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APPLE APPS FOR STUDENTS WITH INTELLECTUAL DISABILITY: SAUDI FAMILIES EXPERIENCE

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ABSTRACT

In order to better fulfil the requirements of learning kids, mainstream technologies are increasingly being used for students who have intellectual disabilities. For the sake of improved education, professionals in the field need access to certain instruments for putting methods into practise for children in special education. In the research that was carried out, quantitative research was carried out based on primary data in the form of a survey about the utilisation of apple apps for students who have requirements associated with special education. Through the use of digital forms, a survey with 76 participants was carried out. The study was carried out by the parents of children with intellectual disabilities who were residing in the kingdom of Saudi Arabia. There is not a single item on the poll that does not pertain in some way to an Apple application; nevertheless when the parents were asked about particular Apple applications. According to the data, it was determined that using Apple apps does not have a substantial impact on the educational achievements for kids who have intellectual disabilities. The primary problems with were the lack of information on the part of parents regarding the effects of these technologies on the development of their children, the adaptation of the applications, the limited material available on these apps, and the high risk of technological malfunction. It was proposed that these technology businesses prioritise the creation of one-of-a-kind apps for students with disabilities and the organisation of frequent training for both teachers and students on the appropriate use of apps in order to ameliorate the current situation.

Keywords: Apple Apps, Intellectual Disability, Special Education, Educational Technology, Quantitative Research, Technological Adaptation, Inclusive Learning and Digital Applications

1.0 INTRODUCTION

Students with intellectual disability face a variety of obstacles to learning due to their impairments in motor control, language development, and sensory perception (Marrus & Hall, 2017). Typically, interventions are needed for children with developmental disabilities to address behavioural and developmental concerns (Zablotsky, 2019). Students with intellectual disabilities can utilise a variety of Apple apps to practise and improve their speech and cognition in order to learn more effectively (O'Connell et al., 2010; Rodríguez et al., 2015). Cognitive impairments significantly impair one's ability to learn new information, retain it, and pay attention to detail (Seeman-Horwitz et al., 2021.Wu, 2015). Different mobile apps can be used to engage children with intellectual disabilities in various sorts of communication-based activities (Arun & Jain, 2022: Korczak & Zwierzchowska, 2020; Rodríguez et al., 2015). Studies involving children with intellectual disabilities have lacked an emphasis on socio-

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cultural or socio-political issues, despite these issues being ubiquitous in modern schooling (Tan, 2019).

Those with intellectual disabilities benefit greatly from the adoption of e-learning as a teaching method (Al-Zboon, 2022). As a result of their impairments, students with learning and reading problems struggle to read and find it difficult to read anything with fluency. Students who struggle with reading fluency may benefit from a combination of traditional and innovative teaching methods, such as the iPad and peer-assisted learning, as proposed by the author (Mize, 2020). Different mobile applications are seen as a useful tool that professionals, parents, and teachers can use to help their kids and clients. It is not easy to pick and choose among the wide variety of apps offered by app shops. Because of the success of e-learning in helping students with intellectual disabilities close the knowledge gap between themselves and their peers, it should be incorporated into school curricula. The widespread adoption of e-learning has benefited educators, students, and the educational system as a whole (Alharthi & Bagadood, 2022).

Education policy should take into account the needs of students with disabilities so that they can continue studying throughout their lives and receive a high-quality education (Carlisle, 2022). The study aid of Notability is Notes. The program is helpful for pupils in special education in their schoolwork. Parents of students with disabilities have expressed satisfaction with the application's potential to improve their children's education. In order to better understand and address mathematical issues, the Notability App allows users to generate a variety of useful diagrams. The Notability software also aids students with intellectual disabilities in their education by allowing them to compose stories based on course material (Jacob. 2019).

The primary goal of this study is to analyze how students with intellectual disabilities in Saudi Arabia make use of Apple Apps. The finding is essential for the youngsters with intellectual handicap who can utilise the benefits of Apple Apps to increase their learning skills.

1.1 Research Questions

To actualise the research aim of this study, the following research questions will be investigated.

i. Does using Apple Apps have any significant effect of the learning improvement for children with intellectual disability?
ii. What are the most used Apple Apps used by children with intellectual disability?
iii. Does the type of Apple App used have significant impact on the learning improvement for children with intellectual disability?

2.0 LITERATURE REVIEW

Researchers have recommended a study on the use of assistive technology to help students in special education who have learning difficulties learn more effectively (Arun & Jain, 2022: Korczak & Zwierzchowska, 2020; Seeman-Horwitz et al., 2021). The Saudi government has passed new legislation. Law governing special education mandates the use of educational software in both public and private institutions to help pupils with intellectual disability learn

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(Alshaer, 2018). Parents of students with intellectual disability also require training in the effective use of technology in special education settings (Abed, 2021). According to the study by Al-Jarf (2022), several mobile apps are available for download from Apple app stores and can be used by students with intellectual handicap to help them carry out their daily duties. Disabled pupils can expand their vocabularies with the help of a mobile vocabulary app (MVA) (Al-Jarf, 2022). The Apple apps are used by professionals to expand their vocabularies and prepare them to learn new terms in a variety of contexts (Al-Jarf, 2022).

Psychological, cognitive, and technological factors were examined by Alshaer (2018) on special education in Saudi Arabia. The study focused on the use of iPads in the classroom with students who have special needs (Alshaer, 2018). The iPads were found to enhance the learning of students with intellectual disabilities (Alshaer, 2018). The digital technologies open up new channels of communication for students with disabilities (Leib, 2012). Once students with intellectual disabilities are able to overcome the barriers that they face in becoming familiar with the technology, the students can benefit from the use of the apps (Bu-Saeed, 2022). The flexibility to learn whenever and wherever is an important benefit (Klimova, 2019). The apps enable material to be presented in a variety of different formats that can appeal to multiple senses and promote learning (Klimova, 2019).

2.1 Research Overview

This paper proposes a research project in which mobile language learning applications are used to teach Arabic for students with an intellectual disability. Apps such as MALL provides students with a means through which they can investigate the aspects that affect their acquisition of Arabic (Alqarni, 2020). With the goal of improving communication and understanding between students with intellectual disabilities, Apple apps are being used within the classroom by Saudi Arabian teachers (Alqarni, 2020). Students with intellectual disabilities can benefit greatly from the reduction in processing and the reinforcement of learning that these programmes provide. The learning capacities of students with intellectual disability can be boosted by the provision of multimedia tools. Research has shown that visual aids, such as those seen in Apple's apps, can help pupils retain information more effectively than more conventional methods of instruction (O'Connell, 2020). Apple products are accessible to students with a wide range of abilities. The content of special education courses is bolstered by these apps, which gives pupils additional avenues to be motivated. These Apple apps offer a variety of representational strategies, motor behaviours, expressive modalities, and interactive strategies (O'Connell, 2010).

The research by Abed and Shackelford (2021) looked at how parents in Saudi Arabia feel about their children, ages 6-8, using iPads or other touch-screen tablets to help them learn. Students with difficulties in Saudi Arabia who use iPads for school were surveyed using semi-structured questionnaires. The results suggest that Saudi parents see this technology favourably. The results, however, also demonstrate that parents need guidance in order to promote their children's use of technology at home. In conclusion, the current study highlights the importance of research addressing a broader spectrum of parental attitudes regarding digital technology as policymakers and educators integrate digital technology into conventional and LD education.

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In this investigation, we hear from educators on how their students with intellectual disabilities have benefited from online education. The study sample included Seven educators, including Two from elementary schools, Two from middle schools, and Three from high schools. The study employed a qualitative approach by interviewing participants. The research shows that in order for e-learning to be effective, the following are required: first, the availability of appropriate training programmes for teachers, students, and family members; and second, the provision of appropriate digital tools for children to maintain contact with their educators. In light of the findings, the authors of the study recommend that educational software and/or programmers be developed to facilitate e-learning for both teachers and students (Alharthi & Bagadood, 2022).

The goals of the study were to gain insight into how teachers of students with severe developmental impairments and intellectual disabilities use assistive technology (AT), what considerations they take into account when making AT purchases, and what barriers they face. Interviews and a self-administered online survey were used to compile the data. Ninety-two special education teachers from four special higher education institutions were surveyed, and five teachers were also interviewed to offer context for the quantitative data that had already been evaluated. The results also demonstrated significant differences in how AT was employed between teachers with prior AT training and the four special education facilities. The findings point to the necessity of teacher training, additional funding, and the provision of appropriate curriculum in order to effectively use AT in the classroom (Abu-Alghayth, 2022).

3.0 METHODS

3.1 Research Design

Researchers typically employ quantitative and qualitative research approaches to collect data (Bloomfield and Fisher, 2019). Quantitative research uses statistics and measures to evaluate tests (Östlund et al., 2011). The researcher collects and digitises data to find correlations and develop conclusions from the results. Quantitative research relies on numerical interpretations, while qualitative research does not. Case studies are used to get data from smaller samples (Bloomfield and Fisher, 2019). Thus, the quantitative research method was best for assessing Apple apps' impact on intellectually disabled kids' learning. Quantitative research will also examine the significant impact and apps for developing students learning by thoroughly evaluating each participant. Apple apps are used as a key factor for students with intellectual disability because having any kind of disability remains a lifelong challenge. The research is based on quantitative analysis based on survey.

3.2 Sample

Convenience sampling was used to identify 106 parents interested in participating in the research. WhatsApp were sent out to the parents of students with intellectual disabilities studying in schools in the Saudi Arabia. 76 of the participants responded to the questionnaire.

3.3 Data collection

Primary sources were used for data collection in this study. Primary data is defined by Perez-Richet and Skreta (2022) as information primarily collected by the researcher themselves for

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the purpose of a study. As a result, a questionnaire was used to solicit primary data from the participants in the study. Perez-Richet and Skreta (2022) mention several methods for collecting data in social science research, but only the questionnaire method was deemed appropriate for this particular investigation because it allowed the researcher to control for bias while still allowing for some subjectivity. In this study, a survey was conducted to gather the experience of parents of students with intellectual disability regarding Apple apps in education to enhance the learning abilities of special education students.

A survey was sent to 106 respondents. The survey is conducted from both female and male gender to observe their review and recommendations related to Apple apps. For ethical considerations, the survey was distributed to the parents by taking their consent initially, and then the survey was distributed to the parents in Saudi Arabia. The survey was based on questions which are related to the experiences of students with intellectual disability. To know the impact of Apple apps on the learning of students with intellectual disability this survey was conducted.

3.4 Data Analysis

Based on the collected data, SPSS analysis was carried out. The SPSS analysis was based on descriptive, independent sample t-test and an Analysis of variance (ANOVA) for analysing the success rate of Apple apps by considering the experiences of parents of students with intellectual disability. The survey was conducted and sent through WhatsApp with the complete consent of the participants. The participants of the research are the residents in Saudi Arabia

3.5 Ethical Consideration

Human testing is often done ethically. Perez-Richet and Skreta (2022) stated that a survey involving the use of questionnaire, invades a research participant's privacy due to the length of time and the significance of the questions. Thus, the session must maintain high moral standards. Each completed survey form was treated anonymously, and each participant was allowed to participate and react impartially, ensuring member security.

4.0 RESULTS

4.1 Data Extraction

In total, 76 parents in Saudi Arabia participated in the study. Individuals who did not provide their consent to take part in this study had their responses discarded. Furthermore, the results will include analyses of the research questions and report on classification of respondents based on demographic and parental features.

4.2 Characteristics of respondents

Regarding the gender distribution of the respondents, it was noted that 34 (44.7%) were males and 42 (55.3%) were females (Table 1). Based on the responses of the survey, majority of the parents (32.9%) were between the age of “26 to 35 years”. With regards to the Education Level

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it was noted that 39.5% of the parents had graduated from a first degree. From the working experience of the parents, it was noted that majority (42.1%) were employed.

Table 1: Descriptive summary of the parent's characteristics

Factor	Sub-factors	Frequency	Percentage
Gender	Male	34	44.7%
	Female	42	55.3%
Age	18 to 25 years	20	26.3%
	26 to 35 years	25	32.9%
	36 to 45 years	16	21.1%
	46 and Above	15	19.7%
Education level	Graduation	30	39.5%
	Masters	22	28.9%
	PhD	10	13.2%
	Others	14	18.4%
Work Experience	Employed	32	42.1%
	Unemployed	13	17.1%
	Self-employed	16	21.1%
	Others	15	19.7%

As shown in Table 2 below, 53.9% of the parent participants had children that were Females and 46.1% are males. For the age of the children, it was recorded that majority of the parents (39.5%) had children between the age group of "6 to 8 years". When enquiries were made on the use of online apps, 57.9% noted that their children used Apple Apps or other online apps.

Table 2: Descriptive summary of the children's characteristics

Factor	Sub-factors	Frequency	Percentage
Child Gender	Male	35	46.1%
	Female	41	53.9%

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Child Age	6 to 8 years	30	39.5%
	9 to 12 years	19	25.0%
	13 to 16 years	13	17.1%
	17 and Above	13	17.1%
Use of Apple apps or online apps	Yes	44	57.9%
	No	32	42.1%

4.3 Perception of Apple App Impact on Learning

The results of the impact of apple apps can be found in Table 3 below. A total of 8 statements were utilised to investigate this research question. The participants perception for each statement were summarised using a likert scale, with "1" representing strongly disagree and "5" representing strongly agree. Statements that had mean values that were larger than 3.5 were deemed to be acceptable due to the fact that it indicates that the majority of parents agreed with the statement. According to the findings, the vast majority of participants disagreed with each of the eight statements.

Table 3 Summary of the perception on the Usefulness of the Apple Apps

Statements	**MEAN ± SD**	**Comment**	
Apple apps play a vital role for an active learning of students with intellectual disability School.	2.18 ± 1.27	Reject	
Schools should focus on the apple apps that increase the intuitive abilities of disabled Students.		2.22 ± 1.16	Reject
Apple apps are found to be beneficial for students with intellectual disability to improve their learning skills		2.29 ± 1.22	Reject
Apple apps are useful for gaining technical knowledge for students with intellectual disability in School.		2.21 ± 1.27	Reject
According to your experience, Apple apps help to achieve the goal of handling an intellectually disabled student		2.39 ± 1.24	Reject
Has Apple App positively affected the disabled student's life?		2.33 ± 1.18	Reject
Has Apple App negatively affected the disabled student's life?		2.80 ± 1.35	Reject
Do you recommend the Apple apps to intellectually disable students for learning?		2.46 ± 1.39	Reject

The sum total for all of the 8 statements were taken as the overall perceived impact of apple apps on learning outcome improvements for students with disability. An independent sample

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t-test was carried out to ascertain if the perception differed between the students who utilise these apps ad those who do not. Based on the results of the test, t was noted that there is no significant difference ($p > 0.05$) In the responses of children who use apple apps and those that do not.

4.4 What is the usage of Apple apps?

As shown in Figure 1 below, enquires made to ascertain if the participants found Apple apps to be beneficial and based on the results it was noted that 54% of the participants noted the apps to be significantly beneficial and 46% noted that the app was not beneficial to them.

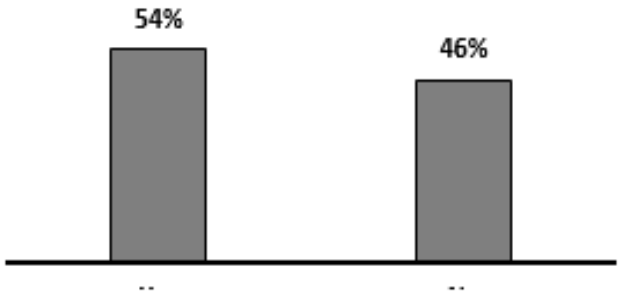

Figure 1: Summary on the Usefulness of Apple Apps

The descriptive summary in Figure 2 below shows that majority of the participants (38%) use all three apps including; Reading App, Notability and Slack. An analysis of Variance

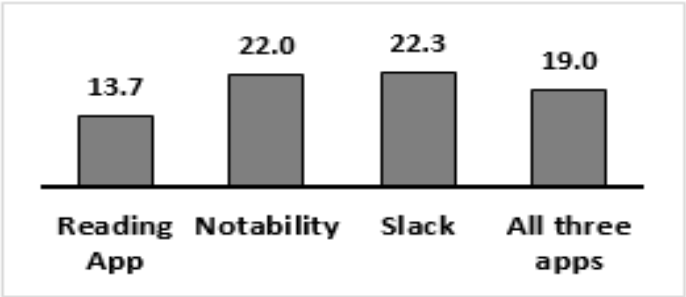

Figure 2: Learning Outcome differences for the different apps.

test (ANOVA) was carried out to ascertain of the impact of Apps used on the learning improvement of students with intellectual disability. Based on the output as shown in Table 4 below, there is a significant effect of Apps on the learning outcome of students with disability ($F = 7.882$, $p < 0.001$).

Table 4: Results for the ANOVA test

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	769.869	3	256.623	7.882	<.001
Within Groups	2181.314	75	32.557		

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A post-hoc test was carried out to ascertain the differences with the 4 groups and based on the results, it was noted that Reading App had a significantly lower overall score when compared to the other three (Figure 3 below) , with regards to the impact on learning outcome for students with intellectual disability.

5.0 DISCUSSION

Through the course of this research, it was discovered that the vast majority of participants utilised Apple Apps. This is in line with the conclusions of the author Al-Jarf (2022), who pointed out that there are currently numerous ways in which technology can be applied in the field of education. In Saudi Arabia, it has been observed that mathematic instruction frequently makes use of iPads, which are used to assist both teachers and students with intellectual disability (Al-Jarf, 2022). Therefore, it is possible to deduce that the primary reason for the substantial population's (54%) adoption of Apple Apps is primarily due to the educational benefits that they provide. According to Sulaimani and Bagadood (2022), some parents do not provide their children with Apple products as the primary form of assistive technology in their homes. It was stated that the reason for this is because many parents are still unaware of the advantages that come with the use of these technology. The fact that the majority of the parents who participated in our present survey were using these applications demonstrates that there is a high level of understanding of the benefits of assistive technologies for enhancing learning for students with intellectual disability in Saudi Arabia.

According to the findings of the research, it was found that the vast majority of participants did not agree with the notion that using Apple Apps can significantly help intellectually disabled children improve their academic performance. This finding was based on the fact that the participants took part in the survey. According to Montazami et al (2022), the majority of the main educational apple Apps that are used in schools are primarily focused on serving the educational demands of the children rather than on improving the intellectual capacities of the students. It is fair to say that while children gain a great deal from taking part in educational activities, pupils see only a little boost in their level of academic achievement as a result of their participation. According to Doulou et al (2022), mobile learning on its own is not sufficient to make a significant improvement in the intellectual capacity of children who are diagnosed with intellectual disability. The authors Du et al (2022) pointed out that there are three primary reasons why Apps do not have a significant impact on a person's capacity to learn. First and foremost, there is the problem of adapting mobile applications (or Apps) to the particular requirements of disabled children in schools. Following that, there is the possibility that certain educational Apps do not offer the appropriate amount of content or level of difficulty to successfully enhance the intellectual performance of students who have disabilities. In conclusion, there is the possibility that problems with technology may greatly impede the learning of students (Du et al., 2022).

Professionals in the field of special education in Saudi Arabia are increasingly relying on the use of mobile applications to aid their work with pupils who have intellectual disabilities. Researchers have also pointed to the importance of mobile learning for students with intellectual disability. Disabled workers and students alike can benefit greatly from the time savings provided by these programs. Use of these tools has the potential to boost educational opportunities for Saudi kids with special needs (Allafi. 2021). In Saudi Arabia, children in

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special education benefit from the usage of a variety of fiction Apps that help them concentrate on the written word. Students in Saudi Arabia who are physically or mentally impaired have access to a variety of fictional Apps available in the Apple App store. Students with disabilities can benefit from the applications since they provide a variety of exams and comments explaining the story's characters, plot, point of view, style, symbolism, narrative tone, and structure (Al-Jarf, 2022).

Based on the results of this research, it was discovered that there are three important applications that are frequently used by children who have intellectual disabilities. These Apps are the Reading App, Notability, and Slack. Reading Apps are software's that provide a convenient and portable way for people to access and enjoy reading materials. They often offer features such as adjustable text size, bookmarking, and night-time reading mode to enhance the reading experience. Reading Apps allow people to access and enjoy reading materials more easily. Notability applications are pieces of software that can be used for a broad variety of purposes, including taking notes in class or during a conference, organising research and data, annotating and sharing key documents, and more. Students are able to stay connected, productive, and informed with the help of the Slack Apps, which are softwares that allow for full collaboration and communication (Fichten et al., 2022). The findings of this recent study indicate that a significantly high proportion of children with intellectual disability use each of these three applications, with the Reading App having the highest individual use overall.

Reading Apps were shown to have the smallest impact on learning development for children with intellectual disability, according to the findings of a study that compared the effects of a variety of educational Apps on the educational progress of these children. This has a very strong correlation with the findings of the authors Mokmin and Rassy (2022), who discovered that contemporary Reading applications are quite effective. However, it is possible that students with intellectual disabilities who do not receive sufficient help on how to use these Apps may struggle, which would result in a sluggish growth of the kids' ability to learn. In addition to this, it was observed that the user interfaces of certain Reading applications are not optimal for kids who have intellectual disabilities (Mokmin and Rassy, 2022). Therefore, it is possible to say that the reason for the significantly low rating for Reading Apps is due to the fact that the majority of the softwares are not aimed to exclusively cater for the unique needs of students who have intellectual disability. This is because the majority of the softwares are not designed to help students who have intellectual disability learn to read. According to the findings, both the Notability and Slack applications had a significant impact on improving children's intellectual disability-related learning abilities, and these two Apps did not significantly differ from one another in terms of their relative levels of effectiveness. These Apps, according to Fichten et al. (2022), are particularly helpful for boosting the engagement of students with disabilities and helping them stay connected with the lessons. They also help students with disabilities keep connected with their peers.

6.0 CONCLUSION AND RECOMMENDATIONS

The research is conducted to analyse the experiences of the families in Saudi Arabia regarding the use of Apple Applications for the learning and practices of the children with intellectual disability. In order to collect the responses of the families in the Saudi Arabia, a survey was conducted, and 76 participants responded to it via Whatsapp. Through the collected responses,

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the data was analyzed through the SPSS for quantitative analysis. The quantitative analysis was done with the ANOVA analysis. In Saudi Arabia it was found that, mobile applications are used for improving the teaching methods for the students with intellectual disability. Based on the findings from this study, it was noted that apple Apps does not have any significant impact on learning improvement for children with intellectual disability. The main issues with were the lack of knowledge for the parents on the impact of these technologies for their children growth, adaptability of the Apps, limited content on these Apps and high changes of technological malfunctioning.

This research found that children with intellectual disability use three major Apps. Reading Apps, Notability, and Slack. Reading applications make reading convenient and portable. To improve reading, they include customizable text size, bookmarking, and night-time reading mode. Reading applications simplify reading. Notability Apps may organise research and data, annotate and share important documents, and more. Slack Apps, which enable collaboration and communication, help students stay connected, productive, and informed. Based on the finds from this study, Reading Apps have the least impact on learning improvement for students with intellectual disabilities. The reason for this was largely due to these Apps not unique optimised for use for students with disabilities. Most Reading Apps have interface that are aimed for the usability of the general populace.

The main recommendation that can be derived from this study is that the use of Apple Apps for learning students with intellectual disability requires awareness campaigns not only for their professionals but also for their parents. Adopting this methodology can help to improve the gaps between the usages of those Apple Apps by the students with intellectual disability. Another recommendation is for tech companies such as Apple to develop special Apps for students with disabilities and organise training programs for professionals of the students with intellectual disability and also make their parent's part of this activity.

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