

EVALUATING THE EFFECTIVENESS OF A TRAINING PROGRAM IN DEVELOPING AWARENESS OF DIGITAL CITIZENSHIP AMONG SECONDARY SCHOOL FEMALE STUDENTS WITH INTELLECTUAL DISABILITIES

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Abstract

Background: Students with intellectual disabilities (ID) face many security risks on the Internet, highlighting the importance of acquiring digital competencies to use the Internet safely and appropriately. **Aims:** The study aimed to explore the effectiveness of a digital citizenship program in enhancing awareness of digital citizenship behaviors among 10 secondary school female students with intellectual disabilities aged between 15 and 18 years. **Methods:** A single group pre-post-test design was adopted. The study instruments included a five-week training program and an attitude test to estimate the growth in digital citizenship behavior awareness among female students with ID. **Results:** The results showed statistically significant differences between the pre-and post-test scores, revealing increased post-test scores and suggesting improvements in digital citizenship awareness. **Implications:** This training program could help to develop plans for educational programs on digital citizenship and improve teaching quality by incorporating digital citizenship concepts into the digital skills curriculum and tailoring these concepts to the needs of students with ID. Further, it may also help to formulate manuals that include guidelines for teachers on how to implement lessons according to the characteristics and specific needs of students with ID.

Keywords: training program, digital citizenship, digital skills, intellectual disabilities, single group design

1. INTRODUCTION

Information and communication technology (ICT), particularly the Internet, has become a part of daily life, and it plays a major role in integrating students with intellectual disabilities (ID) into all aspects of society (Alfredsson Ågren et al., 2020a; Kim & Lee, 2021). It has contributed to enhancing individuals' social communication, access to information, services, and work, and quality of life for all social groups, particularly those with ID. It also enhances their full participation and inclusion in society. Furthermore, it helps students with ID learn new skills and increases their independence in daily activities (Chadwick et al., 2017; Wu et al., 2016).

Using the Internet is an aspect of educational and social inclusion. It is beneficial for accessing information, training material, news, social media websites, games, and so on. (Chiner et al., 2021; Gómez-Puerta & Chiner, 2021). As a result of the rapid digital transformation in society, its use is increasing among individuals with ID, particularly to perform their daily activities (Carretero et al., 2017). Additionally, it enables them to live and work independently, communicate better, decrease social isolation, and enhance their academic, practical, and entertainment activities (Cihak et al., 2015). The Internet is important for students with ID to increase opportunities for education, communication, independence, and employment; eliminate digital illiteracy; enhance self-determination; and participation in leisure activities (Alfredsson Ågren et al., 2020b; Chadwick et al., 2017; Chiner et al., 2021).

Despite the opportunities the Internet provides for students with ID to participate in society, it also involves considerable risks (Gómez-Puerta & Chiner, 2021). According to Chiner et al. (2021), 93% of teachers in their study agreed that the perceptions of Internet security had decreased for students with ID. The more the expected security on the Internet decreases, the more the expected risks increase (Chadwick et al., 2017). Indeed, many studies have revealed that students with ID face many security risks on the Internet, such as perpetrators stealing their personal information from online sources or bank data when shopping online, facing threats, exposure to unsuitable content, communication with strangers, publishing personal photos, overuse of the Internet, and exposure to cyberbullying (Chadwick et al., 2017; Chiner et al., 2017; Chiner et al., 2021; Gómez-Puerta & Chiner, 2021). Therefore, students with ID must acquire digital competencies to use the Internet safely and appropriately. This is because numerous activities formerly performed offline, such as banking services, searching for information, and shopping, are now increasingly carried out online (Buhler & Pelka, 2014). According to Pelka (2018), the digital transformation process includes not only technological transformation processes but also social transformation processes that require digital skills, given the nature and variables of the digital age and the rapid spread of ICT.

Digital citizenship (DC) is a modern concept that has gained popularity recently. This concept has several definitions. Wang and Xling (2018) defined it as a form of social identity shared by society members, regardless of their differences. This social identity provides them with numerous rights and duties that demonstrate the rules, principles, and criteria that individuals rely on for the best use of technology. Ribble (2017) defined it as a technique that enables teachers and learners to realize concepts and issues that they must know to be able to use technology appropriately. This is achieved by paying attention to ethics and responsibilities related to the digital use of information instead of concentrating on the digital communication of information. Individuals should be trained to focus on issues related to digital technology, such as individual ownership, privacy, intellectual security, and ethics (McGillivray et al., 2016). According to Al-Dubian (2013), DC is closely related to education, as it helps teachers and parents understand what students must know to use technology effectively. It is not only an educational tool but also a means to prepare students to connect with society. Thomas (2018) stated that in developed countries, there is consensus that DC is one of the most important skills that students should be taught and trained on. Thus, school curricula should include this subject, as it is a contemporary concept and constitutes a basic educational skill in our current era.

This attention from countries and organizations that prioritize good educational practices is justified. This also addresses the numerous violations caused by the poor use of technology and the Internet by many students, as well as their overuse and dependence on digital technologies (Nordin et al., 2016), resulting from not knowing what behaviors are appropriate in certain situations and no knowing what the appropriate use of technology entails (Ahlquist, 2014). This makes it important for educational agencies at different levels to participate in achieving DC by raising awareness and training students on the suitable use of technology and how to ethically cooperate with the digital environment, ensuring maximum benefit while maintaining the ethical and behavioral rules in their digital interactions (Young, 2014).

Bolkan (2014) indicates that DC identifies preventive standards against the risks of digital technology and clarifies policies for its acceptable use. This helps individuals to live and interact safely in the digital age. Hollandsworth et al. (2011) confirmed that students' low awareness of DC leads to serious behavioral problems. Al-Muslimani (2014) confirmed that not knowing the standards of correct and acceptable behavior regarding using technology among students makes them unqualified to deal with the digital society, which has a negative effect on them. Snyder (2016) stated that including DC in schools increases relatedness between users and the Internet, improves their interactions, and raises their educational responsibilities.

Thus, DC is an important aspect to consider when developing school curricula and teacher training programs. Educational agencies must develop specialized plans and subjects to embrace a preventive policy against digital risks and obtain the maximum benefit from its advantages to overcome what might result from the poor use of technology. It is important not only to identify a list of right and wrong behaviors related to using technology but also to consider it an instrument that helps clarify what is right and wrong. Additionally, it can help teachers connect with students through discussions related to real-life situations (Al-Muslimani, 2014; Hollandsworth et al., 2011; Saleem, 2018).

To implement DC in education and reap its benefits, the current study applied the three key principles of respect, education, and protection (Ribble, 2012; Ribble, 2015; Ribble, 2021) in a training program for students with ID. Each of these principles involves three elements, forming nine elements in total, which together provide a guiding framework for the suitable use of technology; the principles and elements are elaborated below.

The first foundational principle is respect, which guides everyone in making decisions that respect individuals and others in society. It includes three elements: digital access, digital etiquette rules, and digital law. Digital access is the starting point of DC, and it is defined as full electronic participation in society, as technology provides opportunities for many people to communicate and interact quickly. Leaders need to provide free and open technological options for students in society, guarantee equal chances, and provide facilities for those with disabilities to access digital devices and the Internet inside and outside the school. Whereas digital etiquette rules are defined as criteria of behavior based on which users should take responsibility in the digital world and determine suitable digital behaviors. Here, it is important to teach and train every student to be a responsible digital citizen and not to depend only on prescribed regulations and policies. It also refers to the best use of digital devices in a way that is contextually appropriate and does not negatively affect others. The last one is digital law, which is defined as responsibility concerning deeds. It deals with ethics in the digital society to mitigate the unethical use of technology (e.g., violating intellectual property rights; spreading viruses or forbidden content), issues that can lead to legal claims. Students should be taught appropriate behavior when they cooperate in digital activities and the harms and legal consequences that result from violating related regulations and laws.

The second foundational principle is education, which focuses on concepts related to educating oneself and communicating with others. This principle also involves three elements. First, digital literacy is defined as learning about technology and its use. Educational agencies must educate students through digital education programs to teach them how to use digital technologies quickly and appropriately to benefit from available educational opportunities. Examples include teaching students how to use computers and modern communication technologies in daily life and digital basics, such as using browsers and search engines and composing e-mails. The second element is digital commerce, which refers to the sale and purchase of goods and services online. Given the global trend towards digital

commerce, students need to be more aware of the safe sites they can use and how to protect their identities from potential risks (e.g., fraud, theft of identity or personal information, which may occur as a result of sharing important information on unsafe sites) while buying or selling goods and services online. The third element is digital communication, which is defined as the exchange of information online. Regarding communicating with other technology users, students must be taught how to take responsibility and trained on how to make appropriate decisions; they must also be taught the rules, options, and appropriate etiquette to follow, including not texting during class time or using technology to cheat on tests.

The third foundational principle is protection. It focuses on protecting oneself and others, laying the foundation for digital citizenship, and includes the following elements. First, digital rights and responsibilities, which are defined as the requirements and freedoms provided to all individuals in the digital world; adhering to them helps create a balance between individual rights and interests, such as privacy and freedom of expression, and corresponding social duties and interests, to protect technology users and not cause harm to others. The second element is digital health and wellness, which is defined as individuals' physical and psychological health state in the digital era; it focuses on promoting users' health by setting safety guidelines such as limiting screen time to avoid Internet addiction and eye strain. Lastly, digital security is defined as digital security precautions to ensure safety during digital interactions. Students need to learn how to protect electronic data by learning how to use antivirus programs, creating passwords that are not easy to predict, protecting personal identity, and creating backup copies of important files, in addition to preventive measures to protect sensitive files or information.

Ribble (2017) and Ribble and Bailey (2021) summarized the stages of developing DC skills. The first stage is the awareness stage, which means providing students with foundational knowledge and information that raises their technological aptitude. Students must be taught about the etiquette and ethics of dealing with technology, as well as appropriate and inappropriate behaviors related to digital transactions. Second, guided practice stage refers to the ability to use technology in an environment that encourages risk-taking and discovery to determine the uses of technology that are appropriate and those that are not. The third one is the modeling and demonstration stage. This stage presents positive, ideal models of how to use technology at home and school. Thus, the role models surrounding them, such as teachers, other informed learners, and parents, can be good examples for students to emulate while practicing DC. The last stage is the feedback and behavior analysis stage. Students at this stage discuss their use of digital technologies in the classroom, gaining the ability to criticize and distinguish the correct use of technology inside or outside the classroom through self-reflection on their practices.

Many studies have proven the effectiveness of training programs using various teaching methods and techniques to develop DC behavior related to all the nine elements described above among typical students. These methods included storytelling, brainstorming, problem-solving, role-playing, dialogue and discussion, and cooperative learning (Al-Banna, 2021; Al-Sardiya et al., 2020). Also, other studies used technology-based teaching methods such as blended learning, electronic games, augmented reality technology, infographic technology, and participatory web editing (Abu Mughanem, 2020; Ali, 2021; Mahmoud, 2020; Atallah, 2020).

Given the scarcity of Arab studies that have addressed DC behavior among students with disabilities, and those with ID in particular, teachers' knowledge of strategies to enhance their digital skills may be inadequate. Chiner et al. (2017) indicated a substantial lack of teachers' knowledge of risk prevention strategies and that 48% of teachers in their study were not qualified to prevent risks facing students with ID online. This is a source of concern because teachers play an important role in mentoring and guiding students to promote DC behavior (Wright, 2017). Shiner et al. (2021) recommended implementing training programs that provide teachers with strategies to enhance the use of the Internet and help them increase their competencies and skills to convey the correct use of this technology to students; they also recommend implementing training programs for students with ID to help them learn how to boost the benefits of using the Internet, prevent and manage risks, and develop risk management skills.

In Saudi Arabia, the Ministry of Education has implemented school plans and developed educational programs for students with disabilities by introducing new subjects, such as digital skills, which will help promote positive learning outcomes, increase learning opportunities, and improve students' performance in different subjects. Additionally, they can thus acquire vocational skills, according to their age, that qualify them for the labor market and make them productive individuals in society (Ministry of Education, 2021). However, upon examination of the digital skills curriculum, it appears that some important elements are not adequately taught. Specifically, it focuses on providing students with ID digital skills for activities such as electronic shopping, creating accounts on social media websites, surfing the Internet, searching electronic websites, writing e-mails, and using electronic applications. As such, the curriculum focuses only on technical skills and neglects important issues and concepts pertaining to DC.

Moreover, by reviewing the studies and research that dealt with DC, we find that there is a qualitative and quantitative deficiency in the Arab experience in this field and that this experience is still in its infancy and has a lot to offer and reveal in the field of DC. This research is unique as this is the first Arab research to present a training program based on the foundational principles of DC to develop DC behavior among students with ID. This finding indicates the importance of revealing the effectiveness of a training program in developing DC behaviors among female students with ID. To achieve this goal, the following research question was formulated: What is the effectiveness of a training

program based on the foundational principles of digital citizenship in developing digital citizenship behavior among female students with ID in the secondary stage?

2. METHODS

This study adopted a quasi-experimental method to examine the effectiveness of a training program in developing awareness of digital citizenship among female students with ID. A pre-experiment single group pre-post-test design was used. The performance of participants was observed pre- and after the experimental treatment to determine the effect of the experimental variable, thus not necessitating a comparison with another group.

2.1. Variables

The independent variable was the training program based on the foundational principles of digital citizenship to develop an awareness of digital citizenship among female students with ID. The dependent variable was the level of digital citizenship awareness.

2.2. Sample

The study sample of 10 female students with ID in third grade who were enrolled in inclusion classes at a secondary school in Riyadh was intentionally or purposively selected. The criteria for participation were as follows: female students with an ID, whose age ranged between 15 and 18 years; students with mild ID, determined based on a score of 55–70 on the Wechsler scale or an equivalent intelligence test; and students who have relevant technical skills pertaining to technology use (online shopping, creating accounts on social networking sites, browsing the Internet, searching websites, composing e-mails, and using electronic applications). The criteria were confirmed in advance through student records and by asking their teachers.

2.3. Instruments

2.3.1. Training program based on the foundational principles of DC

A training program was designed to develop awareness of DC among female students with ID. The program was built on the foundational principles for DC identified in research (Ribble, 2012; Ribble, 2015; Ribble, 2021). The first author conducted the training program, which consisted of nine sessions, each lasting 45 minutes. The program duration was five weeks, involving 15 consecutive sessions, with three sessions per week. The program covered aspects relating to objectives, content, educational methods, activities, and evaluations, with steps taken for defining the general objectives of the program, formulating the special objectives of the program, selecting and organizing the content, defining the program activities, and identifying the various teaching methods used in the program. Examples include storytelling, brainstorming, problem-solving, role-playing, dialogue and discussion, and cooperative learning. In addition to determining the educational means to implement the activities used in the program, such as educational digital stories, illustrated visual presentations, and multiple programs (Tiny Tap, Wordwall, Make it, Nearpod), the evaluation methods of the program were also defined. The contents of the prepared training program are as follows. Considering the first foundational principle, the principle of respect (respect for oneself and others), we focus on developing the ability to understand the positive and negative effects that a digital fingerprint can have on digital reputation and its real effects, respecting other digital fingerprints, and being respectful and responsible in electronic transactions. It also helps build awareness that directing harmful messages to friends and enemies cannot only harm others but may also harm the user, and this can be exploited for abuse and cyberbullying. This serves as an effective message of caution that one should be careful about what is shared online, which also promotes the development of the ability to know the concept of cyberbullying, what it includes, its types, and the steps that must be taken when exposed to cyberbullying.

Regarding the second foundational principle, the principle of education (teaching oneself and others), it helps one develop the ability to know the dangers of spreading incorrect information and verify the accuracy of the information that is widely transmitted between individuals before re-sending it to others so that incorrect information and news are not spread. This also includes developing the ability to know the risks of online shopping, how to shop safely and protect oneself and others from fraud and manipulation, and how to distinguish between safe and unsafe sites when shopping online. Additionally, it involves the ability to learn how to deal with anonymous communications, know the dangers of talking to or meeting strangers on the Internet, and how to protect oneself from strangers on the Internet.

The third foundational principle, the principle of protection (protecting oneself and others), focuses on protecting personal information, knowing the importance of maintaining privacy on social media, the dangers of sharing personal information, and the individuals with whom personal information can be shared. This principle also helps to determine what happens when someone obtains the password of the same user and how the password can be protected from theft, in addition to the ability to protect personal accounts and use two-factor verification on social networking sites. Finally, it also includes the ability to maintain consistent screen time when using electronic devices amidst other responsibilities and learn about the health risks of the prolonged use of electronic devices and how to protect against their negative effects.

2.3.2. Scenario-based assessment

The scenario-based assessment was used to evaluate the level of awareness of DC acquired after the training program among study sample participants. The assessment consists of 11 statements, each of which expresses a case scenario that includes three behavioral options. The test items present specific scenarios depicting behaviors related to DC; these are then used to identify how students choose to deal with the situations based on the behavioral options presented and discuss why they chose particular options. The assessment was developed through the following steps:

1. Determining the content of the assessment: Formulating situations and corresponding phrases that express simple behavioral actions that can be observed and discussed with the student (multiple-choice style).
2. Specifying the test instructions: The assessment instructions must be clear and indicate the method of completing the test and how to answer the questions, and include illustrative examples when necessary.
3. Determining the assessment method: The assessment is administered interactively, supported by animated objects and illustrations, to present the test to the students easily and interestingly and simultaneously allow them to answer by clicking on the correct option; this is particularly beneficial in cases where students are not fluent in reading and writing.
4. Determining the method of grading the assessment answers: Grades are determined by assigning one point to each question that the student answers correctly and assigning a score of zero for the wrong answer. The scores are then added to obtain the total test score.

2.3.3. Validity and reliability

The study instrument was presented to a group of specialists in the field of special education for review and to determine its scientific and linguistic suitability for application in the study sample. The referees' suggestions were considered, and necessary amendments were made to the instrument. The reliability of the study instrument was verified using Cronbach's alpha coefficient, resulting in a reliability rate of 0.84 and indicating its suitability for the current study.

2.4. Procedures

After reviewing studies and theoretical frameworks pertaining to concepts, theories, research, and basic studies related to the variables of the study, the training program was built, and the study sample was selected, consisting of 10 female third-secondary-grade students with ID. A parent consent form was sent to their parents, clarifying the title of the research, its importance, and defining the variables, and parents were informed that the information would be treated with complete confidentiality and would only be used to serve scientific research. The signed parental consent forms were collected, and participant names were coded during data collection and analysis to ensure information confidentiality. The pre-test was performed one week before the start of the intervention, and the scores obtained were tabulated for statistical processing. Subsequently, the program was implemented according to the procedural plan (duration: five weeks; sessions: 15, three per week). At the end of the program, a post-test was conducted to measure the dependent variable one week after the end of the intervention. Finally, the results of the two tests were compared to determine the effect of the intervention.

3. RESULTS AND DISCUSSION

To answer the research question, the null hypothesis was tested by using the Wilcoxon non-parametric test for small, interconnected samples. The Wilcoxon test was used as an alternative to the t-test to assess whether there were differences between the pre- and post-test scores on the attitude test among female students with ID who participated in the training program.

Table 1 shows that the value of Z is significant at the level of 0.01, which indicates that there are statistically significant differences between the pre- and post-test scores attributable to the training program based on the foundational principles of DC, thus rejecting the null hypothesis. Moreover, the W test revealed a significant difference in test scores. The effect size, as measured by Cohen's d, was $d = 0.64$, indicating a large effect, according to Cohen (1992). [Table 1 here]

This study aimed to reveal the effectiveness of a training program in developing awareness of DC among female students with ID. The results revealed statistically significant differences at the level of 0.01 between the pre- and post-test scores, with improvements noted in the post-test scores. This reflects the effectiveness of the training program based on the foundational principles of digital citizenship in developing awareness of DC among female students with ID in the secondary stage. This result is consistent with the findings of studies that followed a similar experimental approach, applying a training program based on the principles of DC; the studies were conducted with typical peers following different curricula and in different environments and educational stages (e.g., Al-Banna, 2021; Ali, 2021; Atallah, 2020; Mahmoud, 2020), and they emphasized the positive impact of such interventions on students in terms of developing awareness on DC and dealing with diverse types of digital problems. The positive impact of the training program can be attributed to the fact that it was built based on the foundational principles of DC defined by Ripple (2012). These principles eventually form the foundation of a digital society. In the educational context, they are implemented by providing students with foundational knowledge and information that increases their technological

aptitude. Further, they are important for students to develop moral values, follow sound rules, and learn about etiquette for dealing with technology, all of which are essential to help them understand the basics of their technological needs and direct them towards the appropriate use of technology. Such learning can improve students' behavior in the digital world, especially with respect to social acceptance of themselves, others, and technology (Ribble, 2015; Ribble, 2021). This may also be attributed to the program being based on the social constructivist theory as one of the theories of digital citizenship. The program's general and specific objectives were developed per the social constructivist theory, and the content was chosen and organized in a way that was consistent with and simulated the reality of female students, as well as linked to situations derived from their daily lives in a familiar context of previous educational experiences and how to benefit from them. Rice and Wilson (1999) confirmed that learning takes place in real and realistic environments, whether by constructing accurate representations of reality, consensual meanings in social activities, or personally coherent models of reality, and that experience is of utmost importance and is considered a basic incentive for building knowledge, especially if the content is relevant to the learner's current situation.

Another aspect contributing to the current results may be that the training program was built based on various teaching methods. Examples include storytelling, brainstorming, problem-solving, dialogue and discussion, and cooperative learning. This, in turn, helped increase the interaction and participation of the students, attracted their attention, and contributed to providing them with values, skills, and foundational information in an engaging way. This would help them learn how to use technology appropriately, deal with the requirements of the current digital era, and prepare themselves for the labor market. Michele and Jasper (2017) indicated that the social constructivist theory views learners as active participants and not passive recipients of knowledge, that is, they participate fully in the process of constructing knowledge. Thus, learners cannot learn unless they are active participants in the process of constructing knowledge. Accordingly, the current study focused on adopting activities that enhanced opportunities to discuss the use of digital technologies in the classroom, characterized by listening to students' opinions and presenting problems that encouraged them to participate by working, thinking, and finding solutions through motor activities and practical training. All of these contributed to their reaching the level of being able to use technology correctly inside or outside the classroom. Orlando (2013) emphasized that learners build knowledge and meaning through the process of sharing their ideas and opinions with others, thus reviewing the ideas and opinions that are shared, which agrees with the results of many studies (Abu Mughanem, 2020; Al-Banna, 2021; Al-Sardiya et al., 2020) that demonstrated the effectiveness of training programs using various teaching methods to develop DC behavior.

Lastly, the current results may be explained by the formative assessment implemented in the study, by conducting several activities in an organized manner during the sessions, with the aim of monitoring and measuring the progress and development of female students on an ongoing basis and providing them with immediate feedback, which contributed to enhancing their motivation to learn. Marope et al. (2015) emphasize that formative assessment is a well-known form of assessment that enhances and accelerates learning and is necessary to accurately create a series of experiences and activities for students. Constructivists recommend timely formative assessment; therefore, teachers must continuously assess students' knowledge to gauge whether they are on the right track.

The results of this study demonstrate the possibility of developing DC behaviors among female students with ID if they are provided with stimulating educational environments, which aligns with previous findings (Zorn et al., 2019). One of the factors that exacerbate the problem of online safety is that teachers regard students with ID as incapable of acquiring the digital competencies required to use the Internet. This leads to the formation of an empty circle that hinders their development by not training them on the necessary skills (O'Brien, 1985). This overly protective attitude limits the development and motivation of students with ID and hinders the process of their digital inclusion, which is essential for facilitating their access to the Internet (Näslund & Gardelli, 2013).

3.1. Limitation

Despite these distinct findings, the current study had some limitations. First, the study followed a single group pre-test-post-test design. It may have been better to adopt a static-group comparison design involving an experimental group and a control group, but this could not be carried out because of restrictions related to sample size, participant recruitment, and available programs. Second, no follow-up measurements were conducted to assess the persistence of the program's effects because of time constraints at the end of the school year. Therefore, future studies should conduct follow-up evaluations to measure the longevity of the program's impact. The study also recommends applying the program to other groups of people with disabilities using larger samples.

3.2. Recommendations

Based on the results, the following implications and suggestions are presented. Schools must design and implement training programs that provide teachers with strategies to promote Internet use among students and help them increase their competencies and skills to convey the correct use of this technology to students. Additionally, the training program could inform their application of the foundational principles of DC in the development plans for educational programs, such as in the digital skills curriculum, while also adapting them to suit the characteristics of students with ID. Lastly, the training program may be useful for formulating and developing guides that include instructions for teachers on how to implement lessons according to the characteristics of students with ID and their needs to help them comprehend the essential aspects to consider when teaching students about digital citizenship.

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Table 1. Wilcoxon test assessing the differences between the pre-test and post-test scores on the attitude test for DC behavior.

Groups	No.	Mean of ranks	Total of ranks	Z value	Level of significance	Effect size
Post < pre	0	0.00	0.00	2.85	0.004*	0.64
Post > pre	10	9.90	1.449			
Post = pre	0					

* Significant at 0.01.