Reflection of the module

1. **Statistical analysis skills.**

In Units 8 and 9, I have finished all the Measures and Hypothesis Testing Worksheets, Chart worksheets and analysis exercises.

These exercises were helpful for me to discover how to manage quantitative data after having collected all the surveys.

I found that there are challenges when doing quantitative research. The first problem is how much amount of data I need to collect. For example, how many schools do I have to deliver the survey to, and how many students and staff do I need to survey for an accurate result of my research.

The other problem I do concern about is the quality of data. Mirva (2014) suggested that creditability, accuracy, consistency, and completeness are the data quality's primary concerns. For example, the creditability will be lost if the student has completed the questions designed for staff; or some young students have answered intentionally, which is not their choice, or some surveys haven't been conducted in total. These are the concerns of data quality as a source of research.

I also found that there are many different processes after collecting the data. The first thing is prioritisation. For example, I need to prioritise which data is the most related to the research topic or more critical to the research. Such as those questions which are related to law enforcement and privacy policies.

In the other process, I need to identify data issues. Some data may not be expected before the surveys have been delivered, or there is not enough data for a specific question. For example, no one or only a few respondents have responded to a particular question. I need to decide whether these kinds of questions are still included in the research or I need to change the methodology from quantitative to qualitative.

In conclusion, learning statistical analysis skills can give me one more choice to deliver research and make it more accurate and comprehensive.

2. **The research methods process based on your learning in this module**

In this module, I have learned qualitative and quantitative research methods for the research proposal.

The research proposal required a quantitative research method: I needed to create the surveys for different respondents; design the questions which meet the criteria of their daily school life with IoT. For example, for students, I will ask those questions which are related to using IoT in learning, accessing school facilities; for teachers and staff, the questions will be about using IoT for students' registration, accessing their SEN, medical or personal information, to give them any appropriate support; manage the behaviour of students, tracking where have been for school's security.

However, I found it's not easy to do quantitative research. The first problem is how to advertise to every school. However, it's easy to create an electronic survey. For

example, Google Forms (Google, 2019) or SurveyMonkey (2022), but how to let them know there is a survey is an issue.

Even if I can contact different schools, such as through education agencies, the response rate and quality are another uncertain question. Some students may be willing to respond to the questions thoughtfully, but some rebellious students may lie on the survey. Possible reasons are: they don't like their school, don't like to read and do surveys, which make them feel very annoying, or even intentionally against the system (Kari, 2020). These human factors may affect the accuracy of the research or lead the research in the wrong direction.

The other factor is the non-English speakers. There are many EAL students in every school. They may not understand the content of the survey in full if they survey on their own. Although there are translations online, this will decrease their interest to participate; also, errors can be made if they misunderstand some of the questions.

A qualitative, case-study-based research methodology will be more reliable than survey-based quantitative research. Every secondary school are identical at some levels in the use of IoT. For example, most schools will use SIMS for student management (ESS, 2022), Microsoft Office components to deliver lessons: from PowerPoint presentations to interactive books by Sway, or OneNote for lesson plans (Microsoft, 2022). Furthermore, some schools will use Microsoft's competitor's products, one of the biggest firms is Google. Google Classroom and Chromebook are also very popular in secondary schools (Insight, 2022). Through the case studies, I can research the pro and cons of using specific IoTs in each school, not only the function and convenience but also can compare how efficient these IoTs help staffs and students to meet the privacy policies and legal regulations and their awareness of managing the sensitive data when using these IoT apps and devices.

3. **The impact on your personal/professional experience is based on your completed professional skills matrix and any associated SWOT Analysis and Action Plan.**

In this module, I have much detailed research on the posture and behaviour of secondary school staff and students in using the IoT and the research methodology on how to raise their attention on the related cyber security threats and how to increase their awareness.

In the quantitative research method, the Strength is that I can set out the questions specific to different groups of respondents. For example, students will have different survey questions from staff. This can help the research analyse the various impacts of other groups when using the IoT.

However, if the data quality is poor or many answers are invalid due to different reasons. For example, EAL students cannot understand what the questions are asking; they may refuse to respond or even pick an answer at random; this will become a weakness of the research under the quantitative research method.

However, it will be an opportunity if I use both quantitative and qualitative methods in the research. The case studies can fill up the potential gaps in quantitative analysis.

Through the case studies, different aspects, especially the handling of student data and how the IoT apps or devices help schools to achieve the privacy requirements, can be more comprehensive than quantitative research at some point.

The threat I could find is if the respondents respond to the surveys with a wrong answer or do not give any answer intentionally, the research outcome may be inaccurate to the reality.

References:

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