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# Students' Learning through Online Platform and Academic Performance in Mathematics

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**Abstract**

The research was conducted to determine the students' learning through an online platform and academic performance in mathematics. The respondents included 192 students sampled using the proportional stratification technique. A three-part questionnaire was administered to the students. The instrument underwent validation and reliability testing using Cronbach's alpha. The test showed that the instrument was highly reliable for the selected population. The majority of responses were 15 to 19 years old, female, and Grade 12. Additionally, most of the students utilized Google Meet with at least two different learning platforms to learn mathematics. Moreover, the students used an online learning platform very often. The study found out that regardless of learners' profiles, they had similar perceptions toward online learning platforms. However, some specific indicators differed. On average, the students had a very satisfactory performance. Furthermore, the learners' perceptions of online learning platforms were not significantly correlated with their academic performance. However, some specific indicators were significantly correlated, but it had an indirect connection, particularly on their confidence while using online learning content and in using online learning services that could simplify the learning process.

**Keywords:** Online Learning Platform; E-Learning tools; Academic Performance; Senior High school

## Introduction

COVID-19 has wrought devastation worldwide since its emergence in late December 2019, and education, like any other essential industry, has been particularly hard hit. Students, schools, colleges, and universities have all suffered significant consequences. According to the United Nations Educational, Scientific, and Cultural Organization (UNESCO), over 800 million students worldwide have been affected. People could not leave the house due to government-imposed health protocols, which must be strictly followed. Students should stay at home instead of going to school.

There are effects on teacher-student interactions in educational institutions, leading to changes to the teaching-learning process. As a result, the curriculum will need to undergo various adjustments to continue this academic year. Schools were forced to perform all of their activities with students online and through distance learning due to the outbreak. Some argue that online learning is a necessary supplement to make up for the loss of actual classroom presence, while others struggle to acclimate to the digital environment.

Due to the closure of educational institutions, which creates difficulties for students' learning, the contribution of information technology has gained momentum in the current pandemic situation. Information technology is functioning as a solution for the continual learning process during this quarantine period through creative and learning management systems. The online learning platform has been recognized and appreciated by educational institutions and students worldwide. The ease of use, learning flexibility, and customizable environment are the reasons for its acceptability. Despite its numerous benefits, online platforms have several drawbacks, including social isolation and lack of face-to-face interaction.

However, schools support the use of new techniques and teaching strategies to create an engaging and participatory learning environment in which students are the focus of the learning process. Google Classroom, Google Meet, Facebook, YouTube, Tiktok (educational contents), Zoom Meeting, We Chat, Skype, Moodle (learning management system), and Edmodo are examples of e-learning modalities that can be employed in the learning process. A deeper understanding of how students learn mathematics, combined with the efficient use of an online platform, can help students learn mathematics in a more meaningful way and make the subject more engaging.

Studies show a positive correlation between student trust in e-learning systems and student performance (Thabet & Kalyankar, 2014; Tossy, 2017). Generally, students' positive perceptions in learning mathematics could help develop towards the subject, which will, in turn, lead to better performance. In contrast, students' negative perceptions towards the subject will also contribute to their low performance in the subject (Mahanta, 2012; Bayaga & Wadesango, 2014).

Therefore, this study focused on determining the students' learning through online platform and academic performance in learning mathematics.

**Objectives of the Study**

1. Identify the profile of the respondents in terms of age, sex, grade level, and E-learning tool used amidst pandemic.
2. Determine the perception of respondents towards the use of online learning platforms in terms of usefulness, self-efficacy, ease of use, and behavioral intention.
3. Discover the difference on the perception of the respondents towards the use of online learning platforms when they are grouped according to their profile.
4. Identify the academic performance of the respondents in mathematics.
5. Determine the relationship between the perception of the respondents towards the use of online learning platforms and the academic performance.

**Materials and Methods**

The study was descriptive-correlational. A structured questionnaire adapted from the study by Khan et al. (2020) was used in the study. The instrument was evaluated by experts to establish its content validity. The questionnaire had a Cronbach's alpha value of 0.8253 indicated as "Good". The questionnaire was randomly sent as a link to the respondents through a free application (Google Forms). The 192 respondents of the study were senior high school students who were chosen using a proportionate stratified random sampling technique with a 95% degree of accuracy and 5% allowable error. Frequency counts, percentage, mean, and standard deviation were used to determine the age, sex, grade level, e-learning tool used amidst the pandemic, perception of respondents towards the use of online platforms, and academic performance. Mann Whitney U-test was used for the test of difference, and Kendall tau b for the test of the relationship.

**Results and Discussions**

**Table 1. Profile of the Respondents.**

| PROFILE | Frequency n=192 | Percent (100.00) |
|---|---|---|
| **Sex** | | |
| Female | 141 | 73.40 |
| Male | 51 | 26.60 |

| | | |
|---|---|---|
| **Age** | | |
| 15 | 1 | 0.50 |
| 16 | 61 | 31.80 |
| 17 | 88 | 45.80 |
| 18 | 38 | 19.80 |
| 19 | 4 | 2.10 |
| **Grade Level** | | |
| Grade 11 | 92 | 47.90 |
| Grade 12 | 100 | 52.10 |

Table 1 reveals that the majority were females which comprised of 141 or 73.40 percent out of the 192 total of respondents. The males consisted of 51 or 26.60 percent. In terms of age, majority were 17 years old with 88 or 45.80 percent, followed by 61 or 31.80 percent 16 years old. There were 38 or 19.80 percent 18 year old respondents. Only 4 or 2.10 percent were with ages of 19 and only one or 0.50 percent was 15 years old. The Grade 12 respondents numbered 100 or 52.10 percent which was only one respondent higher than those in Grade 11 which comprised of 92 or 47.90 percent.

**Table 2. E-learning Tools Used amidst Pandemic as Identified by the Respondents.**

| **E-LEARNING TOOLS** | **Frequency** | **Percent** |
|---|---|---|
| Google Meet | 22 | 11.50 |
| Google Meet and at least two learning platforms | 136 | 70.80 |
| Google Classroom w/ at least two learning platforms | 11 | 5.70 |
| Moodle (Learning Management System) | 5 | 2.60 |
| Moodle (Learning Management System) and at least two learning platforms) | 15 | 7.80 |
| Zoom and at least two learning platforms | 3 | 1.60 |
| Total | 192 | 100.00 |

Amidst the pandemic, the varied e-learning tools used were Google classroom, Google meet, Facebook, Youtube, Tiktok (Educational Contents), We chat, Moodle (Learning Management System), Messenger, Edmodo and Zoom meeting. As gleaned from the table, the most used was Google Meet with at least any two of the above-mentioned platforms. According to UNESCO (2020) different countries worldwide have introduced various answers during the pandemic to continue the education process like the introduction of distance learning. These are online learning platforms such as Google, TV broadcasts, guidelines, resources, video lectures, and online channels. Similarly, the Commission on Higher Education suggested strengthening online platforms and blended learning such as but not limited to Google classroom, messenger, zoom, Edmodo, Facebook, and YouTube (CHED, 2020).

Table 3 reveals the respondents' perception towards the use of online learning platform in learning mathematics. The table suggested that the respondents have the same level of perception in terms of usefulness, self-efficacy, ease of use, and behavioral intention described as very often. According to several researches, students began to focus on the adoption of online learning platforms during the pandemic because they were utilized so frequently in the educational environment. These platforms were chosen because students' positive perceptions about mathematics learning could as-

sist them establish a positive attitude toward the subject, leading to improved performance. Students' negative perceptions toward the subject, on the other hand, will contribute to their poor performance (Mahanta, 2012; Bayaga & Wadesango, 2014). Moreover, multiple studies confirm that the interaction of students in mathematics using an e-learning platform in the classroom creates prospects for gaining access and understanding various demonstrations of mathematical concepts (Swan, 2010).

**Table 3. Respondents' Perception towards the Use of Online Learning Platform in Learning Mathematics.**

| INDICATORS | Mean |
|---|---|
| **Usefulness** | |
| 1. Studying through online learning platform mode provides the flexibility to the study at the time convenient to the learner. | 4.02 |
| 2. Online learning platform enables learners to study irrespective of where they are located in the world. | 3.84 |
| 3. There are technologies available to enable one to take tests and submit assignments electronically. | 4.34 |
| 4. There are electronic tools available to enable interactive communication between teacher and student without meeting face-to-face. | 4.34 |
| **Self-Efficacy** | |
| 5. I feel confident while using the online learning platform. | 3.58 |
| 6. I feel confident while operating the functions of online learning platform. | 3.71 |
| 7. I feel confident while using online learning content. | 3.83 |
| **Ease of Use** | |
| 8. I believe online learning platforms are user friendly. | 4.01 |
| 9. It would be easy for me to find necessary information when using an online learning platform. | 4.13 |
| 10. I believe that using online learning platform services can simplify the learning process. | 3.98 |
| 11. The set-up of the online learning platform service is compatible with the way I learn. | 3.83 |
| **Behavioral Intention** | |
| 12. I intend to use online learning platform to assist my learning. | 4.14 |
| 13. I intend to use online learning platform to get updates of my subject knowledge with the latest amendments. | 4.32 |
| 14. I intend to use online-learning platform as an autonomous (free) learning tool. | 4.14 |

Table 4 shows the difference in the perception of the respondents towards the use of online learning platforms according to their sex. The results revealed that the students had similar perceptions in terms of usefulness, self-efficacy, ease of use, and behavioral intention. This implied a no significant difference between male and female respondents. They had the same intention in the use of online learning platform in their learning of Mathematics.

**Table 4. Difference in the Perception of the Respondents towards the Use of Online Learning Platforms according to their Sex.**

| INDICATORS | SEX | | | | Z | Sig |
|---|---|---|---|---|---|---|
| | FEMALE | | MALE | | | |
| | Mean | Desc | Mean | Desc | | |
| **Usefulness** | | | | | | |
| 1. Studying through online learning platform mode provides the flexibility to the study at the time convenient to the learner. | 3.96 | VO | 4.20 | VO | 1.65 ns | 0.10 |
| 2. Online learning platform enables the learners to study irrespective of where they are located in the world. | 3.77 | VO | 4.04 | VO | 1.63 ns | 0.10 |
| 3. There are technologies available to enable one to take tests and submit assignments electronically. | 4.34 | VO | 4.33 | VO | 0.14 ns | 0.89 |
| 4. There are electronic tools available to enable interactive communication between teacher and student without meeting face-to-face. | 4.35 | VO | 4.31 | VO | 0.27 ns | 0.79 |
| **Self-Efficacy** | | | | | | |
| 5. I feel confident while using the online learning platform. | 3.52 | VO | 3.73 | VO | 1.38 ns | 0.17 |
| 6. I feel confident while operating the functions of online learning platform. | 3.66 | VO | 3.86 | VO | 1.35 ns | 0.18 |
| 7. I feel confident while using online learning content. | 3.79 | VO | 3.92 | VO | 0.89 ns | 0.37 |
| **Ease of Use** | | | | | | |
| 8. I believe online learning platforms are user friendly. | 3.97 | VO | 4.12 | VO | 0.94 ns | 0.35 |
| 9. It would be easy for me to find necessary information when using an online learning platform. | 4.09 | VO | 4.24 | VO | 0.85 ns | 0.39 |
| 10. I believe that using online learning platform services can simplify the learning process. | 3.97 | VO | 4.02 | VO | 0.08 ns | 0.94 |
| 11. The set-up of the online learning platform service is compatible with the way I learn. | 3.79 | VO | 3.94 | VO | 1.14 ns | 0.26 |
| **Behavioral Intention** | | | | | | |
| 12. I intend to use online learning platform to assist my learning. | 4.11 | VO | 4.20 | VO | 0.75 ns | 0.45 |
| 13. I intend to use online learning platform to get updates of my subject knowledge with the latest amendments. | 4.35 | VO | 4.22 | VO | 1.64 ns | 0.10 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14. I intend to use online-learning platform as an autonomous (free) learning tool. | 4.14 | VO | 4.12 | VO | 0.12 ns | 0.90 |
| *Significant ns Not Significant VO = Very Often A = Always | | | | | | |

**Table 5. Difference in the Perception of the Respondents towards the Use of Online Learning Platforms according to their Age.**

| Indicators | AGE | | | | Z | Sig |
|---|---|---|---|---|---|---|
| | Below 18 | | 18 and above | | | |
| | Mean | Desc | Mean | Desc | | |
| **Usefulness** | | | | | | |
| 1. Studying through online learning platform mode provides the flexibility to the study at the time convenient to the learner. | 3.96 | VO | 4.24 | VO | 1.72 ns | 0.09 |
| 2. Online learning platform enables learners to study irrespective of where they are located in the world. | 3.81 | VO | 3.95 | VO | 0.90 ns | 0.37 |
| 3. There are technologies available to enable one to take tests and submit assignments electronically. | 4.31 | VO | 4.45 | VO | 0.63 ns | 0.53 |
| 4. There are electronic tools available to enable interactive communication between teacher and student without meeting face-to-face. | 4.31 | VO | 4.45 | VO | 1.19 ns | 0.23 |
| **Self-Efficacy** | | | | | | |
| 5. I feel confident while using the online learn- | 3.59 | VO | 3.55 | VO | 0.10 ns | 0.92 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ing platform. | | | | | | |
| 6. I feel confident while operating the functions of online learning platform. | 3.73 | VO | 3.67 | VO | 0.23 $^{ns}$ | 0.82 |
| 7. I feel confident while using online learning content. | 3.84 | VO | 3.79 | VO | 0.27 $^{ns}$ | 0.79 |
| **Ease of Use** | | | | | | |
| 8. I believe online learning platforms are user friendly. | 4.01 | VO | 4.00 | VO | 0.24 $^{ns}$ | 0.81 |
| 9. It would be easy for me to find necessary information when using an online learning platform. | 4.12 | VO | 4.17 | VO | 0.11 $^{ns}$ | 0.91 |
| 10. I believe that using online learning platform services can simplify the learning process. | 3.94 | VO | 4.14 | VO | 1.33 $^{ns}$ | 0.18 |
| 11. The set-up of the online learning platform service is compatible with the way I learn. | 3.81 | VO | 3.88 | VO | 0.35 $^{ns}$ | 0.73 |
| **Behavioral Intention** | | | | | | |
| 12. I intend to use online learning platform to assist my learning. | 4.13 | VO | 4.14 | VO | 0.08 $^{ns}$ | 0.94 |
| 13. I intend to use online learning platform to get updates of my subject knowledge with the latest amend- | 4.32 | VO | 4.31 | VO | 0.33 $^{ns}$ | 0.74 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ments. | | | | | | |
| 14. I intend to use online-learning platform as an autonomous (free) learning tool. | 4.10 | VO | 4.26 | VO | 0.84 ns | 0.40 |
| nsNot Significant VO = Very Often | | | | | | |

Table 5 reveals the difference in the perception of the respondents towards the use of online learning platforms according to their age. The findings of the study suggested that regardless of students' age, they had the same observations on the use of online learning platforms in terms of usefulness, self-efficacy, ease of use, and behavioral intention. Such result revealed that the respondents' age has no bearing on their perception about the use of the online learning platforms.

Table 6 shows the Z-values from 1.97 to 4.46 with significance levels less than 0.05 that led to the rejection of the null hypothesis. This revealed that the Grade 11 and Grade 12 respondents significantly differed in their perception about the usefulness of on-line learning platform. As shown in the table, the Grade 12 group were the most benefited from the on-line online learning platform as to the flexibility of the study at the time convenient to them and having the opportunity to study well irrespective of where they were located in the world. Likewise, as compared to the Grade 11 respondents, they were more benefited as to the technologies available which greatly enabled them to take tests and submit assignments electronically. In addition, their interactive communication between teacher and student without meeting face-to-face brought about by the available electronic tools were better than the Grade 11.

**Table 6. Difference in the Perception of the Respondents towards the Use of Online Learning Platforms according to their Grade Level.**

| Indicators | GRADE LEVEL | | | | Z | Sig |
|---|---|---|---|---|---|---|
| | Grade 11 | | Grade 12 | | | |
| | Mean | Desc | Mean | Desc | | |
| **Usefulness** | | | | | | |
| 1. Studying through online learning platform mode provides the flexibility to the study at the time convenient to the learner. | 3.72 | VO | 4.30 | VO | 4.46* | 0.00 |
| 2. Online learning platform enables learners to study irrespective of where they are located in the world. | 3.57 | VO | 4.09 | VO | 3.93* | 0.00 |
| 3. There are technologies available to enable one to take tests and submit assignments electronically. | 4.18 | VO | 4.48 | VO | 1.97* | 0.05 |
| 4. There are electronic tools available to enable interactive communication between teacher and student without meeting face-to- | 4.15 | VO | 4.51 | A | 2.84* | 0.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| face. | | | | | | |
| **Self-Efficacy** | | | | | | |
| 5. I feel confident while using the online learning platform. | 3.43 | S | 3.71 | VO | 2.18* | 0.03 |
| 6. I feel confident while operating the functions of online learning platform. | 3.63 | VO | 3.79 | VO | 1.27 ns | 0.21 |
| 7. I feel confident while using online learning content. | 3.68 | VO | 3.96 | VO | 2.18* | 0.03 |
| **Ease of Use** | | | | | | |
| 8. I believe online learning platforms are user friendly. | 3.72 | VO | 4.28 | VO | 4.23* | 0.00 |
| 9. It would be easy for me to find necessary information when using an online learning platform. | 3.91 | VO | 4.33 | VO | 3.09* | 0.00 |
| 10. I believe that using online learning platform services can simplify the learning process. | 3.72 | VO | 4.23 | VO | 3.52* | 0.00 |
| 11. The set-up of the online learning platform service is compatible with the way I learn. | 3.60 | VO | 4.04 | VO | 3.26* | 0.00 |
| **Behavioral Intention** | | | | | | |
| 12. I intend to use online learning platform to assist my learning. | 4.02 | VO | 4.24 | VO | 1.90 ns | 0.06 |
| 13. I intend to use online learning platform to get updates of my subject knowledge with the latest amendments. | 4.23 | VO | 4.40 | VO | 1.12 ns | 0.26 |
| 14. I intend to use online-learning platform as an autonomous (free) learning tool. | 3.87 | VO | 4.38 | VO | 3.96* | 0..00 |
| *Significant ns Not Significant S = Sometimes VO = Very Often A = Always | | | | | | |

As far as "Self-Efficacy" is concerned, the table also reveals the same Z-scores of 2.18 with significance levels of 0.03 that led to the rejection of the null hypothesis. This result implied a significant difference in the perception of Grade 11 and Grade 12 respondents. Specifically, the Grade 12 group felt more confident while using the online learning platform and while operating the functions of online learning platform than the Grade 11. On the other hand, the Z-value of 1.27 with 0.21 significance level led to the acceptance of the null hypothesis which revealed that the confidence level of the Grade 11 and Grade 12 while using online learning content was the same.

On "Ease of Use", the Z-values from 3.26 to 4.23 with significance levels less than 0.05 led to the rejection of the null hypothesis. As observed, the Grade 12 respondents had significantly higher perceptions about the ease of use of the on-line learning platforms than the Grade 11.

Lastly, in Table 6, on "Behavioral Intention", the Z-value of 3.96 with 0.00 significance level led to the rejection of the null hypothesis. This implied that Grade 12 respondents' intention to use online-learning platform as an autonomous (free) learning tool was much higher than the Grade 11. On the other hand, the Z-scores of 1.90 and 3.12 with significance levels of 0.06 and 0.26, respectively led to the acceptance of the null hypothesis. Hence, the intention to use online learning

platform to assist their learning and to get updates of their subject knowledge with the latest amendments were comparable.

Several studies revealed that learners' perceptions are affected by a host of factors. Factors such as age, gender prior knowledge of computer literacy, and the learning styles of individuals are vital predictors of technology acceptance by students (Salloum *et al.,* 2019; Shrestha *et al.,* 2019; Perez-Perez *et al.,* 2020). Hayat 2019 said that e-Learning tools, including e-mail, dialogue, chat, and instant forums, help to form knowledge and strong opinions among learners. A study conducted by Borisova in 2016 revealed that distance learning could run effectively and efficiently if e-learning platforms facilitate learning activities, the use of precise and innovative learning methods, and specific training conducted.

Multiple studies have found that employing an e-learning platform in the classroom to connect with students in mathematics gives opportunities for students to have access to and understand various examples of mathematical ideas (Swan, 2010). Furthermore, students' perceptions of these online platforms are important in determining how they will react to a sudden shift in classroom teaching approaches and determining whether watching video tutorials and e-learning reduces students' demand for validation. Finally, students' confidence and attitude to complete online learning materials must be considered as one of the factors (Zamari *et al.,* 2012).

**Table 7. Difference in the Perception of the Respondents towards the Use of Online Learning Platforms according to the Major Platforms Used during Pandemic.**

| Indicators | Chi-square | Sig. |
|---|---|---|
| **Usefulness** | | |
| 1. Studying through online learning platform mode provides the flexibility to the study at the time convenient to the learner. | 5.84 $^{ns}$ | 0.32 |
| 2. Online learning platform enables learners to study irrespective of where they are located in the world. | 4.49 $^{ns}$ | 0.48 |
| 3. There are technologies available to enable one to take tests and submit assignments electronically. | 0.91 $^{ns}$ | 0.97 |
| 4. There are electronic tools available to enable interactive communication between teacher and student without meeting face-to-face. | 1.68 $^{ns}$ | 0.89 |
| **Self-Efficacy** | | |
| 5. I feel confident while using the online learning platform. | 12.37 * | 0.03 |
| 6. I feel confident while operating the functions of online learning platform. | 5.37 $^{ns}$ | 0.37 |
| 7. I feel confident while using online learning content. | 8.16 $^{ns}$ | 0.15 |
| **Ease of Use** | | |
| 8. I believe online learning platforms are user friendly. | 2.72 $^{ns}$ | 0.74 |
| 9. It would be easy for me to find necessary information when using an online learning platform. | 3.71 $^{ns}$ | 0.59 |
| 10. I believe that using online learning platform services can simplify the learning process. | 5.27 $^{ns}$ | 0.38 |
| 11. The set-up of the online learning platform service is compatible with the way I learn. | 2.65 $^{ns}$ | 0.75 |
| **Behavioral Intention** | | |

| | | |
|---|---|---|
| 12. I intend to use online learning platform to assist my learning. | 4.45 ns | 0.49 |
| 13. I intend to use online learning platform to get updates of my subject knowledge with the latest amendments. | 5.07 ns | 0.41 |
| 14. I intend to use online-learning platform as an autonomous (free) learning tool. | 6.78 ns | 0.24 |

*Significant ns Not Significant

Table 7 shows the difference in the perception of the respondents towards the use of online learning platforms according to the major platforms used during pandemic.

Under "Usefulness", regardless of what learning platform is used, the extent to which studying through online learning platform mode provided the flexibility to study at the time convenient to them are the same among the respondents. In like matter, the way how online learning platform enabled them to study irrespective of where they were located in the world, the degree to which the technologies available to enabled them to take tests and submit assignments electronically and the contribution of the electronic tools in their interactive communication with their teacher without meeting face-to-face were significantly the same.

Under "Self-Efficacy", from the preceding tables, it was noted that the highest confidence level while using the online learning platform was noted from those who used the "Zoom with at least two platforms brought about the highest". On the other hand, the use of the different platforms did not differentiate the confidence level felt by the respondents while operating the functions of online learning platform and while using online learning content as revealed by the chi-square values of 5.37 and 8.16 with significance levels greater than 0.05 which led to the acceptance of the null hypothesis.

**Table 8. Respondents' Academic Performance in Mathematics.**

| Level | Frequency | Percent |
|---|---|---|
| 90-100 (Outstanding) | 80 | 41.67 |
| 85 - 89 (Very satisfactory) | 82 | 42.71 |
| 80 - 84 (Satisfactory) | 15 | 7.81 |
| 75 - 79 (Fairly satisfactory) | 10 | 5.21 |
| Below 75 (Did not meet expectations) | 5 | 2.60 |
| **Total** | **192** | **100.00** |

Mean = 87.61 (Very Satisfactory)

In terms of "Ease of Use", regardless of what on-line learning platform is used, the respondents' belief that online learning platforms are user friendly, that it would be easy for them to find necessary information when using an online learning platform, that using online learning platform services can simplify the learning process and the set-up of the online learning platform service was compatible with the way they learn were comparable.

Lastly, as to "Behavioral Intention", no matter what platforms are used, the intent of the respondents in the use of online learning platform was similar.

According to local studies students' perceptions of their abilities to use online learning platforms, watch video lectures, and comply with requirements online are unaffected by their socioeconomic position or any other criteria. Whatever position individuals' hold in life has no bearing on their judgment of their capacity to use online learning tools (Cortez, 2020). However, several studies

also concluded that online learning platforms helps acquire information, creativity and heighten self-esteem among students and that more online learning possibilities for a wider audience should be made available. In 2017, Tossy discovered a positive significant link between student trust in online learning platform and student performance.

Table 8 reveals that majority of the respondents obtained grades from 85-89 or "Very satisfactory" numbering 82 or 42.71 percent out of 192. This was followed by 80 or 41.67 percent with grades from 90-100 or "Outstanding". There were 15 or 7.81 percent with grades of 80-84 or "Satisfactory", 10 or 5.21 percent from 75-79 or "Fairly satisfactory" and five or 2.60 percent "Below 75 or "Did not meet expectations". The mean grade was 87.61 or "Very Satisfactory".

In Table 9, none among the indicators of "Usefulness" were significantly associated with the academic performance of the respondents in mathematics. This was revealed by the correlation values from -0.11 to 0.02 with significance levels greater than 0.05. This led to the acceptance of the null hypothesis which states that there is no significant relationship between the perception of the respondents towards the use of online learning platforms and their academic performance in mathematics.

As to "Self-efficacy", the correlation value of -0.14 with 0.02 significance level led to the rejection of the null hypothesis. This implied a significant but inverse relationship; thus, it was noted that there is a possibility that as the confidence of the respondents while using online learning content increases, chances are, their academic performance in mathematics decreases. A study found that students' confidence in online learning tools has a significant relationship with their performance (Kisanjara *et al.,* 2017).

One among the indicators of "Ease of Use" was significantly related with the academic performance of the respondents in Mathematics. This was revealed by the correlation values from -0.14 with 0.02 significance levels which led to the rejection of the null hypothesis. Thus, there is a significant but indirect connection between the belief that using online learning platform services can simplify the learning process, and the academic performance in mathematics. Chances are, the stronger that this belief is manifested by the respondents, their academic performance in Mathematics also gets lower.

Finally, none among the indicators of "Behavioral Intention" were significantly associated with the academic performance of the respondents in mathematics. This was revealed by the correlation values of -0.11, -0.09 and -0.05 with significance levels greater than 0.05. This led to the acceptance of the null hypothesis; hence, their intention of using the online learning platform has no bearing on their academic performance in Mathematics.

**Table 9. Relationship between the Perception of the Respondents towards the Use of Online Learning Platforms and their Academic Performance.**

| Indicators | Corr. | Sig. |
|---|---|---|
| **Usefulness** | | |
| 1. Studying through online learning platform mode provides the flexibility to the study at the time convenient to the learner. | -0.11 $^{ns}$ | 0.06 |
| 2. Online learning platform enables learners to study irrespective of where they are located in the world. | -0.05 $^{ns}$ | 0.34 |
| 3. There are technologies available to enable one to take tests and submit assignments electronically. | 0.02 $^{ns}$ | 0.69 |
| 4. There are electronic tools available to enable interactive | -0.04 $^{ns}$ | 0.50 |

| | | |
|---|---|---|
| communication between teacher and student without meeting face-to-face. | | |
| **Self-Efficacy** | | |
| 5. I feel confident while using the online learning platform. | -0.03 $^{ns}$ | 0.59 |
| 6. I feel confident while operating the functions of online learning platform. | -0.02 $^{ns}$ | 0.71 |
| 7. I feel confident while using online learning content. | -0.14$^{*}$ | 0.02 |
| **Ease of Use** | | |
| 8. I believe online learning platforms are user friendly. | -0.07 $^{ns}$ | 0.25 |
| 9. It would be easy for me to find necessary information when using an online learning platform. | -0.06 $^{ns}$ | 0.33 |
| 10. I believe that using online learning platform services can simplify the learning process. | -0.14$^{*}$ | 0.02 |
| 11. The set-up of the online learning platform service is compatible with the way I learn. | -0.07 $^{ns}$ | 0.26 |
| **Behavioral Intention** | | |
| 12. I intend to use online learning platform to assist my learning. | -0.11 $^{ns}$ | 0.07 |
| 13. I intend to use online learning platform to get updates of my subject knowledge with the latest amendments. | -0.09 $^{ns}$ | 0.15 |
| 14. I intend to use online-learning platform as an autonomous (free) learning tool. | -0.05 $^{ns}$ | 0.38 |
| *Significant $^{ns}$ Not significant | | |

Several studies have been conducted in different countries to determine the factors that could influence students' performance in mathematics (Mohd, 2011). According to George-Walker and Keeffe (2010), there may be changes in students' performance in mathematics if technology can be embedded in the teaching and learning of mathematics classrooms and outside of this environment. Jo et al. (2015) used a prediction model to try to figure out which aspects of learning analytics are most important for students' learning success. The final grades were not predicted by the total amount of time spent in an online learning platform, interactions with the content, interactions with peers, or interactions with the instructor. However, a study conducted by Tossy (2017) found a significant link between student performance and trust in e-learning tools. Similarly, a study conducted by Zelkowski in 2013 reported on the collection of international research disclosing that students learn mathematics better when effective and appropriate technological tools are utilized.

**Conclusion**

In general, the learners' perceptions on the usage of online learning platforms did not differ significantly across the profile variables. Some precise indicators, however, may differ. The study discovered that students' perceptions of online learning platforms in terms of usefulness and ease of use differed greatly depending on their grade level. Grade 12 students, on the other hand, were more likely to believe that they are comfortable using online learning platforms and content. Similarly, when it came to behavioral intentions, grade 12 students were more inclined to use an online learning platform as an autonomous (free) learning tool. Furthermore, students who used various online learning platforms were more likely to consider themselves as confident in their usage of these platforms, according to the research. The students' perceptions toward using online learning platforms were not significantly linked to their academic performance. However, the study discovered that

students' self-efficacy perceptions, specifically their confidence when using online learning content, were highly associated, but only in an indirect way. Their perception that using online learning resources may make the learning process easier yielded a highly significant but unfavorable link.

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