

Exploring Students' Digital Citizenship: Its Importance, Benefits, and Drawbacks

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Abstract This study aimed to determine the degree of students' knowledge and practice of digital citizenship in relation to the nine digital dimensions, and the importance of their awareness, benefits, and drawbacks. A descriptive survey approach was used to gather the data from one hundred fifty-one undergraduate students. The results show that the participants have a sufficient level of knowledge about good digital citizenship. The result also exhibited that of nine digital dimensions, "digital health" ($\mu = 3.16$) and "digital trading" are the ones with the highest mean ($\mu = 2.79$). This indicates that very seldom do the participants follow and practice the dimensions. The participants revealed that they are unaware of the effects of their actions in terms of using digital technology. In addition, forty-one percent of the participants are using digital technology on the average level and thirty-eight percent on the high level. The students who are more exposed to using digital devices are interpreted that they are at risk for abuse.

Keywords: Digital dimensions, Digital citizenship, Technology, Digital health, Digital trading

1. Introduction

Abbari and Pishghadam (2022) clearly said that "technology plays a crucial role in fully understanding all aspects of language" (p. 1). A body of knowledge committed to making tools, processing activities, and extracting resources is known as technology. Technology is a broad concept, and each person has his own interpretation of what it means. On the other hand, science is applied to tackle issues through technology. However, it is crucial to understand that science and technology are two distinct fields that collaborate to complete tasks or address issues. Most people in the world utilize technology every day to do a variety of activities. People are the most important component of any technological system because people use technology to increase their capabilities. They may define technology as the tools and methods used to make their lives easier.

In addition, people communicate on a regular basis to trade information, express feelings, and transmit ideas. To remain in contact with friends and family, people utilize communication technologies, such as phones, laptops, emails, fax machines, or messaging applications. Businesses employ communication technology tools for a variety of purposes, including facilitating information flow

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in the workplace, aiding in decision-making, meeting customer demands and requests, promoting new goods and services to niche markets, and many other business activities. Communication technology is a system that transmits information or data from one location or person to another through technical methods (Ramey, 2022). This is a normal scenario in the present time. It may be awkward to say, but most people in the world nowadays rely on technology when it comes to the fastest way of communication.

At present, most people express themselves via sharing and publishing comments, photographs, and videos as digital citizens. By beginning or signing online petitions, joining or founding online forums and interest groups, or simply producing content like animations or memes, people may discover who they are and take action on topics that are important to them. People have easy access to news and health information on the Internet, and many use it as their first resource for learning about the world and their own identities. Citizens may utilize technology and humanity in a thoughtful and sympathetic way when applying for digital citizenship (Leca, 2022). Thus, the main purpose of this study is to determine the degree of students' knowledge and practice of digital citizenship in relation to the nine digital dimensions and the importance of their awareness, benefits, and drawbacks.

2. Theoretical Framework

2.1. Digital Citizenship and Its Dimensions

Digital citizenship is something that people need to know in a technology-heavy society by using different technical skills and following the acceptable norms, standards, and behavior when using technology in the home, at school, or in the industry. To identify digital citizenship and issues related to the use of technology, nine dimensions of digital citizenship mentioned by Ribble and Bailey (2007) need to be familiarized to help shape how people work with each other in a global digital society.

Digital access is an equal opportunity to fully access any electronic information digitally. Electronic access makes it difficult for everyone; thus, the starting point for digital citizenship is to work towards providing equal digital rights and supporting electronic access for all. Although we live in a digital era, not all have access to technology. Also, not all students can afford a computer, a smartphone, and internet access. That's why educators need to provide suitable alternatives for each student's needs (Ribble & Bailey, 2007).

Digital commerce refers to the buying and selling of goods online. Technology users must know that the major marketplace occurs through technological channels. Legal and legitimate interactions take place online, but also illegal and illegitimate ones do. Thus, it is necessary to be alert to the controls that individuals, especially students, must adhere to. Digital technology is also used in the classroom to teach students about the various career paths that they could choose in the future. According to Mossberger et al. (2012), students should be aware of the threats associated with purchasing online until they know how to protect themselves from stings and are also able to recognize safe payments and sites that contain secured information. Awareness is necessary in order to provide students with a piece of knowledge about the policies for digital behavior so that they will be safe in buying and or selling goods and services online (Altwalbah, 2017).

Digital communication denotes an exchange of information electronically and the ability of the person to use digital technologies by communicating with others through email, mobile phone, and instant messages using social media applications, which are commonly used today (Almallah, 2017). Online communication has become common, and students forget they are doing so in a virtual space, where miscommunication happens most of the time. The Internet becomes the voice of anyone who needs it. In turn, this requires responsiveness and appropriate feedback from its users (Ribble & Bailey 2007).

Digital literacy has something to do with the ability to use technology efficiently and understand digital content to evaluate its credibility and use it appropriately. It also includes the skill to differentiate the real and fake content, which can have a negative effect on the lives of the students. They need to learn which content is better for them and what they should avoid (Ribble, 2015). Everyone must learn how to use digital tools and be responsible for whatever consequences of using them. Everyone must be responsible for learning the different types of technology that must be acquired, learned, and trained, as well as its optimal use (Couros & Hildebrandt, 2015).

Digital etiquette reflects the behavior expected of everyone or the procedure expected by somebody in using digital technologies. Many technology users do not have enough etiquette in using digital tools. Some people are unaware of the rules and regulations imposed on users. The information about the regulations and the formulation of digital policies is not enough. Each student must be a responsible digital citizen in technology usage. It shapes their online behavior to respond positively to online content (Almallah, 2017).

Digital law explains the digital regulations that technology users have to agree to show that they comprehend the legal rights and restrictions that pertain to the use of digital technology. It requires understanding and awareness of what is ethical (adhering to the laws of the digital community) and unethical (those who engage in digital crime) and misuse of the use of modern technology. This includes hacking, illegal downloading of information, stealing others' identities, and other internet misuse and acts of crime (Ribble & Bailey, 2007).

Digital rights and responsibilities are the paybacks extended to all digital users and the expected behavior that everyone enjoys in the world of digital technology. These rights include privacy and freedom. However, everyone has duties and responsibilities in using digital tools properly. Students must be aware of these rights and responsibilities and must be educated on the rules of ethical behavior as well as basic legal concepts that will aid them in the digital community (Hollandsworth & Donovan, 2011).

Digital health and safety denote the maintenance of mental and physical well-being in the world of digital technology (Kara, 2018) that involves digital users. Users must adhere to the recommended session length and ensure that their eyes are properly aligned with the computer screen and maintain an appropriate distance from the computer. Students should be taught to protect themselves from potential harm and how to protect them. Making use of online resources is a plus factor, but everyone should be aware of the dangers as well (Ribble & Bailey, 2007).

Finally, digital security is the procedure used to ensure electronic protection, like virus installation and creating backup files in order to protect our information from any external force that may try to access data unlawfully (Giddour, 2016). Security in the online community is a must, especially when using digital devices at school, home, or at work. Students should be aware of potential malware attacks. Teachers must also discuss how to prevent them and how to guard their devices as much as possible.

2.2. Digital Citizenship and its Importance

The term “digital citizenship” refers to the capacity of a person to interact constructively, critically, and competently in the digital world, utilizing the abilities of effective communication and creation to engage in social behaviors that respect others' rights and dignity while using technology responsibly (Council of Europe, 2022).

Raising Children Network Limited (2021) expounded that digital citizens are teenagers who own cell phones and have social media, online learning, gaming, or other accounts. Being a responsible digital citizen entails participating in online communities in a polite, ethical, and safe manner. The Regents of the University of Michigan (2022) indicate that responsible users of the Internet safeguard their personal data, exercise caution, and respect others. And this is the way users demonstrate excellent digital citizenship. People, as users of the Internet, make the online community a more welcoming place for everyone, whether by posting on social media, emailing someone, or leaving a comment on a blog article when they practice prudence and a sense of respect for others.

McGowan (2016) indicated that digital citizenship education encouraged students to utilize their knowledge, abilities, and understanding to defend and advance human rights, such as freedom, privacy, and security. Leca (2022) added that students at present are becoming more concerned about online safety.

2.3. Digital Citizenship Benefits

According to Teppers et al. (2014), teenagers who use social networking sites are described as having less peer-related loneliness than non-users. Mills (2016) indicates that they are gaining the social skills

that are essential to forming positive peer connections. The use of social media is one of the ways that people could benefit from communication technology. Social media is a messaging tool that most people nowadays use to convey ideas, exchange information, and express emotions. Teenagers often communicate online with people they know and make it one of their most popular online hobbies (Reich et al., 2012).

There are positive and negative effects on the use of social media. Some respondents from Indonesia felt more of a positive impact of social media than the Omani respondents. The Omani respondents of a study revealed that their sleeping patterns are negatively affected while missing the positive experiences and emotions that someone else is getting is the indicator the Indonesian respondents consider as having the highest negative effect on them (Bocar & Jocson, 2022).

Using the Internet creates numerous problems like fraud, misinformation, and disinformation. These problems are increasing, and it is crucial to learn how to safeguard oneself against them. Swindlers and sites that disseminate false information prey on those who are technologically illiterate. This is one of the significant reasons why digital citizenship education is essential since it guards against people becoming exposed to these problems. On the other note, digital citizenship education is crucial in light of the increased use of technology because it teaches users how to interact politely online, know where to obtain trustworthy online sources, and how to prevent human rights violations. This may be done by encouraging young people to broaden their technology expertise (Leca, 2022).

Sparrow et al. (2011) examined a theory about how access to information from an external source may make people less likely to preserve knowledge in their own memory, which displays a prevalent worry about how Internet use can damage memory. They also discovered that interpersonal gestures were less dominant in digital media contacts and that this loss was linked to fewer sensations of closeness and nonverbal affiliation signs. However, Sherman et al. (2013) exposed that it was still feasible to induce emotions of bonding through the use of digital interpersonal signs in text-based communication, such as emoticons or written laughing, and that video chat produced levels of bonding that were comparable to face-to-face engagement.

A study that was published by Ferguson et al. (2015) indicates another theory, as they believed that having access to the Internet made people feel less confident in their knowledge about the solution to a problem. Mills (2016) explained that from the results of different studies, it could not be concluded that there is just little empirical data to support the claim that teenagers who have grown up with nearly continual Internet access are experiencing changes in their cognitive ability because of Internet use. Therefore, it is safe to say that internet use may impact young users' cognitive development.

2.4. Digital Citizenship Drawbacks

Digital citizenship has great chances for learning and self-development. But there are a set of challenges related to the growth of the Internet and digital citizenship. One of the challenges concerns the facilitation of information credibility. There is a wide range of educational resources that deal with new forms of social assimilation and social space practices on the Internet. Thus, it is important to increase the digital competence of students who would like to acquire knowledge (Hicks et al., 2014).

A prevalent worry about internet use is that it might result in shallower thinking. It appears that having access to the Internet impacts how confident a person is in their own expertise. Common Sense Media (2015) survey reveals that young users of the Internet said they frequently or occasionally use social media while completing their schoolwork. Although many of these young users did not believe that multitasking in this way hindered their ability to do their assignments, it has been demonstrated that performing two things at once reduces performance (Mills, 2016).

Therefore, the development of the digital literacy of students and the dropping of the gap must be addressed. Students should be aware of the wide possibilities of the Internet as a source of information and communication. The access and use of digital technology either in the classroom or during distance learning are common among the students as most of them are interested in e-citizenship. Digital education based on computer games, for example, allows students an opportunity to manage the entire state or civilization (Hill, 2015).

3. Methodology

A descriptive survey approach was used to gather information from undergraduate students about the extent of their technology usage. The researchers employed an accessibility sampling approach in gathering the data. The gathered data were tallied and interpreted based on the adapted scale of measurement from Ribble and Bailey's (2005) interpretation. It specifies that the assigned numeric value of each ticked box will be totaled to get the sum.

3.1. Participants

This study was conducted in one of the colleges in the Sultanate of Oman. The 151 students were chosen to represent the population. The participants were aged twenty to twenty-five. The male participants were 76, and the females were 75. They were picked using an accessibility sampling approach, and prior to the administration of the survey questionnaire, the researchers solicited the consent of the participants, which in turn signified their interest to participate voluntarily. A minimal modification was made to the adapted questionnaire to avoid the mid-point scale and to reduce the uncertainty (Frery, 2002) of responses. Thus, instead of three qualitative descriptions, it was made into six. In addition, one verbal interpretation was added to simplify its meaning.

3.2. Instruments

The instrument we used was a questionnaire which was adapted from the article written by Ribble and Bailey (2005) entitled "Is digital citizenship a problem in your school? (Teaching digital citizenship)". The responders are asked to rate the statements with a six-point Likert scale ranging from never to always. It has 10-item indicators that determine the degree of participants' technology usage in relation to the nine dimensions of digital citizenship. Some items were modified and put together to capture the nine digital dimensions.

3.3. Procedure

The data was gathered from undergraduate students in one of the colleges in Oman. After collecting the responses of the participants, these were tallied, interpreted, and analyzed using frequency and percent distribution, weighted mean, and scale measurement, which was adapted from Ribble and Bailey (2005). All numeric values were totaled to get the sum and locate which mean range the sum of the participants' answers belong in relation to the nine digital dimensions and the extent level of their knowledge and practice of digital technologies. Verbal interpretation was used to interpret the data.

4. Results

Table 1 below shows the students' digital usage in relation to the digital dimensions mentioned by Ribble and Bailey (2007) in terms of their behavior and practice while using digital technology, particularly in the classroom setting.

Table 1
Students' Digital Citizenship in Relation to Digital Dimension

Dimension / Item	Item Average (n= 151)	Weighted Mean (μ)	Value Interpretation
Digital Communication	303	2.00	Never
1. use digital cameras to take pictures of a test			
Digital Literacy	224	1.48	Never
2. print excess copies of color materials			
Digital Access	341	2.25	Never
3. copy material from the Internet without giving credit to the author			
Digital Law	254	1.68	Never
4. log onto school programs with another's username and password.			
Digital Health	478	3.16	Very Seldom

5. use tables or chairs at the correct height for using technology			
Digital Ethics	283	1.87	Never
6. leave my cellphone ringer on during public events	308	2.03	
7. use text messaging during class	258	1.7	
Digital Trading	442	2.79	Very Seldom
8. make intelligent purchases online			
Digital Security	270	1.78	Never
9. fail to keep up with virus protection and backup files			
Digital Responsibility	331	2.19	Never
10. provide technology access to those who do not have technology at home.			
AVERAGE MEAN	356	2.35	VERY SELDOM

It is displayed in Table 1 that students are aware of the norms and behavior in using digital technology with a total average mean of 2.35, interpreted as *very seldom*. In consideration of the overall average, it can be determined that the highest average dimension is “digital health”. It shows that students *very seldom* used tables or chairs at the correct height for using technology. Digital health, according to (Kara, 2018), means users must adhere to the recommended session length and ensure that their eyes are properly aligned with the computer screen and maintain an appropriate distance from the computer. It can be gleaned from the result that there are still students who are doing it very seldom. Ribble and Bailey (2007) said that students must make sure that everyone should be aware of the dangers of not using the technology properly.

In addition, digital trading also posited the second-highest average among the rest of the dimensions mentioned. It shows that students are using digital technology in a very rare manner in purchasing items online. Thus, those who are using digital technology to purchase online have to be aware of the threats associated with purchasing online until they know how to protect themselves from stings and are also able to recognize safe payment and sites that contain secured information (Mossberger et al., 2012). The rest of the dimensions, as per the 10-item indicators, imply that students’ digital citizenship is a bit fine in relation to the nine digital dimensions as they said that they never do those mentioned practices and behaviors.

Table 2
Overall Range Scores of Students’ Digital Citizenship in Relation to the Degree of Technology Usage

Range Score	Frequency (n=151)	Percent	Interpretation
1-10	6	4	The participant is not using a great deal of technology or is unaware of technology misuse and abuse.
11-20	26	17	The participant rarely uses technology and is unaware of technology misuse and abuse.
21-30	62	41	The participant’s usage of technology is average, but the participant may be at risk for abuse.
31 and above	58	38	This shows that participants’ technology use is high. Regrettably, technology misuse and abuse are also very high.
Total	151	100	

Table 2 displays the overall range scores of participants’ practice and behavior on their usage of digital technology. It shows that 41 percent of the participants are using digital technology on the average level. It is interpreted that these participants are at risk for abuse as the more the students are exposed to using digital devices, the higher the risk, especially if unaware of the risks. In addition, 38 percent of the participants showed that their technology usage is very high, which indicates a very high risk of misuse and abuse. Mossberger et al. (2012) said that students need to have digital skills, literacy, and knowledge

in using various forms of internet access like smartphones, mobile devices, and other online activities to be aware of the misuses and abuses.

5. Discussion

5.1. Students' Knowledge and Practices of Digital Citizenship

Anyone can have access to any information digitally using digital devices. The level of digital citizenship of the students in terms of online technology skills benefits them properly. Digital citizenship is something that everyone needs to know in a technology-heavy society in using different platforms and following the acceptable standards and behavior when using them not only at home but also in school and in industry. The 10-item indicators that the participants filled out measure their practices and behavior in using digital technology in relation to the nine digital dimensions.

The result revealed that the participants seemed aware of the ethical and unethical behavior in using digital technology, particularly in the classroom, in terms of the nine digital dimensions. Among the nine dimensions, only "digital health" and "digital trading" (see Table 1) are the ones getting the highest mean, which indicates that the students did not apply and practice the indicators mentioned, which they answered *very seldom*. It implies that the students who indicated these responses are not aware of the effect of their actions in terms of using digital technology. Ribble (2015) believed that digital citizens need to be aware of the physical dangers inherent in using technology and any psychological dangers that may be through excessive use or internet addiction, particularly if tables or chairs are not at their correct height when using technology.

The rest of the dimensions indicate that the students are aware of its consequences, as they claimed that they never practiced the indicators mentioned. It implies that college students nowadays are fully aware of the ethical standards in using digital devices. It also implies that college students are already educated about the presence of modern technology in terms of digital literacy, access, policy, ethical behavior, digital security, responsibility, and even communicating it digitally. Students are already armed with digital citizenship values and skills and have the awareness to follow the process of practicing their digital knowledge and skills in the digital world. The exposure of the students to the world of technology becomes more common as one of the courses taught in the academe. In this context, students are already taught how to engage themselves in the digital world (Mahadir et al., 2021).

5.2. Students' Degree in Technology Usage

As manifested in the student's responses, it is noted that their digital citizenship, in terms of the degree of digital usage, ranges from an average of 41% to a high of 38%. It shows that the majority of the participants are digital users. As the world advances, the demand for digital technologies in the classroom also increases quickly. To meet the trend and demand, the presence of smartphones, iPods, iPads, and SMART Boards are used inside classrooms in some countries. The use of IPTV and portable electronic touchscreen devices is rapidly increasing as technology tools (Kucirkova et al., 2013). Those tools have changed literacy instruction and the way students learn. According to Saine (2012), teachers also claim that students nowadays become more creative in their thinking because of these modern digital devices. Despite that, mobile phones and the web also had been a part of digital technologies.

It implies that most students rely on the available information on the web and maximize the benefits of using digital devices in their studies. However, considering the fact that they are aware of the consequences, as reflected in their responses, it is still interpreted that the more the students are using digital technology to the average and maximum degree, the more they are prone to misuse and abuse. Since communication nowadays is instant through digital devices with the aid of the Internet, digital citizens need to make appropriate decisions and responsible choices when they communicate and collaborate with others using digital devices (Ribble, 2015).

Saubari and Baharudin (2016) on their study concluded that students must put effort into discovering digital content sites to gather information for a definite purpose. Students also need to identify the proper way to use the technology, such as skills in writing, learn a little about the interface search engine, learn ways to use the systems, and use social media to avoid misuse and abuse.

5.3. Importance and Benefits of Digital Knowledge

It is important that the students are aware of the ethical and ethical use of digital technologies. It helps in empowering them to control their digital lives. Having digital knowledge will open the minds on how to penetrate the digital world with appropriate behavior and acceptable norms as digital citizens so they can be safe, responsible, and respectful online.

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Digital has something to do with data. To be safe, digital citizens need to be aware of the safety net in using digital devices. As a digital user, it is difficult to ascertain how, where, and when to share information. So, extra care is necessary to avoid identity theft. Awareness and knowledge of the proper way of using digital information will help students to be safe from misuse and abuse. Knowledge of using apps is capable of making it easier to understand how to use settings on apps to limit their reach (Stephens, 2022).

Technology users need to emphasize the importance of online safety so that digital technology users' actions do not call for adverse effects on the digital society. The importance of digital technology awareness is necessary. Online security needs to be stressed because today's digital users are too daring to criticize without a check motion. To be smart to explore and find information is important because there is much information that cannot be checked (Saubari & Baharudin, 2016).

Knowledge of how to be a responsible digital user also matters. One of the benefits of Internet access is how students can explore and trail diverse interests. They can meet others who share these desires and begin to practice an independent sense of self. Yet they need to know how anyone can scrutinize the real from unreal or even fake identity online. Students need to realize the threats of oversharing and that there is no delete button online, so it is best to think before hitting a send or share button. As digital users, respect is the key indicator of good digital citizenship. Being aware of this dimension will encourage students to stand up and help others who they think are being cyberbullied.

The advancement of information and communication technology has been successfully utilized in coping with the needs of digital users, such as online businesses, social media, and the teaching and learning process. However, despite the digital world's development, we cannot deny the fact that there is the existence of digital abuse, such as online fraud, scams on social media, pornography, and others (Kim & Choi, 2018).

5.4. Drawbacks in Digital Technology Usage

As the degree of technology used by the participants is high, it implies that the technology misuse, abuse, and risks are also high. One of the downsides of technology usage is misinformation. Since almost all the information needed by students is available online, it is difficult to identify which information is right or wrong. With the advent of modern technological access, at whatever place, almost everybody has a device to record an event. Technology does foster laziness and adds to the instant fulfillment of our needs. Moreover, it provides information more quickly, which leads to students having more time to learn.

Secondly, digital citizens need to be aware of crime and terrorism as one of the drawbacks. Goodman (2022) said that the Internet is fertile territory for malevolent forces to operate. Thus, terrorists are using social media to promote themselves and encourage others to get potential victims. Digital devices like laptops, tablets, and smartphones are the main source of digital exploration for students, which leads to the misuse of information and leads to being abused by digital terrorists. This is especially true if the software doesn't prevent access to apps unrelated to lessons, quizzes, and other educational activities. A need exists for appropriate restrictive measures on gadgets in education to ensure that further learning goals are used properly and appropriately.

Lastly, plagiarism is a common downside that students face in the classroom. This happens when students access information from the web without paraphrasing and summarizing the information they took from the sites. Digital media is usually easy to copy and reproduce, which results in students being charged with academic dishonesty. Also, the culture of "sharing" on social media means that often the original creator of a piece of media is forgotten, as the piece is adapted and claimed by others. Thus,

knowledge of digital ethics is a must for digital users to be aware of. Digital citizens also need to be aware of the implicit and explicit rules in the use of technology (Ribble, 2015).

As technology progresses, problems with its usage also increase noticeably. Students' technological behavior, values, ethical rules, and awareness should be created. A person who has the skill of using digital information technologies properly and appropriately in official business transactions, social media communication, and education is referred to as one with digital citizenship; thus, they are exposed to digital devices, which leads them to a higher risk for abuse especially if unaware of the consequences. To broaden the knowledge of digital citizens, the researchers in this study would like to suggest that in future research, a larger number of participants must be involved in the study and not only be limited to those who are in their twenties but also all other people who are using digital information technologies. Moreover, it would also be valuable when further study is conducted in relation to the area of what can students or digital device users do to keep themselves safe in their social media environments in addition to the preservation and protection of their health when using digital information technologies.

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Appendix A*The Digital Citizenship Questionnaire*

Item indicators	Never 1	Very Seldom 2	Sometimes 3	Often 4	Very Often 5	Always 6
1. use digital cameras to take pictures of a test						
2. print excess copies of color materials						
3. copy material from the Internet without giving credit to the author						
4. log onto school programs with another's username and password.						
5. use tables or chairs at the correct height for using technology						
6. leave my cellphone ringer on during public events						
7. use text-messaging during class						
8. make intelligent purchases online						
9. fail to keep up with virus protection and back-up files						
10. provide technology access to those who do not have technology at home						

Legend:**Option Equivalent Points Value Interpretation**

6	6.50 – 7.00	Always
5	5.50 – 6.49	Very Often
4	4.50 – 4.49	Often
3	3.50 – 4.49	Sometimes
2	2.50 – 3.49	Very Seldom
1	1.50 – 2.49	Never