The calibre of the students, content developers, and courses determines how good SWAYAM is. It will aid the country's skill-development initiatives, essential for producing skilled labour and jobs. The government, national organisations like the UGC, NPTEL, IGNOU, CBSE NCERT & NIOS, and the best educational institutions are all essential to SWAYAM's success.

Trehan et al., (2017) discussed MOOCs from the distinct perspective of India and China to highlight MOOC development in these countries, the significance of MOOCs for their educational systems, and review current issues of MOOC development in these countries.

Arya (2017) investigated how MOOCs, or Massive Open Online Courses, have grown in India. This research applies to find the probability of keywords being searched by various Indian states and cities, the year-by-year extent of occurrence of the selected keywords in the Google databases of Google Search and Google Trends, data occurrence for the selected countries and the entire world in Google Search and Google Trends, and The disruptive innovation theory put forth by Christensen and preliminary research form the foundation of the current study.

In order to ascertain the opinions of 110 lecturers in the Management and Social Sciences discipline at a private university in Nigeria, Soyemi et al., (2018) conducted a survey on digital literacy proficiency, participation in MOOCs, and determining how digital literacy abilities affect MOOC participation. The findings showed that lecturers' participation in MOOCs is unaffected by their level of digital literacy, and lecturers needed to take advantage of the opportunities for skill development and knowledge expansion.

Ogembo and Getergechi (2018) investigated the existing relationship between language proficiency and learners' achievement in mathematics. It illustrated that learners' achievement in mathematics is highly dependent on their proficiency in the languages of instruction and mathematics. Learner mastery of the four skills, including reading, writing, listening, and speaking, impacts proficiency in language instruction and learning mathematics; these findings confirm the significance of giving the language of instruction more

attention, especially as regards mathematics education. The study, therefore, recommends that English as a language of instruction be given more attention.

Zhu et al., (2018) provided a model better to understand the phenomenon of MOOCs and their methodological challenges; this research investigates research paradigms and subjects related to massive open online courses (MOOCs). Findings showed that quantitative techniques were primarily employed, and most MOOC researchers used descriptive statistics to analyse their data. The research focused primarily on students, followed by design-focused, context-focused, impact-focused, and instructor-focused studies. Most authors collaborated within the same nation, and MOOCs from the United States were the most extensively studied, followed by those from the UK, Spain, and China.

Misra (2018) discussed the challenges of teachers' professional development, reflected on the promises of using MOOCs for teachers' professional development, and proposed actions for promoting the use of MOOCs for teachers' professional development communication and outcomes. This discussion was based on reviews of numerous reports, documents, and research papers. According to the authors, future researchers should consider students' perspectives when analysing MOOCs as a teaching tool.

Qiu and Xu (2018) revealed that undergrads could use MOOCs to keep up with the latest advancements and changes in the business world, and they believed that MOOCs could offer sustainable and lifelong learning.

The learning perceptions of American and Asian students majoring in hospitality and tourism and having experiences taking courses through both the traditional face-to-face and online modes of instruction were compared by Baker and Unni (2018). There were 356 students in the sample. The results showed that students from the USA and Asia did not perceive learning through online or traditional face-to-face course methods in significantly different ways. Students from both countries were satisfied with both delivery methods.

Ambadkar (2020) studied the E-learning platform using Swayam and MOOCs among Commerce students focusing on graduating students. The research was descriptive, and data was collected through a structured

questionnaire; the study concluded that most students were unaware of the online platform and preferred classroom coaching to online coaching. It was further added that there should be collective efforts of Government, Educational Institutions, and Corporate bodies to promote these courses and make everyone aware of such courses and their importance in careers.

Adom et al., (2020) elaborate on the evaluation process for students' final learning outcomes and learning progress. However, particularly in Ghana, the terms should be more frequently applied in education. The study aimed to fully explain the concepts to help practitioners and researchers apply them more effectively in educational discourse. The study also recommends the best ways to design tests for assessing students' learning outcomes and provides policy recommendations to support practitioners and researchers in educational evaluation.

Blum et al., (2020) massive open online courses promised to make education accessible to anyone with an internet connection. The study revealed that the scope of MOOC education could be expanded. Nevertheless, top universities continue to provide MOOCs on various private platforms, many in the health sciences. Therefore, a thorough understanding of MOOCs' role must be included in research on online education. Studies on MOOC participants have mainly focused on students' course evaluations.

Hartshorn and McMurry (2020) investigated the effects of the COVID-19 pandemic on a group of ESL learners and TESOL practitioners in a university context in the USA. Their study's findings showed that teachers and students experienced higher stress levels after the pandemic to the extent that teaching and learning were not their main priorities. Also, the students faced more challenges in the online mode.

Vijayashekaranayaka (2020) investigated that SWAYAM is one of the government's efforts to provide the nation with a high-quality education. The national goal of providing a high-quality education to the general public through SWAYAM is realised. The study also investigated that SWAYAM is still in its early stages; how it develops will depend on the students, the government, and

national organisations like the UGC, NPTEL, IGNOU, CBSE, NCERT, and NIOS, as well as educational institutions across the nation.

Duan (2021), the author conducted a questionnaire-based survey of 5,000 students and 620 teachers at the Communication University of China from May 2020 to June 2020 and analysed the respondents' attitudes toward online community learning during the outbreak and the associated trauma period. The survey reveals that the mimicked social networking environment ensures students perceive the social presence and makes the trauma more bearable. By applying social presence theory to the ongoing crisis and conducting a case study of online education adopted by a Chinese university, this research deepens our understanding of technical reality and the creation of social networking environments described by the theory.

In an attempt to identify the role of educational technologies in the transition from face-to-face to online teaching and learning activities during the COVID-19 pandemic, Turnbull et al., (2021) identified five challenges associated with online education experienced by higher education institutions: synchronous and asynchronous learning tool integration, access to technology, faculty and student online competence, academic dishonesty, and privacy and confidentiality.

Fitzmaurice and Ní Fhloinn (2021), the authors, conducted an online survey addressing 257 teaching staff members in 29 different countries about how mathematics lecturers handled emergency remote teaching and received responses. The authors of this work describe how mathematical assessment was done online and remotely. They look into how lecturers handled a forced shift away from traditional closed-book, heavily weighted, proctored, in-person exams and how happy they were with the results of their final evaluations. The authors investigate how lecturers perceived how the modifications affected the distribution of grades during this particular teaching period. They also discuss how their experiences with emergency remote teaching during the COVID-19 outbreak may affect how they approach teaching the same modules in the future.

Mathur (2021) conducted a study to evaluate MOOCs using SWAYAM, an initiative of the Education Ministry that stands for Study Webs of Active

Learning for Young Aspiring Minds. The Consortium for Educational Communication, one of the nine national coordinators for creating E-content for graduate and postgraduate online courses, has been the research subject. The researchers have conducted a thorough assessment of the literature and analysis of the SWAYAM website to gather data on the online courses offered by different institutions in India, the disciplines covered in these courses, their structure and design, and their mode of production. Also, an effort has been made to evaluate the difficulties MOOCs face. The findings showed that these courses positively affected students' knowledge, awareness, abilities, accessibility, affordability, and course content quality.

Mohile (2021) the study investigated the factors affecting students' use of SWAYAM and MOOCs and the awareness of MOOCs and the SWAYAM platform among Commerce students. The study revealed that Commerce students have a favourable attitude toward learning through SWAYAM MOOCs; there is low awareness of SWAYAM MOOCs among them. Lack of ICT skills was one of the main factors preventing people from using MOOCs as a learning tool. Learning through MOOCs was also limited by the absence of classroom instruction and one-on-one interaction with teachers. The study concluded that students should be encouraged to use MOOCs as a learning resource.

Sutadji et al., (2021) utilized different forms of assessment, such as a written test with case study questions/analysis, online discussion with peer assessment, and assessment of activeness by teachers. The study's findings indicated that a more authentic assessment was created due to conducting different assessment strategies.

Zhang et al., (2021) investigated the online assessment practices of six EFL teachers in a Chinese university. The study's findings revealed that the EFL teachers made assessment decisions and selected specific assessment methods based on policy, the local context, and their teaching experience and reflections.

Tanko et al., (2022) concluded that English language proficiency has a significant and positive relationship with the mathematics performance of senior secondary school students in the Bauchi metropolis, which indicates that the

Mathematics performance of SS2 students increases as their English language proficiency increases.

1.12 Profile of Present Work

In this dissertation,

- Analysis and Interception of Awareness and Competence level of SWAYAM among College students were discussed.
- Correlation, regression, hypothesis testing and descriptive statistics tools were measured for Mathematics and English graduate students.

CHAPTER 2

CHAPTER -2

SURVEY ON AWARENESS AND COMPETENCE LEVEL OF SWAYAM AMONG COLLEGE STUDENTS

Massive Open Online Courses are one of the major forces behind technological innovation in Indian education. The Indian government has introduced SWAYAM, an indigenous MOOC platform. Study Webs of Active Learning for Young Aspiring Minds courses were created to give everyone easy access to a high-quality education. Awareness is vital to the SWAYAM portal's success. Through this portal, potential users can enhance their ability and skills for lifelong learning. This study looks at the factors affecting students' use of SWAYAM/MOOCs and the awareness of MOOCs and the SWAYAM platform among Arts, Commerce, Science, and other students. The study reveals low completion of courses. Learning through MOOCs was criticized for lacking classroom instruction and one-on-one interaction with teachers. The study concluded that students should be encouraged to use MOOCs as a learning resource.

2.1 Introduction

India's digital revolution is advancing the nation and leading it on its path to developing a road map for economic development. The digital revolution in various industries, including banking, education, retail, agriculture, health, rural development, and financial inclusion, among many others, is bringing about significant changes. Higher education is one of the critical areas of the digital revolution in India, where innovative, disruptive technologies are changing the conventional methods of teaching and learning and opening the door for India to become a "Knowledge Economy." One of the most substantial factors behind technological innovation in education in India has been the introduction of Massive Open Online Courses, which allow thousands of students to enroll in these free, open courses simultaneously, regardless of their location. MOOCs are public, generally cost-free online courses that incorporate online instruction, assignments, discussions, use of free resources, and video-based learning into how they are taught to students worldwide. Although MOOCs are not new to the world

or participants in India, major MOOC providers like Coursera, Edx, Udemy, Futurelearn, and Class2Go have already been delivering MOOCs for a while; the Indian Government has launched its own indigenous MOOC platform SWAYAM.

SWAYAM aims to bridge the digital divide for students who have so far escaped the digital revolution's effects and cannot participate in the knowledge economy (About Swayam, 2019). The potential users' awareness of the SWAYAM portal and its potential to improve lifelong learning skills are critical factors in determining its success.

2.2 Timeline

SWAYAM portal was officially launched on July 9^{th},2014.

On February 7^{th}, 2014, the honourable Indian Prime Minister, when discussing his plans for a "Digital India," Shri used video conferencing to address the India Digital Summit. He described his desire for a "Digital India," where he envisioned providing every Indian citizen with access to the internet access to knowledge, information, and digital services. One of his fundamental beliefs was that "Quality Education, driven by Digital Learning, reaches the most remote corners. India's honourable prime minister, Shri Narendra Modi, introduced the Digital India Initiative on July 1^{st}, 2015.

One of the critical initiatives of the Digital India program was the launch of SWAYAM, an Indian-specific Massive Open Online Course (MOOC) platform. The goal of the SWAYAM portal was to enable internet connectivity on computers, laptops, tablets, and mobile phones so that even the most remote regions of India could access online education.

The National Convention on Digital Initiatives organized by MHRD, Government of India in New Delhi on July 9^{th}, 2017, reported that the President of India, Shri Pranab Mukherjee, officially launched the portal of SWAYAM along with 32 SWAYAM Prabha DTH Channels and National Academic Depository. With the assistance of Microsoft, the Ministry of Human Resource Development and the All-India Council for Technical Education (AICTE) created the native platform "SWAYAM," which was to

house nearly 2,000 courses and 80,000 learning hours for schoolchildren, undergraduates, graduate students, and professional courses.

The Indian Government's Press Information Bureau (Reported on December 31^{st}, 2018) MHRD wants to align the courses on the SWAYAM portal with the curricula of universities, and 92 universities have so far accepted credit transfers for courses taken through the SWAYAM Platform.

On January 11^{th}, 2019, the Press Information Bureau of the Government of India reported that, to date, more than 72 lakh students have registered for different MOOC courses run through SWAYAM and that, on average, 2 lakh students have finished the courses.

During Covid Pandemic, Swayam Prabha is an accumulation of 32 Direct Home (DTH) channels available nationwide that air educational programming 24 hours a day. The channels broadcast K–12 education classes, higher education (undergraduate and postgraduate), vocational training, and teacher education.

2.3 Purpose of the Study

According to the literature review, it is necessary to determine whether students are aware of Massive Open Online Courses (MOOCs). Regular students can now earn credits for SWAYAM Courses thanks to the (UGC Credit Framework for Online Learning Courses through SWAYAM Regulation, 2016). So, students must be aware of these courses, can access them when necessary, and can take advantage of the best free teaching and learning resources.

As a result, the following has been attempted in this study:

- To determine whether students studying commerce, science, arts, and others know about MOOCs and the SWAYAM platform.
- To evaluate the factors affecting students use of SWAYAM/MOOCs.

2.4 Data Collection

A short survey was used to determine how many people were aware of MOOCs and the SWAYAM platform. Five hundred thirty students were given the questionnaire. Students in the postgraduate and undergraduate programs come from various backgrounds including commerce, science, arts, and others are allowed to a range of responses. The questionnaire was revised and polished after the pilot.

2.5 Approach

Four parts make up the questionnaire. Part I evaluated students' knowledge of the MOOC platform. Students received a brief explanation of MOOCs and the features of the SWAYAM portal prior to administering Parts II, III, and IV. The explanation emphasized SWAYAM's status as an in-house created (Made in India) MOOCs platform that will host courses from Class IX to the postgraduate level provided by the best educational institutes in India.

Closed-ended questions comprised Parts II and III of the survey to determine interest in using the SWAYAM portal, availability of necessary resources to access the portal, interest in obtaining certification, the preferred method of grading, and types of MOOC courses. The purpose of Questionnaire Part IV was to evaluate respondent’s perceptions of MOOCs as an educational platform.

The questionnaire was designed to measure how they felt about SWAYAM in general and determine whether they would be open to learning on this platform or would still favour more conventional methods of instruction.

The questionnaire consists of 20 questions most of them are polar questions. The survey questions are based on the awareness and efficiency level of the SWAYAM courses.

2.6 Methodology

Methodology provides a detailed plan that keeps researchers on track, making the process smooth, effective and manageable way. Here a questionnaire was prepared and distributed to various department students for survey. After collecting the primary data, the reliability of the collected data is verified. Statistics were drawn from the information obtained to determine and analysis the data. To understand the analysis more accurately statistical graphs are generated using the data.

2.7 Analysis and Interpretation

Analysis means ordering, manipulating and summarization of data to obtain answers to research questions. The main purpose of the analysis is to reduce the data to intelligible and interpretable form. Interpretation gives the results of analysis and draws conclusion.

The main findings of the survey are though the awareness of the SWAYAM has increased among students but majority of the students have not yet completed atleast one course and students are not learning regularly.

The survey was conducted for Commerce, Arts, Science and Other department students who ranged in age from 18 to 25. A total of 530 students answered the survey questions. Among them 120 were postgraduates and 410 were undergraduates.

Most of students are preferring SWAYAM among various online E-Learning platforms. The competence level of SWAYAM courses and assignments are moderate.

Out of 530 students 247 students were Commerce students, 112 students were Arts, 106 students were Science and 65 students were other department students which indicates among the overall respondents 47% of the students belong to Commerce department 21% of the students belong to Arts, 20% of the students belong to Science department and 12% of the students belong to Education department.

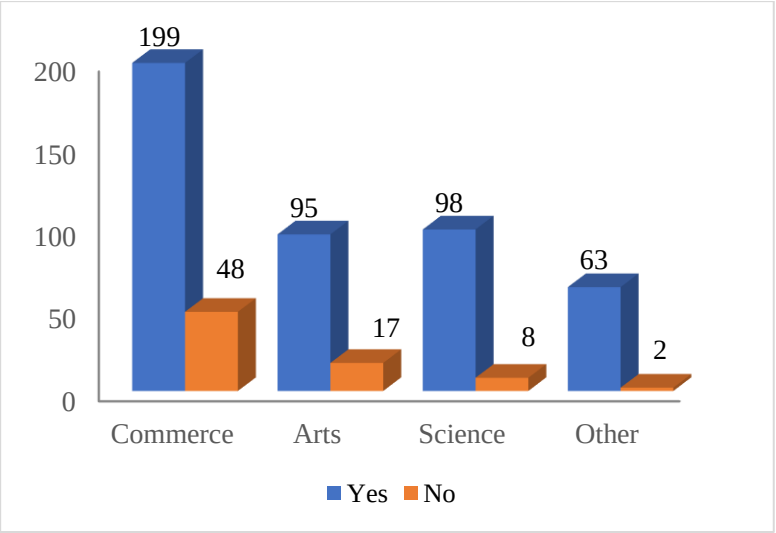

Fig 2.1 Awareness on Online E – Learning Platform

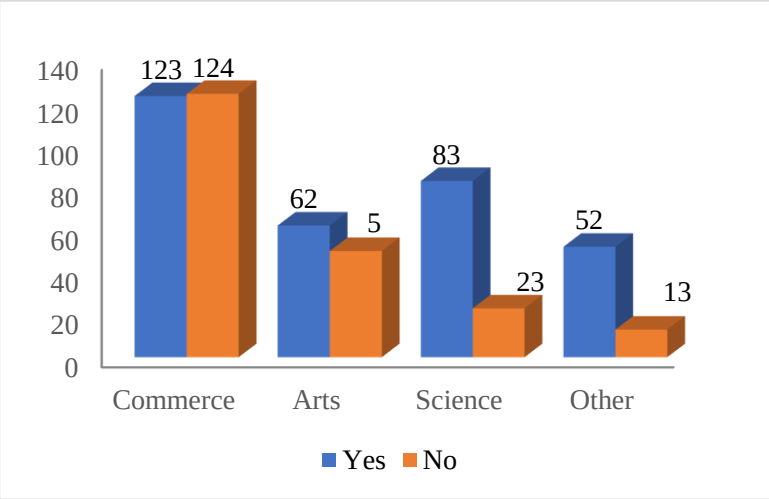

Fig 2.2 Enrollment in SWAYAM

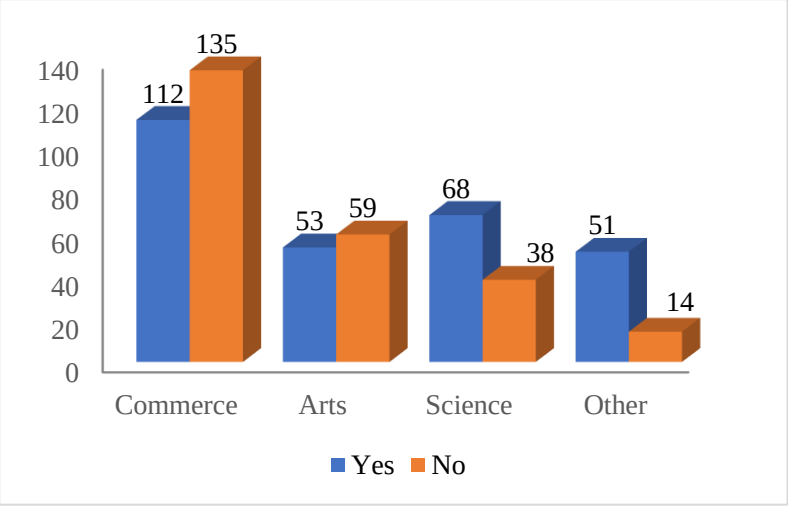

Fig 2.3 Installation of SWAYAM App

Awareness is the key factor which enhance the knowledge of the students. Students should have proper awareness about new Technical resources and materials which provide a wider exposure and knowledge in present Educational scenario. Fig 2.1 represents the awareness of Online E–Learning platform among various department students. From the figure we can understand that most of the students are aware of Online E- Learning Platform. Out of 530 students 455 students are aware of E-Learning platform which indicates that students are using technology in a good way for learning. 81% of the Commerce students, 85% of the Arts students, 92% of the Science students and 97% of the other department students are aware of Online E-Learning Platforms.

SWAYAM is a Mass Open Online Course which provides a numerous number of courses freely for learners. Fig 2.2 represents the enrollment of students in SWAYAM. Out of 530 students 320 students have enrolled in SWAYAM which indicates that 60% of the students have registered in various courses in SWAYAM from this we can conclude that students are interested to learn through SWAYAM. From the Fig 2.2 it also clear that the enrollment of Courses in SWAYAM of Commerce students is low among all other departments. Only 49% of the Commerce students, 55% of the Arts students, 78% of the Science students and 80% have registered in SWAYAM courses.

SWAYAM has its own official app for the easy access and usage of the resources and materials. The registered students can login in that app. The interface of the SWAYAM APP is user friendly and it is available in both Android and Apple systems. Fig 2.3 represents the installation of the SWAYAM App. From the Fig 2.3 we can understand that out of 530 students 284 students have installed the SWAYAM App others are using browser interface for the usage of SWAYAM. 54% of the students have installed and using SWAYAM App for their Learning purpose. The installation of SWAYAM App makes the mobility of the SWAYAM resources easier and more convenient.

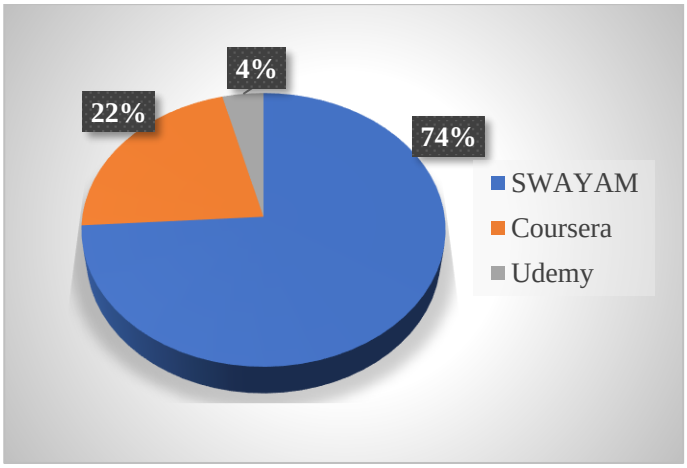

Fig 2.4 Preferred Online E-Learning Platform

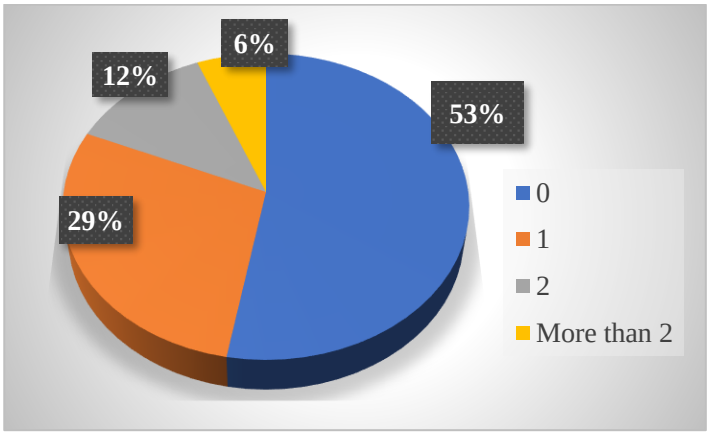

Fig 2.5 Course Completion in SWAYAM

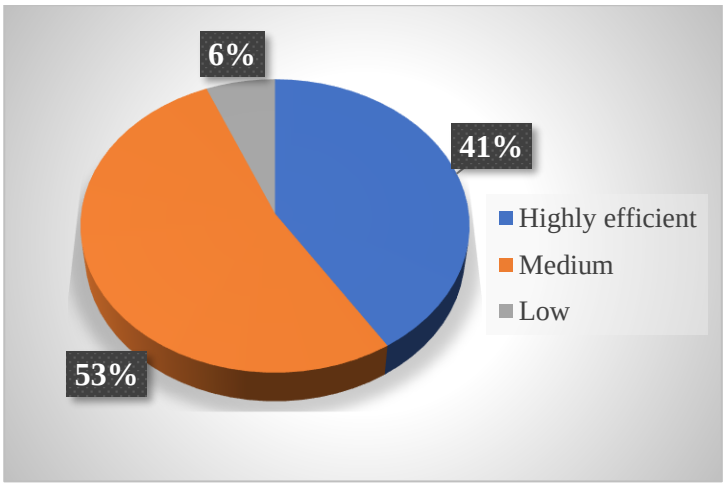

Fig 2.6 Competence Level of SWAYAM

There are various Online E-Learning platforms these platforms provide facilities to learn at anytime and anywhere which will be useful for many students and learners. Fig 2.4 represents the preferred Online E-Learning platform. A bunch of famous Online E- Learning platforms were used to find the preferred learning source among the students. From Fig 2.4 it is clear that majority of the students has chosen SWAYAM as their preference. After SWAYAM, Coursera was students' favourite. Only 4% of the students have chosen Udemy. Coursera and Udemy are paid learning platforms while SWAYAM is free. From Fig 2.4 we can conclude that students are preferring free resources rather than paid ones.

SWAYAM is providing certificates and credit points to the learners who are passing the exam with minimum of 40%. Fig 2.5 represents the completion of SWAYAM courses. From the Fig 2.5 we can clearly understand that majority of the students have not yet completed atleast one course. 29% of the students have completed one course. 12% of the students have completed two courses. Only 6% of the students have completed more than two courses. Among all the departments Commerce students have completed least number of courses. Completion of SWAYAM course can be promoted among college students by giving additional credit points and by providing medals and scholarships to students who are completing the course successfully.

Competence is the measure of productivity. It is essential to determine the productivity level of SWAYAM by finding it we can improve SWAYAM in a better way. Fig 2.6 represents the competence level of SWAYAM. Only 6% of the students have chosen low. 53% of the students have chosen moderate and 41% of the students have chosen that SWAYAM is Highly Efficient. Majority of the students have chosen the moderate. To improve the competency of the SWAYAM more emerging and new courses can be introduced and activity-based learning can also be implemented.

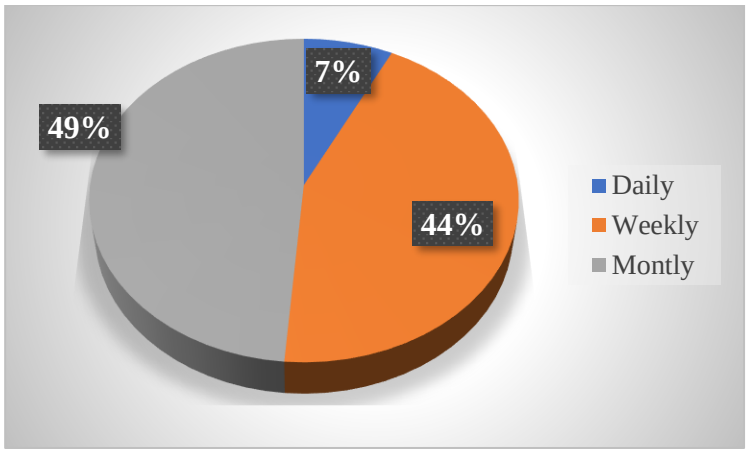

Fig 2.7 Learning Period of SWAYAM

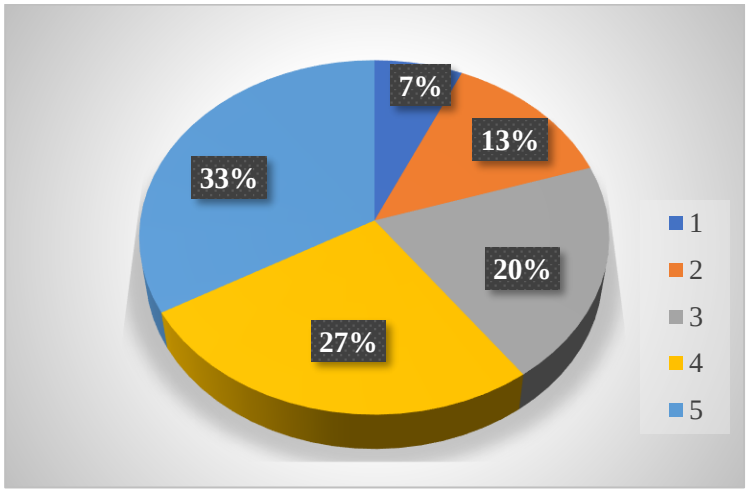

Fig 2.8 Numerical Rating Scale of SWAYAM

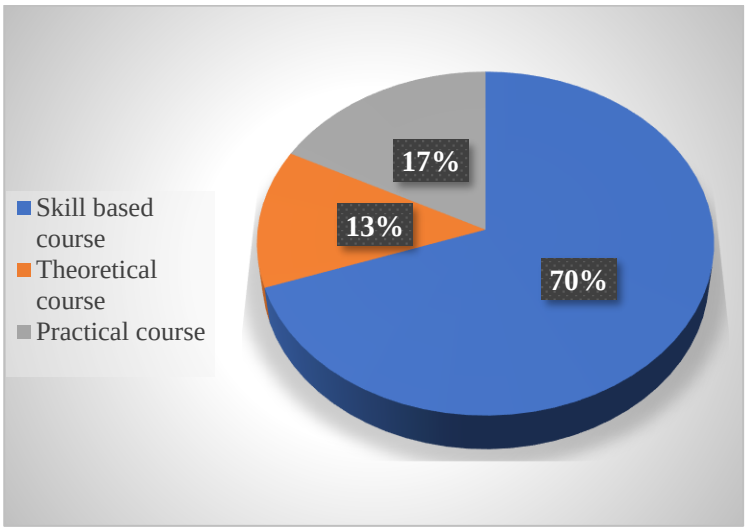

Fig 2.9 Preference of SWAYAM Courses

Learning is a continuous process of acquiring knowledge. Through constant practise for a period or duration we can learn a skill or knowledge. Fig 2.7 represents the learning period of the students in SWAYAM. Fig 2.7 indicates only 7% of the students are learning regularly and 49% of the students are learning once in a month which indicates that most of the students are not learning regularly. From Fig 2.7 we can conclude that there is a negative attitude towards learning to overcome this difficulty daily quiz and weekly discussions can be conducted by marking the attendance regularly for those quiz and discussions the student will constant efforts to attend learn regularly.

Numerical Rating scale is an easy way to calculate the performance and efficiency level. Fig 2.8 represents the rating scale of SWAYAM. 7% of the students have given 1 point, 13% of the students have given 2 points, 20% of the students have given 3 points, 27% of the students have given 4 points and 33% of the students have given 5 points for SWAYAM. Majority of the students have given 5 points which indicates that SWAYAM have a good reputation among students.

SWAYAM have numerous numbers of courses which include many subjects such as Literature, Science, Arts, Education etc these are widely classified into three types which such as Skill based course, Theoretical course and Practical courses. Fig 2.9 represents the preferenced courses in SWAYAM. 70% of the students have chosen skill-based courses 17% of the students have chosen practical based course and 13% of the students have chosen theoretical based course. Majority of the students are preferring Skill based courses. Only few are preferring Theoretical and Practical based courses so the theory courses can be taught in new educational methods and practical can be demonstrated on hands on experience which will improve Theoretical and practical based courses. Advanced and new skill-based courses can also be added in SWAYAM which will promote the skill-based courses.

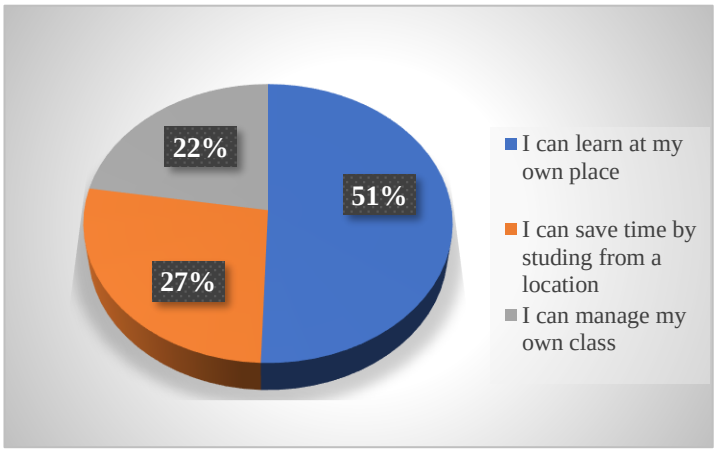

Fig 2.10 Reason for Choosing SWAYAM

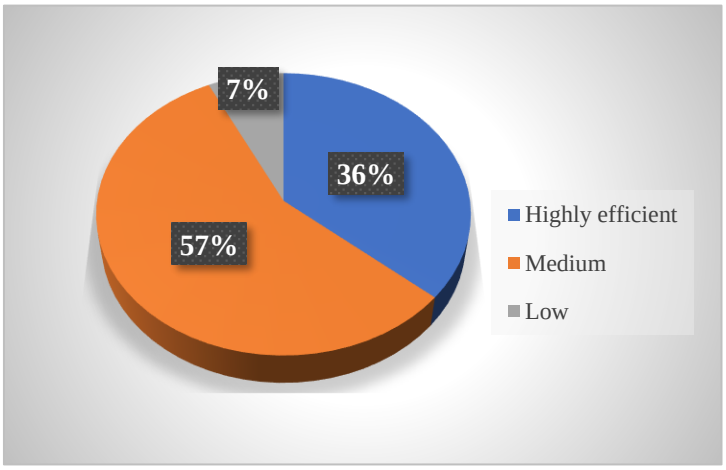

Fig 2.11 Competence Level of SWAYAM Course

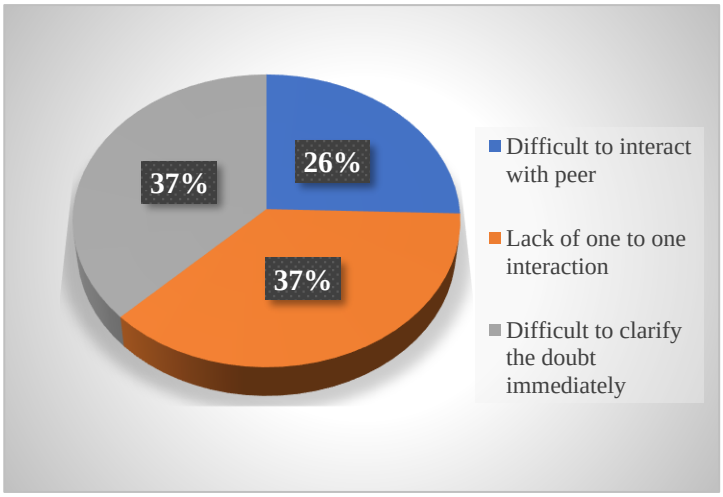

Fig 2.12 Difficulties in SWAYAM

SWAYAM is an Online Open learning platform which was created and administrated by the central Government. The main objective of SWAYAM is to provide a standard free education for learners through online. Fig 2.10 represents some of the factors for joining SWAYAM. 51% of the students joined SWAYAM because they can learn at their own place. 27% of the students joined in SWAYAM because they can save time.22% of the students joined SWAYAM because they can manage their own class. From these we can conclude that most of the students are interested to learn new course from their own location.

It is always essential to calculate the competence level of courses in online learning platforms for future development of the Courses. Fig 2.11 indicates the competence level of SWAYAM courses. From Fig 2.11 we can understand that majority of the students have chosen moderate. Only 7% of the students have chosen low efficient level. To improve the efficiency level of SWAYAM courses high standard content can be used to take lectures. New methods of teaching and learning can be added in the curriculum. Brainstorming, Mind maps, Puzzles and riddles can be included in the course which make the course more efficient.

Every Online E-Learning platform have some advantages and disadvantages. SWAYAM also have some difficulties and disadvantages. Fig 2.12 represents the difficulties that students are facing in SWAYAM. From the Fig 2.12 we can understand that the major difficulty is to clarify the doubts immediately and lack of one-to-one interaction to overcome this difficulty the tutor may conduct doubt clarifying session atleast once in a week through any online meetings which will pave a way to clarify the doubts immediately. To overcome the lack of interaction problem, the tutor many give group assignments, debates which will encourage the students to make interactions. Only 26% of the students feel it is difficult to interact with peers. Interacting and sharing knowledge with peers will also encourage the students learn with a positive attitude and it will also improve the teamwork.

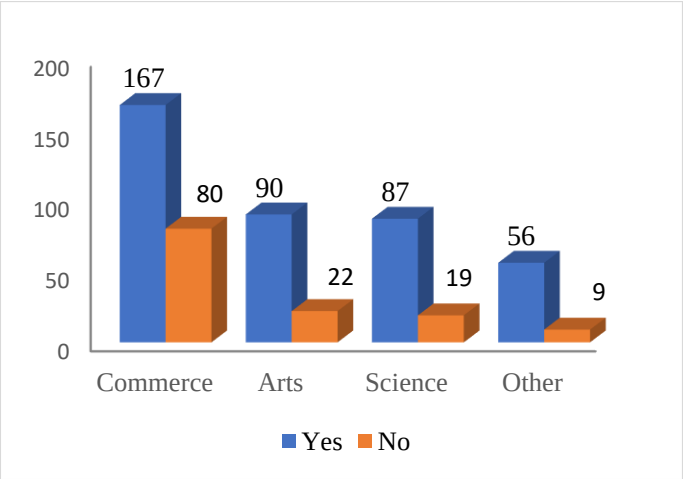

Fig 2.13 ICT Facilities to Access SWAYAM

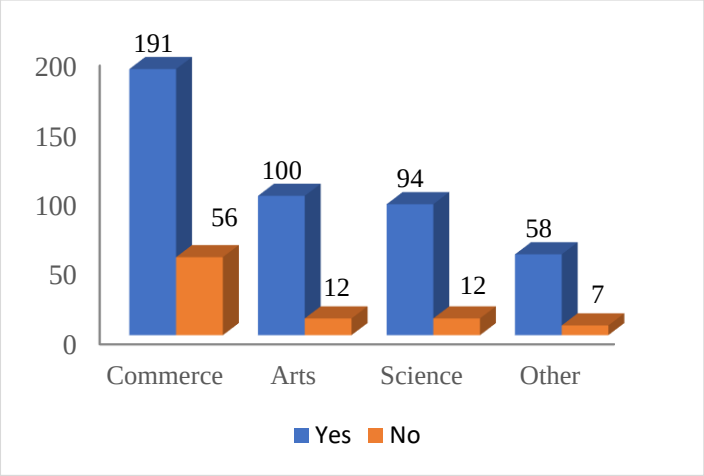

Fig 2.14 Usefulness of SWAYAM

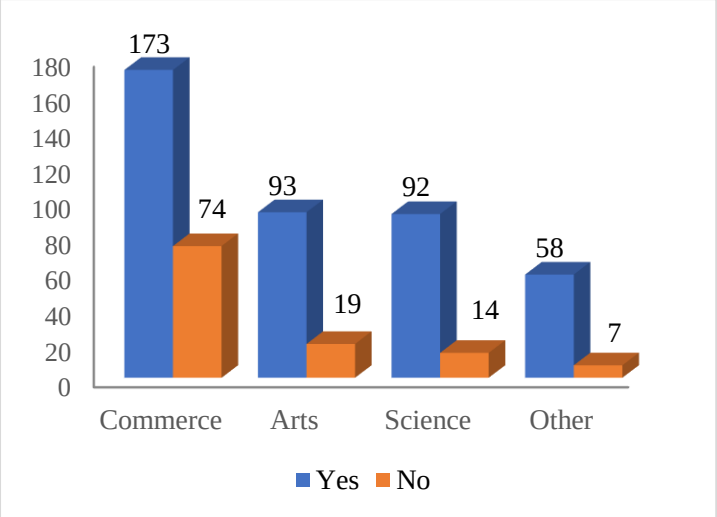

Fig 2.15 Recommendation Level of SWAYAM

ICT means Information and Communication Technology. In education ICT facilities include Computers, Laptops, Educational software and internet facilities to access these hardware and software. An Educational institution should have proper ICT facilities for their students learning purpose. Fig 2.13 indicates the ICT facilities in educational institution for the usage of SWAYAM. Out of 530 students 400 students have ICT Facilities to access SWAYAM which indicates that 75% of the students are having proper ICT facilities. By providing free internet facilities to students, it will enhance and encourages them to learn and access the online resources.

Fig 2.14 represents the usefulness of the SWAYAM. From the Fig 2.14 we can conclude that out of 530 students 443 students feel that SWAYAM is a useful platform. 77% of the Commerce students, 89% of the Arts students, 87% of the Science students and 89% of the other department students feel that SWAYAM is useful. From this we can conclude that SWAYAM is a useful platform which is providing a wide space for the learners to learn at anytime and anywhere in a cost-efficient manner.

Recommendation is a way of creating and spreading awareness to others. Recommendation acts as a positive factor in learning. Fig 2.15 represents the recommendation level of SWAYAM course. 70% of the Commerce students, 83% of the Arts students, 86% of the Science students and 89% of the Education department students will recommend SWAYAM courses to their friends and family which shows the positive impact of SWAYAM among college students. SWAYAM have earned a good will among the learners which will grows gradually and students are trusting it. From 2.15 majority of the students are recommending SWAYAM which will help other students to get an awareness and provide a way to access and use SWAYAM Courses.

Table 2.1 Assessment on SWAYAM Courses during Pandemic Time

	Commerce		Arts		Science		Other	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Difficulties in SWAYAM	51	196	25	87	30	76	15	50
Satisfication of SWAYAM	171	76	96	16	90	16	57	8
Adequate courses in SWAYAM	158	89	98	14	92	14	56	9
Usage of SWAYAM during Pandemic Time	183	64	95	17	99	7	58	7

Table 2.1 represents the Assessment of the SWAYAM Courses during Pandemic period. These assessments include Adequate courses, Satisfication, Difficulties and Usage of the courses in SWAYAM. From the table we can conclude the majority 77% of the students does not have any difficulties in SWAYAM during Pandemic and 78% of the students are satisfied with SWAYAM during Pandemic. 76% of the students feel that SWAYAM have adequate courses. 82% of the feel that SWAYAM was useful during Pandemic Time. The above table indicates that majority of the students are satisfied with SWAYAM during Pandemic Time.

Table 2.2 Assessment on Competence Level of Assignment in SWAYAM

Department	Interesting and useful	Moderate	Inappropriate
Commerce	174	26	47
Arts	77	15	20
Science	72	18	16
Other	46	10	9

Table 2.2 denotes the efficiency level of the assignments that are given in SWAYAM. Assignments are the tools that help the tutors to assess the understanding and knowledge level of the students. From the table 2.2 majority of the students feel

that the assignments are interesting and useful which is a positive indicator of learning. In SWAYAM assignments are given equal importance as final exams.

2.8 Reliability and Item Analysis

A reliability analysis was carried out on the observed attitude values scale comprising 20 items. Item analysis is a process which examines students' responses to individual test items.

Table 2.3 Item Analysis for Each Question in the Questionnaire

Item	Mean	Standard deviation
Awareness on Online E-Learning Platform	1.8582	.34915
Favourite Online Platform	2.7032	.54426
Enrollment of SWAYAM	1.6030	.48973
Installation of SWAYAM app	1.5369	.49911
Completion of SWAYAM courses	1.7013	.89908
ICT facilities	1.7580	.42868
Usefulness of SWAYAM	1.8450	.36226
Efficiency level of SWAYAM	2.3478	.59353
Difficulties in SWAYAM	1.7864	.41024
Learning period of SWAYAM	1.5974	.63251
Rating Scale of SWAYAM	3.4442	1.16824
Recommendation of SWAYAM	1.7883	.40891
Satisfication level of SWAYAM	1.7864	.41024
Reason for Choosing SWAYAM	2.2287	.85205
Preference of SWAYAM Course	2.5671	.70960
Adequate courses in SWAYAM	1.7713	.42041
Usefulness of SWAYAM During Pandemic Time	1.8053	.39635
Difficulties that are faced in SWAYAM	2.1229	.78216
Efficiency level of SWAYAM Assignments	2.3819	.63195
Efficiency level of SWAYAM Course	2.2911	.59220

Table 2.3 represents the Item Analysis for each question in the questionnaire. Cronbach's alpha showed the questionnaire reached a reliability, $\alpha = 0.763$. Since the Value of Cronbach's alpha is more than 0.70 all the 20 items were taken into consideration and none of the item was deleted for further analysis.

2.9 Conclusion

The main objective of SWAYAM courses is to make the best teaching and learning resources available to everyone. A flexible, adaptable, and forward-thinking educational system is required to meet the needs of future learners. Majority of the students are aware of Online E-Learning platform and they have also enrolled in SWAYAM but most of them have not yet completed atleast one course. Educational institutions are providing credit points and ICT facilities for learning in SWAYAM which are an encouraging factor that promote SWAYAM. Learning is a continuous process but from the survey students are learning once in a month. Overall, the awareness of SWAYAM has increased and students are using it in an effective manner but majority of the students have not yet completed one course and not learning regularly.

2.10 Suggestions

Awareness of SWAYAM has increased but first year of undergraduates are unaware of SWAYAM. By creating awareness program during their school days or during the initial stages of college days will improve the awareness level among them. Majority of the students have not yet completed atleast one course. By insisting the students to complete atleast one course in an academic year will promote the completion of SWAYAM course. Majority of the students are learning once in a month. By conducting daily quiz and marking attendance for their presence in weekly discussions will promote the learning process in SWAYAM.

CHAPTER 3

CHAPTER – 3

SURVEY ON TEST AND MEASUREMENT AMONG MATHEMATICS AND ENGLISH GRADUATES

Tests and measurements are standardised instruments such as questionnaires, inventories, and scales used to measure constructs in various social science disciplines. They are used for diagnosis, research, or assessment. A test was conducted for Mathematics and English graduate students. Their scores were considered as primary data. Descriptive statistical tools were used to analyse and evaluate the collected data. Then, correlation and regression are also measured. The hypothesis testing was conducted for Mathematics and English students. The study reveals the correlation between Mathematics and English scores and results of the Hypothesis testing for both group of graduate's students.

3.1 Introduction

Statistics is the study of the scientific procedure for gathering, organising, analysing, and interpreting data for description and decision-making. Croxton and Cowden, two well-known statisticians, created a more extensive definition and scope. Statistics is the field of study that deals with collecting, presenting, analysing, and interpreting numerical data. It is an effective way to organise the data that has been collected, analyse it, and use it to draw reliable conclusions. There are numerous statistical methods available to researchers. The choice of appropriate statistical techniques is greatly influenced by the research design, the hypothesis, and the type of data that will be gathered. After the data have been gathered, edited, classified, and tabulated, they are then analysed and interpreted using various statistical tools, depending on the type of investigation. Therefore, the researcher is expected to have a basic understanding of statistics to conduct a systematic analysis and provide an accurate and precise interpretation of the data. In statistics, representation of data refers to the process of compiling data about a population or sample. This aids researchers in better analysing their data and identifying patterns.

3.2 Purpose of the Study

The main purpose of the study is to

- Evaluate and analysis the correlation and regression between scores of Mathematics and English graduate students.
- Analysis the descriptive statistics tools for the collected data for both Mathematics and English graduate students.
- Measure the Hypothesis testing for both Mathematics and English Graduates.

3.3 Data Collection

A questionnaire was developed according to the Blueprint. The questionnaire consists of 50 questions which are divided into two sections. The first section consists of 25 questions that are based on Mathematics questions, and the second section consists of 25 English-based questions. The questionnaire was sent to both English and Mathematics graduate students. A total of 180 students from each graduate answered the questionnaire.

3.4 Methodology

The methodology provides a detailed plan that keeps researchers on track, making the process smooth, effective, and manageable. A questionnaire was prepared and distributed among 180 Mathematics and English graduate students. The descriptive statistics tools are calculated for the collected data, the hypothesis is analysed, and conclusions are drawn.

3.4.1 Formation of Questionnaire

A questionnaire is a very handy tool for quickly gathering data from a big number of people. So, the questionnaire's design is vital for guaranteeing that reliable data is gathered and that the findings can be interpreted and generalised. A excellent questionnaire should be accurate, trustworthy, understandable, engaging, and efficient. It is crucial to use a conceptual framework to create the questionnaire, examine each question for clarity and relevance, and consider the analysis.

3.4.2 Weightage Table

Weightage table represents the number of questions which will appear in the questionnaire.

Table 3.1 Weightage Table for Mathematics and English Question Paper

S.No	Objectives	Mathematics Question Paper	English Question Paper
1	Knowledge	7	4
2	Understanding	7	7
3	Application	6	5
4	Skill	5	9
	Total number of questions	25	25

Table 3.1 represents the weightage of the Mathematics and English question paper. Knowledge and understanding based questions were given equal importance in Mathematics questionnaire. Since, Mathematics based on cognitive knowledge of the student while the weightage of the English questionnaire shows that skill based and understanding based questions were given more importance. Since, English is a language subject so the question paper is based on the skill-oriented questions.

3.5 Analysis and Interpretation

Analysis and Interpretation refers to the systematic and critical examination of the collected data. The main purpose of Analysis and Interpretation is to present the data in a easily understandable and self-explanatory manner.

3.5.1 Descriptive Statistics Analysis

Descriptive statistics analysis summarizes or describes the characteristics of a data set. Descriptive statistics consists of three basic categories of measures they are measures of central tendency, measures of variability and frequency distribution. Measures of central tendency describe the center of the data set which include mean, median, mode. Measures of variability describe the dispersion of the data set which include variance and standard deviation.

Table 3.2 Descriptive Statistics Analysis of Mathematics Graduates

Items	Statistical Values
Mean	65
Median	64
Mode	84
Range	68
Quartile deviation	14
Interquartile deviation	28
Average deviation	13.30
Variance	256.68
Standard deviation	16.02
Skewness	-0.32
Spearman's Rank Correlation coefficient	0.6

Table 3.2 represents the single value representation of the entire data distribution of Mathematics score from this table we can conclude that the average score of the mathematics students is 65 and the most frequent score is 84 and the range of the mathematics score is 68. The median denotes that it separates the distribution into two halves at 64. The average deviation is low which denotes that the scores are clustered around the mean. The skewness lies between – 0.5 to 0.5 which represent that the data are fairly symmetric. Spearman's Rank Correlation coefficient is 0.6 which represent there is a positive correlation between the scores of Mathematics and English among Mathematics students.

Table 3.3 Descriptive Statistics Analysis of English Graduates

Items	Statistical Values
Mean	63
Median	64
Mode	76
Range	72
Quartile deviation	9.5
Interquartile deviation	19
Average deviation	11.38
Variance	216.65
Standard deviation	14.71
Skewness	-1
Spearman's Rank Correlation coefficient	0.47

Table 3.3 indicates the single value representation of the entire data distribution of English score from this table we can conclude that the average score of the English students is 63 and the most repeated score is 76 and the range of the English score is 72. The median denotes that it separates the distribution into divided into two halves at 64. The average deviation is low which denotes that the scores are clustered around the mean. The skewness is between -1 and -0.5 which represent that the data are moderately skewed. Spearman's Rank Correlation coefficient is 0.47 which represent there is a positive correlation between the scores of Mathematics and English among English students.

3.5.2 Regression and Frequency Polygon

Regression is defined as a statistical method that helps to analyze and understand the relationship between two or more variables. A graph of class frequency plotted against class midpoint is known as a frequency polygon.

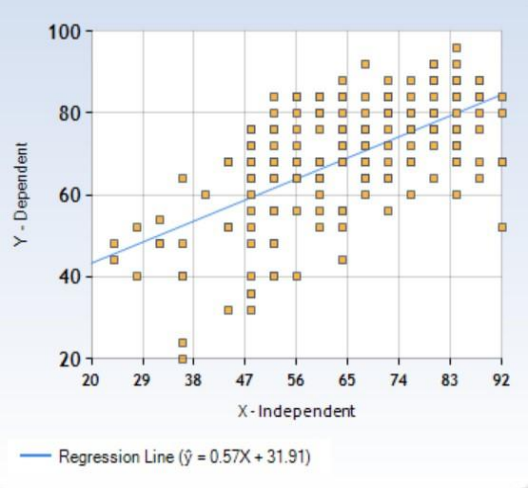

Fig 3.1 Regression for Mathematics Graduates

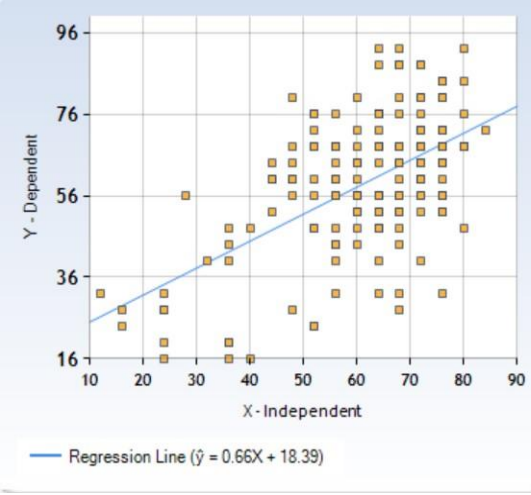

Fig 3.2 Regression for English Graduates

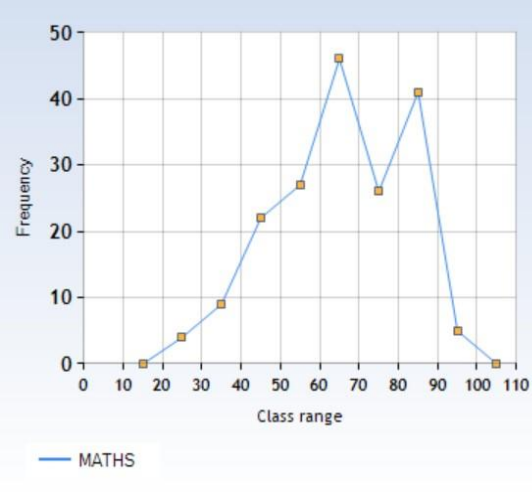

Fig 3.3 Frequency Polygon for Mathematics Graduates

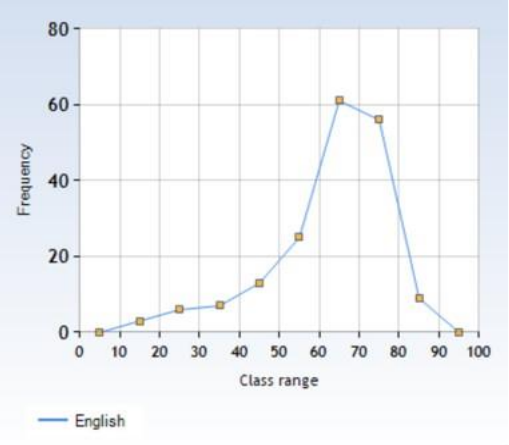

Fig 3.4 Frequency Polygon for English Graduates

Fig 3.1 represents the relationship between Mathematics and English score of Mathematics graduates through this regression we can determine that the English score is distributed nearly to the regression line where Mathematics marks is independent variable and English marks are the dependent variables. Fig 3.2 represents the relationship between English and Mathematics score of English graduate students through this we can determine that mathematics scores are distributed around the regression line where English marks are independent variable and Mathematics mark are dependent variable. A frequency polygon graph is commonly used in statistics to display numerical data in a visual format that can be used to determine the central tendencies and variability of the data set. Fig 3.2 represents the histogram of the Mathematics score from this we can determine that there is a sudden drop at the range 70-80. Fig 3.4 represents a histogram of English students. From Fig 3.4 we can clearly understand that the variability lies between 70-80 which indicated most of the scores lie between the class 60-70.

3.6 Hypothesis

Hypothesis is a testable assumption about the relationship between two or more variables or a possible causal cause of an observed phenomenon. For this study, a possible hypothesis was generated. The hypothesis test was conducted for both Mathematics and English graduate students.

1. H_0 – There is no mean difference between Mathematics and English subject among students.
2. H_1– There is a difference in mean between Mathematics and English subject among students.

Table 3.4 Hypothesis Testing of Mathematics and English Graduates

	Mathematics Subject Mean	**English Subject Mean**	**Result**
Mathematics Graduates	65	64.4	H_1 is rejected
English Graduates	60	63	H_0 is rejected

Hypothesis testing is calculated using the software “Statical Calculator”. From Table 3.4, H_1 is rejected is for Mathematics graduates which indicate that the performance of Mathematics students is same in both Mathematics and English subject. H_0 is rejected for English graduates which indicate that the performance of English students is not same in both Mathematics and English subject.

3.7 Conclusion

Descriptive Statistics research helps to measure and analyse the data in a meaningful way. In Education sector descriptive statistics can be used to analyse and measure the score level and effective performance of the students. By the results the competence level of Mathematics Students is quite higher than English students. From the rank correlation there is positive correlation between both the group of students. But the correlation and performance of Mathematics students is slightly greater than English students.

SUMMARY AND CONCLUSION

Summary and Conclusion

The goal of this study is to use survey to assess and interpret college students' awareness and competence with SWAYAM as well as to ascertain the correlation, regression and hypothesis testing between Mathematics and English scores between graduate students of Mathematics and English.

SWAYAM is a Massive Open Online Course (MOOC) platform run by the Indian government that offers Educational opportunities to a huge number of students for free. From Chapter 1 we have concluded that majority of students are familiar with online E-learning platforms and have signed up for SWAYAM as well although majority of them have not yet finished at least one course. Credit points and ICT resources are offered by educational institutions for use in SWAYAM, which is a positive development that promotes SWAYAM among students. Learning is a lifelong process, but according to the survey students are learning once in a month. Majority of the students are satisfied with usage and competence level of SWAYAM Courses during the pandemic time. Overall, SWAYAM knowledge has grown and students are using it effectively, but most of them have not yet finished one.

Research in descriptive statistics helps in the meaningful measurement and analysis of data. Descriptive statistics can be used in the education sector to evaluate student performance and evaluate their performance level. According to the findings in chapter 2, graduates who study Mathematics are far more competent than those who study English. According to the rank correlation, both student groups have a favourable association. The mean average of Mathematics graduates is slightly greater than English graduates. From Hypothesis testing we have concluded that the performance of Mathematics students is same in both Mathematics and English subject while performance of English graduates is good at English only.

QUESTIONNAIRE

Questionnaire

A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. In this research study, two questionnaires were used to collect the required data.

The First Questionnaire consists of 20 questions which are related to SWAYAM. The questions that are used in the questionnaire where mentioned below.

1. Are you aware of Online E – Learning Platform?
2. Which is your favourite E-learning Platform?
3. Have you enrolled in SWAYAM?
4. Have you installed SWAYAM APP in your phone?
5. So far how many courses have you completed in SWAYAM?
6. Do you have adequate facilities to access SWAYAM courses in your Educational institution?
7. Does SWAYAM courses are useful?
8. What is the efficiency level of the SWAYAM courses?
9. Do you face any difficulties in SWAYAM courses?
10. How often do you learn SWAYAM courses?
11. On a scale of 1 to 5, give your rating for SWAYAM courses
12. Would you recommend SWAYAM COURSES to your friends and family?
13. Does the SWAYAM courses have satisfied your expectations?
14. Reason why you joined SWAYAM courses?
15. What kind of course do you prefer in SWAYAM?
16. Does SWAYAM have adequate courses in each sectors?
17. Do SWAYAM courses are useful during CORONA period?
18. Difficulties that you face in SWAYAM courses?
19. How do you feel about assignments given in SWAYAM course?
20. How useful were the course materials that are provided in SWAYAM courses?

The second questionnaire consists of 50 questions which has two sections each section contains 25 questions. First section questions are related to English while the second section questions are related to Mathematics.

Section – I

English

1. _____ dogs do not bite.
2. Synonym of " Solitary".
3. American English Word for " Tap ".
4. Calf: Cow:: Puppy:?
5. What is the Idiom meaning of "Up in the arm"?
6. Synonym of "Bustle".
7. What is the Idiom meaning of "In Cold Blood"?
8. Change the following sentence into Direct Speech "I told him that he was not working hard."
9. Fill the appropriate word. Do not laugh_____other's mistakes.
10. Join the parts to make a meaningful sentence. I / Immediately / Salary / My / Want.
11. Spot the error. The consequence of / his careless was / that the game was lost.
12. Make sure you work hard_____ you will not be able to score good marks.
13. _____ President of India is going to visit the US soon.
14. Identify the tense "We were waiting for them."
15. Write the Question tag for the following question.
    The train is never on time, _____?
16. _____ She is dead.
17. _____ lovely weather!
18. Identify the sentence pattern. She was a friendly person.
19. We have one _____ before _____ appointment with the real estate agent.
20. A group of wolves is called as_____.
21. Meaning of "Risk."
22. Who is a Patriot?
23. What do the best soldiers do?
24. Why do soldiers risk their lives?
25. What do the soldiers love the most?

Section – II

Mathematics

1. 36, 34,30,28,24, _____. What number should come next?
2. 21, 9, 21, 11, 21, 13, 21, _____. What number should come next?
3. Find the square of 14.
4. The average of first 5 Natural Numbers is _____.
5. There are how many types of triangles?
6. Which of the figures completes the pattern?
7. 20% of 100 is _____.
8. Mode of 5, 10, 15, 15, 20, 25, 30.
9. Which branch sold the maximum number of books in 2000?
10. Which branch sold the least books in 2001?
11. What is the average sales of all branches in 2000?
12. What are the least sales count?
13. Convert 13/36 m/s into Kilometre per hour.
14. What is the angle of a Right Angle triangle?
15. In a Triangle, if A = 3, B = 4, C =?
16. Find the 3D shape?
17. If 2 Apples + 2 Orange + 2 Apples = 40,
    2 Strawberries + 1 Strawberry * 1 Apple = 70,
    2 Strawberries + 2 Strawberries + 2 Orange = 36,
    1 Orange * 1 Apple – 1 Strawberry =?
18. It was Sunday on Jan 1, 2006. What was the day on Jan 1, 2010?
19. A man has 480 rupees in the denomination of one rupee note, five rupee note, and ten rupee note. The number of notes of each denomination is equal. What is the total number of notes that he has?
20. Pyramid is the 3D image of which shape?
21. Find the odd man out. 3,5,11,14,17,21.
22. The ratio between the perimeter and the breadth of a Rectangle is 5: 1. If the area of the rectangle is 216 sq. cm, what is the length of the rectangle?
23. In 1 Million there are how many zeros?
24. 1 km = _____ m
25. Two coins are tossed. Find the probability of getting atleast one tail.

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PRESENTATION AND PUBLICATION

DETAILS OF PAPER PRESENTATION AND PUBLICATION

PAPER PRESENTATION

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