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ASSESSMENT OF THE RELATIONSHIP AMONG UNDERGRADUATE STUDENTS' ATTITUDES, COMPETENCIES IN DIGITAL SKILLS AND ACADEMIC ACHIEVEMENT AT THE FEDERAL UNIVERSITY OYE-EKITI, NIGERIA

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ABSTRACT

This study assessed the levels of digital skills, attitudes, and competencies, and their relationship with undergraduates' academic achievement at the Federal University Oye-Ekiti, Nigeria. The descriptive survey, and correlational research design were used in this study, with a population comprising the entire students of the university. The purposive and random sampling techniques were used to select the students from the faculty of education. In all, 189 students constituted the sample of the study. Data was collected with the use of a questionnaire tagged: "Students Digital Skills and Competence Questionnaire". The reliability of the three sections of the instrument were 0.68, 0.56, and 0.78 respectively. The data was analyzed using descriptive statistics (frequency counts and percentages, mean and standard deviation), and correlational analysis. Results revealed that undergraduates in the university possessed low digital skills and competencies, but a positive attitude towards digital skills; a positive and significant relationship was found among

undergraduates' attitudes toward digital literacy, competence, and academic achievement. The study recommends that universities should provide an enabling environment that promotes the development and application of digital skills among students; a special and compulsory course on digital education be enshrined into the university curriculum.

Keywords: Digital skills**;** Attitudes; Digital Competencies; University.

Introduction

Modern societies are reliant on information and communications technologies (ICT) to support economic development by fostering the development of new goods and services, improving education systems, connecting communities, teachers, and students, and providing access to knowledge and skills that support advancements in agriculture, health, and education. Teachers and students can create multimedia presentations, gather and analyse data, and learn more deeply with the help of ICT (UNESCO, 2016). According to Bimbe et al. (2015), new methods of producing, locating, and disseminating knowledge will accelerate rapidly in the future, posing both opportunities and challenges for global development agendas and initiatives.

The widespread use of digital technology in daily life is radically altering how students acquire and apply knowledge. People must be able to digest complex information, reason methodically, and weigh various types of evidence when making decisions. At their varied educational levels, they must also constantly update their skills to keep up with the rapid changes in technology. More importantly, people need to acquire the necessary skills to make meaningful use of digital technologies to take advantage of the new opportunities they are creating in many fields, particularly in education. According to Jorgensen (2019), digital tools are machines that are used to reduce official tasks. For undergraduate students to use these tools, they must learn how to use digital skills to survive in the twenty-first century. With more people than ever using digital devices and services for work and other aspects of their lives, the world has undergone a digital revolution.

Over the past ten years, a wide range of technologies have become increasingly prevalent. These include but are not limited to, artificial intelligence, big data, blockchain, cloud computing, the internet of things, machine learning, mobile applications, nanotechnology, and 3D printing. The capacity of students to process information is crucial. In essence, digitally literate students are capable of analysing and assessing the data they gather online. A person with this literacy is better equipped to actively consume information. The ability to locate, assess, and produce understandable written and other media on a variety of digital platforms is referred to as digital literacy (Fahrurrozi et al., 2019). Individual grammar, composition, typing, and the capacity to use technology to create texts, graphics, sounds, and designs are all taken into consideration when evaluating it. Digital literacy was first centred on digital skills, but as a result of computer use, the internet's introduction, and social media use, the focus has shifted to mobile devices (Chib et al., 2019; McDougall et al., 2018).

Conversely, digital skills are the abilities required to "use digital devices, communication applications, and networks to access and manage information," encompassing everything from standard emailing and web searching to specialised programming and development. Fundamentally, these abilities support problem-solving, digital content creation and sharing, and communication and teamwork. It could manifest as any of the entry-level digital skills, such as word processing, emails and chats, social media, web-based research and communications, computer literacy, data entry, and secure information processing. Programming, web, and app development, data science, user experience design, digital product management, digital marketing, digital design, and data visualisation are examples of advanced digital skills. A range of abilities to access and manage information through digital devices, communication apps, and networks is also referred to as digital skills. To achieve effective and creative self-fulfillment in life, learning, work, and social activities at large, they allow people to create and share digital content, communicate and collaborate, and solve problems (Kehinde & Olatunde, 2022; UNESCO, 2018).

Higher-level competencies that enable people to use digital technologies in empowering and transformative ways, like ICT careers, fall into the advanced spectrum of digital skills (UNESCO, 2018; van Laar et al., 2020). Significant digital shifts like artificial intelligence (AI), machine learning, and big data analytics alter the skills needed, which affects the developing capacity and skills for the digital economy of the twenty-first century (McCarthy et al., 2023). Digital skills need to work in tandem with other abilities like strong reading and numeracy skills, critical and creative thinking, complex problem solving, collaboration abilities, and socio-emotional skills to flourish in the connected economy and society (Kolade & Owoseni, 2022; UNESCO, 2018). One useful teaching strategy to improve students' learning outcomes is digital learning. It places a strong emphasis on providing students with a top-notch learning environment and gives them access to difficult material, formative assessment feedback, and opportunities for independent study at their own pace (Ong & Quek, 2023).

People's attitudes influence their decisions and behaviours, as well as how they react to various circumstances. It summarises a person's worldview, dispositions, inclinations, and perceptions. Tella and Bashorun (2012) identify attitude as a psychological state that exists within and shapes behaviour. It is not innate; rather, it relies on an individual's background and how that influences a novel circumstance. According to Gajalakshmi (2013), attitudes are made up of three main parts: affective (how we feel), cognitive (how we think), and behavioural (how we act) towards a specific object. Furthermore, attitudes are defined by Adekunle, Ogie, and Tella (2007) as propensities and sentiments, biases or prejudices, ideas, fears, and convictions regarding any particular subject.

The way that students feel about digital skills has the potential to greatly impact their general competencies. Studies (Liaw & Huang, 2011; Rhema & Miliszewska, 2014) have demonstrated that attitudes towards ICT can be significantly predicted by a student's proficiency with technology. The students' perceived and

actual ICT and digital skills may be impacted by this mindset. It is believed that having stronger digital skills will benefit students' attitudes and motivations both inside and outside of the classroom. Better digital skills are linked to a more positive attitude towards technology, according to research studies (Abdullah, Ziden, Aman, & Mustafa, 2015; Nassoura, 2012). Additionally, students who possess a computer and have a positive attitude toward using ICT are more likely to have strong digital skills (Motshegwe & Batane, 2015; Klomsri & Tedre, 2016).

Digital competence has emerged as a central idea in conversations about the knowledge and skills that students require in the modern knowledge society. Developing employable graduates requires graduates to extend and enhance their digital competence (Gallardo-Echenique et al., 2015). Students without adequate ICT skills would be at a disadvantage in the labour market, with less access to information even after graduation, as 90% of new jobs in this day and age require excellent digital skills (European Commission, 2013). According to Ferrari (2012), digital competency is the set of knowledge, skills, and attitudes—which also include abilities, strategies, values, and awareness—necessary for using information and communication technology (ICT) and digital media to carry out tasks, solve problems, communicate, manage information, collaborate, create and share content, and build knowledge for work, leisure, participation, learning, socialising, consuming, and empowerment.

Larraz (2013), referenced in Gallardo-Echenique et al. (2015), defined digital competence as the ability to mobilise various "literacies" to manage information, communicate knowledge, and resolve problems in a changing society. According to the author, to be considered digitally competent, one must possess four different types of literacy: information literacy, which is necessary for managing digital information; computer literacy, which is necessary for handling data in various formats; media literacy, which is necessary for creating and analysing multimedia messages; and communication literacy, which is necessary for using a digital identity in a safe, moral, and responsible manner. According to Ruiz (2016), for tertiary students to fulfill the demands of the modern technological era, they must possess digital competency.

Marzal and Cruz (2018) reiterate the necessity of providing individuals with digital competency training to enhance their employability, political clout, and economic outlook. According to Durán, Gutiérrez, and Prendes (2016) and Ocaña, Valenzuela, and Garro (2019), digital competencies must be viewed from a comprehensive viewpoint that includes technological knowledge and abilities that must be developed initially at the higher education level and are further supported by a highly complex network of technological and functional literacies. According to Sicilia et al. (2018), digital competencies are crucial facilitators who must perform a variety of tasks requiring the creation and application of digital tools to the demands of the environment in which they are needed and the type of outcome that is anticipated.

One of the most important factors in determining how well students have mastered and applied the knowledge, experiences, and skills they have acquired throughout their

academic journey is their academic achievement. The academic programme of the faculty of education at Federal University Oye-Ekiti, Nigeria, used the students' scores from one of the digital (or electronic technology) courses to measure the academic achievement of the participants in this study. 'Educational Technology (EDU 313)' is the course code. Research by Vigdor et al. (2014), Walkington (2013), Jackson and Makarin (2018), and others have demonstrated the beneficial effects of digital skills on students' learning outcomes. However, Vigdor et al. (2014) found that computer technology hurt students' test scores. This current study is required by these contradictory findings.

Research has been done on students' attitudes toward information technology and how those attitudes relate to their academic performance by Abdullah et al. (2015) and Dalshad et al. (2015). The results indicate that these students have a positive attitude towards ICT, which has a positive impact on their academic performance. Nguyen and Habók (2022) looked into how Vietnamese university students felt about digital literacy. The results show that their attitudes towards digital literacy were favourable. The digital literacy skills of undergraduate students at Bayero University Kano, Nigeria, were evaluated by Abdullahi (2020). The results show that the respondents' levels of digital literacy were low.

In a cross-sectional study, Haghi (2018) examined the degree of digital literacy among Shahid Beheshti University of Medical Sciences students studying Allied Medical Sciences. The results show that the sampled students had low levels of digital skills and that there was a positive correlation between students' academic success and their digital skills. The study conducted in 2020 by Martzoukou, Fulton, Kostagiolas, and Lavranos focused on how higher education students perceived their digital competencies for learning and using the internet in daily life. The findings showed that students' assessments of their digital competencies were extremely low and deficient. Pre-service teachers' digital competency was assessed by Guillen-Gamez et al. (2020) based on their use, attitude, and knowledge. The pre-service education teacher's level of digital competency is medium, according to the results.

The extent to which Benue State University students had acquired digital skills was the subject of a study conducted in 2021 by Ile and Abi. The findings indicated that OTM students in Benue State's higher education institutions had acquired these digital skills to a moderate degree. Okeji, Tralagba, and Obi (2020) looked into the level of digital literacy among librarians employed by Nigerian university libraries. According to the study, the respondents, who were librarians, assessed their level of digital literacy as high, moderate, or low. The study also showed that although the respondents' ratings of their competence were moderate, they lacked adequate knowledge of these abilities. The study concludes that the sample had a moderate level of digital skills. Coşkunserçe and Aydoğdu (2022) used a survey research design to look into the digital skills of undergraduate students at a university. The sampled students' levels of digital proficiency varied, according to the findings. Students who had previously received this type of training or instruction from teachers who possessed it demonstrated

higher levels of proficiency in digital skills. İzmir Democracy University undergraduates' digital literacy was studied by Yoleri and Anadolu (2022). The results showed that the sampled students' digital skills were moderate.

The study conducted by Lei, Xiong, MingChiu, and Cai (2021) examined the connection between students' academic success and ICT literacy. The findings demonstrated that students frequently achieved significantly better academically when they were more ICT literate. The impact of students' technology use on their learning outcomes in University of Dammam physiology courses was the subject of Al-Hariri's (2017) study. The study found a strong correlation between students' success in health colleges and how they use technology. Dalshad et al. (2015) looked at the connection between academic success and students' attitudes towards information technology. The findings showed a strong relationship between students' opinions about IT and their academic success. The study by Pagani et al. (2016) looked at how digital literacy affected academic results. Overall, the results show that having proficiency with the Internet improves academic performance. The impact of digital literacy on students' academic performance was investigated by Abbas et al. (2019). The findings showed that students' academic performance was not significantly impacted by digital literacy or skills.

In the academic setting and the wake of the COVID-19 pandemic, it is still critical to develop students' digital skills and evaluate their attitudes and competencies in these areas. Therefore, at the Federal University of Oye-Ekiti in Nigeria, this study seeks to evaluate undergraduates' levels of digital skills, attitudes, and competencies as well as their relationship to their academic achievement.

Statement of the Problem

The proliferation of digital devices and technology in recent times is astonishing. This may have led to its adoption in almost all spheres of human endeavour, including education. With the advent of these digital devices, the teaching-learning processes may have been transformed for the better, while the unemployment rate, especially for the youth declining (Kehinde & Olatunde, 2022). However, in tertiary institutions in Nigeria, students' academic performance may have been affected due to the lack of digital skills, poor competence, or unhealthy use of digital devices. Education stakeholders seem to be worried about the role of these digital devices on students' academic achievement. Do undergraduate students who own and use digital devices necessarily have the digital skills, attitudes, or competencies for improved academic achievement? Hence, this study assessed the levels of digital skills, attitudes, and competencies, and their relationship with undergraduates' academic achievement in the Federal University Oye-Ekiti, Nigeria.

Research Questions

1. What are the prevailing digital skills among undergraduates in the university?
2. What are undergraduates' attitudes toward digital skills in the university?
3. What is the level of digital competence among undergraduates in the university?

4. What is the relationship among undergraduates' attitudes toward digital skills, digital competence, and academic achievement in the university?

Research Method

Research Design: The descriptive survey, and the correlational research design were used for this research. The design was appropriate as the researchers did not manipulate the variables under study.

Population, Sample, and Sampling Technique: The population of this study consisted of the entire students of the federal university Oye-Ekiti, Nigeria. The purposive sampling technique was used to select the faculty of education of the university, since the target of the study was only students from the faculty, and the random sampling technique was used to select students from the various departments of the faculty. In all, 189 students constituted the sample of the study.

Research Instruments: The research instrument employed by the researchers for data collection for this study is a self-developed questionnaire. The instrument was tagged "Students Digital Skills and Competence Questionnaire" (SDSCQ). The instrument had three sections (A, B, and C). Section A measured students' bio-data, such as gender, departments, academic level, the kind of digital device they possess, and the level of their knowledge in using these devices. Section B contained 14 items measuring students' digital skills, which were placed on a dichotomous scale of Yes=1 and No=2. Section C contained 12 items that measured students' attitudes toward digital skills, and this was placed on a 4-Likert scale of Strongly Agree=3, Agree =2, Disagree=1, and Strongly Disagree=0. Section D contained 13 items measuring students' digital competence, and were placed on a 4-Likert scale of Very poor=0, Poor=1, Good=2, and Very good=3. Undergraduates' Academic Achievement was measured by their scores in an educational technology course in the faculty (EDU 313), which was harvested from the overall score sheet of the course upon consent and approval of the examination officer. The respondents' matriculation numbers were matched with those earlier filled out in the questionnaires.

Validity and Reliability of the Instruments: The researchers presented the instrument to experts in educational evaluation (tests and measurement in education) for critical examination and necessary suggestions/recommendations; corrections arising from their suggestions were executed before the pilot survey of the instrument. The reliability of the instrument was determined by the Cronbach Alpha Method, yielding α values of 0.683, 0.560, and 0.782 respectively, for the three sub-sections, denoting that the instrument was internally consistent.

Method of Data Collection: The questionnaires were administered to the respondents by the researchers. The exercise lasted for three weeks. The researchers retrieved the questionnaires for sorting, coding, and analysis. There was a 97% instrument return rate.

Data Analysis: Data to be collected from the respondents was analyzed using descriptive

statistics (mean and standard deviation) and correlation analysis, at a 5% significance level.

Presentation of Results

Table 1 shows the demographics of respondents regarding gender, Department, and the digital devices owned. Respondents who are male are 89 (47.1%), and female respondents are 100 (52.9%). More so, 35 (22.1%) are in the Department of Adult Education, 112 (86.1%) are in EMBS, 18 (9.5%) are in Educational Foundations, 10 (5.3%) are in Library and Information Science, and 10 (5.3%) are in Guidance and Counselling. Similarly, 11 (9.8%) owned a Desktop
computer, 16 (8.5%) owned a Laptop, and 119 (68.2%) owned a Smartphone.

Table 1: Demographic Information of Respondents

Variable	Frequency	Percent
Gender		
Male	89	47.1
Female	100	52.9
Department	35	22.1
Adult Education	112	86.1
EMBS	18	9.5
EDF	10	5.3
LIS	10	5.3
G & C		
Digital Devices Owned by Students		
Desktop Computer	11	9.8
Laptop Computer	16	8.5
Smartphone Device	119	68.2

Research Question 1: What are the prevailing digital skills among undergraduates in the university??

Table 2 indicates the prevailing digital skills among undergraduates in the university. As revealed, the pooled mean of the respondents regarding their digital skills is high, since it is greater (M=1.29) than the criterion mean (M=1.50). Thus, it is implied that undergraduates in the university have a high level of digital skills.

Table 2: Prevailing digital skills among undergraduates in the university

S/N	Items	Mean	Std. Deviation
1	Typing of text	1.26	.489
2	Cut, copy, paste, and edit the document	1.40	.492
3	Save documents in storage devices	1.29	.454
4	Retrieve files from the storage devices	1.35	.479
5	Create and edit tables and shapes	1.16	.372
6	Cut, copy, and paste icons	1.38	.487
7	Insert borders and shade in the document	1.27	.445
8	Use the correct fingers on the keyboard	1.37	.484
9	Adjust margins	1.19	.393
10	Suitably align text in a document	1.24	.426
11	Change font type, style, and size	1.22	.414
12	Insert page numbers and symbols in a document	1.26	.442
13	Print document	1.32	.481
14	Preview a document before printing	1.29	.466
	Pooled Mean	**1.29**	

***Criterion Mean=1.50**

Research Question 2: What are undergraduates' attitudes toward digital skills in the university?

Table 3 shows the attitudes of the undergraduates toward digital skills. As indicated, students have positive attitudes toward the acquisition of digital skills. This is so since the pooled mean (M=1.68) is greater than the criterion mean (M=1.50). Thus, this implies that the sampled undergraduates possess a positive attitude towards digital skills.

Table 3: Undergraduates' Attitude toward Digital Skills

S/N	Statements	Mean	Std. Deviation
1	Digital skills agree with my learning style	1.67	.939
2	Digital skills can improve my learning outcomes	1.53	.585
3	I am more productive by using digital skills	1.60	.626
4	I can easily solve my academic problems by using digital skills	1.76	.534
5	Digital Learning is helpful for students	1.49	.576
6	I feel more comfortable when learning using mobile devices	1.68	.504
7	The use of digital skills makes learning sessions easier	1.57	.530

8	Digital skill encourages mobile learning	1.83	.486
9	Digital skills enhance students' understanding of concepts taught	1.70	.647
10	I prefer learning through digital skills to the usual classroom interaction	2.05	.643
11	I would love to have more training in digital skills	1.52	.633
12	Money spent on acquiring digital devices is not a waste.	1.79	.676
	Pooled Mean	**1.68**	

***Criterion Mean=1.50**

Research Question 3: What is the level of digital competence among undergraduates in the university?

Table 4 denotes the level of digital competence among students in the Federal University Oye-Ekiti. As shown in the table, students digital competence level among students is low, since the value of the pooled mean (M=1.69) is less than that of the criterion mean (M=2.50), implying that the level of digital competencies among these undergraduates is low.

Table 4: Level of Digital Competence among Undergraduates

S/N	Items	Mean	Std. Deviation
1	Word processor (e.g. Word, Pages, Google Docs)	1.67	.939
2	Spreadsheet (e.g. Excel, Numbers, Google Spreadsheet)	1.53	.585
3	Presentation tools (e.g. PowerPoint, Keynote, Google Presentation)	1.60	.626
4	Image processing	1.76	.534
5	Video editing	1.49	.576
6	Digital collaborative writing tools Systems for cloud storing of files	1.68	.504
7	Social media	1.57	.530
8	Email	1.83	.486
9	Online discussion groups	1.70	.647
10	Learning management systems (e.g. Canvas, It's Learning, Moodle)	2.05	.643
11	Tools for creating content Tools for interactive whiteboards (e.g. Smart Board, Promethean)	1.52	.633
12	Tools for creating graphical representations	1.79	.676
13	Educational games	1.73	.69
	Pooled Mean	**1.69**	

***Criterion Mean=2.50**

Research Question 4: What is the relationship among undergraduates' attitudes towards digital skills, digital competence, and academic achievement in the university?

Table 5: Relationship among undergraduates' attitudes toward digital skills, digital competence, and academic achievement (N =189)

Correlations		Attitudes towards Digital Skills	Digital Competence	Academic Achievement
Attitudes towards Digital Skills	Pearson Correlation	1	0.68**	0.71**
	Sig. (2-tailed)		0.05	0.05
Digital Competence	Pearson Correlation	0.68**	1	0.76**
	Sig. (2-tailed)	0.05		0.05
Academic Achievement	Pearson Correlation	0.71**	0.76**	1
	Sig. (2-tailed)	0.05	0.05	

**. Correlation is significant at the 0.05 level (2-tailed).

Table 5 indicates the relationship among undergraduates' attitudes toward digital skills, digital competence, and academic achievement. As revealed, there exists a positive and significant relationship among undergraduates' attitudes towards digital skills, digital competence, and academic achievement ($r = 0.68, 0.71, 0.76$; $p<0.05$). This infers that an increase in undergraduates' attitudes toward digital skills, results in higher digital competence, and this also results in their better academic achievements.

Discussion

This study assessed the levels of digital skills, attitudes, and competencies, and their relationship with undergraduates' academic achievement at the Federal University Oye-Ekiti, Nigeria. Given the import of technology, digital literacy, and competence, undergraduates' learning outcomes would be fostered and reassured by the possession of these skills and competencies. More so, given that these undergraduates would one day transit to the worlds of work, their having these digital skills and competencies cannot be overruled.

The findings of this study reveal that undergraduates in the sampled university have low digital skills. This is unexpected, as these undergraduates barely started adopting the online learning mode under their academic concerns, which had been necessitated by the advent of the COVID-19 pandemic. This finding supports that of Haghi (2018) who revealed a low level of digital skills among the study's sample and partially agrees with the findings of Coşkunserçe and Aydoğdu (2022) who found varying levels of digital skills among the sampled students. Yet, the finding contrasts those of Yoleri and Anadolu (2022) and Okeji, Tralagba, and Obi (2020) whose studies revealed that the level of digital skills among students was moderate and high respectively.

The findings of this study have also revealed a positive attitude of the sampled undergraduates towards digital literacy. We think that this positive attitude among these students may have been necessitated by the recent introduction of the online learning mode in the university. As such, students have to acclimatize themselves to the very demands of the online teaching-learning

processes. This is in tandem with the findings by Dalshad et al. (2015), Abdullah et al. (2015), and Nguyen and Habók (2022) whose results indicated a positive attitude of students toward digital skills. The findings of this study have also shown a low level of digital competencies among the sampled students. We think that since these students are just getting to acclimatize themselves with digital skills and their applications into their academic tasks. Their competencies in the use of various digital devices and tools may be below standard. It is expected that with time, these students would adjust to the requirements of online learning demands, by beefing up their competencies in it. This agrees with the findings of Guillen-Gamez et al. (2020) and Martzoukou et al. (2020) which showed a low digital competence level among their sample. Still, the finding negates that of Okeji, Tralagba, and Obi (2020) who indicated a moderate level of digital competence in their sample.

Lastly, the findings showed a positive and significant relationship among undergraduates' attitudes toward digital skills, digital competence, and academic achievement. Students' possession of digital skills does boost their digital competence, which when properly channeled into their academic endeavour, results in improved academic outcomes. This finding is consistent with those of Abbas et al. (2019), Al-Hariri (2017), Haghi (2018), Walkington (2013), Jackson and Makarin (2018), Dalshad et al. (2015), Pagani et al. (2016), Lei et al. (2021) showed the positive effect of digital skills on students' learning outcomes. It however negates the findings of Vigdor et al. (2014) which found that computer technology harms students' test scores.

Conclusion and Recommendations

This study has assessed the levels of digital skills, attitudes, and competencies, and their relationship with undergraduates' academic achievement at the Federal University Oye-Ekiti, Nigeria. The study found that undergraduates, despite having low digital skills and competency levels, possess a positive attitude toward digital skills. A positive and significant relationship exists among digital skills, attitudes, and competencies, and their relationship with undergraduates' academic achievement. Based on the findings and discussions of the study, undergraduates' possession of digital skills and their competence in it would enhance their academic accomplishments. It is recommended that technology-oriented training programmes, as well as enlightenment, be provided for undergraduates by governments or university management. Universities should provide an enabling environment that promotes the development and application of digital skills among students; a special and compulsory course on digital education should be enshrined into the university curriculum, to enhance undergraduates' digital competencies and attitudes.

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