Title of Paper: Needs Assessment Report for Master Elementary School: Part 3,

Component A – Individual Assignment

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The University of the West Indies-Open Campus Site

Postgraduate Degree in Instructional Design and Technology 2020-2023

EDID 6507: Needs Assessment for Learning and Performance

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Date: 15 November 2021

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Executive Summary

Master Elementary School contracted the Mendez ID Team to conduct a needs assessment in order to identify the human performance problem and performance gaps that were debilitating the institution so that recommendations could be made to remedy those problems and consequently satisfy the needs of its target audience. The assessment was carried out in a three phase approach. Phase one entailed a scope of the environment whereby a preliminary survey was conducted, objectives were set, its purpose outlined and its target audience identified.

Objectives of this needs assessment are:

- Conduct the three phases of the needs assessment in a professional and ethical manner following the protocols outlined by the International Board of Standards for Training, Performance and Instruction

- Inform the client of problems of the organisation by delivering reports in a timely manner before October 18th and or no later than January 10th using good feedback and communication practices

- Analyse the different systems at Master Elementary with 98% accuracy by using tools and instruments that can limit bias and give reliable data

- Justify findings and recommendations in the needs assessment with 98% accuracy by using a systematic process that is grounded by models, theories, research and principles

The needs assessment targeted a homogeneous group of educated teachers at Master Elementary School who possess tertiary education in their respective studies and its decision-makers. In the first stage, it was revealed through felt needs gathered in the preliminary survey that the problem at Master Elementary School was that of an underutilisation of

available resources and assets since there was a computer laboratory that had no internet access, there is only one space for internet access reserved for teachers only where the prime area for both students and staff, that is the computer laboratory, has been neglected. Moreover, the underutilisation of resources is also noticed in human resources since teachers with current skills and knowledge in computers are not effectively leveraged to promote instructional and pedagogical support to those who may possess minimum knowledge.

In the penultimate stage of the assessment, several analyses were conducted to determine the present and optimal states of the organisation. In addition, this information was used to help determine whether the perceived gap, which was identified tentatively as a skill and knowledge gap as it relates to outfitting and placing certain equipment and technologies so that teaching staff and students could fully exploit technology, was accurate. In the gap analysis and using a dual-response survey along with five exemplary performers as was suggested by Rothwell and Linholm (1999) for their display of exemplary workplace competencies and performance, it was revealed that there is an operational need at the institution for internet access to enhance work performance but that this issue was being caused by decision-makers lack of knowledge, awareness and involvement with other teachers and students of current technologies capabilities such as the use of Wi-Fi extenders and so on. With this information, the Mendez ID Team conducted a study to determine whether the hypothesis of technology integration and internet use for pedagogy could increase student academic performance could be proven. To do this, the team used Master Elementary School along with another and similar population and gathered students' mean scores for a mathematics class for two academic years where it was revealed in the control group that students' scores were higher with internet access. Thus, the hypothesis had been accepted.

In the ultimate stage of the assessment, the Mendez ID team sought solutions to the problems and used a Multicriteria analysis to determine which solution would be the most fitting for the organisation. Solutions at this stage were combined for a more lucrative option for the client. In addition, a cost consequence analysis was done so that the client could compare results at a far greater rate. Before making a decision, the Mendez ID team used a process approach whereby they presented evidence and research of each recommendation to the clients to help aid in their decision-making. The solution of Wi-Fi extenders installations and providing social learning and strategic planning was chosen. Due to the school's collegial environment and high levels of technological savvy staff, which was revealed in the environmental analysis, along with evidence and research presented, there is a high probability that Master Elementary would benefit from this intervention. In addition, strategic planning would help decision-makers purposefully allocate resources in an integrated manner considering students and teachers' needs.

Scope of the Project

The Mendez ID Team has been contacted by the School Improvement Team at Master Elementary School to assess the school's technology needs and to suggest proposals regarding established objectives set forth by the school's interest groups and technology committee. The principal of the school has also shared her commitment in collaborating with the team in their assessment since there is an upcoming opportunity of a disbursement of financial assistance that would be allocated toward modernising the school's technology infrastructure. Consequently, the principal is hopeful that the needs assessment would prepare educators for the change. Mendez's ID team used a systems analysis whereby the business, technological and organisational issues were scrutinised at the preliminary stages of data collection to identify and evaluate problems, opportunities and needs.

The needs assessment was initiated by key stakeholders and one of the decision-making committees, namely the School Improvement Team where, after meeting with another formal interest group, the Technology Planning Committee, the two formal groups felt as though the school lacked technology advancement, that teachers were reticent with integrating technology into their classes and that there was a disconnect between technology education and parental involvement.

A Gantt chart was used to guide the team on the itemisation of tasks to be completed and important elements that may impact the outcome. In order to get an authentic understanding of the business process, the problem, opportunities and needs, a preliminary survey was conducted by the team between the period of 4th September, 2021 and 14th September, 2021. During this stage, the school's systems process was examined and several elements were fragmented to get a concentrated view of the problem(s) and needs. Elements examined include identifying organisational needs and the school's background, determining

the current use of technology, identifying teacher capabilities and interests and further

analysis of interest groups and the technology committee's perspective. In this initial phase,

The Mendez ID team intends on meeting with the client and other decision makers and

delivering Phase one's report in order to garner agreement on the problem of the institution

on 25th September, 2021.

Constraints

The results from this needs assessment may be attributed to variables outside of the

control of the Mendez ID team including:

1. Trends and innovations in education and pressure from stakeholders and interest

   groups to take action on modernising the school's technological advances

2. Technological constraints

3. Time constraints– there are only two available dates for a teacher in service: October

   18th and January 10th

4. Upcoming and expected changes to the school's technological infrastructure

Being a novice team, the Mendez's ID team has deliberately selected the [Needs

Assessment Report: Brandon University Recruitment and Retention of First Nation Student

(2011)](#) for a guide for needs assessment writing due to its shared commonalities such as both

being educational institutions and its presentation of a detailed and informative report.

Introduction

There are several benefits to be derived by integrating technology into classrooms at the primary level. Typically, these initiatives are actioned by governments who may be inclined to consider changes or revisions to curriculum and changes in professional and students' needs among others (Leask & Meadows, 2000). Yet, the relevancy of technology in primary schools is often deliberated due to the minimal levels of integration that is observed after funding (Goldstein, 1995).

Leask and Meadows (2000) posited that when technology is integrated into classrooms at the primary level, it benefits a wide array of individuals. This notion is also maintained by Jimoyiannis (2012) who stated that information communication technology in schools has technical, organisational and pedagogical benefits. Exposure to information communication technology has the potential to enhance learners' abilities and skills in ways relating to their critical thinking and creativity and in their organisation and research skills (Leask & Meadows, 2000).

Hayes and Whitebread (2006) stated that through students' perspectives, computers are essential tools that serve as informational and interactive sources. Moreover, for education practitioners, it can be used as a personal and professional resource. To nullify arguments of its minimal use, Leask and Meadows (2000) contended that typically, the level of teacher use of information technology varies and is usually dependent on the teachers' epistemology beliefs and knowledge of technology especially as it relates to their prior experiences. Leask and Meadows (2000) further stated that teachers are likely to rationalise their technology use in classrooms due to factors such as whether it is curriculum mandated and the age of pupils to other considerations such as skill development gained after its use including social and or technical skills.

Grounded by prominent considerations such as improving students' learning outcomes and empowering teachers by transforming schools into ecosystems of collegial learning, governments in the global arena are likely to move forward with their projects to lend their support to primary institutions by allocating funds to include hardware and software fixtures and accommodations to their plants (Jimoyiannis, 2012). However, despite these initiatives and investments made, Lee and Winzenried (2009) stated that in 2008, the underutilisation of technology in these schools was a growing concern since teachers resorted to pens, paper, whiteboards and their voices as principal instructional methods and technologies. Lee and Winzenried (2009) recommended that before technology is implemented in schools that there be a holistic developmental strategy in place that considers the organisation's goals and vision and that considerations be made toward the school's infrastructure such as its network support and infrastructure and bandwidth among others.

Purpose

The purpose of this needs assessment is to identify the core problem and subsidiary problems that are being created at Master Elementary School so that true needs can be determined. Ultimately, this needs assessment seeks to provide recommendations to remedy those problems and satisfy the needs of its target audience. To do this, one of the needs assessment study aims is to conduct a mixed methods approach in order to collect data on participants' perceptions of the problem in this study such as teachers, formal organisation interest groups, students and decision-makers including the school's principal and the administrative staff at Master Elementary School. At this stage in the needs assessment, an environmental scan and a preliminary survey has been conducted to get a better idea of the organisation's process.

Objectives of this Needs Assessment

- Conduct the three phases of the needs assessment in a professional and ethical manner following the protocols outlined by the International Board of Standards for Training, Performance and Instruction

- Inform the client of problems of the organisation by delivering reports in a timely manner before October 18th and or no later than January 10th using good feedback and communication practices

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Identification of the Problem

Master Elementary School has a computer laboratory that can serve 100% of its teaching staff for instructional and recreational purposes and, on a scheduled class basis, 100% of its pupils for instructional and learning purposes for basic computer operations and functions only. Moreover, some teachers have knowledge of computers and are interested in integrating information communication technologies into their classes. Yet, there is no operationalisation of these efforts since the computer laboratory has no internet access and students and teachers resort to performing and using basic computer applications.

The problem at Master Elementary School has been identified as the underutilisation of available resources and assets. According to Lee and Winzenried (2009), the underutilisation of resources in schools occurs when provision for the school's infrastructure and network was not properly considered before implementation. As a consequence, there is only one space for

internet access reserved for teachers only where the prime area for both students and staff has been neglected. Moreover, the underutilisation of resources is also noticed in human resources since teachers with current skills and knowledge in computers are not effectively leveraged to promote instructional and pedagogical support to those who may possess minimum knowledge.

Background: Current Context at Master Elementary

Master Elementary School is a public primary school located in Albuquerque, New Mexico which provides formal instruction to 400 students in hopes of preparing them for high school. The school offers kindergarten classes to Grade 5 and also has a Special Needs annex. Master Elementary is managed by Julie Leung, who with her staff of 30 teachers are supported by the school's interest groups such as the School Improvement Team and the Technology Planning Committee.

Educators at the institution currently expose students to technology and this exposure ranges from VCRs, overhead projectors to one hour weekly sessions in the computer laboratory without internet access. In spite of these limitations, Leung is hopeful that the school will soon receive a disbursement of funds to upgrade the plant technologically. Teachers in the interim have varying levels of computer knowledge but some are interested and curious of being afforded opportunities to integrate technology into their classes. Despite two computers placed in the teacher area, teachers expressed that they have insufficient time to explore materials and others were concerned of finding age appropriate content and resources and content designed for special needs students. Moreover, students currently leave the institution without computer or technological skills that would readily prepare them for high school and even the world of work and are one of the only schools in the district with this disadvantage.

Key stakeholders who are actively involved in interest groups have realised the trends and innovations of pedagogical technology and are pressuring the school to boost its internet use. These groups have actively moved forward and initiated proposals with key objectives requiring action.

Target Audience

The population of this sample is a group of teachers at Master Elementary School. The population is a homogenous group who are educated and possess tertiary education in their respective studies. The group includes all 30 members of the teaching staff inclusive of the specialist teacher. In addition, this teaching population is inclusive of decision-makers such as the Principal and her administrative team.

Perceived Gap

Master Elementary School's computer laboratory can serve 100% of its teaching staff for recreational purposes and 100% of pupils on a scheduled basis. In spite of its high percentile, teachers rarely take advantage of its resources and students are only exposed to basic computer functions and computations. However, growing demands of students, stakeholders and the community is changing and challenging these current inefficiencies. The notion of schools taking initiative of technology but not fully exploiting its benefits is mentioned by Lee and Winzenried (2009) who contended that after investing in technology, teachers tended to resort to their earlier and familiar technologies such as the chalkboard, paper and pen and so on. Due to these problems, the Mendez ID team has recognised that there may be a skill and knowledge discrepancy as it relates to outfitting and placing certain equipment and technologies so that teaching staff and students could fully exploit technology fruitfully.

Research Methodology

In order to confirm the perceived gap, the need assessors will be exploring the discrepancy between the actual and the desired states of the educational institution. As such, an organisational analysis and environmental scan will occur. At the organisational analysis stage, the need assessors will not only engage in extant data review but will also interview top-level management. Moreover, one of the need assessors will engage in an ethnographic study where she will use her knowledge as a complete participator to supplement interviews with top-level management. Data will be further analysed through probing levels. Subsequently to determine the level of entropy that exists at the institution, the team will use this information in order to engage in a four-stage gap analysis. It is important to note that at each stage, data collection, analysis and the findings will be discussed.

Limitation

One of the limitations to this study is the small sample size of the two different populations in the problem analysis stage. Despite using two different populations, results would be unable to generalise due to the small number of participants surveyed.

Master Elementary Current Organisational Analysis

The Mendez ID Team seeks to glean insight into the business process and functioning of Master Elementary School. According to Stefaniak (2020), this is crucial since the decisions of needs assessment can affect persons and workflows. Therefore and ideally, it benefits need assessors to consider the relationships that exist between objects, processes and people who are both directly and indirectly involved within the system prior to implementing an intervention. Moreover, the purpose of this organisational scan is to bring about learning, break down nebulous inner processes and to create opportunities for positive changes. Tosti and Jackson (1997) revealed that an organisational scan has the ability to modify workplace performance as well as disclose the impact that changes in one area of the system can have on the rest of the system in its quest to achieve its goals. To engage in a logical and communicable organisational scan, the Mendez ID Team uses the Business Logic Model and is guided by Silber and Kearny's (2006) guiding questions to interview top-level management and review extant data in order to unearth this information. Ultimately, the team will complement the scan with further probing. It will fuse probing questions from Lusthaus, Adrien, Anderson, Carden and Montalván (2002) and Tosti (2008) for a more comprehensive and balanced perspective of the organisation and as a way for planning for future change. This instrument and response can be viewed in Table 1 of the Appendix.

Strategy logic

There is an adequate sense of direction in the school's mission statement. Teachers are expected to deliver effective instruction that would sufficiently prepare students for the real-world and for their transition from elementary to high school after their six year tenure. This is explicitly stated in the school's mission statement which states that through combined

efforts of the community, parents, staff and students, the school seeks to provide a teaching-learning environment that caters to students' needs and maximises their fullest potential.

To guide Master Elementary School in its quest to accomplish its mission statement, the school has developed concentrated objectives. These objectives are not very specific in terms of listing specific criteria and measurable indicators but they outline the task, path and direction to achieve the mission statement and sometimes list conditions that the objective should be carried out under. An excerpt of these objectives are as follows:

• Provide a balanced and varied curriculum that is responsive to the individual characteristics and aptitudes of students

• Optimise human, physical and financial resources by employing more systematic planning at all levels and by sharing throughout the school.

• To improve the accommodation for staff and students and to provide more modern and stimulating classrooms.

• To give opportunities for our students to identify and explore their peculiar areas of interest by giving them wider choices in their programme of study (Student Handbook, 2020).

Moreover, the school's vision statement is unclear. According to Silber and Kearny (2006), a vision statement should activate the organisation's affective domain and should express broad and bold goals for the future. The school's vision is to be a learning institution that inspires excellence and achievement.

Furthermore, the school's culture is collegial and institutionalised. There are certain events that staff execute which are not a part of their daily functions such as after-work socials on Fridays and festivities after the end of each term. Moreover, there is an annual

decoration of the teaching work area to depict and celebrate national and public holidays and even for awareness days. Other subcultures such as 'staff to students' relationships are formal. Students dress conservatively in their school uniforms accompanied by teachers who are properly attired. Students show respect and are cordial to their teachers by standing when a teacher enters their classroom and expressing good modalities and pleasantries. In addition, there is a strong presence of performance culture at the institution. Master Elementary School seeks to be recognised and places value on students' academic successes in standardised tests as well as success in sports and other competitions. In addition, the Principal places emphasis on renowned individuals who began their learning education at the school and now excel in business, career and sports among others. There is a designated space for these individuals where their photographs are mounted in the school's library. Moreover, trophies for competitions won and framed newspaper clippings highlighting outstanding recognition of the school's performance over the years are displayed in the principal's office.

The organisation seeks to be much more than a learning institution. Its core competencies include developing students' technical and digital skills so that learners can operate successfully in the world of work and in their high school career. Currently, students are exposed to basic letter writing, drawing applications and tools and calculation functions on the computer system. Moreover, there is a strong emphasis on integrating technology into classes to help learners acquire knowledge at their own rate and to personalise the learning process. Moreover, the school values respect, commitment, self-control, integrity, excellence, teamwork and spirituality (Student Handbook, 2020).

The organisation's strategy logic is aligned to its other business logics. There is a linkage between product and strategy logics since both are connected and interdependent on each other to develop and create an educational product that benefits its stakeholders. Additionally, the strategy logic is communicated in the organisation's formal documents and artefacts.

They are semi specific and measurable indicators to determine whether the organisation is fulfilling its strategy logic.

Internal logic

There is a hierarchical organisational structure that exists at Master Elementary School. In addition, teachers are subdivided by year groups and by content areas in some instances which denotes that there is a wide span of control. According to Katz and Khan (1966), a hierarchical structure is useful in organisations for centralisation of decision-making so that one main individual can make and or approve decisions in the organisation. Moreover, this organisational structure takes place so as to avoid the duplication of functions (Katz & Khan, 1966).

Teachers usually engage in decision-making surrounded by topics involving instruction, shaping behaviour and content planning. Examples include:

1. What topics should I teach and how should I deliver instruction?

2. How long should I stay on this concept?

3. How should I administer negative and positive consequences so that good behaviour is encouraged and negative behaviour is lessened?

4. What teaching methods will I use to make classes interactive?

5. What resources will I employ to make learning authentic and more engaging?

Teachers are usually guided by the school's principal and her administration team, legislation such as the Education Act, ministry mandates such as the curriculum, students' responses and teachers' epistemology beliefs and prior knowledge for answers to these decisions.

Master Elementary School recruits individuals who possess a tertiary degree in the relevant field of study into their teaching fraternity. Subsequently, teachers are encouraged to

be formally trained in the teaching profession by studying at a tertiary institution that is dedicated to honing and developing learners' knowledge and skills as it relates to knowledge transfer. During training, the programme focuses on technology integration, curriculum design, lesson planning and other related areas. Moreover, teachers are assigned supervisors who observe their classes and expect to see some level of technology integration. Ultimately, after successful completion of the programme, teachers are awarded with a Post-graduate Diploma of Education and an increase in salary by 0.25% monthly. It is important to note that tertiary training is not compulsory and teachers can attend at their discretion. Presently, 95% of teachers are trained and 3% are currently undergoing training. Moreover, 100% of teachers have tertiary qualifications ranging from Associate Degrees to Postgraduate Degrees and certificates in their specialist areas such as Music and Physical Education.

Product logic

Master Elementary School is not solely concerned with instructing conventional subject areas to its learners. On the contrary, the school seeks to differentiate its educational product by affording students learning experiences that would promote life-long learning through the use of technology. Consequently, this focus prepares students for the real-world and for their high school tenure. The computer laboratory was built with an aim to expose learners to technological and digital skills at an early age. Presently, all students inclusive of those in kindergarten and those in the special needs unit are exposed to learning in the computer labs. The integration of technology is useful for students with special needs since teachers are able to deliver instruction based on their zones of proximity and engage them accordingly. According to Reigeluth and Carr-Chellman (2009), technology integration advances learner-centred principles and is in line with other disciplines such as psychology. Furthermore, it affords opportunities for learners to collaborate and engage in contemporary acquisition of knowledge such as problem-based learning among others (Reigeluth & Carr-

Chellman, 2009). Moreover, technology has been integrated in some classes through VCRs and overhead projectors. Drysdale (2020) highlighted the prominence of this differentiated product as many universities are requesting students to attend universities already possessing technological and digital skills. This becomes ideal in situations where learning has to be transferred to an online or remote learning platform. In addition, Drysdale (2020) also noted that more students have expressed a need for more technology classes into their studies.

Environmental Analysis

The Mendez ID team explored the actual organisational state by using a SWOT analysis. This analysis was scoped through the lens of contextual factors. According to Burton and Michael (1994), when a SWOT analysis is employed, it allows need assessors to determine internal or external forces that could potentially impact the needs assessment in the long and short-term. Moreover, the utility of contextual factors is revealed in its ability to explore specific factors that contribute to or hinder performance and create unique nuances (Stefaniak, 2020). Moreover, it also aids in the needs assessor acquiring knowledge on the organisation in which he or she is assisting. Take for instance the transfer factor, Wathne, Roos and von Krogh (1996) advanced that this factor allows for processes in an environment to go under scrutiny to ascertain whether the organisation supports knowledge development at individual and collective levels. Similarly, Tessmer and Harris (1992) proffered that employee demographics are disclosed in utilising orienting factors; cultural nuances, learner and employee roles in instructional factors use and political, legal, economic and technological underpinnings in environmental factors.

In order to support the analysis of the environment, the Mendez ID team circulated 20 questionnaires to its target audience where only 15 were returned which resulted in a response rate of 75%. To select members from the population, a simple random sampling technique was used. The majority of respondents, 53%, were between the age ranges of 31 to 40 years. 73% were females and 40% were in the teaching service between seven to 15 years and 80% were trained graduates. Review the Instrument 2 as well as Respondents' Responses for the Environmental Analysis in the Appendix to view the team's method for collecting data. Additionally, view the SWOT analysis below for the analysed data.

Strengths	Weaknesses
• **Orienting Factors** - 100% of teachers possess tertiary education and are knowledgeable in their content areas - There is a collegial organisational culture. Evidence of strategy logic alignment. It correlates with the school's objective to engage in sharing and is aligned with its values which emphasises teamwork. - 95% are formally trained in the teaching profession -86% of respondents revealed that they are technological savvy	• **Orienting Factors** - 20% of teacher respondents are not experiential in using technology for pedagogical purposes **Instructional Factors** - Only 27% of practitioners indicated that they are experiential - 20% of respondents declared that their teacher professional development was prior to 1999 and was limited to charts and graphics as main sources of technology

- Educators are open to acquiring new knowledge and skills about pedagogical technological integration (Flynn & Klein, n.d.)

- **Instructional Factors**
- Hierarchical structure – one central leader in the organisation makes and approves decisions
- Seniority and authority is favoured in the institution
- The school is recognised as a formal learning institution in the country
- 47% of respondents revealed that they believe they can influence peers with new ideas and resources
- More than 50% of respondents indicated that they use resources and technological tools more than three times weekly

- A practitioner expressed that school leaders do not lead by example by integrating technology use into their own classes
- Inept adoption and managerial staff not leading by example: A respondent stated that there is minimal teacher involvement in planning and that policy makers look at what is done internationally and try to fit it into the current educational model without proper planning. Internal logic misalignment.

- **Transfer Factors**
- The Teacher Training Programme is a sole event
- There is no offering of a refresher's course or human resource development post teacher training
- There are no incentives for continual training if teachers acquire additional skills post training

- More than 80% of respondents are convinced of the benefits of technology integration to classes

- Technological integration signifies that teachers are not seen as the only source of knowledge in classrooms

- The possibility of multi-assessments and not only relying on paper and pen tests to assess students' knowledge, skills and attitudes. (Product logic alignment).

- **Transfer Factors**

- Adequate resources provided such as two computers with internet for teachers' sole recreational use, a computer lab for pedagogical purposes, overhead projector and a VCR (Flynn & Klein, n.d.). Process logic alignment. It correlates with the school's third objective which seeks to improve staff and students' accommodations by providing stimulating classrooms

- Several respondents recommended internet access as a way to ameliorate technological problems at the institution

- Permanent members of staff are only appraised once every three years. Internal logic misalignment.

- A respondent expressed that current technologies only serve a small percentage of the student population at a single time. Product logic misalignment.

- **Environmental Factors**

- 40% of respondents do not feel as though the school's current and available resources can compete in the global market

- Teachers mentioned perceived feelings of exclusion in policy making and being professionally marginalised when they are unsure of curriculum changes

- Many secondary and tertiary institutions are desirous of students who possess digital and technological skills (Drysdale, 2020) - Teacher Professional Development Programme expects to observe teachers integrating technology into their classrooms - Certificate and increase in salary post teacher development training programme - Most respondents express an openness to share resources and ideas with peers above and below their superior level • **Environmental Factors** - Technologies provided are adequate to match global competitors - Political and stakeholder support is given to maintain continued use of technology use in pedagogy	- Teachers indicated that they are labelled as being resistant to change when in fact the ministry's guidelines are unclear

- School's initiative to use technology is in line with their social responsibility. Learners will be able to grasp concepts at their own paces.	
Opportunities	**Threats**
• **Orienting Factors** - A technologically advanced global community of learners by 2030 - Networking opportunities and international business partnerships (e.g. fostering relationships with regional and or international educational institutions that share similar educational goals) - Globally competitive staff and learners • **Instructional Factors** - Dual modality learning to support emergency situations	• **Orienting Factors** - Practitioners may be disillusioned by the latest technological trends that are in the phase of inflated expectations. As such, these trends may fail and cause loss of money in investment etc. - Teachers seldom engage in action research post teacher training - Local competition which would result in a weak competitive edge. Other schools in the district are successfully diversifying their educational product to

• **Transfer Factors** - Rapid technology growth with a focus on education as a niche market - Government provides an attractive and affordable education product for its main stakeholders: □ 71% of bus fare is subsidised for students when they use public transportation □ Textbook loan scheme □ Petty fee contribution □ Eye care services Product logic alignment. • **Environmental Factors** *Legal* - National and international laws advocate for students' rights to an education such as International Labour Law.	include more sophisticated technology learning. Product logic misalignment. - Global competition • **Instructional Factors** - Collective feelings of teacher burnout of having to support dual modalities simultaneously • **Transfer Factors** - Disequilibrium: Low supply and high demands – Government implements standards and targets to remain globally competitive. Schools' demands and needs increase to meet those standards. Government is unable to sustain those needs in a timely manner (Gutmann, 1987). Economic logic misalignment.

In addition, local law stipulates that parents can be charged for unexplained students' school absences

Technological

- Communication: The creation of a School App so that parents, students and other stakeholders can stay abreast of school events and notices. Strategy logic alignment.

- Transition of physical organisation to a Learning Management System to support remote learning in events of a pandemic and other emergency situations without major problems

Economic

- Return on investment: Government's investment in students' education can be retained if students put their knowledge and skills acquired from school to use and add to the working force

- Potential budget changes that could cause cuts or modifications to current welfare and school subsidises

- **Environmental Factors**

Technological

- Ethical and legal issues: Cyberbullying and other computer misuse acts

- Fidelity issues: cheating on examinations; additional expenses of purchasing special software to curb online cheating

- Digital divide

- Approximately 20% of the student population is impacted by a pandemic and cannot access online classrooms, resources and materials. Strategy logic misalignment.

- Staff transfers if students are underperforming

	- Students possess digital and technological skills but if there are not sufficient jobs in the country to sustain these new skills, this can create a brain drain in the economy - School's permanent closure due to combined and compound factors such as low birth rates, low population density, school's underperformance or continual inability to accomplish their goals - More parents may opt to home-school their wards due to increasing school issues such as safety, peer pressure as well as parents' belief that they can offer a better education (National Center for Education Statistics, 2006)

In the analysis, a gamut of factors were revealed that make Master Elementary School stand out as it relates to catering to and accommodating knowledge transfer as well as supporting orienting, instructional and environmental factors for both students and educational practitioners. Some of these include the ability to multi-assess students as well as Government's support and aid services among many others.

Unfortunately, there were some negative factors that not only threaten the organisation's environment but do not align with certain business logics. This misalignment can cause dire repercussions for the organisation as it is its commitment to its clients and main stakeholders. Take for instance, the misalignment of the economic logic whereas students' needs change calls for the organisation to require certain technologies; however, the Government's slow disbursement causes a hold on and even rejection for certain materials and resources. These misalignments would further guide the Mendez ID team as it relates to exploring the performance gap.

Gap Analysis

In order to analyse the gap at Master Elementary school, the Mendez ID Team requested five exemplary performers to be identified and used a competency model. According to Rothwell and Linholm (1999), an exemplary performer displays the requisite and desirable behaviours and competencies in an organisation. Moreover, a dual-response survey was used whereby the exemplary performers were asked a series of questions in order to deliberate and agree on the school's desirable performance and its current performance with the use of a Likert scale. Watkins, Meiers and Visser (2012) advanced that a dual-response survey offered the advantage of avoiding assumption making especially when the desired performance is unknown and there has been no final agreement. In addition, it offers the ability of receiving precise measures of the need (Meisers et al., 2012).

The survey with the five exemplary performers was held as a web conference meeting. Performers were not told why or how they were selected so as to avoid pre-empting information and causing a bias to occur. The survey fashioned a scale which denoted one for strongly disagree, two for disagree; three as neutral; four as agree and five as strongly agree. These numbers were then converted to percentage values where a score of one represented 20%; two signified 40%; three represented 60%; four signified 80% and five represented 100%. Having agreed on responses, the exemplary performers were then asked to elaborate on occasions where the gap was 40% or more using the critical incident technique where they had to detail a positive or negative response of their choice.

	Desired Performance	**Current Performance**	**Gap/ Need**	**Notes**
Strategic needs				
1. Are students satisfied with your teaching capabilities as it relates to technology integration, their engagement levels and interaction?	1 2 3 4 5	1 2 3 4 5	There is a 40% need for teachers to achieve stakeholders' satisfaction as it relates to engagement and interaction in classes	Dissatisfied key stakeholders. This is not in keeping with the school's strategic logic
2. Is technology integration included in your lessons to satisfy students' needs at least 85% of the time?	1 2 3 4 5	1 2 3 4 5	There is a 40% need for teachers to integrate technology into classes at least 85% of the time	Students' decreased motivation and disengagement
3. Do you help promote a learning and collegial environment by engaging in peer-sharing of resources and ideas? **Individual needs**	1 2 3 4 5	1 2 3 4 5	There is no gap existing in the execution of this process. It is already being satisfied.	The desired and the actual states are in sync

1. Do you use on-site technology for recreational purposes that could indirectly help with finding new ways to integrate technology in classes?	1 2 3 4 5	1 2 3 4 5	There is a 60% need for practitioners to use available technology recreationally so that they can find additional materials and ideas as it relates to pedagogy	Stagnant growth and learning. Lack of updated and current knowledge and information
2. Do you enrol in or attend programmes or courses post teacher training that are geared toward new and existing technologies and pedagogical technology integration?	1 2 3 4 5	1 2 3 4 5	There is a 40% need for educators to enrol in or attend programmes post training that are geared toward new and existing technologies integration and pedagogy	As knowledge updates and changes, some teachers will only be aware of what knowledge they possessed at the time of their teacher training and will not go beyond that

3. Does the school's present technologies cater to your needs?	1 2 3 4 5	1 2 3 4 5	There is a 20% need for the school's present technologies to be further enhanced to meet educators' needs	Time wastage, students being left behind in their learning, teachers' frustration, teachers' spending salaries to supplement inadequate technologies
4. Would you prefer if organisational leaders modelled or led by example with regards to technology use?	1 2 3 4 5	1 2 3 4 5	There is a 60% need for organisational leaders to model the desired behaviour	School's culture may change: younger employees may lose respect for their superiors. They may view them as being unprogressive and traditional

5. Do you feel motivated whether intrinsically or extrinsically to continue completing your daily tasks?	1 2 3 4 5	1 2 3 4 5	There is a 60% need for the school to use managerial tactics to increase motivation for teachers	Performers' high absenteeism and low productivity
Operational Needs				
1. Do you take advantage of the computer laboratory and other technological resources?	1 2 3 4 5	1 2 3 4 5	There is a 60% need for educators to take advantage of current technological resources	Students' technology skills and knowledge may be delayed compared to their peers at similar schools
2. Do you require internet access to enhance your classes, promote active student participation and to use more engaging indirect methods?	1 2 3 4 5	1 2 3 4 5	There is an 80% need for internet access to enhance pedagogy, promote more student active participation among others	Students are passive learners and the teacher is seen as the only source of knowledge in the classroom
Knowledge and Skills Needs				

1. Do you have the knowledge to operate technology in the classroom?	1 2 3 4 5	1 2 3 4 5	There is a 60% need for educators to acquire knowledge in operating technology in the classroom	Teachers may adopt negative reasons for not using it and may conform other members against using it
2. Do top-level management and decision-makers exhibit the knowledge to adequately outfit and or make recommendations about technology fixtures and fittings?	1 2 3 4 5	1 2 3 4 5	There is a 20% need for top-level management and decision-makers to acquire knowledge on outfitting and making recommendations about technology fixtures and fittings	This could aggravate key stakeholders such as students, parents and teachers. Parents may request for transfers. Teachers may request for teacher transfers as well

Gap Prioritisation

The gaps are prioritised using the direction analysis approach. This approach allows the need assessors to identify the direction of the gap between the two states but also identify and label it accordingly and identify its priority (Watkins et al., 2012).

Survey question	Gap size	Need/ opportunity	Position or priority	Analysts' comments
1. Are students satisfied with your teaching capabilities as it relates to technology integration, their engagement levels and interaction?	+2	Need	Medium	- Exemplary performer 1 stated that students usually appear more enthusiastic and eager when technology is integrated into classes. An increase in students' academic performance is noticed in formative assessments. - Exemplary performer 2 mentioned that students who are shy and diffident transform into active learners when technology is integrated. Those students are more likely to ask and respond to questions when technology is used than when it is not used.

				- Exemplary performer 3 indicated that when technology is integrated, her students are energetic, there is laughter and sometimes noise. Unfortunately, this is sometimes negatively seen by other colleagues who perceive learning should be more formal and often complain of the disruption. - Exemplary performer 4 indicated that students usually look forward to technology and ask whether it would be used in the session. - Exemplary performer 5 remarked that when technology is integrated, she is able to include more activities to assess students' learning.
2. Is technology integration included in your lessons to satisfy students' needs at least 85% of the time?	+2	Need	Medium	- Exemplary performer 1 stated that technology is used as much as possible. - Exemplary performer 2 said that it is integrated about 89% of the time. In some occasions, peer

				sharing does not always allow individual practitioners to gain access as hoped.
				- Exemplary performer 3 mentioned that technology is integrated purposely the majority of the time to match lesson objectives and outcomes.
				- Exemplary performer 4 agreed with Exemplary performer's 3 comments and added that in lesson planning, as long as the lesson could fit technology, it was included.
				- Exemplary performer 5 mentioned that technology integration was used in the majority of classes but preferred not to use it in every session since it was tedious to set up resources
3. Do you help promote a learning and collegial environment by engaging in	+0	No discrepancy	-	- Exemplary performers 1, 3 and 4 mentioned that they were members of a Professional Learning Community and

peer-sharing of resources and ideas?				although now defunct, still share ideas and resources with persons in their year groups. - Exemplary Performers 2 and 5 stated that they both share resources of educational websites of teaching methods and activities through flash drives and web cloud sharing with their peers.
4. Do you use on-site technology for recreational purposes that could indirectly help with finding new ways to integrate technology in classes?	+3	Need	Medium	- Exemplary Performers 1 to 5 stated that they all use the available computers approximately two to three times weekly and their searches were likely to include pedagogy as well as recreational searches. Since most staff complained that they did not have sufficient time, it was usually at their disposals
5. Do you enrol in or attend programmes or courses post teacher training that are geared toward new and	+2	Need	Medium	- Exemplary Performer 1 has not enrolled in courses but has attended several webinars on teacher training and development

existing technologies and pedagogical technology integration?				- Exemplary Performer 2 has enrolled in three online teacher professional development courses. One of the courses was suggested by the Ministry of Education whilst the other two were chosen personally. - Exemplar Performer 3 stated that the teacher training programme usually offered courses in their vacation that she usually signed up for and attended - Exemplary Performer 4 stated that she has recently enrolled and completed a MOOC course entitled 'Introduction to Technology-Enabled Learning' - Exemplary Performer 5 expressed her fancy for Udemy courses as one has life-long access to materials

6. Does the school's present technologies cater to your needs?	+1	Need	Low	- Exemplary Performers 1 to 5 agreed that despite current technologies were not the most sophisticated or advanced, they could manipulate them to suit their needs by pre-downloading elements
7. Would you prefer if organisational leaders modelled or led by example with regards to technology use?	+3	Need	Medium	- Exemplary Performers 1 and 5 referred to the process as "backward" where leaders are expected to evaluate her performance but may be unaware of how to use technology in their own classes. - Exemplary Performer 2 stated that she was often given high praise by her direct superior for using technology but has never witnessed her superior using it, not even on an experimental basis. - Exemplary Performer 3 agreed with performers 1, 5 and 2 and expressed feelings of annoyance. This performer stated that there should be a tool used to

				measure leaders not as a punishment but to ensure they too were up-to-date with technologies. - Exemplary Performer 4 discussed how leaders' lack of technology use affected the purchasing of items. Exemplary Performer 4 relayed that because some leaders seldom used technology, items such as P.C adapters and HDMI, USB cables etc. were usually not on their item purchase list.
8. Do you feel motivated whether intrinsically or extrinsically to continue completing your daily tasks?	+3	Need	Medium	- Exemplary Performer 1 stated that she is intrinsically rewarded by praise. However, she only receives praise in a small group such as her year group setting. She related that whole school praise was given at the end of the term in general but praise from her year head usually tended to

				motivate and encourage her despite it being infrequent.
				- Exemplary Performer 2 stated that in spite of the most advanced technologies she was still motivated to complete tasks. This performer stated that students' enthusiasm kept her going.
				- Exemplary Performer 3 indicated that she was motivated by students' performance on standardised tests.
				- Exemplary Performer 4 relayed that when alma maters revisited the school to give her praise and thanks for the hard work, she was greatly motivated.
				- Exemplary Performer 5 stated that she too was motivated by students' enthusiasm especially when they have finally grasped a concept.

9. Do you take advantage of the computer laboratory and other technological resources?	+3	Need	Medium	- Exemplary Performers 1 to 5 stated that as per schedule they attended the computer laboratory. However, they note that some peers had become frustrated attended the lab sessions and having to repeat information due to the lab's limited computer use
10. Do you require internet access to enhance your classes, promote active student participation and to use more engaging indirect methods?	+4	Need	High	- Exemplary Performer 1 stated that whilst it is possible to download videos, songs etc. beforehand, with internet access, students would be able to take on different roles such as the role of a researcher, evaluators and so on depending on the activity - Exemplary Performer 2 mentioned that it would be easier to make learning more authentic and realistic. For example, in teaching students shapes and colours, it might be useful to have them scan an

				online supermarket store and have students place particular items in a virtual cart.
				- Exemplary Performer 3 suggested that learners could collaborate and engage in more social learning online
				- Exemplary Performer 4 said that internet access would make much of the learning acquired from training sessions easier to implement
				- Exemplary Performer 5 stated that students could meet experts and go on virtual tours with the use of internet access
11. Do you have the knowledge to operate technology in the classroom?	+3	Need	Medium	- Exemplary Performers 1 to 5 stated that due to their recreational and personal use of technology and it being an integral part of their daily lives also coupled with training that they were all comfortable using technology for pedagogical purposes

| 12. Do top-level management and decision-makers exhibit the knowledge to adequately outfit and or make recommendations about technology fixtures and fittings? | +1 | Need | Low | - Exemplary Performers 1 to 5 agreed that the ITC specialised in the area of Information Technology. Moreover, the school's Principal, whilst is the main decision-maker, makes decisions based on her knowledge and recommendations. They all contended that it was not an issue of not having adequate knowledge, but rather not revising the school's infrastructure to suit its changing needs |

Cause Analysis

Chevalier (2007) suggested furthering the gap analysing by categorising gaps according to whether they are individual or environmental factors and asking clients to determine the reasons why they exist. The Mendez ID team uses this approach with the most critical need identified in the gap prioritisation. See the table below for the results.

Need	Environmental / Individual Factor	Reasons for the gap's existence
There is an operational need for internet access to enhance work performance	Environmental factor	1. Lack of awareness of current technologies capabilities such as the use of Wi-Fi extenders and so on

Discussion

There is a slight semblance of the perceived gap and the discrepancy gap. The perceived gap which was that there may be a skill and knowledge discrepancy as it relates to outfitting and placing certain equipment and technologies so that teaching staff and students could fully exploit technology fruitfully has been recognised not as the gap but rather, the cause or the reason for the gap's existence. The performance gap is that there is a need for internet access to enhance work performance.

Analysing the Problem

In order to analyse the problem at Master Elementary School, the Mendez ID team proposes to use a systematic inquiry. The purpose of this study is to compare the effects of a technology integrated learning environment with the internet on the academic achievement of Grade five mathematics students. The analysts seek to answer the following three questions:

1.   Is there underutilisation of available resources and technologies at Master Elementary?

2.   What are the causes of teaching in an environment without internet access?

3.   Is there a relationship between students' performances or outcomes and teaching without internet access?

The study involved a survey which sought to compare students' academic performance before internet use was integrated in classes and one post-test which measured and compared test results after internet use as integrated for the treatment group. The Mendez ID team was desirous in proving the hypothesis that technology integration and internet use for pedagogy can increase student academic performance.

The population of Master Elementary School led to the Mendez ID team randomly selecting two Grade 5 teachers. Thus, to compare results, the team looked for a similar school in the district where similar mathematics concepts and principles were taught and one where students were around the same age, shared similar characteristics and approximately had the same number of students. In the treatment group, students' results were expected to have been exposed to learning with technology and internet access for their post-test.

Data were collected through a survey that was created and distributed through the creation of a Google form. The instrument can be viewed in the Appendix entitled 'Data Collection Instrument for Problem Analysis'. Furthermore, respondents' responses can also be viewed in the Appendix with the title 'Respondents' Responses to Problem Analysis'

Data were further organised and analysed through the use of SPSS 12 software for data requiring statistical information. However, research question one which sought to find out whether there is underutilisation of current and available resources at Master Elementary School, asked an open-ended question to its respondents. The respondent in the control group responded negatively. Answers to this item can be found in the Appendix.

In order to answer the second research question which attempted to find out the causes of teaching in an environment without internet access. Another open-ended question was asked to respondents. It was revealed based on the respondent from the control group that a lack of internet in classrooms causes the respondent to question his own teaching abilities, a reliance on direct teaching methods and fears of losing students' interests in the content area. Responses to this item can be found in the Appendix. This information was also used to create an Ishikawa Diagram which can be found in the Appendix.

To answer research question three which sought to find out whether there was a significant difference between average test scores between the control group (Master Elementary School) and the treatment group, SPSS computations were used whereby two results of their class' mean were requested from the respondents. Thus, the pre-test and post-test average test scores for each group were measured to determine whether there was a significant difference between the two groups. As such, an independent sample t-test was calculated to prove the null hypothesis.

Please review the tables below for the findings of the two sample t-tests for research question

three.

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
Class average as a percentage for 2019 - 2020	control group	12	66,500	21,0907	6,0884
	treatment group	13	68,462	18,0537	5,0072
Class average as a percentage for 2020 - 2021	control group	12	57,833	11,5902	3,3458
	treatment group	13	81,231	14,5725	4,0417

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Class average as a percentage for 2019 - 2020	Equal variances assumed	,032	,859	-,250	23	,804	-1,962	7,8323	-18,1639	14,2408
	Equal variances not assumed			-,249	21,779	,806	-1,962	7,8829	-18,3193	14,3962
Class average as a percentage for 2020 - 2021	Equal variances assumed	,329	,572	-4,418	23	,000	-23,397	5,2964	-34,3538	-12,4410
	Equal variances not assumed			-4,459	22,537	,000	-23,397	5,2469	-34,2638	-12,5311

Explanation of Findings

To confirm the performance gap, a quantitative survey was conducted. The third research question, which explored whether or not the use of internet access impacted students' academic performance, employed a descriptive statistical test and compared pre- and post-tests results to a similar institution. The results of this descriptive test revealed that in 2019 where both control and treatment groups were not exposed to internet and pedagogy, there was no significant difference between students' mean averages in the control and treatment groups. There was a mean difference of 1.962 where the control group scored higher but not with any major or significant difference. In 2020, where only the control group was exposed to internet-based pedagogy, a significant difference was noticed. There was a mean difference of 23.38 where the control group scored significantly higher. This test then rejected the null hypothesis and accepted the hypothesis that internet use for pedagogy can increase students' academic performance.

Watkins et al (2012), recommended a review of the findings of the needs assessment in order to link potential improvement solutions to the causal factors. To do this, the Mendez ID team uses a Multicriteria Analysis Table. This method is useful in objectively assessing, comparing different options and avoiding potential selection biases that could occur (Watkins et al, 2012). See the Multicriteria Analysis Table below for the results of the comparison of alternative solutions.

Comparison of Alternatives for Implementing Internet Access into Classrooms and the Computer Laboratory at Master Elementary School

Ratings: 1-2 = very low, 3-4=low, 5-6 = medium, 7-8 = high, 9-10 = very high

	Criterion 1: Ability to accomplish desired outcomes	**Criterion 2**: Client satisfaction	**Criterion 3**: Feasibility	**Criterion 4**: Expected results within six months	**Criterion 5:** Cost of the activity overtime	Sum of weighted ratings
Weights	.25	.20	.20	.20	.15	
Alternative solution 1 Just-in-time learning with the use of personal teachers' devices and Wi-Fi installation	8.5 x .25= **2.13**	8 x .2= **1.6**	4 x .2= **0.8**	8 x .2= **1.6**	7 x .15= **1.05**	7.18
Alternative solution 2	9 x .25= **2.25**	9 x .2= **1.8**	9 x .2= **1.8**	9 x .2= **1.8**	6 x .15= **0.9**	8.55

Install Wi-Fi extenders, provide social learning and strategic planning					
Alternative solution 3 Organisational learning	6 x .25= **1.5**	8 x .2= **1.6**	8 x .2= **1.6**	6 x .2= **1.2**	9 x .15= **1.35**	7.25
Alternative solution 4 Strategic Planning for future technology integration and blended learning	8 x .25= **2.13**	5 x .2= **1**	9 x .2= **1.8**	7 x .2= **1.4**	3 x .15= **0.45**	6.78

It is established that the use of Wi-Fi extenders, social learning and strategic planning scored highest. However, to be more prudent, Kaufman and Watkins (1996) suggested offering clients a comparison tool that measures costs so that they could make better and informed decisions based on unique elements such as their budgets. Stefaniak (2020) suggested that a cost analysis consequence allows needs assessors to evaluate and analyse costs as it relates to returns on investments and other benefits and consequences. Moreover, if this step is ignored, Kaufman and Watkins (1996) cautioned that it could be unrewarding and costly for an organisation. Please see the table below for the findings of the cost analysis consequence.

	Potential Costs Associated with not Addressing the Solution	Potential Costs Associated with Addressing the Solution
Alternative solution 1 Just-in-time learning with the use of personal teachers' devices and Wi-Fi installation	Stakeholders' dissatisfaction, interest groups may be reluctant to help in future projects. **Intangible costs**	Training costs (US $500 per session) * 6 sessions + Wi-Fi installation (US $69 - $249.99) + laptops/ other devices for teachers who do not have (US $US500 * 10 teachers). **Estimated $US 8,069 - $US 8,249.99**
Alternative solution 2 Install Wi-Fi extenders, provide social learning and strategic planning	Wasted money invested in incoming technology as teachers may not know how to use technology, feel as though they do not have the time or have the desire to use technology, stakeholders' dissatisfaction, **>$US 50,000 for wasted technology and other intangible costs**	Two training costs (US$500) * 12 sessions + Wi-Fi extenders ($US 110) **Estimated $US 12,110**

Alternative solution 3 Organisational learning	Teachers' lack of motivation and low teacher self-efficacy, high employee turnover, stakeholder dissatisfaction with teacher performance. These can result in low productivity and efficiency **Intangible costs**	Training sessions $US 650 per session * 8= **Estimated $US 5,200**
Alternative solution 4 Strategic Planning for future technology integration and blended learning	Underutilisation of technologies, wasted investment, dissatisfied key stakeholders **Intangible costs**	$US 1000 per 8 training sessions + Senior Management buy in = **Estimated $US 8,000**

Proposed Solution

To determine a proposed solution, the Human Performance Evaluators in the Mendez ID Team assumed the role of process consultants. Rothwell (2005) advanced that this role involves active involvement with stakeholders which includes communicating, providing guidance and lending support so that clients could select their own intervention based on facts and evidence. To aid in the selection of a proposed solution, the Mendez ID Team concentrates on criteria such as the company's budget and the comparison of alternative solutions. Therefore, it is recommended that the proposed solution of Master Elementary School is the installation of Wi-Fi extenders and providing social learning and engaging in strategic planning for learners and the organisation respectively. This decision was made with the client after several discussions on each solution, research and evidence-based findings.

Recommendation 2: Install Wi-Fi extenders, provide social learning and strategic planning

Nehaniv and Dautenhahn (2007) defined social learning as a constructive approach whereby knowledge may be transferred in a social context. This type of learning recognises that learners are not passive recipients of information and that human behaviour is learned mostly through observation and imitation (Bandura, 1977). However, Reed, Evely, Cundill, Facey, Glass, Laing, Newig, Parrish, Prell, Raymond and Stringer (2010), proffered a more contemporary definition. They stated that social learning is a process that should demonstrate a social change whereby people learn from each other through active social participation or in the practices of a community. Moreover Reed and researchers (2010) further advanced that social learning should satisfy three components:

1. Individuals involved in the social change should demonstrate that there has been a change in their understanding

2. The change goes far beyond the individual level and extends to wider social

   communities such as communities of practice and

3. Learning should occur through social interactions within a social network

This intervention offers a gamut of organisational benefits. It offers the benefit of creating organisational knowledge where learners create and share information accordingly (Valamis, 2021). Additionally, it is cost-effective and results in collaboration and productivity and sustainability (Valamis, 2021). In the workplace, it can be actualised through Frequently Asked Questions, organisational wikis, leveraging expert knowledge, forums and gamification and rewards (Powell, 2021). Moreover, the environment at Master Elementary School naturally lends itself to the use of this solution without impinging or changing systems in the organisation. It was noticed in the analysis stages that the school has a collegial organisational culture and that 86% of learners are technology savvy. Moreover, 95% are formally trained whereby 80% were trained to use current and updated technology. Therefore, it is believed that social learning could heighten personal development for this learning population.

In terms of strategic planning, Van tiem, Moseley and Dessigner (2012) cultivated that strategic planning is a solution based on organisational pro-action which affords an organisation to think about its future and plan creatively by actioning its objectives with an understanding of the influences of environmental factors in mind. Consequently, Van tiem et al (2012) stated that it fosters employees' confidence and commitment to the organisation. Strategic planning stems from this approach and it refers to the organisation's direction on allocating resources to benefit the company's strategic vision and plan (Van tiem et al., 2012). This is a valid solution for Master Elementary due to the fittings and fixtures of current technologies and resources that inadequately benefit learners and teachers (Flynn & Klein, n.d.).

According to Espy (1986) strategic planning offers several benefits in organisations. Firstly, it allows a business to create a future. By doing this, leaders are able to plan and delve into their future by analysing and weighing pros and cons of achieving their objectives (Espy, 1986). Moreover, Espy (1986) suggested that strategic planning allows for organisations, especially those with limited resources, to plan for resource allocation and competition. Lastly, it also encourages team building by allowing other members in the organisation to share their ideas as each person works together toward common goals (Espy, 1986). Espy (1986) explained though that it may be difficult to develop and put plans into action and that challenges were likely to arise with this solution such as other employees viewing it as a mundane task etc. However, it was recommended that with determination and courage, it could be a fruitful and effective intervention (Espy, 1986).

Evidence

The proposed solutions have a high probability of success at Master Elementary School due to the fact that they have been tested and tried in other organisations internationally. This section details supporting evidence that buttresses the use of the proposed solutions and demonstrates how they were carried out at other organisations globally.

There is strong evidence for the support of social learning in organisations especially in schools. Wheeler, Guevara and Smith (2018) asserted that social learning is a key component found in international frameworks such as UNESCO and the United Nations Sustainable Development Goals. In Wheeler and researchers' study, it was revealed that a collective approach including community, stakeholders, parents and teachers was necessary to create an effective social learning environment whereby disadvantaged students benefitted from the partnerships formed. The study sought to determine whether social learning could alleviate some of the issues in schools such as funding, short-term and unorganised partnerships, lack of teacher time and so on (Wheeler et al, 2018). Social learning was realised by establishing champions who facilitated projects and activities in the study. The study's initiatives were able to prove that through social learning and partnerships, there was an increase in student learning and engagement as well as student empowerment as it relates to sustainability and students developing a sense of pride in their local communities (Wheeler et al, 2018).

Additionally, in spite of social learning's positive effects, it was found that there needs to be purposeful and pragmatic implementation. Social learning has been lauded by Schlager and Fusco (2003) who stated that these social learning environments inspire change and motivation and play a key role in teachers' professional development. Since there is a direct focus on student learning, peer collaboration, metacognitive and reflective thinking and providing social and normative support for teachers, these environments tend to result in high

teacher motivation and sustained levels of continued learning for teachers. It was noted in

Smylie, Greenberg, Harris and Luppescu (2001), as was cited by Schlager and Fusco (2003),

that social learning as a teacher community of practice, promotes positive instructional

change. It has the ability to challenge teachers to think critically, to deepen their cognitive

skills by providing feedback, sourcing innovative ways to accomplish tasks and questioning

common assumptions among many others. However, Schlager and Fusco (2003) argued that

social learning should be implemented systematically in a teacher community of practice

since there are underlying and complex policies and hierarchies that could either encourage

or resist change. Schlager and Fusco (2003) stated that there may be issues such as

incompatible leadership, cultures and tools. Therefore, before this type of learning is

implemented, Schlager and Fusco (2003) recommended creating and developing the

community's history and culture, developing membership identity where members feel at

ease to build and develop their professional identity and share with peers etc. as well as

correcting any learning processes that are misaligned.

Moreover, the importance of strategic planning, especially as it relates to technology

and educational institutions, is evidenced in Youssefi and Merati (2017). The report assessed

an Information Technology Strategic Plan at Ferdowsi University of Mashhad. Youssefi and

Merati (2017) contended that a company's IT strategic plan is an important and valuable tool

especially for a business that relies heavily on its use. Thus, it should be updated to suit the

company's present day needs and changes. Moreover, Youssefi and Merati (2017)

recommended surrounding the IT strategic plan around performers who use the technology in

carrying out their work functions and duties, specific objectives and the gap analysis among

many others. In the report, it was recorded that a strategic plan allowed the university to

exploit their technological resources, inspire new projects and innovations, achieve optimum

research capabilities and increase their teaching and learning among others.

In addition, strategic planning was accomplished successfully and was able to highlight deficiencies in a research study conducted in an urban college in New York City. To develop a strategic plan for the college, Mowete (1991) examined the institution's decision variables and conducted several analyses which included exploring its mission statement and resources as it relates to its strategic planning processes. At this stage, several problems were unearthed which included, funding, budget cuts due to a financial crisis and the university's president turnovers. Planning at the university then had an operations control where it was ad hoc and focused narrowly on short-term events. Usually, it came about only in emergencies and would disappear slowly when problems were fixed. Fortunately, a new strategic plan was in place that attempted to have more faculty and student involvement especially as it relates to decision-making activities. Moreover, the plan was created with the college's strengths and opportunities at its helm and was recommended to be assessed every five years, where amendments would be made accordingly which would result in a renewed five year plan. Moreover, it was recommended that the new strategic plan be used along with a Decision Support System to aid in the college making better long-term decisions (Mowete, 1991).

Concluding Remarks

This needs assessment was conducted with the sole purpose of identifying discrepancies at Master Elementary so that these needs would be addressed in a timely and efficient manner.

In the gap analysis phase, it was revealed that there is an operational need for internet access to enhance work performance. This need is caused by a lack of awareness of current technologies capabilities such as the use of Wi-Fi extenders and so on. Therefore, through providing multiple alternative solutions and conducting a cost consequence analysis, the client selected the proposed solution of Wi-Fi extenders installations and providing social learning and strategic planning. Social learning is expected to have great success at the institution since it was noticed in the environmental and analysis stages that there is a collegial culture and that 86% of teachers are technology savvy. Moreover, Master Elementary School will benefit from strategic planning so that trends and changes that were revealed in the environmental stage could be managed more appropriately in their futures as well as helping the school with purposeful resource allocation and decision-making in its future.

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Appendix

Table 1 - the data collection instrument for organisational analysis that was employed as a technique for further probing for the Principal and top-level management.

Table 1.

Performance System Factor	Questions and Responses
Organisational Environment	**Is the organisation structured in a way that contributes to effective and efficient performance of the work?**
Functional and Administrative divisions	•**Are organisational functions set up to produce clear outcomes that are useful to other units or the organisation as a whole?** *A: In general, the school's objectives typically act as overarching objectives. Sub-division departments and extra-curricular clubs are encouraged to create enabling objectives based on the school's objectives.* • **Do people typically know what other functional groups do and how it is related to their own work or that of the organization?** *A: Yes, historical events play a major role in the organisational functions being easily communicated and understood by new members.* • **Is the organisation affected by bureaucracy?** *A: Yes, since it is a public organisation, there is a high presence and influence on bureaucracy and following certain rules and regulations.* • **Has the organisation identified other institutions/ organisations/ groups to which it relates or might be expected to relate?** *A: Yes. The school is expected to perform at a level similar to seven other schools in its district.* • **Has the organisation been identified as influential or important to the sector by consumers, policymakers, suppliers, competitors and other organisations in its external environment?** *A: Consumers perceive the organisation to be a formal institution for elementary learning. In addition, the school is recognised for its satisfactory students' performances on formative and summative assessments and even standardised tests such as the Standards of Learning test, the Social, Emotional Screener test and Cognitive Abilities Test (CogAT) among others.*
PHYSICAL WORK ENVIRONMENT	**Is the work environment set up to make it as easy as possible to work efficiently and effectively?**
	• **Are necessary equipment, tools, and information available?**

Resources, resource accessibility, support services and physical work environment	*A: Each department produces estimates of their resource and equipment needs for the following school year which includes rudimentary equipment such as stationery. It may also include technological equipment. Unfortunately, all that is requested is not always granted. This is mostly observed in the Information Technology Coordinator's estimate to include internet access in the school's laboratory but to date, this has not materialised.* **• Are equipment, tools, and information readily accessible when and where they are needed?** *A: Since current technologies such as the overhead projector and VCRs and the school lab have to be shared among the teaching body, the school's secretary uses a log book to create a daily tracking system of each device and resource. This information avoids over-booking with the exception of the school laboratory as this resource is scheduled and fixed on each teachers' timetable. However, it means that some teachers cannot access the other technological resources as they would like.* **• Are resources designed to be easily used and to effectively support the work?** A: Yes, the main purpose of the technologies is to provide great pedagogical benefits and to promote student engagement. However and unintentionally, the impracticalities of having a computer laboratory without internet access and having to teach rudimental computer functions, make the process more tedious, cumbersome and less than constructive. **• Are necessary support services available?** Yes, an Information Technology Coordinator is in charge of the general functioning of equipment, maintenance issues and supporting teachers in the computer technological use in the computer lab. **• Are space, light, and temperature adequate to work effectively?** *A: Yes, teachers and students carry out their daily functions in a well-lit and modern environment.* **• Is the environment free of physical obstacles that get in the way of doing the work?** *A: There are no physical obstacles that stop performers from completing their duties.*
SOCIAL WORK ENVIRONMENT	**Do people throughout the organisation typically behave in a way that supports effective performance?**
	Do organisational leaders typically . . . **• Provide people with clear direction about goals?** *A: No. Goals and objectives are prescribed in official school documents and the school handbook for a new cohort. However, they are not referred to or communicated at regular intervals at staff meetings and other decision-making events.* **• Create a compelling vision about purposes and what the future could be like?**

	A: The school's principal has devised a vision statement with the help of administrative and general staff. However, its vision statement lacks a tangible futuristic perspective. There are no real and justifiable goals for the future.
	• Provide advice and coaching when needed?
	A: Yes, administration staff members usually provide mentorship and informal coaching to new staff members. There was also a Professional Learning Community that governed this process in previous years; however, it is mostly inactive and efforts are usually done informally nowadays.
	• Demonstrate through their own behaviour what they expect of others?
	No. Although the school expects teachers to use technology in their classes, senior teachers are reticent and diffident about using technology in their classes and integrate it minimally. However, they encourage their subordinates to do so.
	• Offer recognition/rewards for improved or excellent performance?
	A: Praise is often administered at departmental meetings but is seldom done at whole school meetings.
	• Encourage initiative?
	Yes. New staff members who integrate technology and VCRs into their classes are often supported by their departmental heads. Oftentimes, they are asked to share their ideas and approaches with their peers informally.
	• Do people accept and even encourage information, opinions, and ideas from people who are below them in the organisational hierarchy?
	A: No. Junior staff member's ideas are always listened to but their ideas and Information have very little impact on senior staff especially as it relates to implementing changes.
Institutional Ethos: Leadership practice, hierarchical relationships, peer relationships and business values	Do organisational peers or colleagues typically . . .
	• Share relevant information with each other as well as encourage/accept suggestions and feedback from each other?
	A: Yes. There is a collegial environment. Usually, peers at the same position of level are open to sharing their ideas and giving each other feedback.
	• Treat each other with respect?
	A: Yes, respect is given to all staff members.
	• Has the organisation defined and communicated its business values to people within the organisation – and to suppliers and customers as well?
	A: Yes. In a minor way the school has published its business value on its website and in school official documents.

	• Do people in the organisation typically behave in a way that reflects those values? A: Marginally. Members behave professionally 95% of the time. However, there is a disconnection between home, school and the community which is an integral aspect in the school's mission statement. Teachers may sometimes call parents to report on students' behaviour. Overall, the organisation lacks a tangible relationship among the trio. **• Are the values compatible with the organisation's strategy and goals?** *A: Yes, the school's values are compatible with the organisation's strategy and goals as well as stakeholder's needs and expectations*
TECHNOLOGY ENVIRONMENT	**Is the technology needed to carry out the organisation's work supported by systems in the broader environment?**
	• Is there adequate physical infrastructure (power, telecommunication etc.) to support the organisation's work? *A: Yes, however, some systems seem to be inappropriately placed without considering the school's needs such as the provision of computers and internet access only in the teacher work area.* **• Is the technology needed by the organisation to carry out its work supported by the overall level of national technological development?** *A: Yes. The organisation's need for students to gain technological and digital skills is aligned with high schools, universities and several workplaces which seeks for students to be* adept with technology. **• Does the system of government facilitate the organisation's process of acquiring needed technology?** *A: Whilst there is some evidence to suggest that the government supports the organisation's initiative for technology integration and internet access, its disbursement of funds is usually slow.* **• Is human resource development adequate to support new technology?** *A: Some staff members are computer literate. ITC may be able to support those who have a minimal level of computer literacy.* **• How reliable are available utilities?** *A: The two computers in the teacher work areas operate satisfactorily as well as the computers in the computer laboratory. The ITC is in charge of maintenance updates and checks them periodically. At the end of each school academic year, there are scheduled checks and updates. Any defects or malfunctions must be reported to the Ministry followed by a request for a replacement.* **• What is the organisation's networking capability?**

	A: The school's network can accommodate two Local Area Networks. Moreover, the school has provision to house Wireless Fidelity and dongles for areas where buildings and other objects may obstruct transmissions. **• Does the organisation have access to research?** *A: Research regarding outfitting the school with technology, careful consideration to the school's needs and internet access should be sought through experts such as the Superintendent, the ITC as well as an external telecommunication expert.*

Data Collection Instrument for Environmental Analysis

Instrument 2

Environmental Analysis

Questions   Responses   15   Settings

Section 1 of 4

Environmental Analysis

Dear participant,

I am conducting an environmental analysis at your educational institution. The study seeks to find relationships among your teaching environment as it relates to orienting, transfer, instructional and environmental factors. Some of the questions this survey seeks to answer are as follows:

1. Does your environment provide necessary resources for transfer post training?
2. What are the strengths and weaknesses of performance drivers relating to your role as instructor?
3. What are the drivers of your environment?

The views of school teachers are particularly valuable in achieving the research questions and it is therefore hoped that you will agree to complete this instrument which should only take 10 minutes.
The information presented in this questionnaire will only be used for its intended purposes and will be kept in the strictest confidence.

Thank you for your kind cooperation.

Select your age range   *

○ 20 - 30 years

○ 31 - 40 years

○ 41 - 50 years

○ >50 years

○ Less than a year

○ One to six years years

○ Seven to 15 years

○ 16 to 25 years

○ More than 26 years

What is your teaching position? *

○ Trained graduate

○ Untrained graduate

○ Qualified teacher

○ Specialist teacher

After section 1   Continue to next section   ▼

Section 2 of 4

Transfer Factors   ⤢   ⋮

Instructions: Please indicate the extent to which you agree with the following statements concerning your opinions on your organisational culture. Please read each statement carefully. Select the number that matches your desired response using the below scale.

Select "1"   if you Strongly Disagree
Select "2"   if you Disagree
Select "3"   if you are Neutral
Select "4"   if you Agree
Select "5"   if you Strongly Agree

⊕   ⊡   T̅   ▣   ▶   ▤

I work in a friendly work environment *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I get along well with my peers *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am comfortable sharing resources and ideas with my colleagues *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am comfortable sharing resources and ideas with my supervisors *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I can influence peers above and or below my superiority level with new ideas and resources *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

After section 2   Continue to next section   ▼

Section 3 of 4

Instructional Factors

Instructions: Please indicate the extent to which you agree with the following statements concerning your opinions on your role as an instructor and your learners' roles. Please read each statement carefully. Select the number that matches your desired response using the below scale.

Select "1"   if you Strongly Disagree
Select "2"   if you Disagree
Select "3"   if you are Neutral
Select "4"   if you Agree
Select "5"   if you Strongly Agree

I perceive myself to be experiential in my technological and pedagogical pursuits *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Students appear to enjoy lessons where technology integration is involved *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There are adequate tools, resources and equipment to aid in my teaching *

	1	2	3	4	5

I use tools and resources more than three times weekly *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am trained in Teaching Professional Development and I am convinced of the benefits of technology integration *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My teacher training development programme was prior to 1999 and technology integration was limited to charts and graphics *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I know how to use and integrate computers and technology for pedagogical purposes *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Lack of internet access is not a major hindrance to technology integration for pedagogical *

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

After section 3   Continue to next section   ▼

Section 4 of 4

Environmental Factors   ✖   ⋮

Instructions: Please indicate the extent to which you agree with the following statements concerning your opinions on government's support and initiative to meeting your teaching needs. Please read each statement carefully. Select the number that matches your desired response using the below scale.

Select "1"   if you Strongly Disagree
Select "2"   if you Disagree
Select "3"   if you are Neutral
Select "4"   if you Agree
Select "5"   if you Strongly Agree

I believe that the school's current technologies and resources can sufficiently compete in *
the global market

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Are you satisfied with the level of political and managerial support as it relates to technology *
integration? Why or why not?

Long-answer text
_____

⊕   ⬚   T̅ᴛ   🖼   ▶   ▤

technology and infrastructure at your institution?

Long-answer text

Respondents' Responses for Environmental Analysis Survey
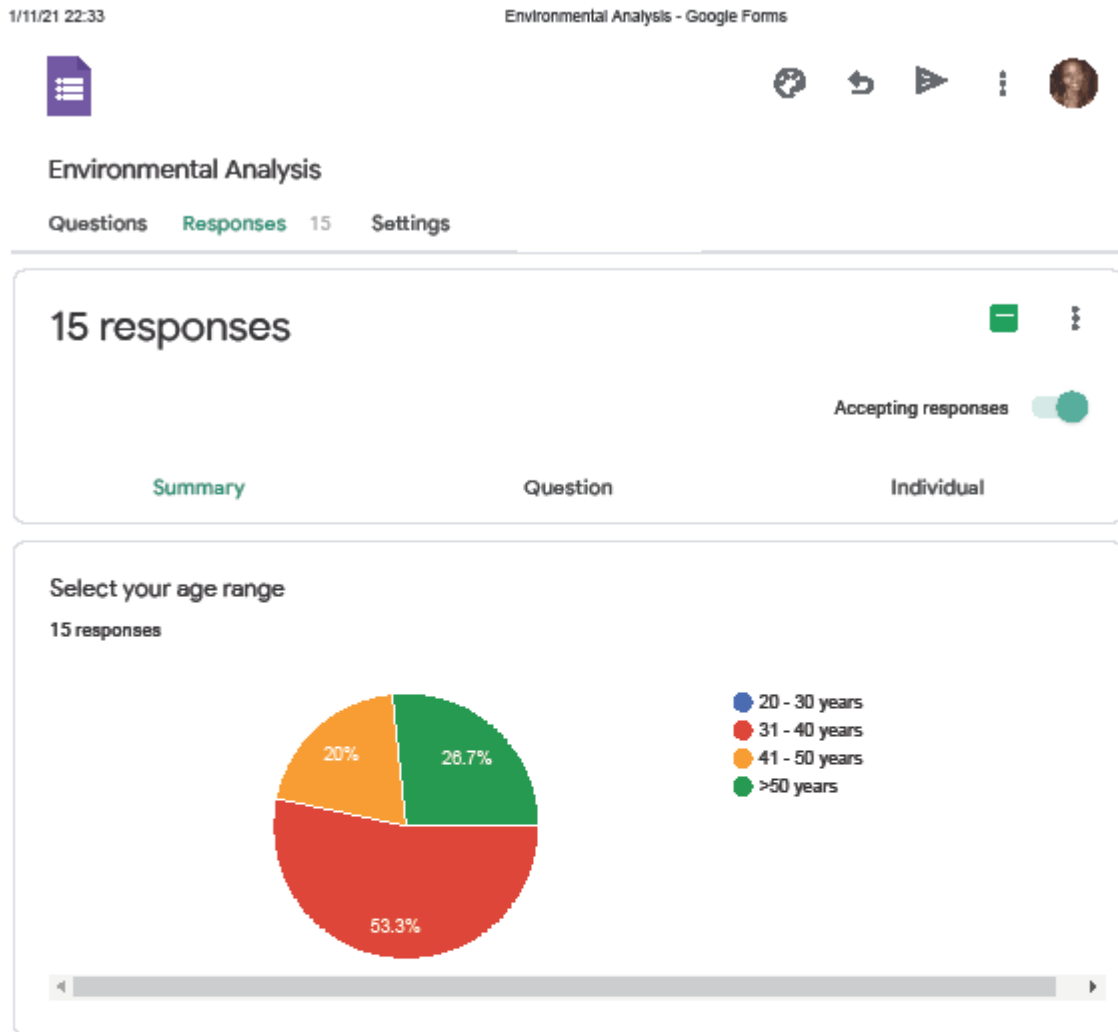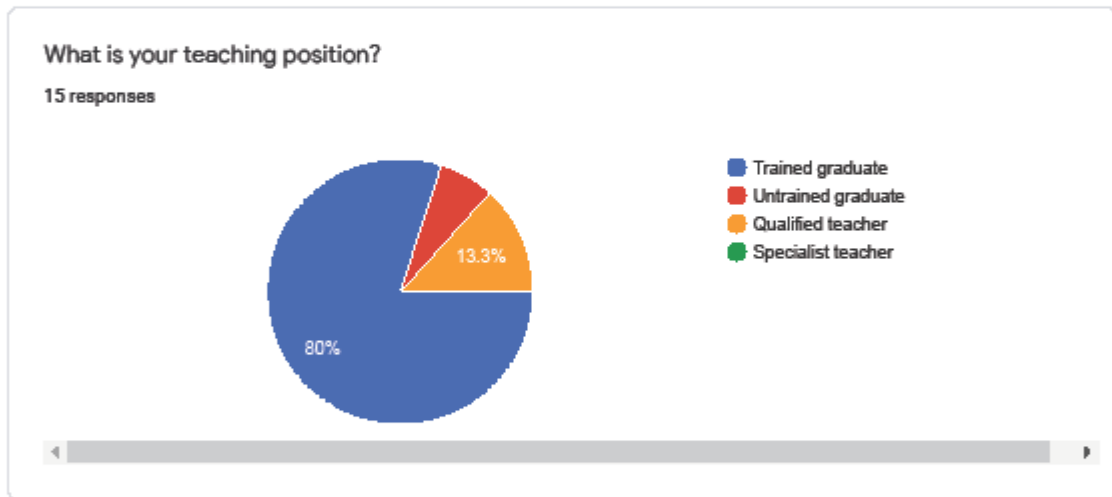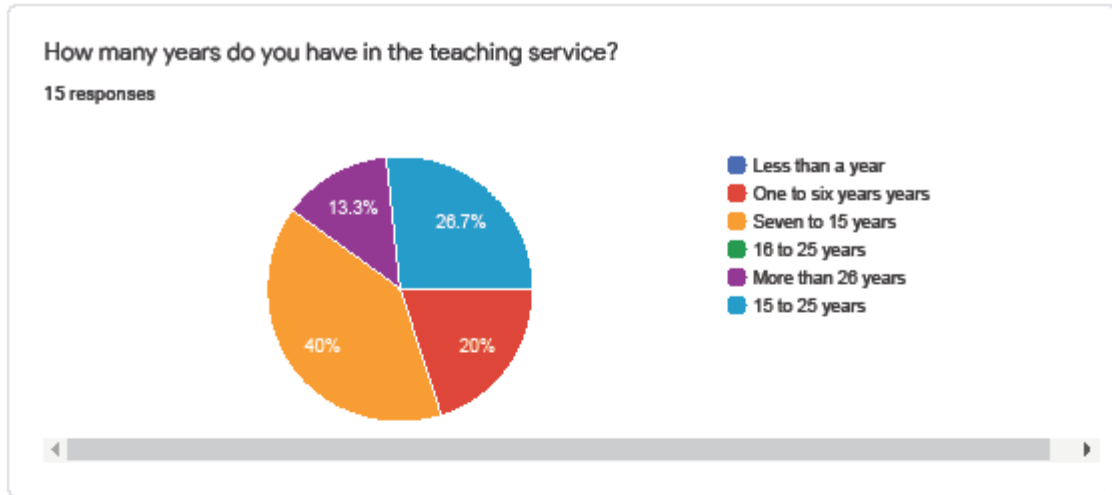
Environmental Analysis

Questions   Responses   15   Settings

15 responses

Accepting responses

Summary   Question   Individual

Select your age range

15 responses

- 20 - 30 years
- 31 - 40 years
- 41 - 50 years
- >50 years

20%   26.7%   53.3%

How many years do you have in the teaching service?

15 responses

- Less than a year
- One to six years years
- Seven to 15 years
- 16 to 25 years
- More than 26 years
- 15 to 25 years

13.3% 26.7% 40% 20%

What is your teaching position?

15 responses

- Trained graduate
- Untrained graduate
- Qualified teacher
- Specialist teacher

13.3% 80%

Transfer Factors

I work in a friendly work environment

15 responses

I get along well with my peers

15 responses

I am comfortable sharing resources and ideas with my colleagues
15 responses
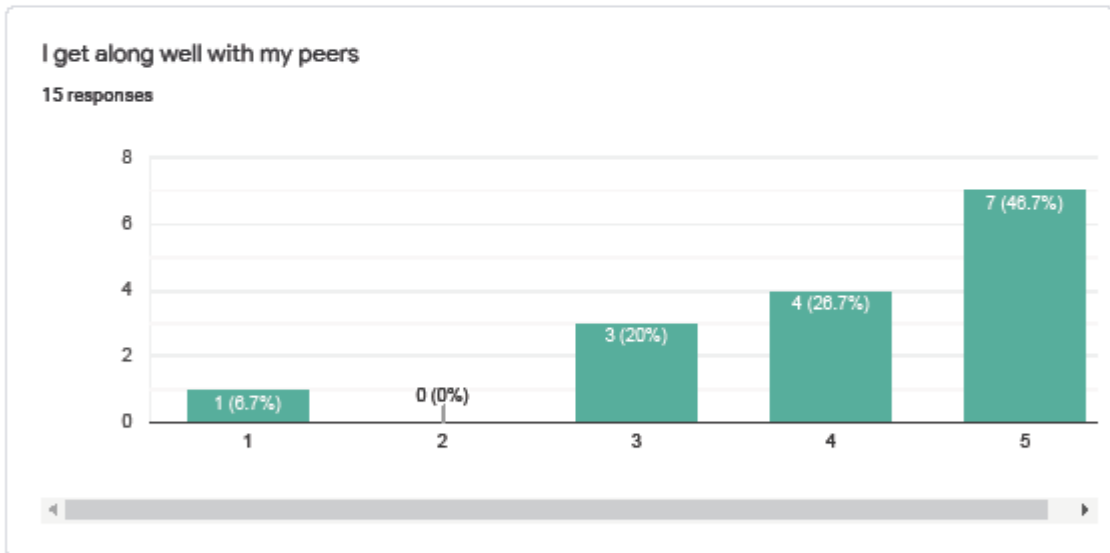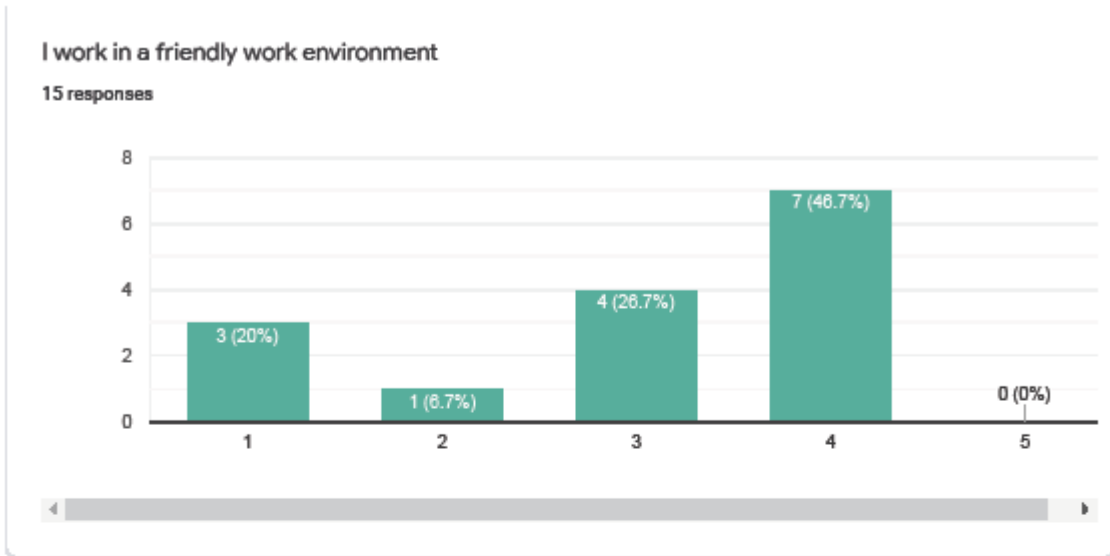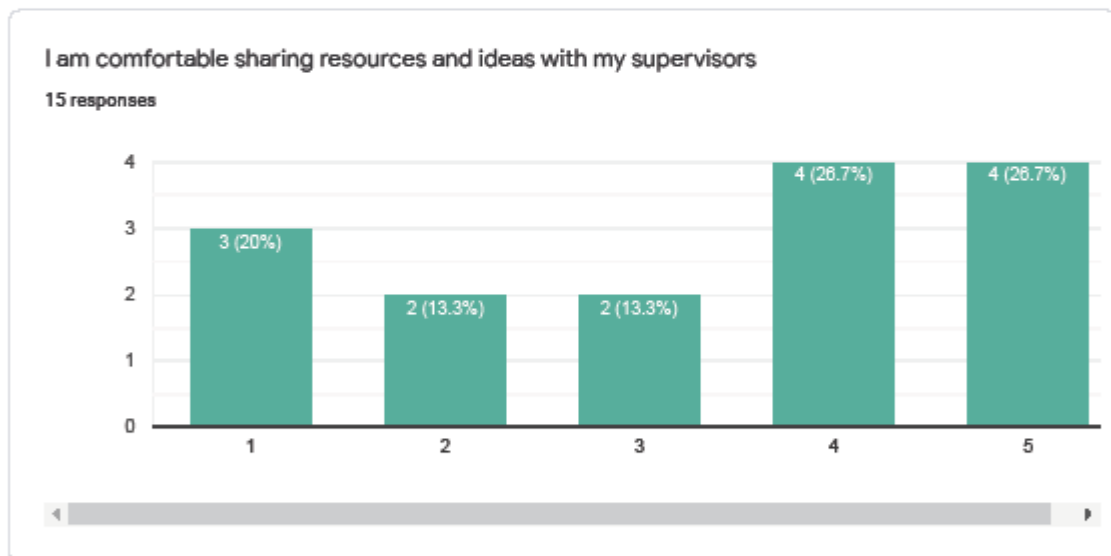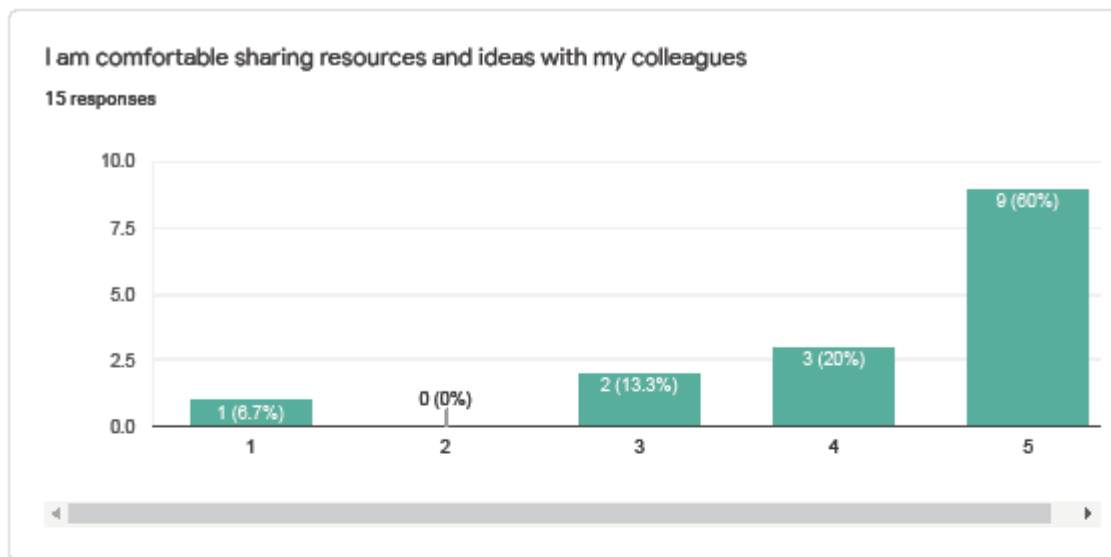
I am comfortable sharing resources and ideas with my supervisors
15 responses

I can influence peers above and or below my superiority level with new ideas and resources

15 responses
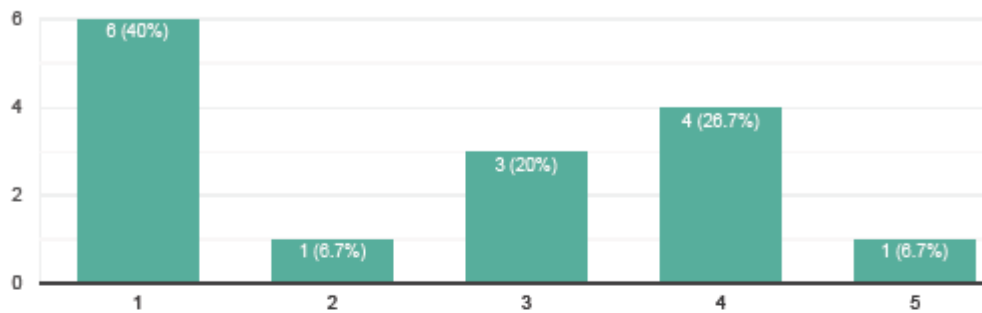
Instructional Factors

I perceive myself to be experiential in my technological and pedagogical pursuits

15 responses
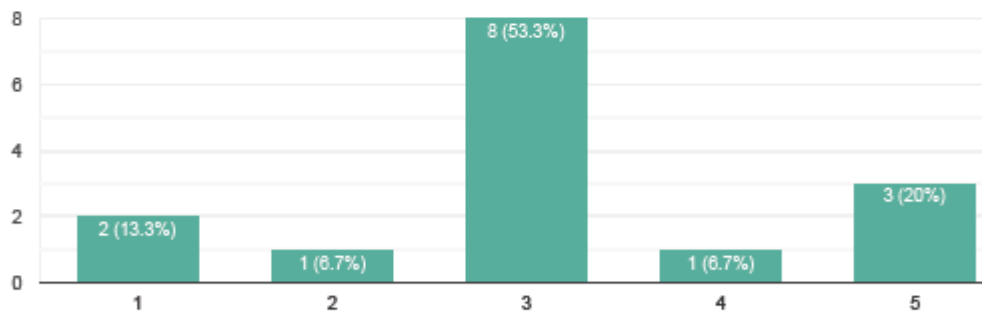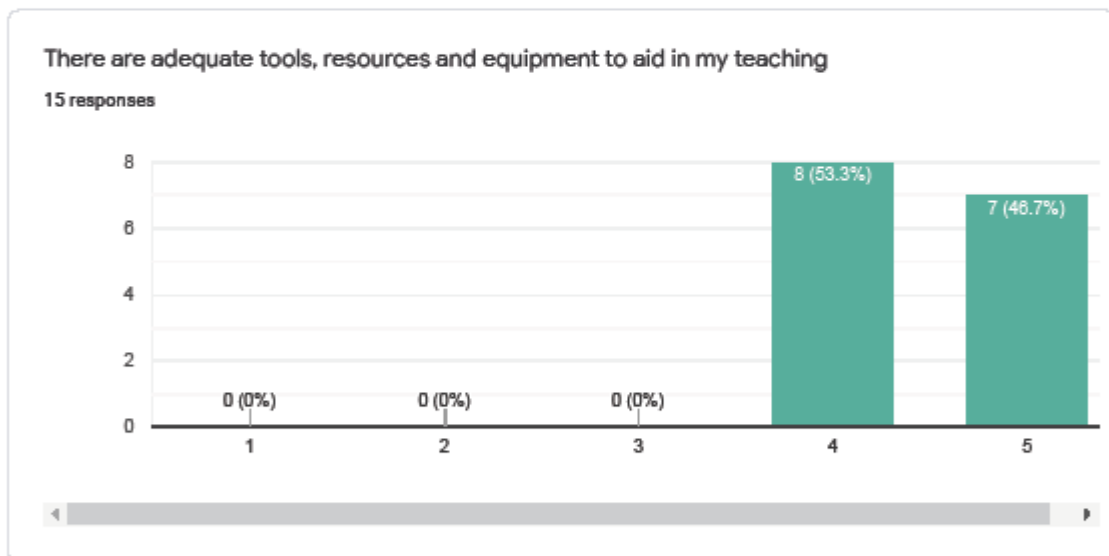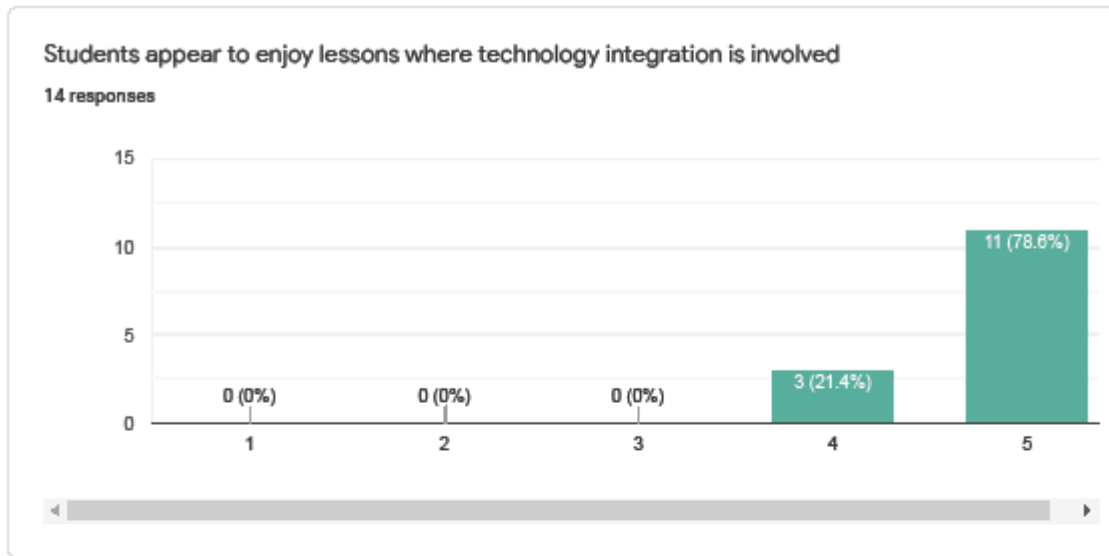
Students appear to enjoy lessons where technology integration is involved

14 responses

There are adequate tools, resources and equipment to aid in my teaching

15 responses

I use tools and resources more than three times weekly

15 responses

I am trained in Teaching Professional Development and I am convinced of the benefits of technology integration
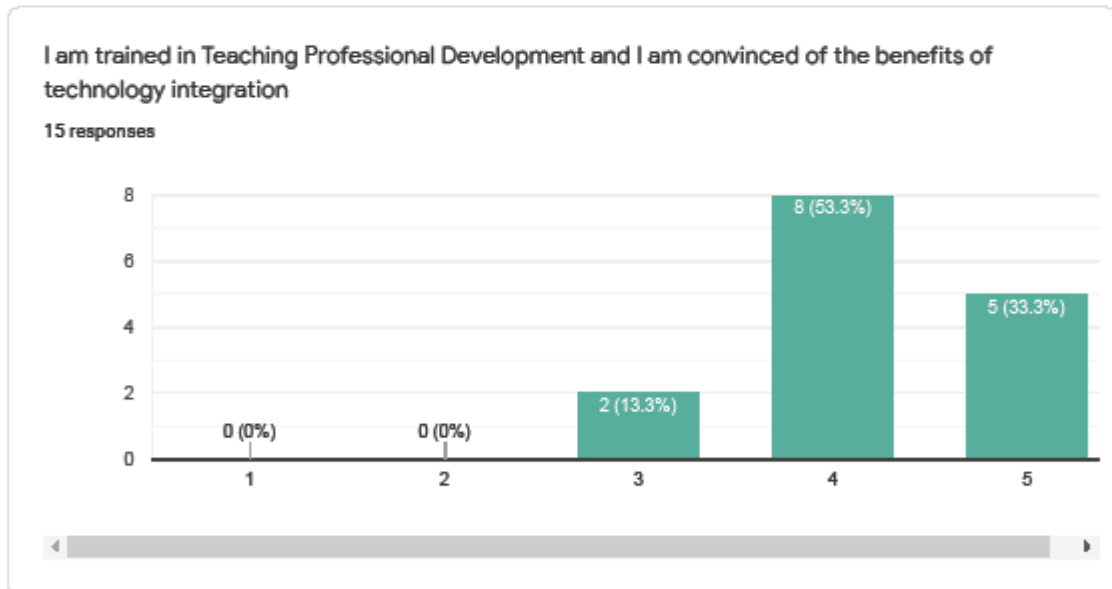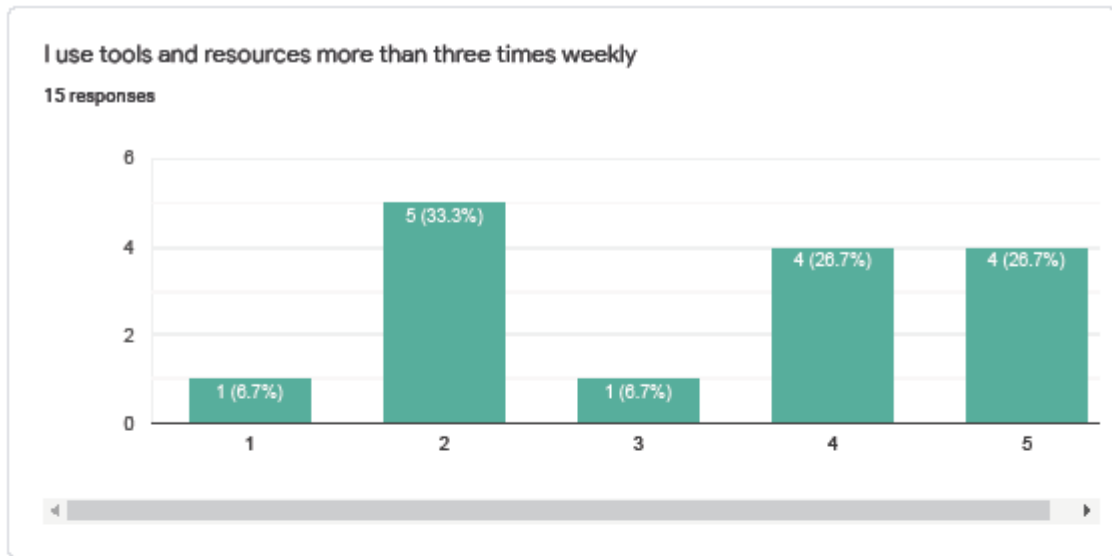
15 responses

My teacher training development programme was prior to 1999 and technology integration was limited to charts and graphics

15 responses
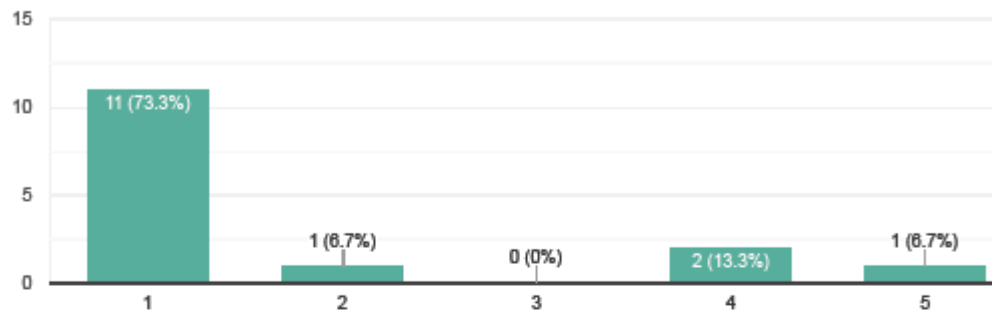
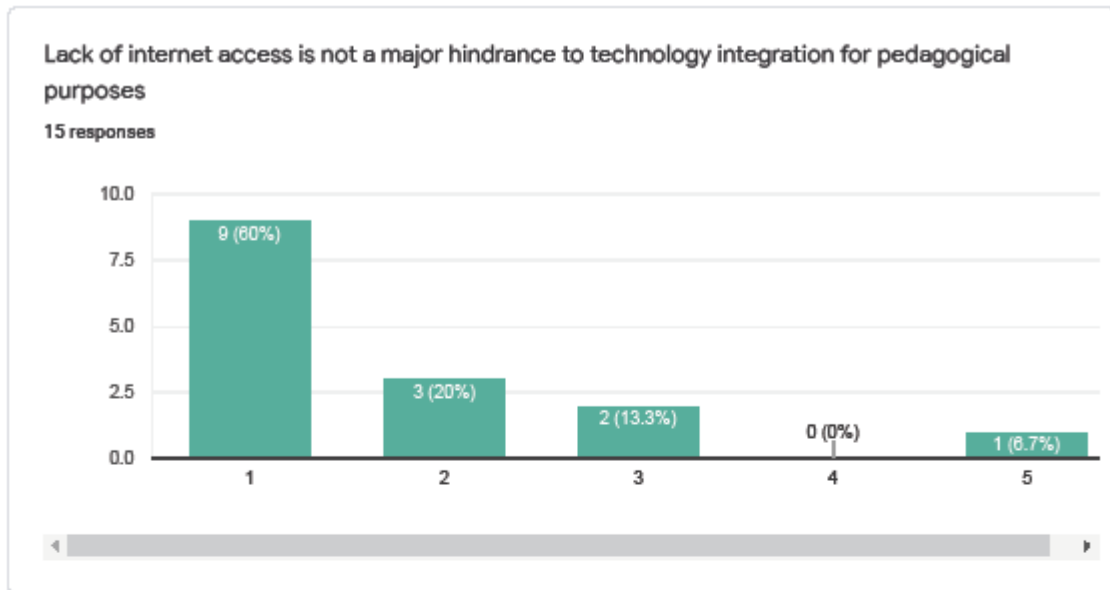I know how to use and integrate computers and technology for pedagogical purposes
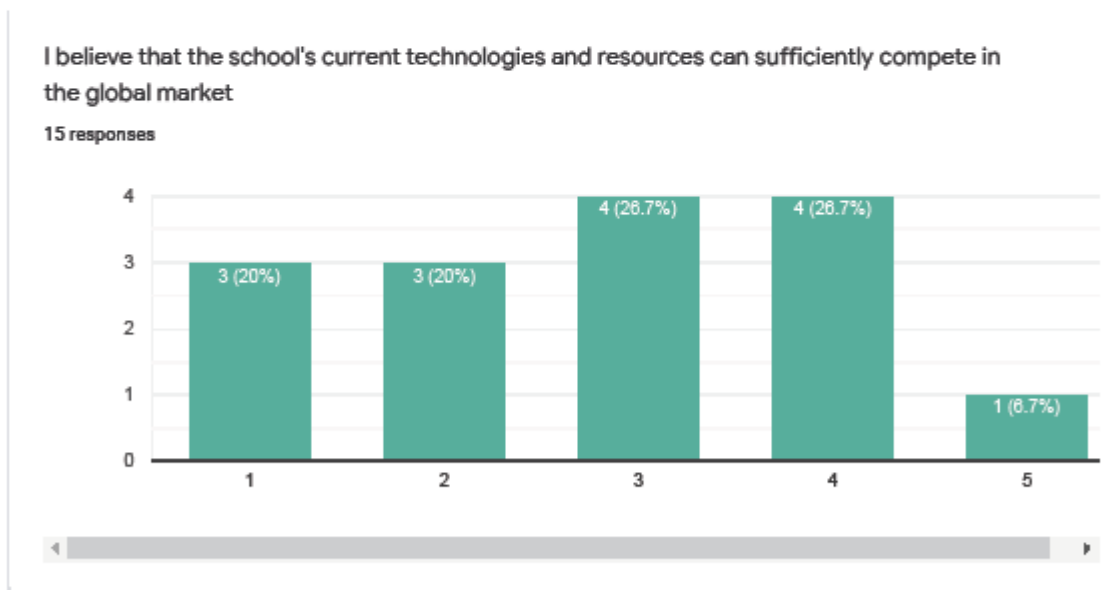
15 responses

Lack of internet access is not a major hindrance to technology integration for pedagogical purposes

15 responses

Environmental Factors

I believe that the school's current technologies and resources can sufficiently compete in the global market
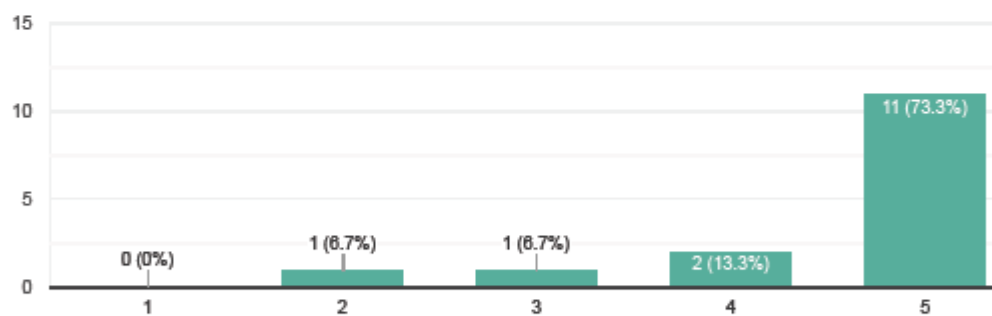
15 responses

Are you satisfied with the level of political and managerial support as it relates to technology integration? Why or why not?

15 responses

Yes but may be it could be improved. I often feel as though teachers are targeted when we are hesitant because of unclear guidelines

No, the two computer laboratories are insufficient for the number of student intake. Additionally, we only cater to approximately 5% of students as junior school students do not have access to labs and only two fifth year classes can benefit from the computer lab use

Yes, the school provides projectors and some head of departments have requested and received their own personal projectors and have encouraged members in their department to use them

No, more guidance is needed on a large scale perspective. More guidance is needed in planning, monitoring and evaluating these systems.

Yes, the school has quite a few technologies that I can use at my disposal

No. In my field of work, I would need specific technology that government is not interested in providing such as GPS

What suggestions would you give to the government to ameliorate problems relating to technology and infrastructure at your institution?

15 responses

1) better and faster internet access and wifi
2) students should have their own internet access for recreational and educational purposes that is monitored

Engage in proper planning before implementing changes. Outfit schools with technology that can suit present and future needs

Faster wifi connections especially for remote teaching purposes

1. Talk to teachers firstly- find out what they want and involve them in the process
2. Develop local ideas instead of international and foreign ideas
3. Measure and test periodically through surveys and questionnaires

Install a more stable wifi connection at the school for teachers and in their classrooms

More efficient internet access

I would recommend that the government installs a faster internet access to staff and use 'hot spots' so

Data Collection Instrument for Problem Analysis Survey

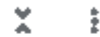31/10/21 23:18   Problem Analysis - Google Forms

Problem Analysis

Questions   Responses   2   Settings

Section 1 of 3

Problem Analysis

Dear participant,

I am conducting a need assessment where the following hypothesis will be test: technology integration and internet use for pedagogy can increase student academic performance. The study seeks to compare the effects of a technology integrated learning environment with internet on the academic achievement of Grade five mathematics students. The analysts seek to answer the following three questions:

1.   Is there underutilisation of available resources and technologies at Master Elementary?
2.   What are the causes of teaching in an environment without internet access?
3.   Is there a relationship between students' performances or outcomes and teaching without internet access?

The views of school teachers are particularly valuable in achieving the research questions and it is therefore hoped that you will agree to complete this instrument which should only take 10 minutes.
The information presented in this questionnaire will only be used for its intended purposes and will be kept in the strictest confidence.

Thank you for your kind cooperation.

What is your gender?   *

◯ Male

◯ Female

◯ Prefer not to say

Select your age range *

https://docs.google.com/forms/d/1CUxpZcbwnjuDWMMHDLgpBw-COb1bkmj2fn2hBL1fQwM/edit   1/3

○ 31 to 40 years

○ 41 to 50 years

○ >50 years

How many years do you have in the teaching service? *

○ One to six years

○ Seven to 15 years

○ 16 to 25 years

○ >26 years

After section 1   Continue to next section   ▼

Section 2 of 3

Technology Utilisation

Description (optional)

Do you believe your institution is optimising the use of technological resources and benefits? Why or why not?

Long-answer text

What effects does this have on your work performance? *

⊕   ⊡   T�   🖼   ▣   ☰

Long-answer text

After section 2   Continue to next section   ▼

Section 3 of 3

Student Performances

✕   ⋮

Description (optional)

Provide your class average for mathematics for Grade 4 students for the academic year 2019 – 2020.   *

Short-answer text

Using the same class, what is the class average for mathematics for Grade 5 students for the *
academic year 2020 – 2021?

Short-answer text

⊕   ⯈   T⊤   🖼   ▶   ☰

Respondents' Responses to Problem Analysis Survey

Problem Analysis

Questions   Responses   2   Settings

2 responses

Accepting responses

Summary   Question   Individual
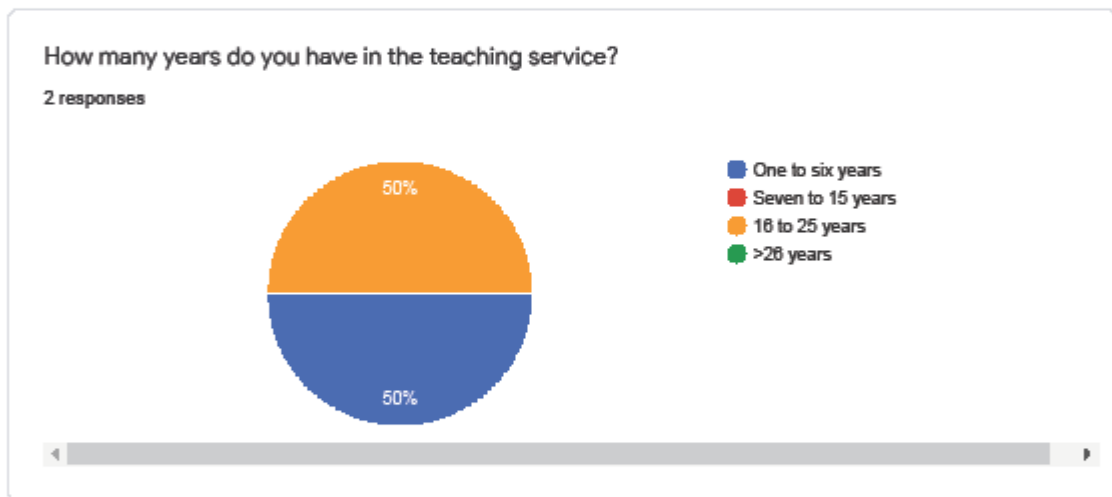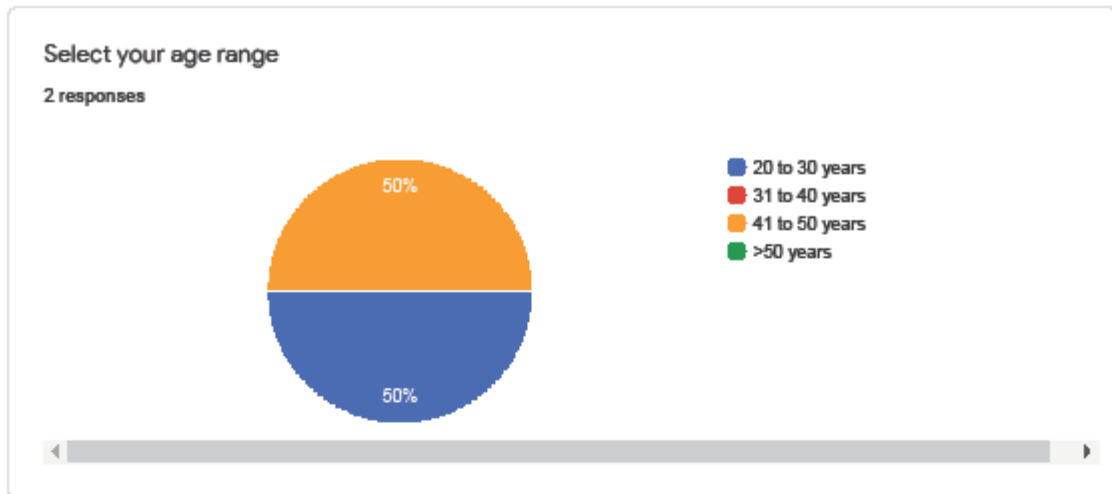
What is your gender?
2 responses
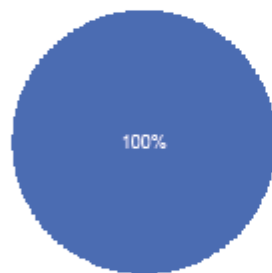
Male
Female
Prefer not to say

100%

Select your age range

2 responses

- 20 to 30 years
- 31 to 40 years
- 41 to 50 years
- >50 years

How many years do you have in the teaching service?

2 responses

- One to six years
- Seven to 15 years
- 16 to 25 years
- >26 years

Technology Utilisation

Do you believe your institution is optimising the use of technological resources and benefits? Why or why not?

2 responses

No. The school is not taking full advantage of its resources because there is no internet access in classrooms. The development of students' technological skills are limited to simply knowing about basic calculations and computations. If there was internet access, more realistic learning could occur

Yes. Recently, the school has added smartboards and laptops to their technology resources and included internet access in classrooms among others

What effects does this have on your work performance?

2 responses

Poor administering of resources has caused me to rely on indirect teaching methods solely to transfer knowledge, not use the computer lab as scheduled, I believe that I have lose students' interest in the subject area. I often question my capabilities to deliver effectively

I am able to transform students to active participants. Students are able to search for formulas independently and in groups. Moreover, students can complete pre-set tests online and receive feedback instantaneously

Student Performances

Provide your class average for mathematics for Grade 4 students for the academic year 2019 – 2020.

2 responses

63%

61.3%

Using the same class, what is the class average for mathematics for Grade 5 students for the academic year 2020 – 2021?

2 responses

62.5%

78.7%

Ishikawa Diagram using data captured from Problem Analysis