Using Instructional Materials to Develop Higher Order Thinking Skills

Kunasunthary Duraippah[1*] ● Zahari Bin Hamidon[2] ● Peter Ong[3]

[1] Faculty of Education and Social Sciences, Open University Malaysia, OUM Graduate Centre, Selangor, Malaysia.
[2] Centre of Learning Technology, Open University Malaysia, Selangor, Malaysia
[3] Faculty of Education and Social Sciences, Open University Malaysia, OUM Graduate Centre, Selangor, Malaysia.

*Corresponding author. Email: mataji@oum.edu.my

Abstract

This paper investigates and explores the use of instructional materials for a learning environment to develop higher order thinking skills. This study was conducted in an international school in Kuala Lumpur. This research is based on qualitative research involving unstructured interviews to obtain more complex or personal information. A total of three participants were voluntarily selected for this interview; the principal, the Information Communication and Technology teacher and one student from Year 10 were involved in this research. More participants could not be interviewed due to the second phase of the Covid-19 pandemic. Information Communication and Technology is used to improve students' learning performance including higher order thinking skills to enable students to ask logical and intelligent questions and to help students solve solutions to understand the target knowledge. Instructional materials used in Information Communication and Technology lessons during teaching and learning exercise to engage more effectively with the learners. Tools used include digital worksheets, quizzes, and assignments. The findings of this study show that this research school inspires teachers to create instructional materials and incorporate higher order thinking skills into the daily teaching and learning. higher order thinking skills are elements that incorporate creativity skills, communication skills, collaboration skills and critical thinking skills. The right pedagogy and development higher order thinking skills together can develop a culture of thinking and facilitate students to develop advanced ideas and imagination, while enhancing students' abilities to analyse and evaluate information by working collaboratively to create new knowledge and solutions. The Information Communication and Technology teacher used a Google Form to conduct formative assessment of the students' ability and performance.

Keywords: *applications, higher order thinking skills, Information Communication and Technology, instructional materials, instructional strategies, learning environment*

1. Introduction

This study was carried out because developing higher-order-thinking skills (HOTs) is essential to encourage students to become more active and participatory in the learning process. Teachers must not only explain concepts in front of the class, but must create lessons that engage students to be active in

discussing challenges that occur during the learning process. Bloom's taxonomy, which was created in 1956 by American educational psychologist Benjamin Bloom, presents the various levels of cognitive skills involved in learning, and is used to help plan and implement successful teaching. Well-judged selection of instructional materials requires a well-defined procedure, encourages students to be more engaged when learning and incorporates technology. Teachers have faced the challenge to develop instructional materials with elements of HOTs for students so that they will become more adept at problem solving, raising complex questions, developing consistent arguments and expressing their opinions from critical perspectives. Definition of HOTs, according to the Ministry of Education (2015), involve the ability to apply knowledge, skills and values in a meaningful way and reflecting to solve problems, making decision to solve a solution logically.

Critical thinking intelligence refers to the capacity to judge ideas with reasonable reason and evidence in a logical and efficient way. The ability to analyse a problem, assess it, and come up with solutions is referred to as HOTs. Since developing HOTs, it is important for the environmental learning because environmental problems are complex problems, so students must have the ability to evaluate, analyse and create in order to develop these skills (Anderson et al., 2001; Lee & Lai, 2017, Tajudin & Chinnapan, 2016; Vidergor, 2018).

In the 21st century, education is generally defined as to enhance learning. This indicates that students must learn not just Lower Order Thinking Skills (LOTs), but also HOTs. HOTs is an advanced learning process of combining a variety of cognitive concepts, methodologies, taxonomies for learning, teaching and assessment. Lee, and Lai (2017) indicated that asking students open ended questions could lead them to make comparisons or conduct inquiry-based on prior knowledge. This will enable students to think critically.

Teaching aids and instructional materials can be seen as "learning and teaching resources" for hybrid online learning from a post-pandemic point of view. They are now primarily digital instructional materials connected digitally (Shukia, 2018). Instructional materials are basically books, maps, pictures or devices such as computers and digital video discs. The instructional designer as a designer who develops suitable instructional material with the aim to improve teaching and learning in an educational organisation of any setting. The designer has to provide details on the development and evaluation of the instructional materials.

The study took place in an international school. It was difficult to conduct interviews due to the 30 minutes limitation for each interview. Three participants were involved in this research. This school recently opened with the permission from the Ministry of Education during a restricted movement control order (RMCO) during the fourth recovery plan of the Covid-19 pandemic. The school is strictly adhering to the rules and regulations that were given by the Ministry of Health. The school will be opening only for the Year 10 students who will be sitting for the final International General Certificate for Secondary Education (IGCSE) examination in November, 2022.

2.   Literature Review

HOTs are essential components of teaching and learning that should not be overlooked. Because thinking skills are so important in the educational process, a student's thoughts can influence their ability, speed and effectiveness of learning. As a result, thinking skills are connected to the learning process, allowing students with HOTs to learn, improve their performance and eliminate their weaknesses (Nurazidawati & Kamisah, 2019; Sunaryo et al., 2020; Yee et al., 2015). The significance of HOTs is essential in overcoming this challenge since it requires strong analytical abilities. Students are among the individuals who can help solve problems by having good analytical skills (Çankaya & Dag, 2017; Owusu-Agyeman et al., 2017; Xia, 2017).

Since environmental problems are complex problems, students must be able to analyse, evaluate and create in order to learn about them (Anderson et al., 2001; Lee & Lai, 2017; Tajudin & Chinnappan, 2016; Vidergo, 2018). Students with strong HOTs will be able to think critically, analyse problems and come up with solutions. The problem is that conventional teaching approaches are still used in multiple media learning, teaching materials, learning materials, student worksheets, and learning evaluation. Twenty-first century learning involves the use of media learning, teaching materials, teaching resources, worksheets, and HOTS-based learning evaluations, (Quieng et al., 2015; Sharif & Cho, 2015; Talmi et al., 2018). Curriculum has advantages in terms of students abilities based on the scientific method approach. The application of the curriculum can have an impact on increasing HOTS students. This is because children are used to thinking about and analysing problems, drawing conclusions, and finding up with answers (Husamah et al., 2018; Narayanan & Adithan, 2015; Ritter & Mostert, 2017; Teimourtash & Yazdani, 2017).

In the past, HOTs were only associated with mathematics and science rather than the languages or arts. However, today, HOTs have become fundamental in education (Latief et al., 2016). The importance of certain cognitive abilities has been known for decades. It may also be stated that integrating HOTs into the classroom should not be a problem for teachers of all generation. However, though many teachers are aware of what HOTs comprises, they are unable to put their knowledge of HOTs into teaching. As a result, poor teacher training may result in the failure of HOTs to be adopted in the classroom (Yeung, 2015). Fern & Umi Kalsum, (2015) believe that incorporating HOTs in Malaysian schools is still relatively new, and that both teachers and students need time to adjust (Ganapathy et al., 2017). Teachers must be introduced to strong teaching frameworks that emphasise the application of HOTs, according to the argument that teachers struggle to incorporate HOTs into their lesson.

Mohammad et al. (2015) state that active learning will be more effective than just face-to-face learning and there are many strategies that can be used in higher order thinking skills (HOTS) enhancement. Dolan and Collins (2015) confirmed that principles in learning that encourage the increase of HOTS are teaching the concept of concepts, tell and show, moving from concrete to abstract and back, going from basic to sophisticated, connecting concepts and teaching inference. According to Sulisworo (2017), Bloom's Taxonomy skills such as analysis, evaluation, synthesis and creation are considered to have a higher level than the ability to memorize facts and concepts. As stated in the Malaysian Education Blueprint 2013-2025, the Ministry would like to increase the proportion of questions in the National Examinations that test higher order thinking and the questions will be based on Blooms Taxonomy. Moreover, testing skills and the assessment will be strengthened to include creative and problem-solving skills.

In Malaysia, the higher education ministry aims to build a system which is less focused on traditional academic pathways and transform the mass product delivery model of teaching to technology-enabled innovations that deliver and tailor education for all students (Ministry of Education Malaysia, 2013). Through this programme, lecturers are expected to integrate Information Communication and Technology (ICT) into their respective higher education institutional curriculum. Another important aspect of tertiary education which requires educators to promote HOTS was heavily emphasised in the National Higher Education Action Plan (NHEAP) and the Malaysian Education Blueprint as well.

Previous studies have focused on instructional materials, conducted with diverse focus and attention. Research on primary school English teachers found that teachers are reluctant to use digital devices, they do not have the confidence to handle digital devices with a class of 40 students, they have limited digital devices to circulate around the class, and that they have limited knowledge and time to prepare their lesson. Besides, most of the English teachers have difficulties in handling or operating technological devices (Çakır, 2015).

The objective of this study is to identify teachers' understanding towards using instructional materials for a learning environment to develop HOTs in the Year 10 ICT class. The study also aims to examine how

teachers design instructional materials that present information in a variety of ways to develop HOTs. Some of these skills are integrated at the upper end of Bloom's taxonomy of the cognitive domain such as analysing, evaluating and creating. The ICT teacher could include critical thinking, creativity and problem solving in the lesson during teaching time. Students should be actively involved during learning time and incorporating ICT enables students to collaborate, communicate and share information online together online.

To acquire a better understanding of the implementation of the instructional materials with the aim to improve teaching and learning using ICT in the classroom and to examine how to use these tools to promote higher-order thinking skills (HOTS), the following research questions were posed:

i.   What are the purposes of using instruction materials or tools in the classroom?
ii.   Is it feasible to promote higher-order thinking skills using instructional materials?

3.   Research Method

In this research, qualitative methodology was used to collect and analyse the data obtained from the three participants. A structured interview was conducted with participants and each participant was only given about 30 minutes to be interviewed individually due to Covid-19-related restrictions. A face-to-face structured interview is one in which the exchange of information occured. It is a data collecting method in which the interviewer gathers information from the respondent through direct dialogue in line with the research setting and pre-prepared questions. Qualitative research methods were used to collect data, by conducting interview sessions with the principal, a teacher and a student from a secondary level International School in Kuala Lumpur. The interview mainly focused on teachers' and students' opinions of using ICT tools as part of the instructional materials and using Bloom's taxonomy HOTs cognitive domain to design engaging worksheets for the lesson.

3.1.   Instructional Materials

Instructional materials are like a delivery vehicle or tools that are used in the daily lesson in the classroom, which include active learning and assessment. Instructional materials have been seen as a significant learning tool to incorporate in the teaching and learning.

Resources or materials used by teachers in the teaching and learning are known as instructional material. Instructional materials can develop students learning; these tools make teaching active as it enables learners to share and collaborate actively in classroom learning. Computers are also used as a type of instructional material and tools for learning. Dahan (2011) stated that maps and charts are generally used during lecturers and discussions about the relationship of things, like colour, among others. Materials such as texts and articles, workbooks, readers, reference resources, images for example class timetable, leaflets, brochures, handouts), digital resources like the (websites, applications and interactive software), and digital devices for example (laptop, Chromebook, smartphone, LCD projector, camera) are used as instructional materials in the classroom (Epstein, 2010; Hall, 2010; Guerrettaz & Johnston, 2013). Teachers can prepare their lessons using instructional materials which will provide teachers with exciting and convincing platform for transmission of information since teachers inspire students to engage in the learning (Okobia, 2011).

During the pandemic, schools around the world used Google applications to continue teaching remotely. A high proportion of teachers used Google applications to design instructional, with. 95% of primary and 97% of secondary teachers directly using instructional materials. Moreover, teachers feel that digital learning tools, such as websites, applications, and online resources are important, with many preferring to use them in classrooms (Tosh et al., 2020).

3.2. Instructional Materials Used in the ICT Lesson

The teacher prepared topic 8 "Safety and Security" for the Y10 IGCSE ICT students. In this topic there are three subsections and in each sub-section, there are goals on how the lesson must be delivered. The goals are to make sure that the teacher fulfils the requirements and to make sure students understand the topic thoroughly before they move on to the next topic. The subsections are listed as below:

3.2.1. Strategies of Safety and Security

Students learn physical safety issues and what causes these issues. They also learn simple strategies for preventing these issues and strategies to minimize the potential safety risks. In this subsection, the teacher used Quizlet to prepare the key contents to introduce these terms to the students. Students enjoyed working with this application. Secondly, students looked for more key content and the meanings of terms by browsing the internet in groups. The teacher worked with the students and provided them with more content and explanations of the terms. The purpose of introducing the key content to students was to give them an understanding of the meaning of important terms, which will also help them answer questions within the topic. Using this approach, students could understand the content better and connect the terms with other topics. Instructional strategies such as group work were applied during lesson time, with students working in groups to complete this task. They presented their work using Google Slides before the end of the lesson.

3.2.2. The importance of E-Safety

The teacher had invited the school IT Expert to give a talk on awareness of "Data Protection" but because staff were unable to be in the school campus due to the lockdown, the teacher showed students a video on "Data Protection". Students worked in pairs for this assignment, taking notes and submitting their completed assignment on Google Classroom. In this activity, students l planned, thought about and discussed the importance of data protection, thereby developing their higher order thinking skills to obtain consistent arguments and express their opinions and views.

3.2.3. The Security of Data and Data Online

The ICT teacher invited the school IT Technician to demonstrate the "Installation of Firewall Software" in laptops and desktop computers to protect and secure the device. Due to the CMCO lockdown, staff were unable to be in school campus for this demonstration since all staff were working from home. Therefore, the teacher uploaded a YouTube link and notes on "Installation of Firewall Software" on Google Classroom. This was an individual assignment. Students watched the video on YouTube, and then used Google docs to write down the installation procedure step by step to complete this assignment.

3.3. Graphic Design Principles Used

Graphic designs are also called communication design and it is the art of practice of planning and projecting ideas and experiences with visual and textual content. Graphic design can involve images, words or graphics. What is a good design? Good designs are everywhere. This involves more than just eye appeal though; good design balances form and function, enhances space and works in a useful way by pulling together both purpose and effortlessly.

When designing learning materials, the teacher needs to include various elements. For example, if the teacher is going to design a digital worksheet for students, the teacher will need to include elements such as colour, lines, texture, space, fonts and shapes composed together in a logical manner based on the guiding standards. The elements are what makes effective design for both printing and creating webpages. The main goal of graphic design is to create an output that would attract students' attention and motivate them to get engaged and willingly to complete the task given successfully.

The elements of good design are as follows:

- Colour will be mainly used for attention-seeking purposes, to spark emotions and to make the graphics meaningful. Colour offers the most powerful visual impact.
- Lines are the most basic of the design elements. There are different kinds of lines such as straight, curved, thick, thin, solid and non-solid.
- Texture focuses the attention of students; students love to apply texture on their presentation especially when creating slides.
- Space is the part of a design that is left blank. The margins and gutters between other elements are referred to as passive space.
- Shapes are geometric symbols such as squares, circles and triangles. Shapes makes the design looks more interesting and exciting.
- Alignment is frequently aligned along the left edge of the layout. Different-sized photos appear as a unit when they are aligned across the top or the bottom.
- Contrast is very important for directing the eye of the viewer to projecting areas in a website or multimedia presentation.

3.4. User's Guide with Instructions to create Instructional Materials

Google Form is an online tool, which teachers can use to create and easily share quizzes and collaborate with all students in the class on the same form in real-time. The User Guide Manual to access Google Form is designed for both new and experienced students working with technology. This User Guide shows the procedures on how to access the Google Form to complete the Formative Assessment. Google Forms allows the teacher to collection information from students via quizzes. In Google Form, students' information is automatically linked to a Google Sheet, in which data will be updated automatically The spreadsheet is populated with the students' responses from the quiz in real-time. This makes is very easy to analyse students' formative assessment performance. Google Forms are auto saved and the data is directly stored into the spreadsheet.

User guideline instruction manual for the Formative Assessment is shown as below:

- Step 1 - Login into Gmail ID account. The teacher will send a link to proceed with the Formative Assessment "Quiz – "Safety and Security" CLICK on the LINK.
- Step 2 - CLICK on the button "Fill in the Form".
- Step 3 - Type in your email address and proceed with the questions.
- Step 4 - CLICK on the NEXT button to continue the PART B questions.
- Step 5 - After completing PART B, click on the SUBMIT BUTTON
- Step 6 - After computerised marking, a notification will be sent for you to view your marks.

3.5. The Evaluation Plan

The evaluation plan is on the next page of the guide; it displays how and when the lesson took place. The evaluation plan includes information about how the lesson was done and finally how the information in the lesson is analyzed. It is a step-by-step process in which methods and tools are employed to collect the data to be analyzed. It is always a good idea to check how well the planning works before moving forward. Evaluating the lesson is a very important stage in teaching. Firstly, in the evaluation plan, the teacher must have a clear implementation of higher order thinking skills in the teaching and learning because it is helpful to students' real lives. If there is a problem delivering a lesson, for example, if a student needs to have more time to complete a challenging and problem-solving task, it is often assumed that the planning must be adjusted. The Evaluation Plan shows clearly how the lesson was delivered to the students. In the planning it shows the goals students need to achieve and the objectives of the lesson that must be completed. The description indicates the content of the lesson, how the lesson will be delivered to the students, the important facts students must know and understand, and the activities that

will be conducted. When the teachers prepare the lesson, the activities must have elements for students to think critically and creatively.

3.5.1. *The Evaluation Plan*

The purpose of this evaluation plan is a guideline through each step of this lesson.

Table 1. The Evaluation Plan

The Evaluation Plan					
Goal	Objectives	Description	Questions Formative Assessment	Source of Data	Methods of data collection
Introducing Key Content and explaining the meaning of the terms in this topic. Students must do further research on this topic independently, in pairs. Students must understand the importance of Protection Data from Hackers Students must know how to protect their computer from viruses. The invited experts must provide valuable information	Describe causes and prevention strategies of physical safety. Describe what is e-safety and how to avoid disclosure of personal data, (via social networks and email) Strategies to minimize potential dangers when using the internet. Understand the effective security of data and data online (hackers, user id, password biometric, virus, SSL, digital certificate)	What is the content of this programme? Safety and Security. How will the programme be delivered to the participants? Online. What are the number and duration of programme sessions? 3 lessons 1.5 hours What are the programme tasks for participants? Look for key content. Strategies and causes of physical safety. E-Safety. Avoid disclosure of personal data using Data Protection Strategies to minimise potential danger when the using internet.	Safety Issues included What are the causes of electrocution? List down two causes of fires in the computer lab. What are the causes and prevention measures to avoid tripping over wires? The internet has provided us with various ways of communication with each other. List three ways of communication. What are the dangers of communicating online? What is the meaning of internet anonymity? What is personal data? Explain what is personal data. Give 3 examples of personal data. Why shouldn't you share your personal data online? What is e-safety and why is it needed? How can you play games on the internet safely? What are some strategies to prevent hacking?	Year 10 IGCSE Students ICT Textbook Revision guide IGCSE past years papers Online notes Quizlet, Video	Computerized programme Data collected online. Quizlet, Google Form Google Classroom Google Slides Google Doc Zoom

3.6. Implementation

There were seven students in the Year 10 class involved in the study. They were taking ICT as a subject for the final IGCSE examination. These students were between 15 and 17 years of age, with very high computer proficiency skills. They were able to use all the applications in Microsoft Office Suite and use Google Applications confidently.

This study used a qualitative research design, which focuses on gaining insights and understanding of a particular phenomenon. In the unstructured interview sessions, with the school principal, the ICT teacher and a Year 10 ICT IGCSE student questions were not prearranged. Due to the Covid-19 pandemic lockdowns, the school had to be closed and switched to remote teaching and learning. The school opened during fourth Stage of Recovery Movement Control Order (RMCO). Only the Year 10 students were allowed to attend school physically as they were preparing for their final IGCSE examinations. The school was strictly adhering the rules and regulation given by the Ministry of Health and the Ministry of Education. The principal allowed only 30 minutes for each interview session. The three participants included the principal, the ICT teacher and a Year 10 student were interviewed in the principal's office as well as in the ICT lab. The recorded interviews were conducted by practicing social distancing.

4.   The Findings

The interviewed student's favorite subject is ICT. He talked about the challenges he faced while completing the ICT activities. He enjoys using Quizlet, in activity 1: "Strategies for Safety and Security". This was a group activity, where students looked for the meaning of key contents on the internet. He said his group searched for information, checked and compared the meaning of words with each other to identify the correct terms. HOT skills were incorporated in this activity. Students worked together to find the most accurate meaning for each key content. They used Google Slides to present their work as a group on the Liquid Crystal Display (LCD) projector. The students shared the Google Slides with their group and worked collaboratively to complete the task fast and efficiently. The students enjoyed working together online in the computer lab.

Activity 2: "The Importance of E-Security" was a paired activity. Due to CMCO lockdown the technician was unable to be in the school campus, the teacher had a plan B and showed the students a video on "Data Protection". All students had to take down notes and submit the completed work on Google Classroom. Both students in the pair were required to watch the content of the video very carefully, jot down notes and submit their completed work on Google Classroom. The student expressed his ability to analyze and assess the entire video to understand "Data Protection". Upon completing the task, the student uploaded his assignment on Google Classroom using the classroom code created by his ICT teacher. It was easy for the both students to submit their work on Google Classroom, the ICT teachers has create a classroom on Google Classroom and each students has their own class code to access into the classroom.

Activity 3: "The Security of Data and Data Online" was individual work. Due to CMCO lockdown the technical staff was unable to be in school so the ICT teacher shared the "Installation of Firewall Software" YouTube link on Google Classroom with all the students. Students sat on their own and started working on the activity. Using the class code on Google Classroom all students were able to access the video. The student was very excited to work independently and used Google docs to complete his task. While watching the video on YouTube the students typed the steps and procedures to install Firewall software in a laptop and desktop computer. Student's will watch and listen carefully to the guidelines given on Youtube. The ICT teacher's responsibility was to guide students to apply the right technology skills and understand the content they watched on YouTube. The student was required to mentally assemble all he had seen and heard while watching the video. The student said he asked questions to his ICT teacher in order to clear his doubts. Students can access the YouTube link directly from Google Classroom. Students can pause and replay the YouTube video according to their convenience. Students are able to understand clearly and follow the procedure carefully to install firewall.

The ICT teacher integrates HOTs because these skills require students to use concept connection, getting big-picture thinking, visualization, problem solving, questioning, generating knowledge, and critical and creative thinking. During lessons students were fully focused and able to work together to develop advanced ideas, think critically, and solve problems to complete the task successfully.

Students also watched a video on "Data Protection", working in pairs and jotting down notes using Google Docs. Students were engaged in planning, thinking and discussing the important facts they observed and understood from viewing the video. In this task students developed HOT's related to building consistent arguments and expressing their opinions and views. Students downloaded their last assignment from the learning platform using Google Classroom, in which they were given a YouTube link to watch the video on "Installation of Firewall Software". They completed their assignment and submitted their work via the Google Form. The last assignment, students did was a formative assessment using Google Form.

The ICT teacher created a user guide, or instructional manual, for his students so that they would be able to use the Google Form without difficulties to proceed with their formative assessment. The user guide was designed for both new and experienced students working with technology and it shows how to access the Google Form to complete the formative assessment.

The teacher was happy with his student's performance, stating that students appeared to be enjoying the ICT lesson and the activities. The ICT teacher was well versed with Google Apps on the Google platform. Google Forms offers a variety of options for the ICT teacher to select and create online questionnaires, according to the student's abilities.

Teachers are sent for training to learn the latest applications as technology keeps changing. Therefore, teachers have to adopt the latest applications and techniques to create instructional materials for their students, and students usually eagerly embrace the new style of learning. Technological changes allow teachers to access information on a global scale through the internet to enhance teaching and learning. Moreover, teachers must implement the elements of HOTS in the lesson so that the students will be able to look for information, discuss and share their knowledge while trying to solve problems during lessons.

4.1.   Interview with a Year 10 Student

In the interview, the student mentioned that he enjoyed working with digital devices and presenting slides online over the LCD projector. He said using applications was simple and made it easier to complete the assignments given by his teacher. Students enjoy working collaboratively to complete the instructional material prepared by their teacher. The student said during MCO, his ICT teacher used Zoom as a communication channel to conduct online lessons. Other teachers preferred using Google Meet or Google Hangout to conduct their classes online. The student said he was able to apply knowledge, skills and values while completing his activities. He said he was allowed to make decisions, give ideas, and solve problems and he was happy to plan and confirm important decisions to complete the task. His ICT skills have improved and he was introduced to Quizlet. He used keywords to search for information online. He also said that the resource materials provide by his teachers were well organized, and he was able to complete all his activities. He was happy to receive the Google Form guideline to access into the application without delay. He also commented that the activities allowed him to solve problems and make decisions positively. He was excited that the activities allowed him to interact and communicate with his friends and discuss the topic, through very challenging learning activities which enable him to apply HOTs. The student was satisfied with the lesson because he was able to discuss, collaborate and communicate with his peers.

4.2.   Interview with the Principal and the ICT Teacher

The principal stated that all teachers in the three divisions must be able to handle ICT devices confidently and efficiently. They must be able to confidently work with basic applications provide by the Google Application Suite. He said that teachers must be able to use the Google Applications to create instructional materials with challenging HOTs cognitive domains to accommodate all students' competencies and capabilities. Teachers must attend technology training to enhance their technological skills in order to create challenging and engaging instructional materials for their lessons.

Connecting content will enable students to use their prior knowledge and apply the new knowledge in the learning. The ICT teacher will support students to make inferences by relating situations to real-life scenarios or by using images. Asking questions and using graphic organizers are some methods the ICT teacher can use to develop students' HOTs. The ICT teachers prepare the worksheets and activities related to the topics using Google Apps and students will work online during ICT lessons. According to the ICT teacher, his readiness to incorporate HOTs in his ICT lesson plays a significant role in preparing the lessons. He felt that it was important to develop students' critical thinking in the ICT lesson. Above all, incorporating HOTs in the classroom creates a student-centered learning environment. When new technology devices are implemented into the school, the principal makes sure to make arrangements for professional development and aim to provide time and space for all the teachers to attend and upgrade their technology skills.

The ICT teacher feels fortunate working with Google Applications, it saves a lot of his time when preparing the activities for his students. The ICT teacher communicates well with all his students online. He is also able to communicate with parents through Gmail to give them feedbacks and discussing with parents the students' performance in class. The ICT teacher create the ICT marksheet using Google Sheet, he shared the marksheet with all is students for them to view their marks online. Besides using Google Classroom, the ICT teacher uses the Google Calendar, Google Docs, Google Form, Google Slides, Google and more. Google Classroom bring the benefits of paperless environment, sharing resources, students can work collaboratively online they can interact with each other to discuss lessons or homework from home. The ICT teachers uses Google Classroom to post announcements and reminders about assignments. In Google Classroom, the teacher can easily identify who has submitted their work as well as the submission date and time. The ICT teacher uses Google Meet for video conferencing, he set up video meetings from within Google Classroom for Live or synchronous learning. Google Meet has recording features, the ICT teachers can easily record all his lessons for asynchronous learning, students will be able to watch the video during their free time and at their own pace from home.

5.   Discussion

The application of HOTs cognitive domains in the teaching and learning process by teachers in this school has been demonstrated based on the preceding explanations and descriptions. The presence of HOTS elements in this school demonstrates that the teacher attempted to apply knowledge at each student's level of thought. There are four levels of HOTs elements namely applying, analyzing, evaluating and creating. It has been stated that the teacher may use structured thinking to encourage teaching and learning and to focus on students (Ministry of Education, 2016). The HOTs cognitive domains are found in every step of the disciplines of the ICT lesson in the classroom. Students in the computer lab were using the desktop computer to surf the internet and use the applications in the system. The smartboard and LCD projector were used during the lesson, to present activity 1. Most of the students were able to complete their activities, as the ICT teacher provided guidance and support for students to smoothly continue their activities. Students were able to complete the HOTs activities efficiently and finish the task on time.

The User Guide Manual taught students how to access the Google Form independently. The instructions given in the User Guide were easily understood by the students. The language used on the Google Form was also very simple and straightforward. Students completed the Formative Assessment on Google Forms and submitted their work online. Students enjoyed listening to and watching the videos on YouTube, which enabled them to understand the information about "Data Protection" and "Installing of the Firewall" into their personal computer. Besides, the students were able to install programs and use the applications provided by the school confidently. The activities prepared by the ICT teacher allowed alternative channels of communication between the teacher and the students. In this lesson, students will be able to understand, listen and resolve, to think, to speak, to write, to use media and technology and also allow students to communicate collaboratively. The principle of using instructional materials is to

enable teaching and learning. HOTs promote indispensable skills such as critical thinking and problem solving and help students understand their own potential and challenges.

The implementation of instructional materials is a key aspect of teacher education that is getting a lot of attention. The things that a teacher uses to simplify their teaching are known as instructional materials. They can be concrete or non-concrete and include both visual and audio-visual aids. By inspiring students to learn, these instructional materials bring learning to life. The use of instructional resources in the classroom can assist the teacher in effectively explaining new concepts, resulting in better comprehension among students regarding the concepts being taught.

Instructional material can also promote effective communication. For example, when teachers use motion pictures, students will be able to develop a continuity of thoughts related to the topic. Moreover, by making the lesson interesting and memorable, instructional materials can improve teaching and learning quality. Instructional material also allows teachers to engage students, by assisting and giving ideas through the use of multimedia with sound, images and videos.

The teacher must make sure that the instructional strategies used in the classroom are applicable. The instructional materials prepared by the teachers must build students metacognitive skills. Using good strategies and suitable instructional materials will raise the cognitive demand of the learning that focuses on HOTs and gives students the capacity to process information at a higher cognitive level. The teaching and learning practices need to include higher order thinking skills because students can confront challenges in their daily life by mastering HOTs (Miller, 2012; Faziah et al., 2017; Saido et al., 2018). ICT is part of the instructional material and plays the main role in enhancing classroom activities and learning capabilities (Subran, 2013). Bloom's taxonomy was introduced in the teacher training service in the United States (Watson, 2019). The taxonomy presents six levels to promote HOTs: remembering, understanding, applying, analyzing, revising and creating.

Teachers must include ICT in the classroom during lessons and apply different types of teaching strategies, for example individual, paired or group work for students to collaborate and work together with the teacher using the network for accessing or sourcing valuable information online (Khashkhuu, 2017). To achieve the curriculum goals and objective of the lesson, the teacher must include HOTs elements into the lesson activities or projects such as problem solving, communication, collaboration, experimentation, critical thinking and creative expression for students to be participating in transferable skills that can be critical in a wide variety of contexts for students to complete a given task successfully. Higher order thinking skills make bigger cognitive processing requests and can be more challenging for both teacher and students.

Technology has virtually been in the classroom since the 20th century. Technology in the 21st century is the digital technology. Technology is the major part of education and the inclusion of technology into today's classroom has shown to improve students' participation and also boost students' confidence. When designing a worksheet or an activity teachers must make sure they create fun and exciting work for their students. Teachers can create group projects, students guided research, this can help students to understand the activity better and they will complete their work efficiently. Collaborative online activity will encourage students to complete high level task, students will be able to complete complex lesson will encourage students to go to the next level with high confidence and inspire them to be more creativity.

6.   Conclusion

This research has focused on the implementation of HOTs development activities and instructional materials into the ICT lesson. Instructional materials serve as a channel between the teacher and the students during lessons. They may also serve as positive motivation for students during the teaching-learning process. The focus on developing HOTs is not just to develop students' higher-order cognitive

abilities but also to help shape them into well-rounded individuals. According to the ICT teacher, HOTs will help students to develop their intelligence and to avoid errors in thinking and planning. HOTs cannot be taught or learned individually or in isolation; teachers must practice HOTs skills collaboratively with students during lessons (Samelian, 2017). HOTs can develop students' high-level thinking to strengthen their reading comprehension and analytical thinking skills. The ICT teacher incorporated the twenty-first century learning skills in his ICT lesson, which highlights the growth of critical and creative thinking skills and new ways to stretch and connect students' thinking in the classroom. The school is equipped with the latest digital devices like iPads, tablets, Chromebooks and desktop computers. According to the principal of this research school, teachers must attend ICT training to enhance their technology skills and understand the benefits of learning ICT. Teachers require extensive on-going exposure to ICT to be able to evaluate, create and design instructional materials for teaching and learning. Teachers may use technology to boost their performance, incorporate valuable digital tools to enhance their students' learning options and boost students support and engagement. One of the most important roles of technology in education is that it enables teachers to offer all teaching materials and allowing students to better understand topics and solve problems more easily.

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