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The Readiness on Virtualisation in the New Normal and Educational Outcomes among NISU Students

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Abstract

Virtualisation has been a significant part of the educational system since the COVID-19 pandemic, enhancing the learning process through computational technologies. A descriptive correlation study conducted at Northern Iloilo State University (NISU) in the Philippines found that students have a moderately high capacity to adapt to virtualisation using various tools, and the educational outcomes are moderately favourable. However, the results are not guaranteed due to mental and psychological readiness, material resources, and IT infrastructures. An intensive review of remote learning initiatives through virtualisation is recommended to promote highly favourable educational outcomes for public university students at NISU and the country to achieve the expected outcomes.

Keywords: *virtualisation, new normal education, educational technology, correlational study*

1. Introduction

Before the emergence of COVID-19, societies had been adaptive to advanced technologies in response to the changes brought about by the so-called 4th Industrial Revolution (Lagendorf, 2020). These rapid technological changes resulted in a paradigm shift in the daily lives of humanity as they try to cope with the use of digital technologies and the application of virtualisation in all walks of life, including education (UNESCO, 2020).

Modern information technologies (IT) are becoming essential to the educational process. As a result, the IT revolution gives education new forms and raises educational standards (Targamadze et al., 2010). Virtualisation technologies, which substantially impact the teaching-learning process, are an alternative answer in the IT world for educational institutions that frequently lack IT resources (Misevicie et al., 2012). By facilitating better access to materials, virtualisation technologies offer a solution to increase educational accessibility, particularly for distance learners (Kurilovas & Dagiene, 2009).

2. Literature Review

Numerous articles and research (Baloran, 2020; Mateo, 2020; Rotas & Cahapay, 2020) witness the advantages and possibilities that can be observed (BouSaba et al., 2010) as well as the difficulties that the students have in adopting virtual technology in the classrooms. From the perspective of the students and in the setting of public higher education institutions, positive and harmful educational effects are already expected (Bao, 2020).

The deadliest event to humanity, COVID-19, broke out in the latter part of 2019 (Zhang, 2020). The teaching-learning process was forced to switch from an offline to an online mode on an untested and unprecedented scale, making it one of the worst disruptions to the global educational system (Burgess & Sievertsen, 2020). This event opened the door for the teaching-learning process to be virtualised in most educational systems worldwide (Sun et al., 2020), which came with much trial and error and uncertainty for everyone (Basilaia & Kvavadze,

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2020). Despite efforts to make education accessible to everyone, studies have shown that remote learning and virtualisation present several issues since they worsen student disparities (Rotas & Cahapay, 2020).

This type of classroom modality has obstacles and challenges because it is difficult to adapt to new learning styles and because of unreliable internet access. While the latter relates to the poor degree of adaptation caused by the lack of material resources and IT infrastructures, the former is a sign of low mental and psychological preparation, which may cause unfavourable educational outcomes (Baticulon et al., 2020). Additionally, as students are compelled to use virtual learning environments more frequently, they experience increased anxiety and negative attitudes toward learning and the accompanying procedures (Baloran, 2020), negatively impacting their performance (Alvarez, 2020).

Results from education are evaluated both directly and indirectly. Indirect measures include course evaluations, student surveys, course enrolment data, retention in the major, alumni surveys, and graduate school placement rates based on the Centre for Teaching Innovation of Cornell University. Direct measures may include homework, quizzes, exams, reports, essays, research projects, case study analysis, and rubrics for oral and other performances. Because students have been given more freedom to explore and the virtual environment is now accessible at all times and locations, adopting virtualisation positively impacts direct educational results (Crawford et al., 2020). These educational outcomes, however, do not apply to indirect measurements because they necessitate a critical and analytical approach in contrast to direct measures (Baticulon et al., 2020).

In general, this study found a link between students' ability to adjust to virtualisation and their academic performance when using virtual tools in the classroom. It has specifically identified the various virtual tools used in the New Normal, assessed how well students can adjust to virtualisation in terms of their mental and psychological preparedness, material resources, and online infrastructures, identified the direct and indirect educational outcomes among students while utilising the virtual tools, and examined the link between students' ability to adapt to virtualisation and educational outcomes while using the tools. In the case of Northern Iloilo State University in the Philippines, this research has yet to pinpoint the same questions. Thus, this investigation was carried out.

3. Research Objectives

This study aimed to gather empirical evidence about the relationship between a student's ability to adjust to virtualisation and the learning outcomes when using virtual tools in the classroom. The study was able to accomplish the following goals in more detail:

1. To identify the different virtual tools utilised during the New Normal;
2. To evaluate the capacity of the students to adopt virtualisation regarding mental and psychological readiness, material resources, and online infrastructures;
3. To determine the direct educational outcomes among students while utilising virtual tools and
4. Analyse the relationship between students' capacity to adopt virtualisation and educational outcomes while utilising the virtual tools in class.

3.1. Null Hypothesis

Ho: There is no significant relationship between students' capacity to adopt virtualisation an educational outcome while utilising the virtual tools in class; the hypothesis below was drawn at a 0.05 level of significance

4. Research Methodology

4.1. Research Design

Using a descriptive-correlational research design, the study established empirical data to analyse the relationship between students' ability to adjust to virtualisation and educational outcomes when conducting virtual mode in attending classes. While correlational research compares two or more variables, groups, or entities and allows testing of the expected relationships between and among variables as well as the making of predictions without establishing cause and effect (Quaranta, 2017), descriptive studies aim to make an overview of the current state

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of the variables used (Stangor, 2011). The descriptive portion of this study was carried out by surveys utilising a questionnaire created by the researcher. The correlation between the variables was determined based on the information gathered during the survey.

4.2. Research Instruments

A researcher-designed questionnaire was used to gather information from the students attending several Northern Iloilo State University campuses. Using Cronbach Alpha, the validity of the survey questionnaire was evaluated to demonstrate the internal consistency of the assertions in the instrument. Parts III and IV of the survey questions produced test results of 0.89 and 0.85, respectively, signifying internally consistent claims.

The survey questionnaire has four parts. The first part elicited the demographic profile of the students; the second part determined the different virtual tools used in classes; the third part elicited the capacity of students to adapt to the use of virtual technology, and the fourth part determined the direct and indirect educational outcomes to students when they use virtual technologies in attending their classes. The third and fourth part of the questionnaire has a Five Point Likert Scale designed to interpret the descriptive results verbally. Verbal interpretations of the data were assigned to describe the students' capacity to adopt virtual technology while attending their classes.

To collect data, a Five-Point Likert Scale score sheet was used.

Range	Response for Capacity to Adapt to Virtualization	Response to Educational Outcomes
4.51 – 5.00	Very High	Very Favourable
3.51 – 4.50	High	Favourable
2.50 – 3.50	Moderately High	Moderately Favourable
1.51 – 2.50	Low	Fairly Favourable
1.00 – 1.50	Very Low	Not Favourable at all

4.3. The Respondents, Data Gathering Procedure, and Technique

Three hundred eighty-three students responded to the online survey and were included as respondents of this study. Convenience sampling was employed in gathering the data. Due to health protocols related to the COVID-19 pandemic, the survey was done online through Google Forms. A quantitative analysis was employed in the study using various statistical elements to provide descriptions and interpretations of the gathered information regarding the various virtual resources used by students, their capacity to adapt to virtualisation in terms of mental and psychological readiness, material resources, and online infrastructures; and the direct and indirect educational outcomes among the students.

4.4. Data Analysis

The data were analysed using descriptive and inferential statistical methods, such as the frequency count and percentage, which were then ranked, followed by the mean. The standard deviation was also used to assess the replies' homogeneity and heterogeneity. Spearman's rho, a non-parametric statistical tool for correlation analysis, was utilised for inferential statistics. The data elicited during the survey were usually distributed, and the sample size was greater than 30 (Quaranta, 2017). Non-parametric statistics for correlation were employed to study the relationship of the conditions for employing parametric tools like random or probability sampling

The study's use of convenience sampling, a non-random sampling approach, meant that the presumptions mentioned earlier needed to be met. Therefore, the non-parametric test was run even if the second and third requirements were satisfied. The confidence interval level was established at 95%, and as a result, the threshold

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for rejecting the put-forth hypothesis was set at a 0.05 level of significance. The Statistical Package for Social Sciences (SPSS) program calculates all tests.

5. RESULTS AND DISCUSSION

5.1. The Different Virtual Tools Utilised in Class During the New Normal

Results from Table 3 display the various virtual learning technologies used in lectures at Northern Iloilo State University during the New Normal. It was discovered that social media tools like video feeds and conversations are the most popular among these technologies (Rank 1: 378, 98.7%). Then came Zoom (Rank 3: 298, 77.8%), Google Meet (Rank 2: 352, 91.9%), file attachments in emails and messenger (Rank 4: 255, 66.6%), and Google Meet (Rank 3: 298, 77.8%). Teams (Rank 5: 15, 4.0%) and Canvas (Rank 6: 10, 2.6%) are the least used virtual tools.

These findings demonstrate that social media video streams and chats are more accessible to teachers and students because of their simple operational procedures and ease of usage. Similarly, students and teachers like utilising Google Meet and connecting it with Google Classrooms since it is convenient. Since not all students have computers or tablets, these virtual tools can be accessible with internet data on mobile devices such as cellular phones.

Zoom is hardly ever utilised. It might be challenging to access, unlike social media and Google Meet. Since asynchronous meetings are not permitted, file attaching via email and messenger is only used to supplement the classroom. It has successfully uploaded the files that both professors and students need. Finally, because of their intricate operational procedures and high data use demands, Teams and Canvas may not be well-liked by professors and students.

The virtual tools indicated above demonstrate Northern Iloilo State University's use of virtualisation. It supports the findings of earlier studies that the COVID-19 pandemic has caused a significant and unprecedented shift in online education delivery (Zhu & Liu, 2020). Similar to COVID-19, which opened the door for virtualisation of the teaching-learning process in the majority of educational systems worldwide (Sun et al., 2020), virtualisation appears to be the only option for schools to survive despite trial and error and uncertainty for everyone (Basilaia & Kvavadze, 2020). The many virtual technologies that Northern Iloilo State University students and faculty tested during the New Normal demonstrate this.

Table 1. Virtual Tools Utilised in Class during the New Normal

Virtual Tools	Frequency	Percentage	Rank
Social Media (Video Feeds and Chats)	378	98.7	1
Google Meet/Classroom	352	91.9	2
Zoom	298	77.8	3
File attaching/Email and Messenger	255	66.6	4
Teams	15	4.0	5
Canvas	10	2.6	6

5.2. The Capacity of the Students to Adapt to Virtualization Regarding Mental and Psychological Readiness, Material Resources, and Online Infrastructures

As a whole (x = 2.76), as well as in terms of the indicated domains, including mental and psychological preparation (x = 3.05), material resources (x = 2.59), and online infrastructures (x = 2.65), NIPSC students have

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a moderately strong capacity to adapt to virtualisation. The limited dispersion of the standard deviations of 0.394, 0.425, 0.341, and 0.415 indicates homogeneity in the answers based on the means.

The average ability of students at Northern Iloilo State University to adapt to virtualisation is relatively high, suggesting that some issues may eventually need to be addressed to improve their ability. These areas have been identified as having high results, such as material resources, internet infrastructures, and mental and psychological preparation.

The findings also suggest that, despite the college's efforts to enable remote learning through virtualisation, the students still need help with several difficulties and impediments. The students may have needed help adjusting to the new method because they need more material resources or more intellectually and psychologically prepared. One significant area for improvement may be the country's connectivity problems, particularly in rural areas.

Previous research found that despite schools' best attempts to make education accessible for their students, remote learning and virtualisation revealed many issues, such as worsening student inequality. Similarly, difficulty transitioning to new learning styles, inadequate connectivity, and a lack of physical resources like computers and mobile phones may be the root of students' difficulties and barriers while utilising virtual tools (Baticulon et al., 2020).

Therefore, challenges are inevitable and appear difficult for Filipino university students (Mateo, 2020), especially in public schools like Northern Iloilo State University, despite the efforts of universities in the country to continue the schooling of the students during a pandemic by adopting New Normal modalities through the introduction of various virtual tools. Similarly, not all students, particularly in underdeveloped nations like the Philippines, can adapt to the quick technological advancements of the modern digital age, especially if pressures are placed on these attempts, such as during the COVID-19 pandemic (Alvarez, 2020).

These arguments are supported by some questions about the student's ability to adapt to it (Vegas, 2020), including those about their material resources, mental and psychological readiness to use the system, and the IT infrastructures required to adopt virtualisation during the new normal (Lu et al., 2018). The ability of developing nations to adopt these technologies is impacted by many elements and regions (Dhawan, 2020).

Table 2.The Capacity of the Students to Adapt to Virtualization RegardingMental and

Psychological Readiness,Material Resources, and Online Infrastructures

Areas	Mean	Verbal Interpretations	SD
Mental and Psychological Readiness	3.05	Moderately High	0.4251
Material Resources	2.59	Moderately High	0.3411
Online Infrastructures	2.65	Moderately High	0.4151
Overall Mean	2.76	Moderately High	0.3938

5.3.The Direct and Indirect Educational Outcomes Among Students While Utilising Virtual Tools in Attending Classes

Table 4 displays the pupils' direct and indirect educational outcomes. Students' perceptions of the direct educational consequence of using virtual tools in the classroom are optimistic (x = 4.52), but their perceptions of the indirect educational outcome are more favourable (x = 2.45). Northern Iloilo State University students had moderately favourable (x =3.49) educational results due to using virtual resources. The 0.443, 0.398, and 0.421 acquired standard deviations, respectively, show a tight dispersion, indicating homogeneity of the answers based on the obtained means.

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The findings suggest that students must take advantage of other aspects of virtualisation in the classroom. Remembering the literature reviews, we can argue that assignments, tests, exams, reports, essays, research projects, case study analyses, and rubrics for oral and other performances are all ways that direct educational results are evaluated. Virtualisation is incredibly beneficial for students, particularly in improving their performances in the mentioned areas. This result also implies that the pupils can explore the Internet thanks to the virtual tools, which is beneficial for raising their performance levels. Because students have been given more freedom to experiment with making the virtual environment accessible wherever and whenever they choose, these findings support the claim that virtualisation positively influences direct educational outcomes (Crawford et al., 2020).

For indirect educational benefits, however, the outcome is different and shows generally positive results. This outcome suggests that virtualisation is only marginally practical for students to achieve the intended educational goals. This finding may be because indirect educational outcomes such as course evaluations, student surveys, course enrolment data, retention in the significant, alumni surveys, and graduate school placement rates necessitate critical analysis from the students and that simple Internet browsing is insufficient to comprehend such measures, which call for higher-order critical thinking abilities. Given the need for higher-order critical thinking abilities, which not all students at Northern Iloilo State University possess, virtualisation does not improve the indirect educational results for students in this regard (Baticulon et al., 2020).

Table 3.The Direct and Indirect Educational Outcomes Among StudentsWhile Utilising Virtual Tools in Attending Classes

Educational Outcomes	Mean	Verbal Interpretations	SD
Direct educational outcomes	4.52	Very Favourable	0.443
Indirect educational outcomes	2.45	Fairly Favourable	0.398
As s whole	3.49	Moderately Favourable	0.421

6.4. The Relationship Between Students' Capacity to Adapt to Virtualization and Educational Outcomes While Utilising Virtual Tools During Class

The findings of a correlation analysis utilising Spearman's rho on the association between students' ability to adjust to virtualisation and educational outcomes while using virtual tools in class are presented in Table 6.

While using virtual tools in class, the ability to adapt to virtualisation and educational outcomes have a substantial and favourable link (r=0.688). Results also showed a strong and positive correlation between the direct educational outcomes when using virtual tools in class and the student's ability to adopt virtualisation in terms of mental and psychological readiness (=0.781), material resources (=0.812), and online infrastructures (=0.971). Additionally, with Spearman's rho coefficient values of 0.711, 0.833, and 0.757, the ability of the students to adjust to virtualisation in terms of the characteristics above is also strongly connected with indirect educational outcomes.

The p-values of 0.001 indicate significant correlations between and among the variables. The null hypothesis of no significant correlation between students' ability to adapt to virtualisation and educational outcomes while using virtual tools in class, taking into account the various variables associated with it, was therefore rejected at a significance level of 0.05.

The findings imply that the student's ability to adapt to virtualisation is directly correlated with the overall and specific areas of these variables' educational outcomes, i.e., the positive educational outcomes depend on the student's ability to adapt to virtualisation. In other words, regardless of the dimensions, a positive educational outcome may be anticipated, provided students are intellectually and psychologically prepared and have enough

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material resources and online infrastructures to adapt to virtualisation. Additionally, the vital capacity of the students to adapt to virtualisation anticipates successful academic results.

These findings support the assertions made by Targamadze et al. (2010) that contemporary ITs are becoming an essential component of the educational process, which is undergoing positive and dynamic changes that raise the bar for instruction. Similarly, virtualisation technologies increase educational accessibility, particularly in distance learning, by facilitating quicker access to materials, particularly in the current era of the New Normal (Kurilovas & Dagiene, 2009). This finding results from using virtual classrooms; students and teachers can easily access various courses and materials in the computing environments provided by virtualisation. Additionally, virtualisation technologies have emerged as a substitute solution that considerably enhances the teaching and learning process due to the limited IT resources an institution may offer (Misevicie et al., 2012).

On the other hand, despite efforts to make education accessible to everyone, issues have been identified through remote learning and virtualisation (Rotas & Cahapay, 2020). The disparities between students are worsening due to these technologies, especially those between public and private schools, where the latter frequently require more funding to implement the technology. Like Northern Iloilo State University's pupils, public school students frequently fall into low-income demographics, preventing them from accessing these technologies. Additionally, as more students are compelled to use virtual learning environments, the more nervous and unfavourable their views toward learning and its procedures become. Unfavourable educational outcomes are thus possible (Baloran, 2020). Additionally, encouraging pupils to learn in a virtual environment might lead to stress and lower performance (Alvarez, 2020).

Table 4.Relationship Between Student's Capacity to Adopt Virtualisation and Educational OutcomesWhile Utilising Virtual Tools During Class

Variables		Spearman's rho Correlation Coefficient	p-value
Capacity to Adopt Virtualisation	Educational Outcomes	0.688	0.000
Mental and Psychological Readiness	Direct Educational Outcomes	0.781	0.000
Material Resources		0.812	0.000
Online Infrastructures		0.971	0.000
Mental and Psychological Readiness	Indirect Educational Outcomes	0.711	0.000
Material Resources		0.833	0.000
Online Infrastructures		0.757	0.000

6. Conclusions

The findings suggest that students at public colleges, including Northern Iloilo State University, are aware of and have been using virtual technologies, including social media in video streams and chats, Google Meet, Zoom, and conventional file attachments through emails and messenger. A strong propensity for adaptability to these technologies has also begun with familiarising oneself with more complex virtual software like Teams and Canvass.

Although there are many opportunities for virtualisation adaption, it was shown that these opportunities depend on various conditions. These include the students' mental and psychological preparedness for virtualisation, the accessibility of material resources, and nearby IT infrastructures like good reception connectivity. The difficulties with adapting to new learning styles may be used to build mental and psychological preparation. The

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students' socioeconomic condition, or perhaps institutional and governmental assistance, can be linked to the accessibility of material resources and IT infrastructures.

It was also clear that positive educational outcomes are only sometimes assured despite efforts to adapt to the New Normal through virtualisation and despite a direct positive association between students' ability to adjust to virtualisation and educational performance. The study's findings suggest that public colleges like Northern Iloilo State University should look at ways to maximise their usage of virtualisation, where appropriate information, training, and support must be provided to both students and the technology's implementers.

To achieve the desired results, which include the promotion of highly favourable educational outcomes for public university students at Northern Iloilo State University and throughout the nation, initiatives concerning the delivery of instruction using the remote learning process through virtualisation should be thoroughly reviewed.

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