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## Exploring Digital Literacy Strategies for Students with Special Educational Needs in the Digital Age.

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### Abstract

21st century learning requires students to be equipped with learning skills, knowledge, media literacy and also life skills. In order to achieve these skills, the school curriculum embeds the use of technological tools and strategies to provide teaching and learning strategies for learners, including students with special needs or Special Needs Students (SNS). Studies found that students struggle to cope with their studies in the digital learning environment due to their limited digital literacy skills. Digital Literacy skills are essential to develop as independent learners in the digital age. Previous studies have shown that digital literacy skills have demonstrated a positive influence on student performance. However, limited studies have been conducted on the issue. This paper aims to discuss the concept of digital literacy skills to support teaching and learning strategies for SNS in Malaysia from teachers' perspectives. The digital literacy skills model consists of cognitive skills, technology and ethics as basic guidelines to explore digital literacy teaching and learning strategies for SNS. This concept has been tested as a preliminary study in a course by interview with five teachers who taught a Desktop Publishing among SNS. From the findings, it was shown that the digital literacy skills model is able to improve the teaching and learning strategies needed for SNS in the digital environment.

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**Keywords:** Digital Literacy Skills, Special Education, Special Needs Students, Learning Strategies

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### Introduction

Malaysia's Special Education is a continuous endeavour under the National Education Philosophy that seeks to create and develop people who are trained, willing, dedicated, independent and willing to plan and manage their lives and achieve success as individuals and members of a healthy and successful society [1]. Special education is associated with the practice of educating students individually by addressing their differences and needs [2]. Ng, P. [3] pointed out that individual variations are natural, thus teaching and learning strategies should be adapted appropriately to the needs of the child rather than making the child suited for a preordained learning pace, expectations and quality of learning.

In Malaysia, Special Education has begun even before independence with the opening of the Visually Impaired School and the Hearing Impairment School in the 1920s through voluntary involvement. Later, the Cabinet Committee Report that reviewed the implementation of the Education Policy 1979 through Certificate 169 stated, "... the government should take responsibility for the education of disabled children. The government is mandated to take over the special responsibility of the associations currently operating in the area of education. Additionally, involvement of voluntary bodies should continue in the development of education for children

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with disabilities". This report became a turning point that led to a clearer emphasis on the development of special education in Malaysia.

In the 1960s, an integrated plan for the education of visually impaired and hearing-impaired children at the elementary and middle school levels was introduced. The government's involvement in special needs students' education began with the establishment of the Princess Elizabeth Special Education Primary School in Johor Bahru, Johor under the Department of Social Welfare in 1948 and the Federal Deaf Children's School, Tanjong Bungah in Penang (Primary and Secondary) in 1954 for hearing-impaired students.

The term Special Needs Students (SNS) refers to students who have received certification from a doctor, optician, audiologist or psychologist in the government or in private sector as proof of the students' visual impairments, audition disabilities, speech impairments, physical incapacity (disabilities), learning impairments or any combination of disabilities. Special Education Schools are schools for SNS at all levels of schooling. The Special Education Division manages all the Special Education Schools by serving and assisting these schools for handicapped students [1].

There are 28 special education primary schools, two special education secondary schools and four secondary vocational special education schools in Malaysia. In addition, the Ministry of Education (MOE) provides Special Education Integrated Programs in 1,521 elementary and 822 secondary schools. These are inclusive programmes where SNS are schooled together with normal students. The MOE has also established Special Education Programmes to address special needs students' dropout problems. The programmes are the Special Recovery Programme, Inclusive Education Programme, Integrated Special Education Programme, and Special Education Service Centre. (Malaysia Special Education Department, 2019).

According to the Malaysian Education Blueprint (2013-2025), 21st century learning focuses on students' performance with a combination of specific skills, knowledge, talent and digital literacy [4]. These are to develop students' advanced computational thinking in multidimensional skills. Students need to acquire and recognize their environmental capabilities, learn using technology applications, and collaborate in teams with other students; therefore, highlighting the need to enhance digital SNS skills. Digital Literacy (DL) and Information, Communication and Technology (ICT) applications are essential learning needs. This blueprint (2013-2025) has set clear objectives for students to achieve quality, equitable and accessible education within 13 years of schooling. A study by Rozinah [5] pointed out that the passion to acquire digital literacy will encourage people to be more efficient and effective in the use of digital tools and the internet to locate information. The usage of technological tools shows that students are digital as well as computer and information literate. Teo, P. [6] concluded that curriculum that is combined with technology is an essential component of 21st century learning.

Former Education Minister, Dr. Mazlee Malek introduced a 'Zero Reject' policy to ensure that every school accepts special needs students. The policy will be implemented in stages. This seeks to ensure that all children in the country, including those with special needs and undocumented children, have access to education [7]. The connections and support of the inclusive learning

movement focuses on the special needs of SNS who share the same classrooms with other children so they can perform in reading, mathematics and language skills. Inclusive learning also be able to develop good relationships SNS with peers, have better socialization skills and fewer behavioral issues than those in segregated settings. In this integrated environment, SNS may be able to achieve academic excellence and develop more effective communication.

A creative teaching and learning framework using interactive teaching materials is an important basis to improve students' understanding. Teachers may enhance their digital literacy skills in order to design suitable teaching and learning strategies to improve the teaching and learning of SNS. Teachers comprehend that digital literacy can be used to support inclusive literacy practices in order to create a learner community, make the curriculum accessible and associate academic goals to real-world platforms. Gill [8] indicated that school leaders should invest in developing general education teachers' abilities to collaborate, communicate, demonstrate kindness and build relationships. At the same time, teachers need hands-on experience to serve students with special education al needs and build their capacity to better serve all learners. Therefore, in the process of preparing and developing the needs of our nation, it is important to address the holistic education system as a whole. Every Malaysian child deserves equal access to education. It is a crucial need to look at the teaching and learning strategies for SNS so that they are not neglected from mainstream learning. As technology advancement has been embedded in current curriculum setting, therefore it is also a crucial to highlights the important of Digital literacy as learning strategies to motivate SNS in their learning process.

### **Problem of Statement**

Digital literacy can be considered as independent learning as students have the ability to access, manage and use information using technology devices. Teachers mould students to be digital citizens using current information technology skills and experiences such as email, Google Classroom, Google Meet, Frog-VLE interactive programmes. Teachers use these media and technology elements in the classroom in order to engage students in interactive learning [9]. Although students are capable of using technology devices, they still have problems accessing the right information using technology platforms which is considered a lacking in digital literacy skills. With regards to digital literacy, advanced skills may need more attention not only in terms of technological skills but also cognitive or thinking skills. This may have an effect to SNS as they may avoid to participate in the digital learning environment due to low self-efficacy and motivation.

Currently, the education system in Malaysia focuses on inclusive learning, therefore students with learning disabilities may also be required to use digital literacy skills as their learning strategies. According to Naz and Murad [10], internal factors such as culture, ethnicity, family history, region, and the schools students study at also factor in students' different learning approaches. These diversities will lead to different learning needs among students, including SNS.

On the other hand, external factors such as infrastructure, Internet connectivity, lack of a successful approach method and funding for their connectivity influence SNS in learning in the

digital environment. A study by Mushtaq [11] showed that ICT facilities provide tremendous capacity to promote lifelong learning for all student classes, including those with special educational needs. Most previous studies investigated digital literacy among students, but still lack focus on SNS. Background of Study

According to Folostina & Jacob [12], special education is a fundamental pillar to creating a humanistic, compassionate and all-inclusive policy to build a nation. Education creates equal development opportunities for all children, no matter their challenges or capabilities to ensure the rights of people with disabilities and ensure their inclusion in society. Malaysia's special vocational education schools offer SNS the Malaysian Skills Certificate (SKM), thus helping them to become independent and enjoy better life quality. These special vocational education schools are located in Johor, Selangor, Pahang and Kedah with 892 students [1].

Teachers at these vocational special education schools are trained at SKM Level Three to enable them to teach as accredited teachers [13]. According to Edilan et al. [14], Special Education Vocational Secondary Schools has a computer technology-related course called the Artist Desktop Publishing Course which is standardised from level one until level two following the National Occupational Standard (NOSS) with a specific Curriculum of Competency Unit (CU). Table 1 shows the use of technology and digital literacy skills required as teaching strategies applied to SNS.

**Table 1. Curriculum of Competency Unit (CoCU)**

Curriculum of Competency Unit	Content / Task
CU1	Desktop Publishing Software Installation
CU2	Image Editing
CU3	Image Digitalization
CU4	Artwork Colour Application
CU5	Type Setting
CU6	Mock Up Preparation

The pedagogy of students with special needs has a long yet contradictory history. Thus, the emergence of technology is accompanied with the demand to add new strategies in teaching and learning for SNS. Williams [15] stated that digital literacy is important for students with special needs. Additionally, knowledge and abilities acquired at the cognitive level can be defined as information literacy skills in the educational context. Such issues will contribute to the implementation of good digital literacy practices in specialised education. Melissa [16] added that special education teachers use these resources by applying digital literacy skills to resolve class issues and ensure that students with lesser learning capability can grow smoothly and steadily. This paper aims to propose a digital literacy skills strategy for SNS in order to support their learning in the digital age from teacher perspectives.

## Methodology

There are prolific studies related to the educational system for SNS. However, there is still a lack of establishment of formal education for special needs in Malaysia. In the early stage of the study, extensive observation was done and a literature search was conducted as a cross check with the current situation of SNS education in Malaysia as reported in previous literatures. This study also been supported by preliminary studies with five teachers' who taught Desktop Publishing subject with teaching experience from three to nine years with SNS. The teachers' experience was expected to be dominant source of evidence about on how SNS learning strategies using digital literacy skills for Desktop Publishing. Approximately 132 articles were extracted from various sources such as Google Scholar, ProQuest databases, ResearchGate hub and other permissible literature databases. Only ten percent of the articles reviewed were utilized for models and theory adaptations and adoptions. The keywords used were digital literacy skills, learning motivations, learning strategies, special needs students, special needs education, 21st century learning, information seeking process and Information Communication & Technology (ICT) based learning as a basic guideline to discuss with teachers.

## Model of Digital Literacy

This paper sought to determine existing theories and models related to digital literacy that support teaching and learning strategies which can be considered for SNS. In addition, literature on SNS was also reviewed, especially those using the Malaysian scenario as a context. From the exercises conducted, some theories and models were identified as digital literacy strategies for the SNS. The list is as below:

**Table 2. Models and Theories on Digital Literacy**

Model /Theory	Dimension	Description
Social Learning Bandura, 1977	Observation Attention Retention Reproduction Motivation	Social learning theory is a theory of learning process and social behavior that suggests that new habits can be learned through watching and imitating others. This theory states that learning is a cognitive process that takes place in a social context, and can occur only through observation or direct instruction even in the absence of motor repetition or direct reinforcement.

<p>Digital Literacy Calvani, 2008</p>	<p>Technology Cognitive Ethics</p>	<p>The researcher focused on the mastery of specific aspects of digital literacy and technical skills while neglected dimensions that are pedagogically significant. He developed a conceptual model for the three-dimensional notion of digital competence that comprise of three elements; technological, cognitive and ethical.</p>
<p>Digital Literacy Staff, 2018</p>	<p>Five Dimension Critical Digital Literacy Decoding Meaning making Analising Persona Using</p>	<p>Change and rapid technology for people. Digital literacy becomes increasingly important at a time when students read as much on screens as on books. The definition of many of these terms changes as media overlap increases. Interactive eBooks can function like blogs and books. Threaded emails can look and work like social media. E-mail, text messages and social media are becoming increasingly similar.</p>
<p>Digital Literacy Promethean, 2017</p>	<p>Core Skills of Digital Literacy Creativity Critical Thinking and Evaluation Cultural and Social Understanding Collaborations Ability to find and select information Effective Communication E-safety Functional Skills</p>	<p>Digital literacy means that technology can be understood and used. It concerns the ability to search, use and build information online in a useful and beneficial manner. Digital literacy also includes recognizing the technical shortcomings and acknowledging the dangers and safeguards needed for the use of technology.</p>

As the concept of education systems is to promote inclusive learning, SNS adapt to the new learning environment in order to be highly trained learners - in other words, in the sense of 21st century learning; they must be digitally educated [17]. According to Promethean [18], digital literacy means the ability to search and use information and apply digital tools in a useful and beneficial manner. Gilavand [19] claimed that the focus of digital literacy is on growth as technology has become increasingly important at a time when students read as much on screens as on books. In the meantime, Staff [20] defined digital literacy as a programme to develop non-cognitive factors such as academic attitudes, mindsets, learning

strategies, social abilities and perseverance in students as a step forward to improve students' abilities. Calvani et al. [21] reflected on the three dimensions of digital literacy which are technology, information ethics and cognitive. Cognitive abilities include mental ability and analytical competencies. Students cope with different technical environments (e.g. technology), and apply it responsibly using ethical-collaborative competencies. All these models of digital literacy will be a basic guideline used to explore the digital literacy strategies suitable for SNS to learn in the digital age.

According to Bandura [22], the social learning theory is a learning process and social behavior which suggests that new habits can be learned through watching and imitating others. In order to adapt to this new learning environment, teachers teach and demonstrate digital literacy skills that cover three main domains: cognitive, technology and ethical. New techniques, including attention exercises, conversations, stories, physical work and fun learning can be used to manage stressors at work [23]. Teachers create special activities for SNS in the classroom using modern technologies, therefore indirectly engaging their participation in learning. Teachers introduce SNS using a variety of platforms or channels such as PowerPoint slides, videos, movies, sounds and images to nurture and attract SNS to focus on their learning.

## Discussion

Exploring digital literacy skills in the process of teaching and learning among SNS covers various aspects such as students' behavior, learning process, learning space, information, communication and technology (ICT) and various references related to student motivation to continue to succeed. After careful consideration from previous literature and preliminary findings with five teachers, three main areas of digital literacy skills (cognitive, technology and ethical) by Calvani et al. [21] that are used to develop a three-dimensional conceptual model for technical skills were chosen as the main domains in the teaching strategies that will be applied to SNS. There are specific problems and various circumstances in today's teaching and learning environment that these SNS need to circumvent in order to understand and be able to follow the learning process well and effectively. In this study, the appropriateness of teachers in addressing the current situation with existing issues and obstacles for the use of digital literacy among special students in the modern age and the future is discussed. Calvani's principle of digital literacy seems to be suitable for digital literacy strategies for different needs, including for SNS.

Based on the preliminary findings, teachers claimed that flexibility and creativity are needed to increase SNS's commitment to learning. The Competency Unit (CU) curriculum, for example, consists of CU1- Desktop Publishing Software Installation, an essential part of class activities, which requires SNS to install software and use it in the class session as a basis for the learning process. Teachers consistently guide how to use, understand and apply the tools and applications in the technology for academic purposes. To do so, all teachers agreed that to ensure students can understand and apply the technology's concept and operations and use a wide range of search strategies on credited and authorised websites,

especially while doing online search. SNS conduct informational search and example activities based on assignments provided by teachers and use technology appropriately. Most of all, teachers will make sure students are able to find basic information, prepare content and complete tasks. This was consistency with Shuhidan [24] study, where teachers focus more on actions related to information-seeking processes as being most relevant to learning; that is, actions such as how to use the Internet and how to synthesize, organize and evaluate the information found. Teachers also suggested that introduce relevant and related search engines along the process of teaching and learning. In addition, teachers assist the retrieval and storage process in classroom sessions with SNS.

The other teaching strategy for digital literacy is cognitive. Teachers attempt to give insight or assessment on content or information and plan strategically to ensure that students are able to read, select, interpret, and evaluate information. As per required by the Malaysian education system, students must be equipped with 3R (Reading, wRiting, aRithmetic) skills. Therefore, it is a must for teachers to guide and facilitate SNS with problem solving skills in order to answer questions and issues and complete tasks. In front of SNS, teachers practice bilateral and holistic communication to help students find information, complete tasks and communicate online. From the teachers' observation, SNS gets more information from their friends than from their own teachers, and they tend to get information from the Internet, which sometimes makes them confused. Some of the SNS will ask for clarification from the teacher. The best way is to advise them on finding the right sources and always advise them to ask their parents and teachers how to deal with information and educational tasks. Shuhidan [24] mentioned that the key findings which are cognitive and action stages for school children were perceived as being important in the process of information search for task completion. Teachers help students use the proper channels in the process of obtaining information to complete class assignments.

With this, SNS can evaluate the information obtained and provide the right response during the teaching and learning process. For example, in the CU2-Image Editing and CU3-Image Digitalization courses, teachers need to encourage SNS to be more creative and practice critical thinking in order to focus on idea generation and knowledge creation. In the CU4-Artwork Color Application course, teachers guide and monitor students to choose the appropriate color associated with an assignment or task. For example, when a student needs to complete the task of creating a greeting card for a birthday or Christmas celebration, the SNS must choose the appropriate color for the occasion and celebration. In the teaching process, teachers use a variety of media to attract students to gain information effectively such as using telecommunication technologies, holding group meetings using teleconference, and creating arts activities such as drawing comics, magazine covers, and pamphlets - tasks already listed under the CU2 and CU3 courses. By doing so, the SNS are given the opportunity to explore their mind's ability and innovation as some of the output can be used commercially. Using the right steps in the teaching and learning process does assist in completing tasks for all competency unit curricula.

Ethics is the teachers' third strategy to ensure that students are ethical and honest in sharing,



collecting and collecting information. Every step of the classroom, the teacher must be alert and inform the students of their responsibility. Do not simply copy, paste and share information with others. Teachers have to make sure SNS can constructively process information and technology with a sense of responsibility and ethics. Initially, students should select reliable sources. In terms of information sharing, students should share information ethically, protect their privacy and be aware of plagiarism. This approach is related to CU5-Type Setting, whereas students are prohibited from copying, plagiarising and abusing the assignments or writings of others. Teachers apply pure values and guide SNS to prepare their own assignments successfully. Ethics is also an excellent fit to prepare for CU6-Mock up Preparation.

Teachers ensure that students prepare their own mock-ups, not with the help of others, but allowing them to share ideas in order to improve their knowledge and support information. In order to proceed and continue the task of providing good mockup with the teacher's guidance and cooperation, SNS should have their own ideas, pick them and speak with the instructor. All these methods and techniques will make the digital learning environment more effective for SNS. Study ethics requirements should be tightened as the SNS do not aware about ethical obligations.

Teachers take a holistic view, illustrate the proper conduct of learning, and display the adverse impacts on the process because most SNS are not aware of their ethical obligations (Aminah [25]; Azlisham [26]; Een [27]; Een [28]; Fauziyana [29]; Fauziyana [30]; Firkhan [31]; Ishak [32]). This is because they do not recognize that some things they do wrong to complete the job; sometimes, they do not know that they did it. SNS will be more mindful of the principles and laws of the classroom (Mohd Norazmi [33]; Nik Nurhalida [34]; Norazmi [35]; Norazmi [36]). A study by Shuhidan [24] showed that teacher skills are also crucial to teaching in order to ensure that students are successful information seekers for their learning. Teachers provide guidance and reminders to uphold ethics when studying and post memoranda or posters on the study mark so that students will be able to understand and practice good tags during learning (Rosnee [37]; Roszi [38]; Saadiah [39]; Yusaini [40]; Zaid [41]; Zaid [42]).

## Conclusion

This paper explores digital literacy strategies based on Calvani [21] as a basic guideline for special needs students in their learning process during the digital age supported by teachers' perspective. Calvani's theory states that digital literacy skills, namely cognitive, technology and ethics could be applied to SNS and teachers in their teaching and learning process. This paper contributes to the improvement and implementation of digital literacy in special education schools which aligns with the Malaysia Education Blueprint 2013 – 2025. It provides an overall perspective to improve policies for the betterment of 21st century teaching and learning strategies of special needs students and teachers. Teachers can develop their digital literacy skills to design effective teaching and learning strategies to help the SNS succeed. School management should also invest in improving ICT

equipment, providing moral support, and ensuring conducive learning spaces to better serve all students. The comprehensive education programmes as a whole must be discussed as every Malaysian student should have fair access to education. It is important to ensure that teaching and learning approaches for students with special needs are in line with stream learning.

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