Students' experiences of learning in virtual classrooms facilitated by Google Classroom

Wahid Bakar Hamad [a] * iD

[a] Institute of Social Work, Dar es Salaam, Tanzania

Highlights	Abstract
- Google Classroom as a learning tool facilitates students' experiences and interaction with the teacher, and access to both printed and soft copy materials. - Google Classroom is considered a promising tool for enhancing student online/blended learning experiences. - A positive reaction demonstrated by the students on the online/blended learning experience of using Google Classroom as a learning tool. - Integrating the use of web 2.0 tools such as Google Classroom to facilitate online/blended teaching and learning at the institute was suggested. **Research Article** **Keywords:** Google Classroom, Student Experiences, Virtual Classroom, Blended Learning, Activity Theory	The study evaluated students' experience of learning with virtual classrooms facilitated by Google Classroom at the Institute of social work, Dar es Salaam, Tanzania. The study employed the Activity Theory (AT) as a theoretical framework using the first triangle of the activity system, which includes three components - Subject-Tool-Object (STO). This study adopted an anonymous online survey for data collection and the quantitative method was used to analyze data. Additionally, the survey questionnaires were prepared and distributed using the KoBo Toolbox. The sample size of 79 (96%) questionnaires was considered from a subgroup of institute students, which includes a Bachelor's degree in Labor Relations and Public Management (BLRPM), an Ordinary Diploma in Labor Relations and Public Management (ODLRPM), and a Basic Technician Certificate in Labor Relations and Public Management (BTCLRPM) from the labor studies departments. The findings revealed that the student's opinions specified that overall students were more interested in learning activities using the Google Classroom platform as a learning tool and they managed to achieve learning goals in the ICT module. Alternatively, the findings from ANOVA comparing the differences between the groups of students concerning the use of Google Classroom as a learning tool revealed that the ODLRPM and BTCLRM students demonstrated higher online/blended learning experiences of using Google Classroom for the ICT module compared to BLRPM students. In conclusion, the study calls for institute policymakers to plan and offers the use of web 2.0 tools such as Google Classroom to facilitate online/blended teaching and learning at the institute.

1. Introduction

Undoubtedly, the 21st century has testified to the advancements in modern information and communication technology (ICT) (Moonma, 2021; Patterson et al., 2020; Zhou et al., 2022). The concept of 21st-century education proposed that lecturers/instructors use digital tools such as laptops, personal digital assistants, images, text, audio, and video (Gupta & Pathania, 2021; Malecela & Hassan, 2019) to expand their teaching and ensure their students/learners acquired the required of 21st-century skills (Famularsih, 2020; Oladele et al., 2021). Besides, 21st-century education encouraged students/learners to collaborate, communicate, and

develop creativity and critical thinking skills (Haji, 2022; Kazoka & Mwantimwa, 2019). Additionally, it permits the development of better information services and the transformation of the education system (Gupta & Pathania, 2021; Tue & Hanh, 2021).

Based on its potential, many schools, colleges, institutions, and universities around the world embrace 21st-century innovative technologies to enhance teaching and learning activities (Gupta & Pathania, 2021; Ogegbo & Adegoke, 2021). More specifically, they are considered vital and useful tools for curriculum delivery (Jaca, 2022; Patterson et al., 2020) and a potential substitute for conventional classroom-based learning (Zhou et al., 2022). These innovative technologies have rapidly transformed higher learning institutions' approaches to the technological demand (Kazoka, 2020; Jiang et al., 2022). Furthermore, the existence of these innovative technologies, such as e-learning platforms, has offered most higher-learning institutions around the world online/blended teaching and learning modes (Gurban & Almogren, 2022; Jiang et al., 2022). The current study by Patterson et al., (2020) reported that the rapid expansion of usage of innovative technologies turned out to be unavoidable in facilitating online content delivery within today's tertiary landscape. In some higher learning institutions, they used the e-learning platform such as Schoology, CANVAS, and Blackboard (Almas et al., 2021; Annurwanda & Winata, 2021) to offer full online learning without any face-to-face interactions with the aid of devices such as computers, smartphones, tablets and iPads (Gurban & Almogren, 2022; Mensah et al., 2022) which is called e-learning. In some contexts, higher learning institutions offered a teaching mode that integrated a combination of online interactive activities with face-to-face learning. This included the use of both face-to-face and online learning interactions (Haji, 2022; McKenzie et al., 2022) which is called blended learning. It has been proven that these methods offered a better learning experience and improved education quality (Gedera, 2014a; Mensah et al., 2022).

In Tanzania's context, many higher learning institutions reported adopting and using these emerging e-learning technologies in promoting and enhancing teaching and learning activities (Hamad, 2022b, 2022a; Ibrahim et al., 2020;). Previous studies indicated that many Tanzanian higher learning institutions have experienced the potential of using these emerging e-learning technologies such as Moodle, Schoology, CANVAS, and Blackboard (Almas et al., 2021; Annurwanda & Winata, 2021; Ibrahim et al., 2020; Mtebe et al., 2021) in promoting and enhancing the 21st-century teaching and learning process.

Despite the incredible efforts that have been made by the management of the Institute of Social Work, Dar es Salaam, which included the improvement of the infrastructure, increasing the accessibility of the wired and wireless network, and the distribution of ICT devices such as projectors to facilitate teaching and learning activities. Still, no attention has been paid to offering some of the institute's programs or online/blended learning courses. As a consequence, the potential of these improvements made by the institute has not been fully realized and influential in the teaching activities at the institute. The face-to-face method is mostly used for teaching activities to all undergraduate and postgraduate programs. This may be attributed to the financial constraint, lack of e-readiness, awareness, and knowledge on how to integrate innovative technologies in teaching activities of the management of the institute, instructors, and learners. Moreover, the prior studies on the usage of e-learning technologies in the Tanzanian context have mainly focused on the use of web 2.0 tools such as Edmodo and Moodle (Kazoka & Mwantimwa, 2019; Malecela & Hassan, 2019; Mtega et al., 2013), usage and user attitudes of e-learning (Almas et al., 2021; Hamad,

2022a; Kazoka, 2020), the potential of e-learning (Ibrahim et al., 2020; Lubua, 2015; Mtebe, 2013) and let the usage of some web 2.0 tools such as Google Classroom resting. Little is known about the usage, student learning experiences, and differences in using Google Classroom as a learning tool in Tanzania's context. This will affect the usage and development of online/blended learning environments, and increase the gap between the students in online learning experiences in higher learning institutions in the country, which is then affecting their behavior intention in the adoption and use of technology. Besides, it also affects the requirement to articulate harnessing ICT opportunities to meet the Vision 2025 goals that emphasized the determination of applications of distance education, e-learning, m-learning, and blended learning (Ministry of Education, 2016; Mwakyusa & Ng`webeya, 2022).

this study is guided by the Activity Theory (AT). The AT was found relevant as it offers a broad lens of inquiry and is valuable in highlighting contradictions that happened in universities and institutions (Gedera, 2014a; Pullenayegem et al., 2021), and provided an understanding of learning processes facilitated by Learning Management Systems (LMS) and permitted the investigation and documentation of successful and unsuccessful integration of technologies in online learning environments (Gedera & Williams, 2013; Yakubu & Dasuki, 2021). Therefore, the study set out to answer the following two questions: 1) what are the students' experiences with the use of the Google Classroom platform as a learning tool? and 2) Is there a difference in online/blended learning experiences between the group of students (BLRPM, ODLRPM, BTCLRPM) on the use of the Google Classroom platform as a learning tool at the Institute of Social Work, Dar es Salaam, Tanzania?. Further, the author hopes that the finding provided insights into the students' experiences with the use of the Google Classroom platform as a learning tool at the Institute of Social Work and other higher learning institutions in Tanzania. Besides, the author intends the findings and experiences of using Google Classroom' acts to provide insight into blending learning modes and approaches in higher education. Similarly, the author anticipates the findings can be a launchpad for further studies in a relatively unexplored area in this context.

2. Literature Review

2.1. Theoretical framework

The study employed the Activity Theory (AT) as a theoretical framework. The AT has been used as a theoretical framework for an extensive range of phenomena in many disciplines to capture the complexities involved in learning (Abdullah, 2014; Lee et al., 2021). The Activity theory (AT) has also drawn much attention from academics and researchers interested in the amplification of the ways technology can be exploited within activity systems (Abdullah, 2014; Lioutas et al., 2019) and its high validity has been demonstrated empirically in various earlier studies in the field of education (Alghamdi & Plunkett, 2022; Engeström & Sannino, 2021; Gedera, 2014a) and many others field such as healthcare (Valecha et al., 2019; Yakubu & Dasuki, 2021), and information systems (Simeonova, 2018; Yakubu & Dasuki, 2021).

The AT theory has been accommodated in many studies to recognize the interactions and contradictions of key components of learning in a natural setting (Abdullah, 2014; Lee et al., 2021). Additionally, the AT framework offers a broad lens of inquiry and is valuable in highlighting contradictions that happened in universities and institutions (Gedera, 2014a; Pullenayegem et al., 2021). It provided a wide range of describing the interactions and contradictions within the context in which they occurred and it is mainly

suitable for examining human activities in a study context (Alghamdi & Plunkett, 2022). Besides, previous studies indicated that Activity Theory provided an understanding of learning processes facilitated by Learning Management Systems (LMS) and permitted the investigation and documentation of successful and unsuccessful integration of technologies in online learning environments (Gedera & Williams, 2013; Yakubu & Dasuki, 2021). Therefore, Activity Theory (AT) as a theoretical framework was again deemed relevant to this study as the study focused on the evaluation of students' experience in the interaction with tools (Google Classroom) to achieve desired outcomes. Figure 1 depicts the Activity Theory (AT) as developed by Engeström (1987, 2001).
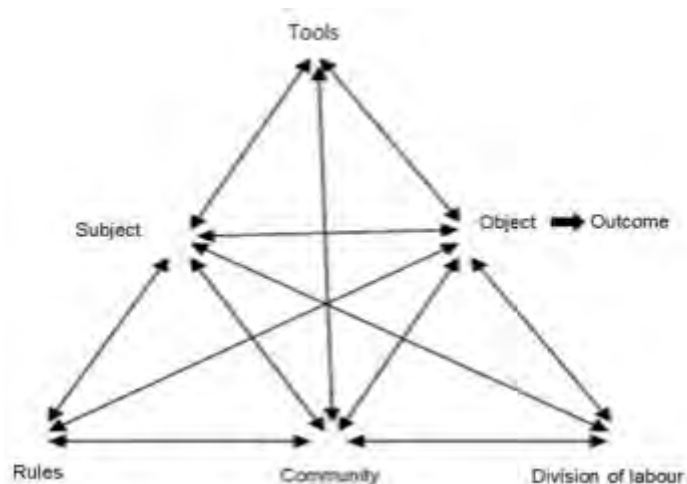

Figure 1: Extended Activity Theory (AT) model by Engeström (1987, 2001)

AT is derived from sociocultural and socio-historical theories. Through the Activity Theory lens, learners' knowledge construction can be observed and analyzed explicitly (Gedera, 2014b; Gedera & Williams, 2013). Besides, the Activity Theory proposed by Vygotsky (1978), regards human interaction with the social world as mediated by semiotic tools and signs (Lee et al., 2021; Soleimani & Rahimi, 2021). The model developed by Vygotsky (1978) used the sociocultural theorist's mediated triangle as a framework to develop Activity Theory, which is then responsible for both individual aspects and the social nature of the activity (Gedera, 2014b). Vygotsky's (1978) model adopted the triangular model that includes tool, subject, and object, which shows the relationships between these elements (Gedera, 2014b; Nguyen & Habók, 2021). Later in 1987, the AT was extended by Engeström (Engeström, 2001) and proposed the second and third versions of AT (Alghamdi & Plunkett, 2022; Yakubu & Dasuki, 2021). Engeström in 1987 considered activity systems as object-oriented, mediated, and collective (Gedera, 2014b; Karanasios, 2013). Engeström (1987) also suggested that human activity expresses itself through the several entities' dynamic and common interrelation. Moreover, added to that the idea of AT arises from the consideration of human activity shaped by subjectivity and experience (Alghamdi & Plunkett, 2022; Soleimani & Rahimi, 2021).

Building on this simple expression of human activity as an extension of Engeström (1987) in the theory, the community, the division of labor, and rules/norms (*Fig. 1*) were added to the activity structure (Gedera, 2014b; Karanasios, 2013). These elements in an activity system act as mediators and the relationships between these elements are continually refereed (Alghamdi & Plunkett, 2022; Gedera, 2014a). Therefore,

as described by Engeström (1987), the Activity Theory model consisted of six main components within a system and the activity is an outcome of the interactions of those components (Lee et al., 2021; Pullenayegem et al., 2020). These components are subject, object, tools, community, rules, and the division of labor (Lee et al., 2021; Soleimani & Rahimi, 2021). The elements work within the activities as follows: an individual or a group of individuals (subject) who are engaged in the activity determined the need to accomplish the aim or goal (object) of an outcome of the activity. An individual or a group of individuals (subjects) can achieve their aim or goal (object) by using certain instruments (tools). In accomplishing this, the individual or a group of individuals (subject) operates within a set of guidelines (rules), recognized by the public (community) who negotiate and mediate the rules that describe how it functions. Finally, the roles and relationships within the community, which is also responsible for organizing how each individual is assigned work (a division of labor) to accomplish the activity goals (outcomes) (Engeström, 2001; Pullenayegem et al., 2020;). In the context of this study, the top triangle of the Activity Theory (part in Orange) is used as a research framework for an in-depth analysis. The framework includes three components which are the Subject-Tool-Object (STO) of the activity system. Figure 2 demonstrates the components used for the analysis of the activity system.
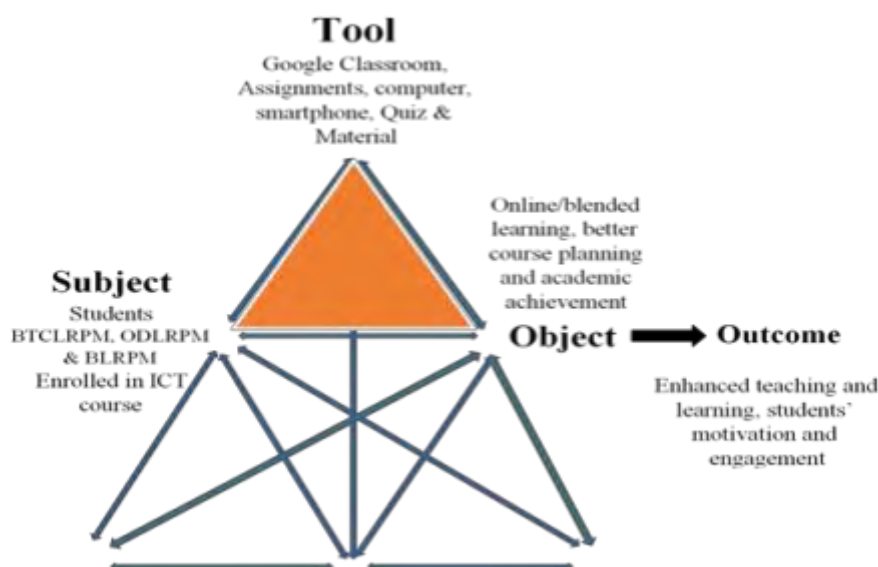

Figure 2: Research Model

Therefore, in the context of this study, the Tools (Google Classroom, Assignments, computer, smartphone, Quiz & Material) are referred to as the mediation tools employed to achieve the goal of the object. The subject (students) referred to as the students (BTCLRPM, ODLRPM & BLRPM) from the labor studies department who were enrolled in the ICT module. The Object (online/blended learning, better course planning, and academic achievement) is referred to as the goal of the activity, which is offering online/blended learning for better course planning and academic achievement using the online platform. These goals of activity resulted in the achievement of the desired outcome (enhanced teaching and learning and students' motivation).

2.2. Student's Experiences with Online Learning

Google Classroom is one of the free services provided by Google in the G-suite for Education plans for education institutions (Alim et al., 2019; Ventayen et al., 2018). It is designed to simplify the instructional, assessment, creation, and distribution of classwork resources (*fig. 6*) in a modern method of teaching and learning (Gupta & Pathania, 2021; Oladele et al., 2021). Additionally, Google Classroom is a suite for education that is easily activated using the Google account (Rahmawati et al., 2020) and integrated with other associated tools such as Google Drive, Google Docs, Google Sheets, Slides, and Google Calendar into a single platform (Alotumi, 2022; Apriani et al., 2020; Saidu & Ibrahim, 2021). It has become helpful for both teachers and students in accessing class materials, conversations, and viewing upcoming assignments via Google Calendar (Rohman et al., 2020) and classwork dashboard (*Fig. 3, 4 & 5*).

The reviewed literature indicated that several e-learning platforms have been adopted and used to facilitate teaching and learning in many higher learning institutions, including Google Classroom, Edmodo, Moodle, and Blackboard (Coman et al., 2020; Tue & Hanh, 2021; Jaca, 2022). However, Google Classroom is one of the most popular and well-known e-learning platforms for online/blended learning (Annurwanda & Winata, 2021; Apriani et al., 2020). According to Haji (2022) Google Classroom offered a platform for online/blended learning in a paperless mode, simplified the creation and submission of students' assignments and obtaining quick grades (*fig. 7*). Besides, previous studies confirmed that Google Classroom as it is easy to use, time-saving, flexible, convenient, and mobile-friendly (Rahmawati et al., 2020; Rohman et al., 2020). More specifically, the previous studies indicated that students demonstrated a positive response to the use of online/blended learning activities using Google Classroom (Famularsih, 2020; Malecela & Hassan, 2019; Moonma, 2021; Ogegbo & Adegoke, 2021). Additionally, Google Classroom enhanced and promoted teaching and learning by improving students' capabilities, and independently working on assignments and class resources (Rohman et al., 2020; Saidu & Al Mamun, 2022). Furthermore, previous studies indicated that Google Classroom is suitable, user-friendly, and offers students the flexibility to accomplish their classwork and receive instant feedback. Additionally, the easy access and printing of online classwork resources at any time and anywhere (Annurwanda & Winata, 2021; Gupta & Pathania, 2021). However, Saidu & Al Mamun (2022) argues that these can only be achieved once the instructor learns and understands the way to produce the courseware successfully within its framework.
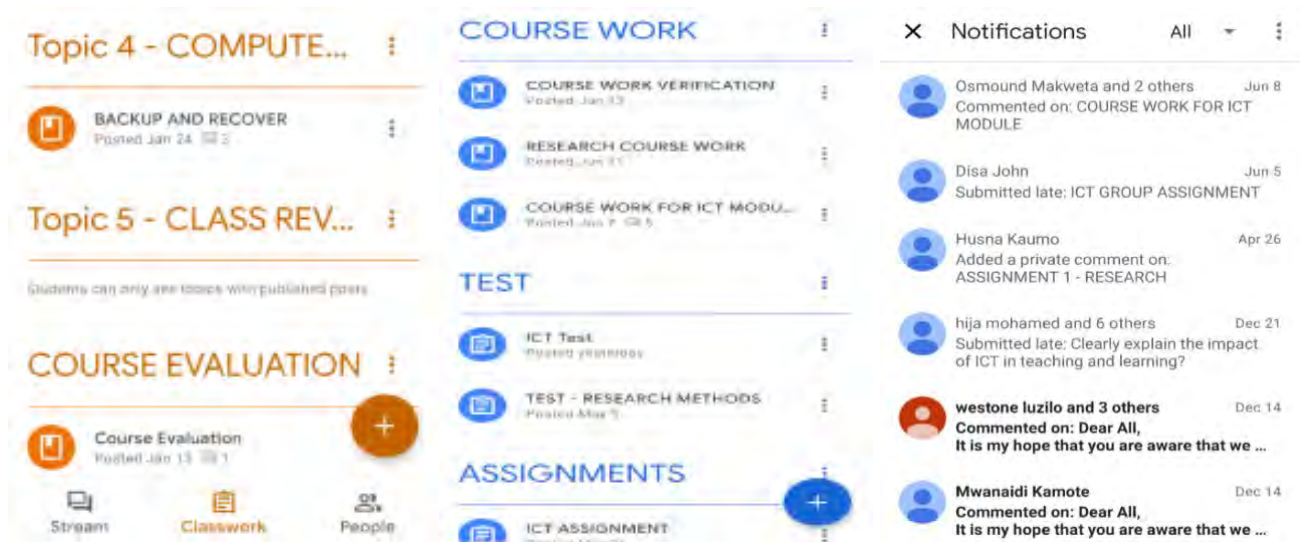
Figure 3: Course Resources   Figure 4: Classwork Dashboard   Figure 5: Classroom Chat

2.3. *Blended Learning Experiences*

The rapid expansion of the usage of innovative technologies around the world emerged a new way of teaching and learning as an alternative to traditional classroom-based strategies. The blended learning method is considered an effective method of teaching and learning in this digital age (Anthony Jnr, 2022; Famularsih, 2020; Mtebe, 2013). Mixing modern ICT tools and traditional face-to-face strategies in the classroom facilitated the communication processes and build trust between students and teachers in providing a blended classroom experience (McKenzie et al., 2022; Nayar & Koul, 2020). Additionally, compared with traditional classroom-based learning, the combination of face-to-face, and online delivery has proven to be more flexible and increases the educational territories without time and space restrictions (Tue & Hanh, 2021; Zhou et al., 2022). For instance, the previous studies confirmed that using blended learning contributes to providing flexibility between teachers and students to use ICT tools and offering opportunities for both sharing class roles, interactive online, and face-to-face (McKenzie et al., 2022; Nayar & Koul, 2020).

Further, previous studies indicated that the use of blended learning has been recognized to offer learners opportunities for selecting anywhere, anytime learning while interacting with instructors and other students (Tue & Hanh, 2021; Namyssova et al., 2019). Besides, blended learning provided the possibility of taking the best of both face-to-face and online learning experiences which then improves the efficiency, and effectiveness of the learning experiences (Gurban & Almogren, 2022; Mtebe, 2013). Furthermore, blended learning offered opportunities to build meaningful pedagogical activities while offering instructions and electronic resources in a collaborative setting (Saidu & Ibrahim, 2021; Ventayen et al., 2018), thereafter boosting student engagement and learning experiences (Alotumi, 2022; Gurban & Almogren, 2022). The current study by (Patterson et al., 2020) confirmed that students positively perceived the use of modern learning methods, such as using short videos that brief the weekly lecture content as useful and helped them in assessment preparation, better understanding, and knowledge retention. Additionally, according to a study conducted (Haji, 2022) enhanced that blended learning offered learners an effective learning

environment that motivates them to actively participate (Alotumi, 2022; Gurban & Almogren, 2022) and successfully enhanced skills acquisition (Gurban & Almogren, 2022; Namyssova et al., 2019).

3. Methodology

3.1. Research design

The study focused on the Institute of Social Work, Dar es Salaam, Tanzania. The study adopts a survey as a research design. The survey design investigates administering a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviors, or characteristics of the population Creswell (2012). İt offers the identification of important beliefs and attitudes of individuals. Based on the nature of this study, it explores the student's opinions and characteristics, and the survey design was deemed the most appropriate design for this study.

3.2. Participants and settings

The participants of this study were undergraduate students from the Department of Labor Relations and Public Management. The group of students includes a Bachelor's degree in Labor Relations and Public Management (BLRPM), an Ordinary Diploma in Labor Relations and Public Management (ODLRPM), and Basic Technician Certificate in Labor Relations and Public Management (BTCLRPM). This group of students was selected as the only group that had online/blended learning experiences using Google Classroom at the institute. The students were invited to join the Information and Communication Technology (ICT) module based on their level of study in separate classes for each program. The ICT course was offered in semester 1 for the bachelor's degree and diploma students and in semester 2 for the certificate students. The ICT module used Google Classroom as a learning platform to support online/blended learning for these targeted students. The students were given a short orientation on how to use, and join to class, and the features of the Google Classroom platform at the beginning of the course.

As provided in Table 1, the finding concerning the gender of the participants indicated that most participants were female (52%) followed by males (48%). Additionally, regarding the age of the participants, most participants (47%) fell within the age range of 18 - 25 years old, (41%) were within the age range of 26 – 32 years old, (12%) were within the age range of 33 – 39 years old and no participant was found at the age of 40+ years old. Furthermore, concerning the name of the course, the participants were persuaded, most participants (44%) pursued a BLRPM, followed by (30%) the ODLRPM and (26%) a BTCLRPM. Furthermore, regarding the semester students use Google Classroom, (74%) of participants, from BLRPM and ODLRPM, used Google Classroom in the first semester, and only (26%) of participants from BTCLRPM used Google Classroom in the second semester.

Table 1:
Demographic characteristics of the Respondents

Gender of the Respondents	Frequency	Percentage
Male	58	48
Female	62	52
Total	120	**100**
Age of the respondents		
18 - 25	57	47
26 - 32	49	41
33 - 39	14	12
40+	0	0
Total	120	**100**
The name of the course you pursue		
Bachelor's Degree in Labor Relations and Public Management (BLRPM)	53	44
Ordinary Diploma in Labour Relations and Public Management (ODLRPM)	36	30
Basic Technician Certificate in Labor Relations and Public Management (BTCLRPM)	31	26
Total	**120**	**100**
Semester students use the Google Classroom		
Semester 1	89	74
Semester 2	31	26
Total	**120**	**100**
The device used to access the Google classroom		
Computer	24	20
Smartphone	77	64
Using my friends' Smartphones	19	16
Total	**120**	**100**
The carrier is used to access the Google Classroom		
Institute wireless	30	25
Institute wired networks	13	11
mobile network (Tigo, Zantel, Airtel, etc.)	71	59
Modem Networks (Tigo, TTC, L, etc.)	6	5
Total	**120**	**100**

Concerning the device used by the participant to access Google Classroom, most participants (64%) used a smartphone, (20%) used a computer, and (16%) used their friends' smartphones to access Google Classroom. The results revealed that most participants used smartphones to access class activities. Besides, concerning the carrier used to access Google Classroom, the participants highly used the mobile network bundles from Tigo, Zantel, Airtel, etc. (59%), followed by (25%) who used institute wireless, (11%) used institute-wired networks (LAN) and (5%) used modem networks (Tigo, TTCL, etc.). Table 1 shows detailed information on the demographic characteristics of the participants.

3.3. Instruments

3.4.   GC platform

The study employed Google Classroom as a learning tool to facilitate online/blended learning for the bachelor's degree, diploma, and certificate students in Labor Relations and Public Management enrolled in the ICT module. The module instructor set up Google Classroom and collected students' email addresses.

Finally, the instructor sent an invitation to the student to join the class through their email address or class code via WhatsApp. The Google Classroom was mainly used outside the classroom for facilitating material sharing, assignment distribution and submission, communication queries, and other class feedback.
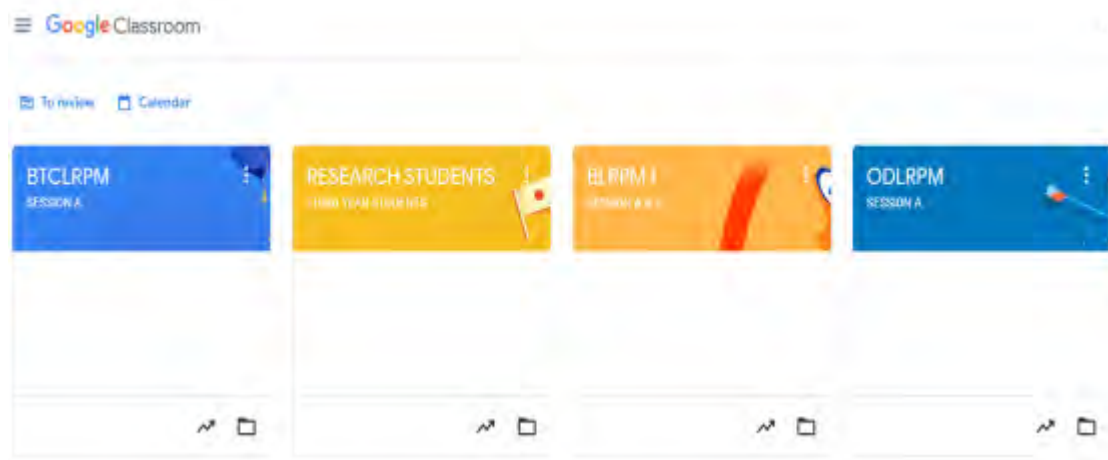

Figure 6: Google Classroom for the 2021–2022 academic year

3.5.   Survey

The online survey questionnaires were used for data collection and distribution using the KoBo Toolbox. The platform provided an online form editor that is more intuitive to many users and the survey can run through the Android application 'Kobo Collect' for data collection (Lakshminarasimhappa, 2021). The questionnaire was sent to the students enrolled in the ICT module at the end of their semester, for bachelor's degree and diploma students in semester 1, and certificate students in semester 2 of the academic year 2021 - 2022. Further, the survey questionnaire started with yes/no questions asking about the willingness of the student to participate in the survey and check in if the student had used Google Classroom during the course. Besides, the survey questionnaire was divided into two sections. The first section consisted of the respondent's demographic information, which includes gender, age, the course pursued, the device used, and the carrier used to access the Google Classroom platform *(table 2)*. The second section consisted of the evaluation of Activity Theory (AT) components. The main components included in this study were Subject, Objects, and Tool (STO), which were used to measure the respondent's opinions. The 5-Point Likert Scale method was used to measure the respondents' opinions, where 1-strongly agreed, 2-agreed, 3-neutral, 4-disagreed, and 5-strongly disagreed. The survey questionnaires in this study were adapted from other previous studies (Abdeldayem et al., 2020; Al-subaie, 2021) with modifications, and the necessary wording changes to fit the context of this study *(appendix 01)*.

3.6. Data collection and analysis procedures

The data in this study were collected using an online survey questionnaire. The study selected online surveys due to their flexibility in saving researchers time and expenses by overcoming geographic distance and paperwork. Moreover, it assisted in retrieving unique topics (Wright, 2017). The online survey was developed based on the variables recommended in the research model *(appendix 01)*. Moreover, the questionnaire collected link was created and distributed to respondents by sending the link and QR code to

the class representative of each class via WhatsApp. This method was selected to increase flexibility and strong safeguards against data loss. Finally, when the data collection period ended, the responses from the students were extracted and downloaded from the Kobo toolbox in a comma-separated value (CSV) file. The cleaning stage was carried out by removing the unwanted data and then imported to the Statistical Package for Social Scientists (SPSS) v.23, for in-depth analysis. Furthermore, Cronbach's (α) was used to check the instruments' reliability. Moreover, descriptive statistics, frequency, and percentage were used to present the demographic characteristics of the respondents and the AT components used in the framework. Besides, a One-Way ANOVA was used to examine the differences between the groups of students regarding their experiences of using Google Classroom as a learning tool.

Figure 7: Student Course Work Grade

3.7. Reliability Testing

The reliability test measures the internal consistency between multiple measurements of variables. The reliability was measured using Cronbach's alpha as a classical measure for reliability. A construct is considered reliable if the alpha (α) value ranges between 0.776 and 0.831, which is acceptable (Sarstedt et al., 2017). In this study, the reliability test was considered. The results revealed that the Tool component with eight items (α =.848), the Subject component with eight items (α =.884), and the Object component

with seven items (α =.847). Furthermore, the constructs measured entirely showed a satisfactory reliability level; hence, the study was considered reliable. Table 2 shows a summary of the reliability test results.

Table 2:

Reliability Testing Result

	N of Items	Cronbach's Alpha
TOOL	8	.848
SUBJECT	8	.884
OBJECT	7	.847

3.8. Validity Testing

The validity test measures how accurately a method measures what it is intended to measure and eliminate the threat of validity for the collection of data at different group or times. The validity test was measured using the Pearson correlation by using SPSS v.23. The critical values of the *t* distribution were calculated according to the probabilities of two alpha values and the degrees of freedom. The degree of freedom at two-tailed, N-2 and alpha (α) = 0.05. The results indicated that obtained values of Tool = 0.954, Subject = 0.961, Object = 0.940, and the critical value in the *t* distribution 118 DF (.05) = 2.8608. Therefore, the obtained values were found to be greater than the critical value and highly significant. Hence, the questionnaires were considered valid. Table 3 shows a summary of the validity test results.

Table 3:

Validity Testing Result

	TOOL	SUBJECT	OBJECT
GC EXPERIENCE	.954**	.961**	.940**

**. Correlation is significant at the 0.01 level (2-tailed).

3.9. Findings and Discussion

3.9.1. Evaluation of the research model and the questions

Research question 1*: The students' experiences with the use of the Google Classroom platform as a learning tool.*

Regarding research question 1, several statements were constructed depending on the components from Activity Theory (AT) used as the research framework, which includes Tool, Subject, and Object components. In responding to this question, the percentage was used to describe the respondent's responses depending on their choices.

The percentage distribution of the students' responses about the **Tool** as the first component, the students expressing their online experiences on the use of the Google Classroom platform as a learning tool provided in Table 4. The results show that most students based on their responses they were strongly agreed/agreed with the highest statement score (65%) and the lowest (53%) with the statements regarding the use of Google Classroom as a learning tool. Alternatively, (38%) of respondents strongly disagreed/disagreed, and only (39%) of the respondents strongly agree/agreed with the statement that using Google Classrooms does not promote a desire to learn. This indicated the overall positive reactions of the students on learning through Google Classroom, easy to follow, and enhanced their chances for interaction with the teachers. Additionally, the students pointed out that using Google Classroom gives them access to both hard and soft learning resources, and they confirmed that it promotes their desire to learn and makes them like the course better. Table 4 illustrates in detail the participants' responses concerning the Tool component.

Table 4:
Respondents' responses concerning the Tool (Google Classroom) component

Statements about the TOOL (Google Classroom)	Agree		Neutral		Disagree	
T01	78	65%	4	3%	38	32%
T02	67	56%	19	16%	34	28%
T03	72	60%	14	12%	34	28%
T04	74	62%	12	10%	34	28%
T05	65	54%	9	8%	46	38%
T06	74	62%	14	12%	32	27%
T07	74	62%	8	7%	38	32%
T08	47	39%	10	8%	63	53%

Regarding the **Subject** theme as the second component of Activity Theory. The percentage distribution of the students' responses is presented in Table 5. The student's responses regarding their online experiences on the use of the Google Classroom platform. The results indicated that most students based on their responses strongly agreed/agreed with the statement given with the highest statement score (65%) and the lowest score (49%) concerning learning the ICT module using Google Classroom. Alternatively, (61%) of respondents strongly agreed/agreed with the statement about their limited ability to use Google Classrooms compared to other students, and only (24%) strongly disagreed/disagreed with this statement. The results indicated that the students demonstrated positive online learning experiences using Google Classroom, regardless of their limited ability to use Google Classroom compared to other students. Table 5 illustrates in detail the participants' responses concerning the Subject component.

Table 5:
Respondents' Responses Concerning the Subject Component

Statements about the SUBJECT (Students)	Agree		Neutral		Disagree	
S01	75	63%	6	5%	39	33%
S02	78	65%	4	3%	38	32%
S03	66	55%	17	14%	37	31%
S04	59	49%	17	14%	44	37%
S05	73	61%	9	8%	38	32%
S06	68	57%	13	11%	39	33%
S07	77	64%	3	3%	40	33%
S08	73	61%	18	15%	39	24%

Concerning the **Object** theme as the second component of Activity Theory. The results of student's responses regarding their online experiences on the use of the Google Classroom platform indicated that most students based on responses strongly agreed/agreed with the statements with the highest statement score (70%) and the lowest score (48%) concerning their online/blended learning experiences using Google Classroom. On the other hand, (45%) of respondents strongly disagreed/disagreed with the statement that their educational needs are not being met in learning in Google classrooms and only (43%) have strongly agreed/agreed with this statement. Based on these results, the students showed a positive reaction to using online/blended learning modes using Google Classroom and they confirmed that their educational needs were met by using online/blended learning through Google Classroom. Table 6 illustrates in detail the participants' responses concerning the Object component.

Table 6:
Respondents' responses concerning the Object Component

Statements about the OBJECT (Online/Blended learning)	Agree		Neutral		Disagree	
OB01	79	66%	7	6%	34	28%

OB02	84	70%	6	5%	30	25%
OB03	73	61%	14	12%	33	28%
OB04	70	58%	13	11%	37	31%
OB05	69	58%	8	7%	43	36%
OB06	58	48%	17	14%	45	38%
OB07	51	43%	15	13%	54	45%

Research question 2*: Is there a difference in online/blended learning experiences between the groups of students (BLRPM, ODLRPM, BTCLRPM) on the use of the Google Classroom platform as a learning tool?*
Research question two explored the difference in online/blended learning experiences between the groups of students on the use of the Google Classroom platform as a learning tool. At first, the normality was also checked with a Q-Q Plot, and no deviations were noted. Second, the tested assumptions were checked. Levene's test was significant ($p =.001$), which indicates that the assumption of homogeneity of variance was violated. The group of students (BLRPM, ODLRPM, BTCLRPM) were significant differences in the use of the Google Classroom platform as a learning tool. Therefore, *Welch Statistics results were* used to present the differences between the groups. Third, a Games-howel post hoc test was used as the follow-up test. The Games-howel Post Hoc test was used by emphasizing that variances were not equal according to the Levene test.

The result indicated that there were significant differences in online/blended learning experiences between the group of students, ODLRPM (M = 76.7778, SD = 14.19882), BTCLRPM (M = 66.8387, SD = 16.07503), and BLRPM (M = 38.9245, SD = 7.88828). The results indicated that the ODLRPM and BTCLRPM students demonstrated higher online/blended learning experiences on using Google Classroom as a learning tool compared to BLRPM students. Further, the *Welch Statistic* results revealed the difference existing among the three groups of students on the use of Google Classroom as a learning tool, *Welch Statistic* (2, 55) = 128.699, *p <.001*. Table 7 depicts the ANOVA and Leven Test Summary of differences between the group of students.

Table 7:
ANOVA and Levene Test Summary of differences between the group of students

			A Test of Homogeneity of Variances		ANOVA			
	Mean	Std. Deviation	Levene Statistic	Sig.	Welch Statistic[a]	df1	df2	Sig.
BLRPM	38.9245	7.88828	6.955	.001	128.699	2	55	.001
ODLRPM	76.7778	14.19882						
BTCLRPM	66.8387	16.07503						

Additionally, Post Hoc Testing as the follow-up test using the Games-howel Post Hoc test was used to emphasize the differences between the groups of students. Table 8 depicts the Games-Howell Post Hoc Test of the difference between the group of students.

Table 8:
Games-Howell Post Hoc Test of difference between the group of students

Multiple Comparisons				
Course Name	Mean Difference	Sig.	95% Confidence Interval	
			Lower Bound	Upper Bound
BLRPM - ODLRPM	-37.85325*	.001	-44.1409	-31.5656
BLRPM - BTCLRPM	-27.91418*	.001	-35.4303	-20.3981
ODLRPM - BTCLRPM	9.93907*	.026	.9694	18.9087

3.9.2. *Discussion*

The study evaluated the student's experience with the use of Google Classroom as a learning tool at the Institute of Social Work. The study employed the Activity Theory (AT) developed by Engeström (1987, 2001) using the first triangle of the Activity Theory (AT) which includes the Tool, Subject, and Object (S-T-O) components, which the author believed these components express the individual experiences in using the system. The study set out to answer the following two questions: 1) what are the students' experiences with the use of the Google Classroom platform as a learning tool? and 2) Is there a difference in online/blended learning experiences between the group of students (BLRPM, ODLRPM, BTCLRPM) on the use of the Google Classroom platform as a learning tool?

Regarding research question one, the findings of the three Activity Theory (AT) components (S-T-O) are described as follows:

Concerning the **Tool** (i.e. Classroom, Assignment, Computer, smartphone, quiz, and materials) components of AT, the findings revealed that most students demonstrated a positive reaction to the online learning experience through Google Classroom. This implied that the students positively realized that the Google Classroom was easy to follow and enhanced their chances for interaction with the teachers. Additionally, the students pointed out that using Google Classroom gives them access to both hard and soft learning resources, which then promotes their desire to learn and makes them like the course better. This finding confirms previous studies that suggested students positively perceived Google Classroom as a learning tool since it increased convenience, provides the flexibility to access/print learning resources at any time and anywhere, and encouraged learning (Ahmad et al., 2022; Apriani et al., 2020; Gupta & Pathania, 2021; Jaca, 2022; Malecela & Hassan, 2019; Moonma, 2021; Oladele et al., 2021; Rohman et al., 2020; Saidu & Al Mamun, 2022; Saidu & Ibrahim, 2021; Famularsih, 2020; Ventayen et al., 2018). However, the findings of this study contradicted some previous studies that suggested that the use of Google Classroom as a learning tool is less effective in terms of material discussion (Rahmawati et al., 2020) and students' lack of interest and motivation to use Google Classroom (Hussein et al., 2021).

Alternatively, concerning the **Subject** (i.e. students BLRPM, ODLRPM, and BTCLRPM enrolled in the ICT module) component of AT, the findings revealed that the students demonstrated positive online experiences toward the use of Google Classrooms as a learning tool. The students report that using Google Classroom was easy for them, provides an easy way to interact with teachers, and helps them receive timely feedback in the virtual classrooms. Further, they confirmed that Google Classroom provided them with an easy way to submit their classwork such as assignments, and encouraged them to ask questions outside the classroom. This finding agreed with previous studies suggesting that Google Classroom improves students' abilities, and provides effective communication and individuality in understanding the subject taught (Alim et al., 2019; Annurwanda & Winata, 2021; Haji, 2022; Ogegbo & Adegoke, 2021; Ventayen et al., 2018). Furthermore, findings of previous studies report that the use of Google Classroom provides instant feedback, user-friendliness, ability to access and send assignments easily and anywhere (Annurwanda & Winata, 2021; Bhat et al., 2018; Gupta & Pathania, 2021; Gurban & Almogren, 2022; Jiang et al., 2022;

Mazana et al., 2019; Rahmawati et al., 2020). Regardless of whether most students complained about their limited ability to use Google Classroom compared to other students, still they demonstrated a positive experience with using Google Classroom. This finding may be attributed to the short time of training on how to use the Google Classroom platform and the use of the Google Classroom platform for only one semester and one module. This finding is supported by the previous study of (Yan et al., 2021) who reported that students' online learning experiences are significantly different across students and school years.

Further, the finding from the **Object** (i.e. online/blended learning, better course/module planning, and achievement) component of AT. The findings revealed that students demonstrated a clear understanding of using online/blended learning through Google Classroom. Most students agreed that online/blended learning through Google Classrooms helps them employ modern technologies and gives them ample opportunities to learn. Besides, they confirmed that online/blended learning through Google Classroom reduced some educational difficulties and encouraged them to self-learning skills, which then encourage them to meet their education needs. As a consequence of this, the student's learning, motivation, and engagement with online/blended learning were significantly boosted and an outcome of the activity was attained. The findings of this study agree with other previous studies suggesting that the use of Google Classroom is extremely useful in planning for online/blended learning since it's understandable, ease of use encourages and expands students' performance and makes them responsible for their learning process (Alim et al., 2019; Annurwanda & Winata, 2021; Jaca, 2022; Kazoka & Mwantimwa, 2019; Malecela & Hassan, 2019; Mazana et al., 2019; Oladele et al., 2021). Additionally, (Mazana et al., 2019) stressed that the use of web 2.0 tools such as the Google Classroom platform gives a student with ample opportunities to learn and employ modern technology skills such as uploading and downloading learning resources, internet exploration, sending and checking emails, and sharing educational resources. Furthermore, these findings contradicted the study of (Rahmawati et al., 2020) who argued that Google Classroom can only enhance and promote teaching and learning when the instructor understands how to produce the courseware effectively within its framework. However, (Saidu & Al Mamun, 2022) add that using web 2.0 tools such as Google Classroom, provides the ability for students to join lectures at any place and at any time, but students may lack interaction with instructors, understanding of lecture material, and poor communication with them.

Regarding the second research question, the ANOVA was employed to explore the differences in online/blended learning experiences between the students' groups (BLRPM, ODLRPM, and BTCLRPM). The finding revealed that there are statistically significant differences between the group of students. The students demonstrated the differences between them in online/blended learning experiences by using Google Classroom as a learning tool. The finding of this study agreed with the finding of a previous study suggested the students demonstrated positive responses to online/blended learning experiences using Google Classroom as a learning tool (Oladele et al., 2021; Famularsih, 2020; Jaca, 2022; Gupta & Pathania, 2021). Additionally, the post hoc tested results provide evidence that the ODLRPM and BTCLRM students demonstrated higher online/blended learning experiences on using Google Classroom as a learning tool for the ICT module compared with BLRPM students. This finding indicated that although these groups of students use Google Classroom for the same time within one semester of their study, their online/blended learning experiences varied among the group of students. This study's finding agreed with a previous study (Yan et al., 2021) suggested that students' online learning experiences are significantly different across students and school years. Further, this finding may be attributed to the individual perception and readiness toward the use of new technologies. As reported in the study previous study (Mensah et al., 2022) that once individual students perceive the ease of use of an online/blended learning platform such as Google

Classroom, they are highly motivated to use such a system. Besides, (Haji, 2022) reported that students confirmed that online/blended learning platforms such as Google Classroom as easier to access information as they receive instant notification on their mobile phones once new information is added. Furthermore, the previous studies confirmed that well-structured and organized online/blended courses, which include a mixture of learning resources such as video files, embedded in texts and hyperlinks positively empower student's online/blended learning experience with learning technologies (Gedera & Williams, 2013; Patterson et al., 2020) and better knowledge retention (Patterson et al., 2020). Additionally, Oladele (Oladele et al., 2021) stressed that the use of emerging technologies in the classroom enhances and encourages students learning, and the creation of knowledge and skill that can settle longer in the mind. In general, the student's opinions indicated the overall realization of online/blended learning settings with the Google Classroom platform as a learning tool.

4. Conclusion

The rapid expansion of technology across the globe and the need to be articulated for harnessing ICT opportunities to meet the vision 2025 goals that emphasize the determination of applications of distance education, e-learning, m-learning, and blended learning, as well as increase enrollment at the institute. The adoption and use of Web 2.0 such as Google Classrooms aimed to enhance teaching and learning activities at the institute, is unavoidable. The study focused on evaluating the students' experience and their learning differences with virtual classrooms facilitated by Google Classroom at the Institute of social work, Dar es Salaam, Tanzania. The findings revealed that the students were more interested in taking learning activities using the Google Classroom platform as a learning tool particularly interaction with the teacher, and access to both printed and soft copy materials and they managed to achieve their learning goals and make them like the ICT module. Besides, concerning the situational comparison between the group of students related to the use of Google Classroom as a learning tool, the findings revealed that the ODLRPM and BTCLRM students demonstrated higher online/blended learning experiences of using Google Classroom for the ICT module compared to BLRPM students. The study considers the limited sample size since only a few groups of students had experienced using the GC platform and the time for the student to use the GC as a learning tool was among the limitations. Therefore, these results may not be generalized to the student's learning experiences and their differences in using GC as a learning tool. The findings of this paper are particularly relevant as the author wished to share the experience of using Google Classroom in offering online/blended learning and the potential of using blended learning mode. Furthermore, the finding encouraged the instructors to embrace the use of ICT in teaching and learning which then enhances their teaching and learning activities at the institute. Moreover, the finding was pointed out as a launchpad for further studies in a relatively unexplored area.

4.1. Implications of the study

In the 21st century, innovative technologies play an important role in facilitating modern teaching and learning in higher education. Adopting and using innovative technologies such as Google Classroom is vital. The study calls for institute policymakers and relevant stakeholders on the following issues:

i.   The institute policymakers should strengthen efforts in planning and offering online/blended learning at the institute, starting with the postgraduate programs, which include many students who are employed and some who are outside the Dar es Salaam region.

ii. ICT administration should widen the range of internet access specifically wireless (Wi-Fi) networks to cover all the areas of the institute's campus including classrooms that will help instructors and students to use the online resources while in the classroom and provide relevant personnel for technical support for teachers and students.

iii. The instructors should deepen efforts on improving their digital literacy to meet the 21st-century skill requirements for academicians in this digital age that parallel facilitates the acquisition of 21st-century skills to students.

4.2. Research Instrument

Would you like to participate in this survey question?
1. Yes   2. No
Have you ever used a virtual classroom such as Google Classroom?
1. Yes   2. No
Questionnaire – Section I
Demographic Characteristics Information (Student)
Gender:
1. Male   2. Female
Age
1. 18 – 25   2. 26 – 32   3. 33 – 39   4. 40 +
What is the name of the course you pursuing?
1. Bachelor's Degree in Labour Relations and Public Management (BLRPM)
2. Ordinary Diploma in Labour Relations and Public Management (ODLRPM)
3. Basic Technician Certificate in Labour Relations and Public Management (BTCLRPM)
Which semester do you use the Virtual Classroom (Google Classroom)?
1. Semester 1   2. Semester 2
Which device did you use to access the classroom?
1. Computer   2. Smart Phone   3. Tablet
What was the carrier you use to access the virtual classroom (Google Classroom)?
1. Institute wired network   2. Institute wireless
2. Mobile network (Bundle from Tigo, Zantel, Airtel, etc.)   3. Modem network (Tigo, TTCL, etc.)
Questionnaire – Section II
The Likert Scale was used to score the students' choices. Please use the (**1 – Strongly Agree; 2 – Agree; 3 – Neutral; 4 – Disagree; 5 – Strongly Disagree**) option to determine your choice in the following questions.
Part A: Tool
T01   With Google Classroom, I get access to both printed and soft copy materials which helps me learn better
T02   The Google Classroom content encourages me to learn
T03   Using Google Classroom to learn enhanced the chance for interaction with the teacher
T04   Using Google Classroom in learning makes me like the course better
T05   The online activities in Google Classroom were closely related to the course objective
T06   Instruction provided in the Google Classroom was easy to follow
T07   Using Google Classroom to learn is useful for my study
T08   Using Google Classroom does not promote a desire to learn
Part B: Subject
S01   I feel that using Google Classroom is easy for me
S02   I feel that user interaction with Google Classroom is clear and understandable

S03	I feel that it is not hard to get help when I have a question in the virtual classrooms
S04	I feel that I am encouraged to ask questions in the virtual classrooms
S05	I feel that I receive timely feedback in the virtual classrooms
S06	I feel that Google Classroom is useful for learning
S07	I feel is easy for me to submit my assignment in a Google classroom
S08	I feel that my ability to use Google Classroom is limited compared to other students
Part C: Object	
OB01	Learning with Google Classroom gives ample opportunities to learn
OB02	Learning with Google Classrooms helps employ modern technologies
OB03	Learning with Google Classrooms has many advantages that reduce some educational difficulties
OB04	Learning with Google classes develop my self-learning skills
OB05	Learning with Google Classrooms helps in acquiring new computer skills
OB06	Learning with Google Classrooms helps employ modern technologies in learning
OB07	My educational needs are not being met in learning in the Google classrooms

References

Abdullah, Z. (2014). Activity Theory as Analytical Tool: A Case Study of Developing Student Teachers' Creativity in Design. *Procedia - Social and Behavioral Sciences*, *131*(2010), 70–84. https://doi.org/10.1016/j.sbspro.2014.04.082

Alghamdi, A. A., & Plunkett, M. (2022). Using activity theory to understand the impact of social networking sites and apps used by Saudi postgraduate students. *Behavior and Information Technology*, *41*(6), 1298–1312. https://doi.org/10.1080/0144929X.2021.1874049

Alim, N., Linda, W., Gunawan, F., & Saad, M. S. M. (2019). The effectiveness of Google Classroom as an instructional media: A case of state islamic institute of Kendari, Indonesia. *Humanities and Social Sciences Reviews*, *7*(2), 240–246. https://doi.org/10.18510/hssr.2019.7227

Almas, M., Machumu, H., & Zhu, C. (2021). Instructors' Perspectives, Motivational Factors and Competence in the Use of an E-Learning System in a Tanzanian University. *International Journal of Education and Development Using Information and Communication Technology*, *17*(2), 76–95.

Alotumi, M. (2022). Factors influencing graduate students' behavioral intention to use Google Classroom: Case study-mixed methods research. *Education and Information Technologies*, *0123456789*. https://doi.org/10.1007/s10639-022-11051-2

Annurwanda, P., & Winata, R. (2021). Students' Perception Towards the Use of Google Classroom for Mathematics Online Learning Viewed From Students' Readiness. *Kalamatika: Jurnal Pendidikan Matematika*, *6*(2), 195–206. https://doi.org/10.22236/kalamatika.vol6no2.2021pp195-206

Anthony Jnr, B. (2022). An exploratory study on academic staff perception towards blended learning in higher education. *Education and Information Technologies*, *27*(3), 3107–3133. https://doi.org/10.1007/s10639-021-10705-x

Apriani, R., Prastiawan, A., Maulina, S., Tryanasari, D., Imaningrum, A. D., Pratiwi, F. D., & Sumarsono, R. B. (2020). The Effectiveness of Using Google Classroom to Measure the Level of Understanding Student Materials. *Proceedings - 2020 6th International Conference on Education and Technology, ICET 2020*, *1*, 200–204. https://doi.org/10.1109/ICET51153.2020.9276608

Barhoumi, C. (2016). Studying the impact of blended learning that uses the online PBwiki guided by activity theory on LIS students' knowledge management. *Reference Services Review*, *44*(3), 341–361. https://doi.org/10.1108/RSR-09-2015-0040

Bernard, R., Msungu, A. C., & Sanare, R. (2012). Using Mobile Phones for Teaching and Learning Purposes in Higher Learning Institutions : the Case of Sokoine University of Agriculture in Tanzania. *Proceedings and Report of the 5th UbuntuNet Alliance Annual Conference*, *2007*, 118–129.

Bhat, S., Raju, R., Bikramjit, A., & D'souza, R. (2018). Leveraging e-learning through google classroom: A usability study. *Journal of Engineering Education Transformations*, *31*(3), 129–135.

Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. *Sustainability (Switzerland)*, *12*(24), 1–22. https://doi.org/10.3390/su122410367

Engeström, Y. (2001). Expansive Learning at Work: Toward an activity theoretical reconceptualization. *Journal of Education and Work*, *14*(1), 133–156. https://doi.org/10.1080/13639080020028747

Engeström, Y., & Sannino, A. (2021). From mediated actions to heterogeneous coalitions: four generations of activity-theoretical studies of work and learning. *Mind, Culture, and Activity*, *28*(1), 4–23. https://doi.org/10.1080/10749039.2020.1806328

Famularsih, S. (2020). Students Experiences in Using Online Learning Applications Due to COVID-19 in English Classroom. *Studies in Learning and Teaching*, *1*(2), 112–121. https://doi.org/10.46627/silet.v1i2.40

Gedera, D. S. P. (2014a). Students' experiences of learning in a virtual classroom: An Activity Theory perspective. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT)*, *10*(4), 93–101. https://www.learntechlib.org/p/150708/

Gedera, D. S. P. (2014b). Students' experiences of learning in a virtual classroom. *International Journal of Education & Development Using Information & Communication Technology*, *10*(4), 93–101. http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=100293832&site=ehost-live&scope=site

Gedera, D. S. P., & Williams, P. J. (2013). Using Activity Theory to understand contradictions in an online university course facilitated by Moodle. *International Journal of Information Technology and Computer Science*, *10*(1), 32–41.

Gedera, D. S. P., Zealand, N., Williams, P. J., & Zealand, N. (2013). The use of learning technologies to facilitate engagement in an online course. *International Journal of Information Technology and Computer Science (IJITCS)*, *9*, 12–20. https://www.academia.edu/3786945/The_use_of_learning_technologies_to_facilitate_engagement_in_an_online_course

Gupta, A., & Pathania, P. (2021). To study the impact of Google Classroom as a platform of learning and collaboration at the teacher education level. *Education and Information Technologies*, *26*(1), 843–857. https://doi.org/10.1007/s10639-020-10294-1

Gurban, M. A., & Almogren, A. S. (2022). Students' Actual Use of E-Learning in Higher Education During the COVID-19 Pandemic. *SAGE Open*, *12*(2), 215824402210912. https://doi.org/10.1177/21582440221091250

Haji, S. A. (2022). Students use online learning platforms to support blended Learning at Cameroonian University. *Journal of Educational Technology and Online Learning*, *5*(2). https://doi.org/10.31681/jetol.1028410

Hamad, W. B. (2022a). Evaluating the students' behavior intention toward the use of the Student Information Management System (SIMS): a case of the Institute of Social Work. *Education and Information Technologies*, *0123456789*. https://doi.org/10.1007/s10639-022-11476-9

Hamad, W. B. (2022b). Understanding the foremost challenges in the transition to online teaching and learning during the COVID-19 pandemic : A systematic literature review. *Journal of Educational Technology & Online Learning*, *5*(2), 393–410. https://dergipark.org.tr/en/download/article-file/2183557

Hoang Ngoc Tue, & Le Duc Hanh. (2021). Vocational English Teachers' Challenges on Shifting Towards Virtual Classroom Teaching. *AsiaCALL Online Journal*, *12*(3), 58–73. https://asiacall.info/acoj

Ibrahim, G., Luzinge, H., & Kapanda, G. (2020). Teaching and Learning Experiences in Medical Education During the COVID-19 Pandemic : The Case of Kilimanjaro Christian Medical University College (KCMUCo), Tanzania. *Journal of Learning for Development*, *7*(3), 433–446.

Jaca, C. A. L. (2022). Students' Online Class Experiences Using Google Classroom Amidst the Covid-19 Pandemic. *Randwick International of Education and Linguistics Science Journal*, *3*(1), 58–68. https://doi.org/10.47175/rielsj.v3i1.409

James Ernest Kazoka. (2020). Users' Attitudes and Usage Intentions Towards Integration of Web 2.0 in Teaching and Learning Processes from Selected Universities in Tanzania. *Education and Development*, *38*(2), 9–25.

Jiang, H., Islam, A. Y. M. A., Gu, X., Spector, J. M., & Chen, S. (2022). Technology-Enabled E-Learning Platforms in Chinese Higher Education During the Pandemic Age of COVID-19. *SAGE Open*, *12*(2), 215824402210950. https://doi.org/10.1177/21582440221095085

Karanasios, S. (2013). Framing ICT4D research using activity theory: a match between the ICT4D field and theory? *Proceedings of the 12th International Conference on Social Implications of Computers in Developing*

Countries, Montego Bay, Jamaica, 31, 527–540.

Karanasios, S. (2018). Toward a unified view of technology and activity: The contribution of activity theory to information systems research. *Information Technology and People*, *31*(1), 134–155. https://doi.org/10.1108/ITP-04-2016-0074

Kazoka, J. E., & Mwantimwa, K. (2019). Perceived usefulness and ease of use of Web 2.0 tools in university teaching and learning in Tanzania. *Salaam Library Journal*, *14*(2), 19–37.

Lee, C. B., Hanham, J., Kannangara, K., & Qi, J. (2021). Exploring user experience of digital pen and tablet technology for learning chemistry: applying an activity theory lens. *Heliyon*, *7*(1), e06020. https://doi.org/10.1016/j.heliyon.2021.e06020

Lioutas, E. D., Charatsari, C., La Rocca, G., & De Rosa, M. (2019). Key questions on the use of big data in farming: An activity theory approach. *NJAS - Wageningen Journal of Life Sciences*, *90–91*, 100297. https://doi.org/10.1016/j.njas.2019.04.003

Lubua, F. (2015). Exploring the Opportunities for Integrating New Digital Technologies in Tanzania Higher Education Classrooms. *International Journal of Learning, Teaching and Educational Research*, *14*(2), 131–150.

Mahali, D. B., Changilwa, P., & Anyona, J. (2019). The Influence of Level of Training in LMS and Student Utilization of LMS in Public Universities in Tanzania. *Journal of Education*, *2*(4), 19–46. https://stratfordjournals.org/journals/index.php/journal-of-education/article/view/396

Mahenge, M. P. J., & Sanga, C. (2016). ICT for e-learning in three higher education institutions in Tanzania. *Knowledge Management and E-Learning*, *8*(1), 200–212. https://doi.org/10.34105/j.kmel.2016.08.013

Malecela, I. O., & Hassan, D. S. S. S. (2019). Investigating Web 2.0 Tools Use and Students Cognitive Engagement in Selected Tanzanian Higher Institutions: Preparing Towards 21st Learning. *International Journal of Advanced Engineering Research and Science*, *6*(1), 173–183. https://doi.org/10.22161/ijaers.6.1.24

McKenzie, S., Hains-Wesson, R., Bangay, S., & Bowtell, G. (2022). A team-teaching approach for blended learning: an experiment. *Studies in Higher Education*, *47*(4), 860–874. https://doi.org/10.1080/03075079.2020.1817887

Mensah, I. K., Zeng, G., Luo, C., Lu, M., & Xiao, Z. W. (2022). Exploring the E-Learning Adoption Intentions of College Students Amidst the COVID-19 Epidemic Outbreak in China. *SAGE Open*, *12*(2). https://doi.org/10.1177/21582440221086629

Moonma, J. (2021). Google Classroom: Understanding EFL Students' Attitudes towards Its Use as an Online Learning Platform. *English Language Teaching*, *14*(11), 38. https://doi.org/10.5539/elt.v14n11p38

Mtebe, J. S. (2013). Adoption of cloud computing in Tanzania. *International Journal of Education and Research*, *1*(8), 1–16. http://www.ijern.com/journal/August-2013/25.pdf

Mtebe, J. S., Fulgence, K., & Gallagher, M. S. (2021). Covid-19 and technology-enhanced teaching in higher education in sub-saharan Africa: A case of the University of Dar es Salaam, Tanzania. *Journal of Learning for Development*, *8*(2), 383–397.

Mtega, W. P., Benard, R., & Dettu, M. (2013). Knowledge Management & E-Learning The prospects of Web 2.0 technologies in teaching and learning in Higher learning institutes: The case study of the Sokoine University of Agriculture in Tanzania). The prospects of Web 2.0 technologies in teaching and lea. *Knowledge Management & E-Learning*, *5*(4), 404–418.

Mwakyusa, W. P., & Ng`webeya, L. M. (2022). The Response of Tanzania Higher Learning Institutions to e-Learning During Covid-19 Pandemic. *East African Journal of Management and Business Studies*, *2*(1), 19–28. https://doi.org/10.46606/eajess2022v03i01.0142

Namyssova, G., Tussupbekova, G., Helmer, J., Malone, K., Afzal, M., & Jonbekova, D. (2019). Challenges and benefits of blended learning in higher education. *International Journal of Technology in Education (IJTE) International Journal of Technology in Education*, *2*(1), 22–31. www.ijte.net

Nayar, B., & Koul, S. (2020). Blended learning in higher education: a transition to experiential classrooms. *International Journal of Educational Management*, *34*(9), 1357–1374. https://doi.org/10.1108/IJEM-08-2019-0295

Nguyen, S. Van, & Habók, A. (2021). Vietnamese non-English-major students' motivation to learn English: from an activity theory perspective. *Heliyon*, *7*(4). https://doi.org/10.1016/j.heliyon.2021.e06819

Ogegbo, A., & Adegoke, O. (2021). Students' Experiences on the Use of Google Classroom: Case Study of a

University in Rwanda. *Education and New Developments*, 280–284. https://doi.org/10.36315/2021end060

Oladele, J. I., Koledafe, O. S., & Daramola, D. S. (2021). Prospects for Online Instructional Delivery Using Google Classrooms: Implications for Higher Education in Sub-Sahara Africa. *Journal of Digital Learning and Education*, *1*(3), 1–17. https://doi.org/10.52562/jdle.v1i3.227

Patterson, N., Schultz, M., Wood-Bradley, G., Lanham, E., & Adachi, C. (2020). Going digital to enhance the learning of undergraduate students. *Journal of University Teaching and Learning Practice*, *17*(3), 1–15. https://doi.org/10.53761/1.17.3.6

Pullenayegem, J. C. N., De Silva, K. R. M., & Jayatilleke, B. G. (2020). Open and Distance Learner Engagement with Online Mediation Tools: An Activity Theory Analysis. *Open Praxis*, *12*(4), 469. https://doi.org/10.5944/openpraxis.12.4.1129

Pullenayegem, J., De Silva, R., & Jayatilleke, G. (2021). Contradictions in learner interactions in a blended-learning writing course: An activity theory analysis. *Journal of Learning for Development*, *8*(2), 327–345.

Rahmawati, F. B., Zidni, & Suhupawati. (2020). Learning by Google Classroom in Students' Perception. *Journal of Physics: Conference Series*, *1539*(1). https://doi.org/10.1088/1742-6596/1539/1/012048

Rohman, M., Baskoro, F., & Endahcahyaningrum, L. (2020). The Effectiveness and Efficiency of Google Classroom as an Alternative Online Learning Media to Overcome Physical Distancing in Lectures Due to the Covid-19 Pandemic: Student Perspectives. *Proceeding - 2020 3rd International Conference on Vocational Education and Electrical Engineering: Strengthening the Framework of Society 5.0 through Innovations in Education, Electrical, Engineering and Informatics Engineering, ICVEE 2020*. https://doi.org/10.1109/ICVEE50212.2020.9243258

Saidu, M. K., & Al Mamun, M. A. (2022). Exploring the Factors Affecting Behavioural Intention to Use Google Classroom: University Teachers' Perspectives in Bangladesh and Nigeria. *TechTrends*, 681–696. https://doi.org/10.1007/s11528-022-00704-1

Saidu, M. K., & Ibrahim, A. (2021). Integration of Google Classroom as an Alternative Learning Environment in Colleges of Education in North-East Nigeria : Solution for 21st Century Teaching and Learning. *International Journal of Innovative Information Systems & Technology Research*, *9*(4), 1–10.

Soleimani, N., & Rahimi, M. (2021). (Mis) Alignment of Iranian EFL Teacher's Written Corrective Feedback Beliefs and Practices from an Activity Theory Perspective. *Cogent Education*, *8*(1). https://doi.org/10.1080/2331186X.2021.1901640

Tossy, T. (2017). Measuring the Impacts of E-Learning on Students' Achievement in Learning Process: An Experience from Tanzanian Public Universities. *International Journal of Engineering and Applied Computer Science (IJEACS)*, *02*(07), 39–46.

Ventayen, R. J. M., Estira, K. L. A., Guzman, M. J. De, Cabaluna, C. M., & Espinosa, N. N. (2018). Usability Evaluation of Google Classroom: Basis for the Adaptation of GSuite E-Learning Platform Software Management View project Data Analysis View project. *Asia Pacific Journal of Education, Arts, and Sciences*, *5*(1), 47–51.

Yakubu, N., & Dasuki, S. (2021). Emergency online teaching and learning in a Nigerian private university : an activity theory perspective. *UKAIS 2021 Conference Proceedings*, 248–272.

Zhou, L., Xue, S., & Li, R. (2022). Extending the Technology Acceptance Model to Explore Students' Intention to Use an Online Education Platform at a University in China. *SAGE Open*, *12*(1). https://doi.org/10.1177/21582440221085259