



## Distance Learning for Students with Disabilities: Perspectives of Special Education Teachers

*Dr. Liyla M. Alamri*

College of Special Education Department, Assistant professor  
Education, Imam Mohammed Ibn Saud Islamic University (IMSIU),  
Kingdom of Saudi Arabia  
[lmalomari@imamu.edu.sa](mailto:lmalomari@imamu.edu.sa)

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### Abstract

The education transition to remote or distance learning that the whole world experienced due to the Covid-19 pandemic and the lack of research concerning people with disabilities during the pandemic, were the motivation for the presented research. Therefore, this paper presents a study into the issue of the effectiveness of distance learning for students with disabilities. The main objectives of this paper are to investigate whether distance learning is an effective approach for students with disabilities, to reveal any barriers and limitations affecting its effectiveness, and to suggest possible solutions. The approach adopted in this study was mixed methodology of both qualitative and quantitative approaches based on interpretive paradigm that allows the use of both approaches. The instruments used in this study are questionnaires and interviews. The questionnaires used close-ended questions as well as a semi-structured interviewing strategy. The findings of this research revealed three main issues that require more attention. These include the need for relevant policies that consider the preparation for distance learning at any time for students with disabilities and any intervention needed. Secondly, the availability of special resources needs to be considered, as required. Thirdly, the interaction between schools and families is an important consideration, as well as the recognition by the society of the needs of people with disabilities.

**Keywords:** Disabilities, Distance learning, Special education teachers, COVID-19 pandemic.

## التعليم عن بعد للطلاب ذوي الإعاقة من وجهة نظر معلمات التربية الخاصة

د. ليلى مرزوق العمري

أستاذ مساعد، قسم التربية الخاصة

كلية التربية، جامعة الامام محمد بن سعود الإسلامية ، المملكة العربية السعودية

[Imalomari@imamu.edu.sa](mailto:Imalomari@imamu.edu.sa)

### المستخلص:

تتمثل الدوافع الكبرى لإجراء البحث الحالي في تحول التعليم إلى تعليم عن بعد خلال جائحة كورونا، بالإضافة إلى شح البحوث المتعلقة بالتعليم عن بعد للطلاب ذوي الإعاقة خلال الجائحة. وبالتالي، فإن هذه الورقة تقدم بحثاً لدراسة فعالية التعليم عن بعد للطلاب ذوي الإعاقة. تتضمن الأهداف الرئيسية لهذا البحث التحقق مما إذا كانت الدراسة عن بعد فعالة للطلاب ذوي الإعاقة. أيضاً، للكشف عما إذا كانت هناك أي معوقات وحدود تؤثر على فعالية التعليم عن بعد للطلاب ذوي الإعاقة وتقديم الحلول الممكنة. اعتمدت منهجية هذا البحث على المنهج المختلط لكل من المنهج الكمي والمنهج الكيفي بناءً على النموذج التفسيري والذي يسمح باستخدام كلا المنهجين (الكمي والكيفي). وقد تضمنت أدوات البحث الاستبانة والمقابلات. في أداة الاستبانة، تم استخدام الأسئلة المغلقة. بينما تم استخدام استراتيجية المقابلات شبه المنظمة في أداة المقابلة. كشفت نتائج البحث عن ثلاث قضايا رئيسية والتي تستوجب مزيداً من الاهتمام. القضية الأولى التي كشفت عنها البحث هي بما يتعلق بضرورة وجود سياسات تهتم بالتعليم عن بعد للطلاب ذوي الإعاقة في أي وقت، بالإضافة على اهتمام مثل هذه السياسات في أي تدخلات ممكن أن تكون مطلوبة. بينما كانت القضية الثانية تتعلق بالموارد الخاصة والتي يجب الاهتمام بها وتوفيرها. وأخيراً كشفت البحث عن القضية الثالثة وهي ضرورة وأهمية التفاعل بين المدارس وأسر الطلاب ذوي الإعاقة، بالإضافة إلى اعتراف المجتمع باحتياجات الأشخاص ذوي الإعاقة.

**الكلمات المفتاحية:** الإعاقة، التعليم عن بعد ، معلمات التربية الخاصة، جائحة كورونا

## Distance Learning for Students with Disabilities: Perspectives of Special Education Teachers

### Introduction

In general, the lack of research concerning students with disabilities has been an area of criticism for some time. Specifically, there has been a lack of studies into distance learning for this group of students, and it is usually attributed to the assumption that the effectiveness of such method of education could be unsatisfactory. However, it is essential to take into account the fact that distance learning is complex in itself, whether it is for ordinary students or those with disabilities, especially with the latter group (Salinas et al., 2020). Relevant research suggested the need for more studies on distance learning for students with disabilities (Koustriava et al., 2020). Therefore, this study hopes to contribute to the knowledge in this field.

The main objectives of this paper are to investigate the quality and effectiveness of distance learning for students with disabilities, and to reveal any barriers and limitations affecting its effectiveness, and to suggest possible and potential solutions.

The main motivation behind this study is the education transition to remote or distance learning that the whole world, including Saudi Arabia, experienced due to the Covid-19 pandemic, and the lack of research concerning people with disabilities during the pandemic (UNICEF, 2020). During the pandemic, education for students with disabilities was not an exception as they were regarded as one of the most likely groups to be infected and affected (World Health Organisation, 2020; United Nations, 2020). According to the report published by The World Health Organisation , people with disabilities constitute 37.5% among the population of the whole world (Inclusive City Maker, 2019). However, when it comes to the efforts made during the pandemic for any fields, it is obvious that the provisions concerning people with disabilities have been inadequate compared with other measures. This situation has been recognised by several world authorities because of the injustice to this group of people (Scully, 2020; UNICEF, 2020). However, research also attributed this lack of provision to the different types and needs of individuals with disabilities (Croft and Fraser, 2022). Overall, many research studies, including United Nations (2020) and World Health Organisation (2020),

revealed that people with disabilities are already considered as facing many problems and this became more obvious during the pandemic. During the pandemic, at least one lesson was learnt in the world, which is the readiness and preparation for any potential crises. The field of education is one of the priority targets in such action, meaning that special education must be included in this readiness and preparation. After a thorough review of relevant literature, to the best knowledge of the author, there is no similar research on the issue of distance learning for students with disabilities in mainstream schools in the Saudi Arabia. So, this paper attempts to fill in this gap and contribute to the field of knowledge.

This paper aims to address the distance learning for students with disabilities since distance learning is one of the required interventions in a crisis, such as was presented by the Covid pandemic. This method of delivering education is one way of educational pedagogies with or without unforeseen crises, hence, such research on the issue of distance learning for students with disabilities should contribute to addressing this essential issue. The results section of this research reveals several issues that are discussed correspondingly, highlighting the need for urgent action in the approach of distance learning for this group of learners. However, it should be noted that some social initiatives had considered the difficulty that people with disability were most likely to face during the pandemic and so facilitated some of their needs. This paper will highlight the role that the society plays in promoting the effective distance learning for those with disabilities.

The presented study focuses on three main themes which are connected to the research questions. The first theme is to understand to what extent distance learning is effective for students with disabilities. In the second theme, the challenges of teaching students with disabilities through distance learning approach are presented. Finally, the third theme is to highlight the possible solutions to overcome any issues preventing the effective distance learning for students with disabilities.

### **Research problem**

During the COVID-19 pandemic, many countries all over the world, including Saudi Arabia, had enforced distance learning through online educational platforms. Since this was globally suggested to be difficult for

mainstream schools' settings, it was even more challenging regarding educating students with disabilities who required more attention because of their different needs and potential health issues. Given that teachers were not ready for this transition and that they had never taken part in such education scenario, they had encountered several internal and external barriers. Significantly, neither teachers or students had taken part in training sessions for such circumstances. Moreover, most parents had encountered the same issues in their own home and work commitments as well (Khalil et al., 2020). Other issues include the availability of suitable technology assets and equipment that students with disabilities require (LH et al., 2022). This is a challenging in itself taking into account the different needs of every individual among this group of students (Khalil et al., 2020).

All of the abovementioned considerations raised concern and doubt of whether distance learning is an appropriate approach for educating students with disabilities. Therefore, this study aimed to investigate this issue from the perspective of teachers in mainstream schools in Saudi Arabia who had experienced the surprising education transition during the pandemic. This focus on the experience of the teachers intended to reveal the problems they have faced in order to discuss and suggest relevant recommendations to limit such issues for better readiness for the future of this kind of education for students with disabilities.

### **Research questions**

To achieve these objectives, the design of this research includes the following research questions which the research attempted to answer:

1. To what extent is distance learning suitable for teaching students with disabilities from the reality of teachers' experience during the period of Covid-19?
2. What are the challenges limiting the application of distance learning for students with disabilities, based on the experience of special education teachers during the period of Covid-19?
3. What are the suggestions and recommendations to overcome these challenges?
4. Are there statistically significant differences between the responses of the research sample about the appropriateness of online learning for students

with disabilities and the proposed challenges and solutions attributed to the variables: (educational qualification, years of experience, age group)

### **Aims of the research**

The goals of this research are as follows. From the perspectives of teachers, the research aims to investigate the status of distance learning for students with disabilities during the pandemic. It also aims to reveal any barriers and limitations affecting its implementation. Finally, the research aims to suggest possible and potential solutions in order to ensure better readiness and implementation of distance learning for students with disabilities in the future.

### **Importance of the study**

Giving the fact that education systems around the globe experienced great upheaval, and even though in some nations distance learning was in and out repeatedly based on the constant measurement and the number of those being infected during the pandemic every day, the presented study should contribute in the theoretical and practical importance, as follows.

### **Theoretical importance**

Conducting this research is intended to contribute in filling the gap of knowledge in the field of special education from the perspective of teachers who had never been ready and trained to teach students with disabilities through distance learning in such crises, neither in pre-pandemic or existing education system. Therefore, the study should theoretically contribute in providing insight into the experiences that teachers had when teaching students with disabilities during the pandemic. It also helps to reveal the problems and obstacles they encountered during that difficult period. In addition, the study seeks to contribute in informing the decision-making about the policies and provisions that should be in place for better implementation of distance learning for those with disabilities.

### **Practical importance**

In terms of the practical importance this study is that this research seeks to make a contribution to the field of special education and the development of practical approaches to distance learning for students with disabilities. This is aimed through raising awareness and suggesting guidance to those normally

involved in distance learning for students with disabilities. These decision-makers include teachers, parents, community, authorities and any relevant stakeholders. Importantly, with the focus on the experiences of teachers teaching students with disabilities through distance learning, together with revealing the problems they face, the study provides suggestions that are intended to contribute in informing the practical aspects that should be taken into account if improvement of this educational method is to be achieved.

### **Study limitations**

It is usually notable that every research is subject to experience some limitations, particularly when the context and the constraint of time are considered. It should also be suggested that more time, access and relevant resources would have contributed to a richer data sample. Some limitations are highlighted as follows:

**Population limitation:** This research is limited to those special education teachers, who volunteered to take part in the study, teaching students with disabilities in kingdom of Saudi Arabia.

**Objectives limitation:** The present study is limited to teachers' experiences of distance learning for students with disabilities.

**Time limitation:** This research was conducted during the COVID-19 pandemic.

### **Study terminologies**

Similar to a number of research and recognised organisations, including UNESCO, this paper uses both distance learning and online learning interchangeably. UNESCO cited different definitions of distance learning. This includes the separation of education environment between teachers and learners through the use of technologies, especially the use of computers and internet. UNESCO also cited that distance learning is characterised by all of the following:



Distance learning is characterized by all of the following:

- A separation of place and/or time between the learner(s) and the instructor.
- The use of standardized curriculum.
- The delivery of education or training that employs technology.
- Support by a tutor, including help with content and assistance with technology, on line, on the telephone, or in person.

### **Literature review**

The continuous development of technologies has influenced distance learning as a contemporary approach to education process (Fedorenko et al., 2019; Elhadary et al., 2020). However, research revealed that the effectiveness of distance learning for students with disabilities is at risk since some types of disabilities are in need for practical intervention, as well as their interaction (Pacheco et al., 2020; Patel, 2020). According to Alhabeeb and Rowley (2018), different needs among those with disability can be problematic when online education takes place. The findings of the study conducted by Croft and Fraser (2022) attributed this to the fact that some types of disabilities and individual different needs require special assistance or activities that online schooling unable to offer through virtual environment. One of the issues people with disabilities experience during distance learning is the issue of their access to some of required online resources and materials (Sakellariou et al., 2020); Masonbrink & Hurley, 2020). This is also supported in the research conducted by LH et al., (2022) that reviewed relevant official documents of 32 countries responding to people with disabilities during the COVID-19 pandemic. Essentially, people with disability usually are deprived from such access on daily basis (World Health Organization,2020). It is known that distance learning is linked to the use of technology, in particular computer and Internet. However, the question must be posed is that whether the technologies used, hardware or software, can influence the effectiveness of distance learning (Fichten et al., 2009).World Health Organisation (2020) emphasizes the importance of many interventions towards people with disabilities during the Covid-19 pandemic in distance learning, including the availability of special resources, suitable accommodation for study, the availability of materials needed and the access to educational activities. However, research also found distance learning can be an advantage for students with different types of disabilities, especially those who cannot attend school for any reason (Di Iorio, Feliziani, Mirri, Salomoni, &



Vitali, 2006; Debenham, 2002). Even though those studies are relatively early, this can be also applied to the time of COVID-19 outbreak. In 2020, Zhang et al., argued that distance learning, when access is available, can enhance learning for students with disabilities due to a more flexible education environment. According to Mahasneh, 2020 and Octaberlina & Muslimin, 2020, distance learning provides many advantages to the process of teaching and learning. However, if this is to make a positive change, then access to technologies and information is required.

### **Methodology and methods**

This article aimed to investigate the quality and effectiveness of distance learning for students with disabilities, to reveal any barriers and limitations affecting its effectiveness, and to suggest possible and potential solutions. The approach adopted in this study was mixed methodology of both qualitative and quantitative approaches (Robson, 2011). Many studies concerning the issue of special education in Saudi Arabia context usually tend to employ quantitative approach which limits the area of so-called the explanatory power. Therefore, since this study is to address issues that concern the distance learning, students with disabilities and teachers in schools, the study attempted to avoid this limitation by employing mixed methodology of qualitative and quantitative approaches. Qualitative approach is vital, especially in terms of gaining more and deeper insights. So, mixed methodology approach is thought to be the most appropriate approach which is driven by the study's paradigm, which is interpretive paradigm, that allows the use of both approaches (Bryman, 2016). This is considered to be a contribution since, to the best of the author's knowledge, this paradigm was not used in relevant research.

The instruments used in this study are questionnaires and interviews. The questionnaire is employed to gain a broader view of the issue being studied together with a general understanding of the same issue, which should facilitate deep understanding obtained by the interview method. It is essential to stress that such mixture assists in the strengthening of the results since each method complements each other, especially when each method addresses the limitations of another (O'Cathain, 2009). Due to the unique challenges that the Covid -19 pandemic presented to the education, especially for teaching those students with additional needs, arguably, the use of mixed methodology is deemed the most appropriate.

## Semi-structured interviews

It is essential to note that the primary goal in the use of interviews is to obtain more understanding of opinions concerning a given situation (Cohen et al.,2007). As noted earlier; to deepen and strengthen the understanding of the participants' perspectives, the use of interviews method was a vital technique. Essentially, this method is invaluable in seeking an insight into a problem, which in turn leads to the careful analysis, interpretation and discussion of the obtained rich data (Kvale & Brinkmann, 2009).

In order to determine the meaning participants conveyed in their answers, this study uses a semi-structured interview method, using pre-prepared, open-ended questions (Robson, 2011).

The following three tables show the interview questions for each theme. These three broad themes are in line with the research questions and objectives of this study. The findings of the interviews will be discussed in the discussion section.

Table 1: Theme one: The degree of suitability of online learning for students with disabilities.

Theme	Interview questions
The degree of suitability of online learning for students with disabilities.	To what extent is distance learning an appropriate approach for students with disabilities? How would you compare its suitability to when learning in school settings? In terms of academic and social skills, to what extent does distance learning improve students' learning of those aspects? How would you describe the issue of individual differences in distance learning environment? To what extent does distance learning help you identify problems facing students with disabilities?

Table 2: Theme two: The challenges that limit the application of online learning for students with disabilities.

Theme	Interview questions
The challenges that limit the application of online learning for students with disabilities.	<p>Have you ever undertaken any training on distance learning? If yes, what are the areas covered in the training?</p> <p>What about virtual environment, have you been participating in any related programmes?</p> <p>To what extent was there any preparation and any relevant training of distance learning for learners?</p> <p>How would you describe your ability to identify any problems that students with disabilities had faced during distance learning? If yes, please explain.</p> <p>How would you describe the communication between you as a teacher and the parents of the students with disabilities?</p> <p>How would you describe the support of social programs on home care during online learning for families of students with disabilities in terms of home care?</p> <p>To what extent was the provision of technology resources available for students with disabilities, especially special technology for different types of disabilities?</p>

Table 3: Theme three: The proposed solutions to increase the effectiveness of the application of online learning for students with disabilities.

Theme	Interview questions
The proposed solutions to increase the effectiveness of the application of online learning for students with disabilities.	<p>How would you describe the availability of professional development training in regard to the use of technology in distance learning for teaching and learning process?</p> <p>How would you describe the importance of training for students' families on distance learning in regard to the educational process development?</p> <p>To what extent is it important to maintain cooperation between families and schools?</p> <p>Would you describe how the school tries to ensure that every student has access to at least basic resources?</p>

## Participants

For the purpose of ensure the sample of this research, purposive sampling was employed. There were ninety-nine participating teachers who responded to the questionnaires. The participants were contacted through an electronic application and reminded with the explanation of the research aims and their right to withdraw if they chose so. In addition, a consent form was shared with the participants to enable them to confirm the acceptance to take part in the research. They were also invited to take part in the interview, on voluntary basis. After questionnaires were returned, six participants agreed to take part in the interviews. Participants were contacted over the phone with every interview lasting for around 30 minutes.

The participating sample participants are special education teachers working in mainstream schools in Saudi Arabia. The demographic information of the interview participants is presented in the flowing table:

Table 4: Demographic information for the interview participants.

Participant	Level of education	The child disabilities
T1	Bachelor's degree in Special Education	Learning disabilities
T2	Bachelor's degree in Special Education	Intellectual disabilities
T3	Master's degree in Special Education	Learning disabilities
T4	Bachelor's degree in Special Education	Learning disabilities
T5	Bachelor's degree in Special Education	Learning disabilities
T6	Bachelor's degree in Special Education	Learning disabilities

## . Data Analysis

Both quantitative and qualitative data were gathered during this study, and each category of data required a different analytical approach.

### Data analysis of Questionnaires

In terms of data analysis, questionnaires were analysed through SPSS software. The following statistical methods were used to calculate the validity and reliability of the questionnaire:

- Pearson correlation coefficient
- Cronbach's alpha stability coefficient

The following statistical methods were used to analyse the questionnaire data: Weighted means, standard deviations, and relative weights-one way ANOVA- Test.

### Determine the degree of agreement and relative weights

The degree of agree was determined based on the value of the arithmetic mean and in light of the cut-off scores of the research tool scale, by adopting the following criterion to estimate the degree of agree, where the length of the five-point Likert scale used in this tool was determined (from 1: 5). The range was calculated ( $5 - 1 = 4$ ), which was divided by the number of the five scale periods to obtain the length of the period, i.e. ( $4/5 = 0.8$ ), then adding this value to the lowest value in the scale, which is (1), in order to determine the upper limit for the first period. This was continued for the rest of the periods, as shown in the following table.

Table 5: Degree of agree and relative weights.

Degree of suitability	Agree	Mean	Relative weight
Very weak	Strongly Disagree	1- 1.79	20 – 35,9 %
Weak	Disagree	1.8 – 2.59	36 – 51,9%
Medium	Neutral	2.6 – 3.39	52 – 67,9 %
High	Agree	3.4 – 4.19	68 – 83,9 %
Very High	Strongly agree	4.2 – 5	84 – 100 %

### Data analysis of Interviews

One of the advantages of the use of qualitative approach in research is that researchers are not required to follow a particular approach when analysing their data, but they need to show what steps they follow when presenting the research data (Creswell, 2014). According to Creswell (2014), qualitative data can be analysed as themes. So, this study used a thematic analysis based on the data collected through interviews by adopting the steps suggested by both (Braun & Clark ,2006; Creswell, 2014). Following those steps allows the presentation of the qualitative data of this paper, as well as enabling the presentation and discussion of the research data in the discussion (see discussion section). After analysing the interview data, three themes were constructed, as follows:

1. The degree of suitability of online learning for students with disabilities.
2. The challenges that limit the application of online learning for students with disabilities.
3. The proposed solutions to increase the effectiveness of the application of online learning for students with disabilities.

To ensure the credibility of the interview findings, a procedure containing a number of steps was followed. This included adopting so called ‘member checking’, as transcripts were shared with the participants to check and ensure the accuracy of data being collected (Cohen et al., 2007). In addition, after listening to audio recording and reading the transcripts several times, the process of the analysis was shared with colleagues, asking them to check and review my initial themes, categories and findings (Rallis & Rossman, 2009).

### **Findings of the study**

The results of this research are presented in a certain order, namely it the results from the questionnaires are summarised first, before moving to interviews results, which will be presented and discussed together in the discussion section. Since a thematic analysis is followed in this paper, the researcher can present and discuss the combined data being analysed (Braun & Clark, 2006).

### **Questionnaires findings**

The questionnaires used close-ended questions, because such method can be helpful in increasing the participants’ understanding of the questions given and then assisting the analysis of the results, hence contributing to the increased validity and reliability of the findings (Bryman, 2016).

### **Participants of Questionnaires**

The research community consists of special education teachers. The research sample consisted of ninety- nine special education teachers. The following is a description of the characteristics of the research sample according to demographic variables:

## 1-Description of the research sample by age

Table 6: Description of the research sample by age.

Age group	No.	%
From 22-30 years old	7	7.1%
From 31-40 years old	58	58.6%
From 41-50 years old	34	34.3%
Total	99	100%

## 2-Description of the research sample according to academic qualification

Table7: Description of the research sample by academic qualification

Qualification	No.	%
Bachelor's degree in Special Education	64	%64.6
Master in Special Education	32	%32.3
PhD in Special Education	3	%3
Total	99	100%

## 3-Description of the research sample according to years of experience

Table 8: Description of the research sample by years of experience.

Years of Experience	No.	%
From 1 to 5 years	3	3%
From 6-10 years	35	35.4%
From 11-20 years	54	54.5%
From 20 years and over	7	7.1%
Total	99	100%



## Search tool

A questionnaire focusing on the challenges of implementing online learning for students with disabilities was presented first to the participants. The current research tool consisted of two parts:

**Section one:** Includes primary data: age group, educational qualification, years of experience

**Section two:** It includes three Dimensions in total (25 phrases) as follows:

The first Dimension: the suitability of online learning for students with disabilities.

The second Dimension: the challenges of implementing online learning for students with disabilities.

The third Dimension: Appropriate solutions to increase the effectiveness of the application of online learning for students with disabilities.

## The validity and reliability of the questionnaire

### a- Reliability

The researcher calculated the stability of the tool by using alpha-Cronbach and split-half methods as follows:

The stability of the questionnaire was calculated by the alpha-Cronbach stability coefficient for the questionnaire as a whole, where its value was (0.82), which indicates a high stability coefficient. Alpha-Cronbach stability coefficients were calculated for each Dimension of the questionnaire, as shown in Table-9

Table 9: Cronbach's alpha coefficients for each Dimension.

Dimension	Number of statements	Alpha-Cronbach coefficient
One	8	0.91
Two	8	0.81
Three	9	0.94
Total	25	0.82

It is clear from Table (9) that the values of Cronbach's coefficients are high for each Dimension of the questionnaire, as the values of the stability coefficients of the resolution Dimensions ranged between 0.81 to 0.94, which gives an indication of its suitability to achieve the goals of the current research

and the possibility of giving reliable and stable results in the case of re-application of the research.

## b- Validity

### 1. The validity of the arbitration

After preparing the tool, it was presented to a group of experienced arbitrators in the specialty, who numbered (5) Arbitrators, and their opinions were taken to determine the appropriateness of the dimensions to measure the phenomenon in question, the appropriateness of the phrases to the Dimension to which they belong and the soundness of the wording of the phrases. An agreement rate of (80%) or higher has been achieved. The opinions of the arbitrators were taken into account, as no Dimension was excluded from the questionnaire, except for rephrasing, and thus the final number of the questionnaire phrases became (25) phrases distributed over three Dimensions.

### 2. Internal consistency validity

Table10: Results of the values (correlation coefficients) of the internal consistency of the questionnaire statements.

Correlation coefficient by Total	Correlation coefficient by Dimension	Statement	Correlation coefficient by Total	Correlation coefficient by Dimension	Statement
0.6	0.67	6	Dimension one		
0.81**	0.85**	7	0.63**	0.64**	1
0.74**	0.80**	8	0.75**	0.82**	2
Dimension three			0.68**	0.71**	3
0.71**	0.81**	1	0.70**	0.82**	4
0.76**	0.83**	2	0.75**	0.85**	5
0.61**	0.72**	3	0.68**	0.74**	6
0.72**	0.78**	4	0.63	0.68	7
0.62	0.65	5	0.68	0.7	8
0.79**	0.80**	6	Dimension two		
0.77**	0.83**	7	0.81**	0.87**	1
0.76**	0.86**	8	0.81**	0.84**	2
0.68**	0.75**	9	0.75**	0.80**	3
			0.69**	0.75**	4
			0.77**	0.89**	5

It is clear from the above table that all expressions are related to the degree of the Dimension to which they belong and to the total score on the questionnaire with positive and statistically significant correlation coefficients at the level of (0.01).

### **Results of the first question**

The first question states: what is the degree of suitability of online learning for students with disabilities? In order to answer this question, the means, standard deviations, and relative weights of the sample's responses to the questionnaire were calculated to determine the suitability of online learning for students with disabilities. Table (11) shows the results.

Table 11: The weighted means and relative weights of the responses of the sample of suitability of online learning for students with disabilities.

No	Statements	Means	SD	Relative weight	Statements order	Degree of suitability
1	Online learning can be used to teach students with disabilities.	1.84	1.1	36.8	1	weak
2	Online learning was suitable for teaching students with disabilities.	1.59	1	31.8	7	Very weak
3	Online learning has made the education of students with disabilities more effective.	1.67	0.89	33.4	5	Very weak
4	Online learning has helped students with disabilities acquire academic and social skills faster.	1.39	0.71	27.8	8	Very weak
5	Online learning takes into account individual differences among students with disabilities.	1.68	1.03	33.6	4	Very weak
6	Online learning helped develop relationships and organise electronic social interaction between teachers and students with disabilities	1.81	1	36.2	2	weak
7	Online learning helped identify problems facing students with disabilities.	1.59	0.81	31.8	6	Very weak
8	Online learning help teachers provide best educational practices for students with disabilities.	1.74	1.02	34.8	3	Very weak
Total		1.66	0.75	33.23	4	Very weak

It is clear from the results shown in Table (11) that: The research sample gave the suitability of online learning for students with disabilities an appropriate degree (very weak) with a mean weight (1.66) and a relative weight (33.23) with a standard deviation (0.75). This indicates that the research sample believes that the degree of suitability of online learning for students with disabilities is very weak. The highest phrases in the degree of suitability came with phrase No. (1) and its text (online learning can be used in teaching students with disabilities.). The highest mean weight (1.84) with a relative weight (36.8) came in the phrase No. (4), which reads the lowest in terms of suitability, namely, (online learning helped students with disabilities acquire academic and social skills faster.) The result here was the lowest mean weight (1.39) with a relative weight (27.8).

### **Results of the second question**

The second question states: what are the challenges that limit the application of online learning for students with disabilities? In order to answer this question, the means, standard deviations, and relative weights of the sample's responses to the questionnaire were calculated to determine the challenges that limit the application of distance for students with disabilities. Table (12) shows the results.

Table12: The weighted means and relative weights of the responses of the sample of the challenges that limit the application of distance for students with disabilities.

No	Statements	Means	SD	Relative weight	Statements order	Degree of Agree
1	Not providing training courses for special education teachers in the field of online learning for students with disabilities.	4.37	1.11	87.4	4	Strongly agree
2	Not training special education teachers to use virtual classrooms and remote communication techniques with students with disabilities during the last period.	4.3	1.17	86	6	Strongly agree
3	Failure to prepare students with disabilities and their families for online learning.	4.3	1.17	86	5	Strongly agree
4	Difficulty identifying the problems facing students with disabilities during online learning.	4.38	1.11	87.6	2	Strongly agree

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No	Statements	Means	SD	Relative weight	Statements order	Degree of Agree
5	Poor communication between parents of students with disabilities and teachers.	4.37	0.9	87.4	3	Strongly agree
6	Failure to train students with disabilities on electronic communication from their homes.	4.44	0.73	88.8	1	Strongly agree
7	Failure to provide social programs aimed at supporting families of students with disabilities with regard to home care during online learning.	2.7	1.66	54	8	Neutral
8	Not providing devices and computers suitable for each disability during the online learning period.	2.76	1.79	55.2	7	Neutral
Total		3.95	0.62	79.09	-	Agree

It is clear from the results shown in Table (12) that: -The research sample gave the challenges that limit the application of online learning to students with disabilities a degree of agreement with a mean weight (3.95) and a relative weight (79.01) with a standard deviation (0.62), which indicates that the majority of the research sample agreed on the existence of challenges that limit the application of online learning to students with disabilities degree. The highest challenges in the degree of agree came in phrase No. (6), which reads (Not training students with disabilities on electronic communication from their homes.), where the highest mean weight (4.44) with a relative weight (88.8). The least challenges in the degree of agree came in phrase No. (7) and its text (providing social programs aimed at supporting families of students with disabilities with regard to home care during online learning...) The result here was the lowest mean weight (2.7) with a relative weight (54).

### Results of the Third question

The third question states: what are the proposed solutions to increase the effectiveness of the application of online learning for students with disabilities? In order to answer this question, the means, standard deviations, and relative weights of the sample's responses to the questionnaire were calculated to determine the effectiveness of the application of online learning for students with disabilities. Table (13) shows the results.

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Table 13: The weighted means and relative weights of the responses of the sample of the proposed solutions to increase the effectiveness of the application of online learning for students with disabilities.

No	Statements	Means	SD	Relative weight	Statements order	Degree of Agree
1	Developing the skills of teachers' capabilities in various aspects of e-learning from a distance for all categories of students with disabilities.	4.59	0.62	91.8	8	Strongly agree
2	Rehabilitation and training of families of students with disabilities to increase their interaction and participation in the success of the online learning process.	4.72	0.45	94.4	4	Strongly agree
3	Raising awareness and educating the families of students with disabilities about the importance of technology in the education process and that it may be a pattern of education in the future.	4.51	1.05	90.2	9	Strongly agree
4	Ensure that computers are provided free of charge to all students with disabilities and that the Internet is well available.	4.79	0.41	95.8	1	Strongly agree
5	Cooperation between each of the families of students with disabilities and the school in order to raise the level of performance of students with disabilities during online learning.	4.66	0.61	93.2	5	Strongly agree
6	The timing of classes for students with disabilities must be appropriate for their families.	4.73	0.45	94.6	3	Strongly agree
7	Activating interactive education techniques by providing online learning lessons for students with disabilities.	4.58	0.62	91.6	8	Strongly agree
8	Designing educational lessons for students with disabilities remotely to help them acquire academic skills.	4.62	0.6	92.4	6	Strongly agree
9	Designing and preparing lessons for students with disabilities during online learning to increase their chances of independence.	4.75	0.52	95	2	Strongly agree
Total		4.66	0.51	93.15	-	Strongly agree

It is clear from the results shown in Table (13) that the research sample gave the proposed solutions to increase the effectiveness of the application of online learning for students with disabilities a degree of agree (strongly agree) with a weighted mean of (4.665) and a relative weight of (93.15) with a standard deviation of (0.51), which indicates that the majority of the research sample strongly agreed with the proposed solutions. Thus, they stressed the need to increase the effectiveness of the application of online learning for students with disabilities. The highest solutions in the degree of agree came with phrase No. (4) and its text (Ensure that computers are provided free of charge to all students with disabilities and that the Internet is widely available.) The result here was the highest mean weight (4.79) with a relative weight (95.8). The least solutions in the degree of Agree came with phrase No. (3), which reads (Rising and educating the families of students with disabilities about the importance of technology in the education process and that it may be a pattern of education in the future.). The result here was the lowest mean weight (4.51) with a relative weight (90.2).

### **Results of the fourth question**

The fourth question states: Are there statistically significant differences between the responses of the research sample about the appropriateness of online learning for students with disabilities and the proposed challenges and solutions attributed to the variables: (educational qualification, years of experience, age group). In order to answer this question, the data were analysed using the one-way analysis of variance method in order to verify the significance of the differences in the responses attributed to the variables of years of experience, educational qualification, and age group. The following tables show the results for each variable:

#### **a)-Differences according to the educational qualification variable**

Table 14: results of one-way analysis of variance to indicate differences between the means of the research sample response: according to the educational qualification variable.

Dimensions	Sum of Squares	Df	Mean Square	F	Sig.	
D1	Between Groups	195.870	2	97.935	2.850	.063
	Within Groups	3298.635	96	34.361		
	Total	3494.505	98			
D2	Between Groups	30.024	2	15.012	.598	.552
	Within Groups	2410.885	96	25.113		



Dimensions	Sum of Squares	Df	Mean Square	F	Sig.
Total	2440.909	98			
D3 Between Groups	25.437	2	12.718	.593	.555
D3 Within Groups	2057.917	96	21.437		
Total	2083.354	98			
Between Groups	354.561	2	177.280	1.686	.191
Total Within Groups	10096.167	96	105.168		
Total	10450.727	98			

It is clear from Table (14) that here are no statistically significant differences between the mean scores of the research sample responses on the adequacy of online learning for students with disabilities and the proposed challenges and solutions due to the educational qualification variable. This indicates that the sample's responses about the appropriateness of online learning for students with disabilities and the challenges and proposed solutions did not differ according to the educational qualification.

### **b)-Differences according to the years of experience**

Table 15: Results of one-way analysis of variance to indicate differences between the means of the research sample response: according to the years of experience variable.

Dimensions	Sum of Squares	Df	Mean Square	F	Sig.
D1 Between Groups	165.701	3	55.234	1.576	.200
D1 Within Groups	3328.804	95	35.040		
Total	3494.505	98			
D2 Between Groups	56.642	3	18.881	.752	.524
D2 Within Groups	2384.267	95	25.098		
Total	2440.909	98			
D3 Between Groups	104.801	3	34.934	1.677	.177
D3 Within Groups	1978.552	95	20.827		
Total	2083.354	98			
Between Groups	379.924	3	126.641	1.195	.316
Total Within Groups	10070.804	95	106.008		
Total	10450.727	98			

It is clear from Table (15) that: There are no statistically significant differences between the mean scores of the research sample responses on the adequacy of online learning for students with disabilities and the proposed challenges and solutions due to the years of experience variable. This indicates that the responses of the participants about the appropriateness of online learning for students with disabilities, the challenges and proposed solutions, did not differ according to the years of experience.

### C-Differences according to Age group:

Table 16: Results of one-way analysis of variance to indicate differences between the means of the research sample response: according to the age of group variable.

Dimensions		Sum of Squares	Df	Mean Square	F	Sig.
D1	Between Groups	367.691	2	183.846	5.644	.005
	Within Groups	3126.814	96	32.571		
	Total	3494.505	98			
D2	Between Groups	13.340	2	6.670	.264	.769
	Within Groups	2427.569	96	25.287		
	Total	2440.909	98			
D3	Between Groups	26.494	2	13.247	.618	.541
	Within Groups	2056.859	96	21.426		
	Total	2083.354	98			
Total	Between Groups	555.477	2	277.738	2.695	.073
	Within Groups	9895.251	96	103.076		
	Total	10450.727	98			

It is clear from Table (16) that there are no statistically significant differences between the mean scores of the research sample responses about challenges and solutions due to the age group variable. This indicates that the sample responses about the proposed challenges and solutions to increase the effectiveness of online learning for students with disabilities did not differ according to the age group.

### Discussion

Discussion section will be presented in three broad themes, including their subthemes presented in the interviews section, based on the objectives of this research.

#### Theme one: The degree of suitability of online learning for students with disabilities

In regard to the first theme, all participants unanimously agreed that distance learning cannot be an appropriate education approach for those students with disabilities. Consequently, it was hard for participants to find this approach as effective as compared to regular learning at schools. Furthermore, interviewees argued that distance learning did not help students' acquisition of academic and social skills.

In terms of the vital issue which is the individual differences between learners, teachers collectively agreed that without interaction with students in schools, it was difficult to deal with this significant aspect through distance learning. This finding is supported by research conducted by Alhabeeb and Rowley (2018) and Croft and Fraser (2022), who stressed that distance learning can be a challenge when teaching those with disabilities, since their needs and types of disabilities are different where special assistance is required for some types. However, the majority of teachers found disparity of students' interaction through distance learning. They attributed this to the lack of access to the resources and familiarity with the technology used by the students, or even their degree of acceptance to engage with distance learning. This reluctance or unwillingness to engage with distance learning is also revealed as a concern in a number of research studies (Sakellariou et al., 2020; Masonbrink & Hurley; 2020; LH et al., 2022; World Health Organisation, 2020).

After all, it is not surprising that participants confront the issue of their ability to identify the problems facing those students with disabilities. Notably, although respondents overwhelmingly came to the conclusion that distance learning is not suitable for students with disabilities, teachers were able to use different creative methods of pedagogy to apply to distance learning.

### **Theme two: The challenges that limit the application of online learning for students with disabilities**

In terms of the second theme of the three themes where this study focuses, teachers were able to strengthen their responses received through questionnaires since they largely agreed on the challenges that limit the employment of distance learning for students with disabilities. Surprisingly, all teachers revealed there was a lack of training provision for special education teachers concerning the area of distance learning for students with disabilities. Hence, this also had led teachers to collectively agree on the absence of ICT training programmes, especially about the virtual classrooms related courses, for the same group of teachers when teaching the same group of students. Many researchers have advocated for the need for more professional training for teachers working with people with disabilities. However, most programmes do not usually focus intensively on distance learning for those specific groups of people. The interest of inclusive schools and integration of those students with their peers may override concerns over distance learning. This is especially

significant when realising that Covid-19 pandemic shocked the world and most countries were not prepared to deal with the potential or unforeseen implications.

In terms of students' and parents' preparation and training for distance learning, all teachers confirmed a lack on this kind of essential training to ensure an effective provision of distance learning. The same agreement was evident among all of the participants on the difficulties they faced when attempting to identify issues that students might face during distance learning. It is always suggested that the effective communication between teachers and students' families is a significant aspect of successful educational outcomes (UNICEF, 2018). However, most of the interviewees in this research found such communication was very weak. Although research on students with disabilities learning found the school-parents communication was a well-known matter in many contexts, this communication may have been worsened during the pandemic, because children's families may had to go to work or even could be distracted if they needed to work from home.

Another relevant aspect to be considered is the issue concerning society and community which is important for students with disability. However, during the pandemic this kind of network support has become more necessary, since some students' families had to go to work and many students were more likely face challenges in their distance learning. Therefore, the provision of social programmes that aim to support the families of students with disabilities, especially in terms of helping in home care, is essential. In this study, all teachers agree this is vital and could make a significant positive difference in distance learning for those most affected. However, participants revealed failure of such involvement in society and suggested a national intervention towards this issue. This is supported by Cahapay (2020), who argues that people with disabilities are still excluded during the pandemic of Covid-19 and warns such exclusion from the society could be lifelong for people with disabilities if their needs are not recognised.

The provision of resources, particularly technology provision, is an essential requirement for all students, including those with disabilities. In a complete agreement, participants agreed on the lack of the provision of related technologies, such as computers. Also, they commented on the absence of provision of any special and related devices for each disability type during

distance learning. Such problem does not only affect students learning but can also be one way of preventing teachers from being able to effectively interact with their students and therefore to identify any challenging issues for the students during distance learning.

### **Theme Three: The proposed solutions to increase the effectiveness of the application of online learning for students with disabilities**

Moving to Theme Three, participants' views revealed in the preceding two themes their belief and keen interest in the importance of relevant interventions to enhance the effectiveness of distance learning for students with disabilities. In this theme, solutions are categorised into three aspects based on the main sub-themes which emerged during the analysis.

The first aspect concerns the process of teaching and learning. All teachers agreed on their need for more professional development. In particular, they required special training courses regarding the development of their skills in e-learning through distance learning for all types of disabilities in order to enhance their ability of effective teaching in distance learning. Yet, it is vitally important to argue that it is not only the development of technology and online skills, but also both technologies and the professional programmes should be integrated in the pedagogical approach for an effective learning (UNESCO, 2016).

Therefore, another relevant issue teachers found to be considered in this area is the employment of interactive education technologies during the educational process in distance learning. Most teachers agreed on the importance of enhancing students' independent learning through preparing and designing suitable methods of teaching and learning process. It is suggested that teachers need to employ different methods of teaching as one way towards effective teaching and learning process. Although independent learning through interactive technologies is one way of developing distance learning, it must be clarified that this method may be useful for some types of disabilities but not for all types. However, there are different technologies for every type of disabilities, and they should be utilised whether in distance or 'normal', traditional education.

The second area is related to students' families as they can play an important role in order to promote the educational process. All interviewees stressed the vital need of providing the necessary training and preparation programmes for families to improve their awareness in order to enhance their interaction and cooperation in the process of teaching and learning. Therefore, families need more awareness about the significance of distance learning, the role it plays in the educational process and the fact that distance learning could be a core method in the future.

As regards the cooperation between families and schools, participants confirmed that responsibility and accountability of both parties must be ensured if the effectiveness of distance learning is to be improved. Most teachers also advised that such cooperation should also consider a discussion on the most suitable time for sessions when families are present.

The final aspect considers the provision of free resources, such as computers and the internet. Participants argued that every student needs to have a free computer and free access to the internet as the basis for distance learning. The 1:1 project where every student has a laptop can be one way to overcome this issue which has been found being effective in many countries who adopted this project. Such intervention is also supported by No Child Left Behind Act 2001 (NCLB) where every student must have equal access to education resources regardless of their needs (Jorgensen and Hoffmann, 2003). Access does not only mean the use and availability of the technologies but also the skills of people and how those technologies are used in distance learning. It is to say, without such access and skills development, effective distance learning will be a continuous problem.

## **Conclusion and recommendations**

Distance learning for people with disabilities could be effective if the challenges and solutions addressed in this paper are considered. However, it is important to note that distance learning along with studying in schools' settings should complement each other. This is not to say distance learning is not right for them but face to face education to those with disabilities has been suggested as a priority. However, as is found in this study which considered the distance learning only, it is necessary to conclude that without required resources, distance learning is more likely not to help the development of learning for



those with disabilities. Yet, education ministries and any related authorities are responsible for making sure that they are ready for everything needed when cases like pandemics or any crises occur. In this case distance learning is required as an alternative or secondary education approach. This is especially significant considering that most of the world was shockingly affected in every field when the pandemic began. It is because societies were not prepared for solutions and interventions to tackle this pandemic and its implications, including distance learning for people with disabilities (UNICEF, 2020).

To conclude this paper, three main issues need a primary attention. Firstly, there is the need for relevant policies that consider the preparation for distance learning at any time for people with disabilities and any intervention needed. Secondly, the availability of special resources needs to be addressed and offered as required and at short notice. The third issue to be addressed is the interaction between schools and families and, at the same level, the recognition by the society of the needs of people with disabilities.

### **Ethics Statements**

Prior to collecting any data, it is essential to seek consent from the participants, as well as the institutions concerned. This entails ensuring that each participant is fully aware of the study's objectives the tools that will be used in the analysis, as well as the potential application of the results. It also means obtaining consent from each participant to use the data exclusively for this research. All of these steps were followed prior to data collection. Furthermore, all crucial details regarding the researcher were made available. The participants were free to withdraw up to an agreed date given to them personally.

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