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Original article

Sleeping Habits and Academic Performance of Library and Information Science Undergraduates in Nigeria

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Abstract

Introduction: The workload of studying library and information science (LIS) at undergraduates in Nigeria often accompanies challenging sleeping habits. Hence, this study examined the influence of sleeping habits on the academic performance of LIS undergraduates in Nigeria.

Methods: The study adopts a mixed-methods strategy, using concurrent triangulation. Data were collected using a Web-based questionnaire and semi-structured interviews. Interview sessions were carried out with twelve participants using the Zoom application, and a total of 291 LIS undergraduates completed the questionnaire. Descriptive statistics and one-way ANOVA were used to analyze the research questions and test hypotheses, respectively. Thematic analysis was used to analyze the transcribed interview report.

Results: It was revealed that most LIS undergraduates (85.6%) had good sleep quality during the examination period compared to no examination (14.1%). It was shown that there is a statistically significant effect of levels of study on students' sleep duration (p-value = 0.02) and a statistically significant effect of types of institution on sleep quality (p-value = 0.03). The thematic analysis found that sleep duration positively influences academic performance while sleep quality negatively influences academic performance.

Conclusion: It was established that LIS undergraduates have adequate sleep duration and sleep only when there is no examination. This implies that their sleep quality and duration are inadequate during the examination period, indicating that they do not have a healthy sleep habit. Moreover, it was established that sleep duration and sleep quality affect the academic performance of LIS undergraduates.

Introduction

Sleep is an essential consolidation of memory, which influences students' academic performance. Inadequate sleep of students portends a danger of experiencing failure at school (1). Depriving oneself of proper sleep may engender disorder behavior like lack of concentration, irritable and unpleasant behavior, and could often come with avoidable mistakes owing to drowsiness (2). Other consequences of inadequate sleep are social strain, emotional instability, and health problems, impacting students in depressing ways (3). Adequate sleep is beneficial for improved mental alertness to enhance effective reorganization/representation, with an ultimate significant effect on students' academic performance (4). Sleep quality and sleep duration are the common constructs for examining sleeping habits, and the same will be adopted for this study. In a nutshell, adequate sleep has many benefits, and it is helpful in students' academic travail. However, its influence on the academic performance of LIS undergraduates is unknown and unexplored.

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Sleep duration is vital in students' memory consolidation and knowledge acquisition (5). Short sleep duration, including sleeping less than nine hours for students aged 6-12 years and less than eight hours for students aged 13-18 years (6). Sleep quality is perceived as one of the crucial mechanisms determining individuals' or students' wellbeing in higher institutions. The measurement of the sleep quality can be achieved either subjectively and/or objectively, which means quantitative and qualitative dimensions (7,8). It was stated that the quantitative approach is the duration of sleep while the qualitative approach is the depth and the feeling of restfulness upon awakening. Since the sleep duration has been addressed in this study, the sleep quality is thus seen from the perspective of feeling of restfulness and subjective of depth upon awakening. Meanwhile, factors associated with students' sleeping habits include:

- gender, academic success, academic background, general health, socio-economic background, and stress level (9);
- poverty level, scarce accommodation facilities (10);
- alcohol intake and other health-risk behaviors and failure in previous year's exam (11,12);
- gender, internet addiction, poor social support, higher neuroticism, caffeine intake, skipping breakfast (13-16).

Academic performance is the degree to which a learner, teacher, or institution has achieved his/her short or longterm educational goals (17). Meanwhile, students' academic performance can be assessed using students' ability to excel in their theoretical and practical examinations. An examination is often used as the standard of judging the intellectual capabilities of students. It was shown that the factors of academic performance of undergraduates include students' academic background, studying hours, and students' behavior on taking the alcoholic drugs (18); student income and IQ score (19); and counseling about professional choice, support of department's instructors, and communication with an instructor (20). However, little attention has been paid to how LIS students' sleeping habits have been influenced students' academic performance.

It was found that night sleep duration during academic sessions is more than six hours among students in Taiwan and the US (14,21). Mah et al. found that more than half of students in Stanford University in the US sleep for seven hours or more, and they had poor sleep quality during academic sessions (22). A longitudinal study revealed that more than three-quarters of the adolescents were sleeping lesser than the recommended nine hours (23). A study in Jordan showed a prevalent of sleep depravity among students (15). A Nigerian study found that more than half of the students were sleep deprived (24). Abdulghani et al. (25) and Wheaton et al. (21) showed gender differences in sleep duration with inadequate sleep duration common with female students than male students. A study in South Florida revealed a high percentage of poor sleep quality among undergraduate students (26). Yilmaz et al. found that Nursing students in Uludag University, Turkey had poor sleep quality (27).

Similarly, it was found that poor sleep quality is prevalent among undergraduate medical students in Ethiopia (13). It was found that more than half of undergraduates in campuses of Chitwan and Kathmandu in Nepal had poor sleep quality (11). However, it was found that more than half of undergraduates in Southern Thailand had good sleep quality (15).

It was revealed that students were in the habit of using caffeine and other stimulants to influence sleep habits (28,29). Studies (6,23,30,31) also show that most students with adequate sleep duration a night before an examination had a better academic performance. Conversely, it was shown that shorter sleep and later bedtimes are associated with high academic performance (25,32,33). It was found that academic performance correlated positively with sleep duration (24,29). Nevertheless, it was shown that sleep duration did not significantly affect undergraduate students' academic performance (8). A study in Jordan revealed significant differences in sleep duration and students' academic performance (7). Also, studies found that sleep quality had a significant association with students' academic performance (9,26,33). A study in Nigeria revealed that sleep quality did not significantly affect student academic performance (29). However, Alqarni et al. found no significant correlation between sleep quality and academic performance (34).

Studies have shown a significant relationship between academic performance and students' sleeping habits (4,9,24,28,29,35). However, these studies were carried out using the quantitative approach, which forecloses in-depth and detailed evidence of the relationships between the two variables. Hence, the present study seeks to extend these studies by adopting a mixed-methods approach to provide detailed relationships between sleeping habits and students' academic performance. Additionally, LIS students are the focus due to the observed overwhelming modules/courses with relatively short examination periods. With all these, different studies have been examined on sleeping habits and students' academic performance, yet there is no evidence of LIS undergraduates' sleeping habits and influence on academic performance. It is based on the foregoing that this study seeks to answer the following questions:

i. What is LIS undergraduate students' sleep duration in Nigeria?

ii. What is the perceived sleep quality of LIS undergraduates?

iii. What are the factors associated with sleeping habits?

iv. What is the academic performance of LIS undergraduates in Nigeria?

v. What is the influence of sleep duration on academic performance?

vi. What is the influence of sleep quality on academic performance?

Moreover, the study seeks to test hypotheses that were tested at a 0.05 level of significance:

H01: There is no statistically significant effect of students' level of study on sleep duration

H02: There is no statistically significant effect of types of institution on sleep quality

Methods

This cross-sectional study adopts the mixed methods research approach. Understanding that all past studies in this study area adopted a quantitative research method, adopting mixed methods will elicit comprehensive and in-depth information on the relationship between sleeping habits and academic performance (36). The study adopts concurrent triangulation, allowing the researchers to collect quantitative and qualitative data (37) simultaneously. Instruments used to collect data were semi-structured interview (qualitative) and web-based questionnaire (quantitative). For the interview,

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the consent of eighteen (18) purposively selected LIS undergraduates' was sought to participate in the study, but only twelve (12) participated. The interview sessions were carried out using Zoom application software; a link to the meeting was shared with the participants via e-mail only an hour before the interview. Sample of the interview questions include "What is your sleep duration during the examination?" and "How well do you sleep during the examination?". Member check was used to ensure the credibility and trustworthiness of the interview data as eight (8) of the participants were able to engage the interview transcripts and codes. Codes were extracted using the empathic approach, allowing sense-making and drawing patterns from the transcripts with the study research questions at the back of mind. Meanwhile, the web link to the Web-based questionnaire (Google Forms) was shared on various LIS undergraduates' WhatsApp groups and via personal messages with the help of eight research assistants. Cumulative Grade Point Average (CGPA) was used to determine academic performance; Pittsburg Sleep Quality Index (PSQI) was adapted to measure sleeping habits, while factors associated with sleeping habits were adapted from (8). PSQI rate as recommended includes "0"= >7 hours, "1"=6-7 hours, "2"=5-6 hours, and "3"=<5 hours. Sleep quality was measured with "0"=very good, "1"=fairly good, "2"=fairly bad, and "3"=very bad. For the CGPA, "0"=first class, "1"=second class (upper division), "2"=second class (lower division), and "3"=third class. The factors were measured with the scale of Strongly Agree=3, Agree=2, Disagree=1, and Strongly Disagree=0. Finally, only 291 students responded to the survey, which serves as the study's sample size. Research questions were analyzed using descriptive statistics (frequency counts and simple percentage), while hypotheses were tested using one-way Analysis of Variance (ANOVA). Descriptive statistics were mined from the backend of Google Forms while hypotheses were tested using Microsoft Excel.

Results

Table 1 shows that there were more male LIS undergraduates than a female that participated in this study. Moreover, more than half of the respondents were undergraduates of federal universities in Nigeria. The most extensive distribution of the respondents (43.3%) were in 300 level, and 100 level students had the least representation with 12.4%.

Table 2 shows that more than half (61.8%) of the students' sleep duration was six hours or more, while 38.2% had six hours or less of sleep duration.

Table 1. Respondents' demographic information

Items	Frequency	Percentage (%)
Gender		
Male	178	61.2
Female	113	38.8
Type of Institution		
Federal university	184	63.2
State university	92	31.6
Private university	15	5.2
Level of Study		
100 level	36	12.4
200 level	78	26.8
300 level	126	43.3
400 level	51	17.5

N.B.: The total (n) is 291 for each item

Table 2. Sleep duration of LIS students

Variables	Frequency	Percentage (%)
Sleep Duration (In the last one month)		
Less than 5 hours	36	12.4
5-6 hours	75	25.8
6-7 hours	129	44.3
7 hours or more	51	17.5

N.B.: The total (n) is 291

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Table 3 shows that more than half (64.6%) of the respondents rarely or never had a nap during the coursework period (without examination). More than half (62.5%) of the respondents always or often go to bed early during the coursework period. Only 48.1% of the respondents rarely or never wake up early during the coursework period. It can be deduced here that most respondents sleep early but only almost half of them wake up early when there is no examination.

Table 3 also shows that more than half (67.7%) of the respondents always or often had a nap during the examination. Also, most (78.7%) of the respondents rarely or never go to bed early during examination. A majority (78.7%) of the rarely or never go to bed early during the examination period, and more than half (71.1%) of them always or often wake up early. This means that most of the students sleep late and wake up early during the examination period.

Table 3. Sleep pattern of LIS students

Items	Items	Always	Often	Sometimes	Rarely	Never
		Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)
During coursework	Frequency of nap	85(29.2)	112(38.5)	61(21.0)	14(4.8)	19(6.5)
	Going to bed early	27(9.3)	23(7.9)	12(4.1)	137(47.1)	92(31.6)
	Waking up early	112(38.5)	95(32.6)	24(8.3)	36(12.4)	24(8.2)
During examination	Frequency of nap	25(8.6)	32(11.0)	46(15.8)	133(45.7)	55(18.9)
	Going to bed early	88(30.2)	94(32.3)	37(12.7)	40(13.8)	32(11.0)
	Waking up early	53(18.2)	60(20.6)	38(13.1)	98(33.7)	42(14.4)

N.B.: The total (n) is 291 for each item

Table 4 shows that the majority (85.6%) of the respondents had good sleep quality without examination. However, it is shown in the Table that only (14.1%) of the respondents had bad sleep quality during the examination. This indicates that significant numbers of the respondents do not enjoy quality sleep during the period of examination.

Table 5 shows that most (79.7%) respondents agreed that academic success is a factor associated with sleeping habits.

Table 4. Sleep quality of LIS students

Items	Very good	Fairly good	Fairly bad	Very bad
	Freq (%)	Freq (%)	Freq (%)	Freq (%)
Sleep quality without examination	135(46.4)	114(39.2)	24(8.2)	18(6.2)
Sleep quality during examination	25(8.6)	16(5.5)	107(36.8)	143(49.1)

N.B.: The total (n) is 291 for each item

Also, more than half (62.9%) of the respondents disagreed that gender is a factor associated with sleeping habits. Table 5 reflects that majority (84.2%) of the respondents agreed that general health is a factor associated with sleeping habits. The more significant percentage (89.4%) of the respondents agreed that stress level is a factor associated with sleeping habits. Furthermore, it can be seen in the Table that more than (54.3%) half of the respondents agreed that socio-economic status is a factor associated with sleeping habits.

The findings of the academic performance of the LIS students show that most representation of the respondents (143 students equal to 49.1%) was Second Class (Lower Division) while the least representation was from Third Class (45 students equal to 15.5%). Also, 31 student (10.7%) was from the first class, and 72 (24.7%) were from second class (upper division).

Table 5. Factors associated with sleeping habits

Items	Strongly Agree	Agree	Disagree	Strongly Disagree
	Freq (%)	Freq (%)	Freq (%)	Freq (%)
Academic success	131(45.0)	101(34.7)	38(13.1)	21(7.2)
Gender	42(14.4)	66(22.7)	85(29.2)	98(33.7)
General health	117(40.2)	128(44.0)	19(6.5)	27(9.3)
Stress level	146(50.2)	114(39.2)	12(4.1)	19(6.5)
Socio-economic status	85(29.2)	73(25.1)	64(22.0)	69(23.7)

N.B.: The total (n) is 291 for each item (SA+A=Agreed, SD+D=Disagreed)

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Table 6 presents the ANOVA results, which show a statistically significant effect on students' level of study and sleep duration (p-value = 0.02) and the types of institution and sleep quality of undergraduate students (p-value = 0.03).

Table 6. The effect of level of study and types of institutions on sleep duration and quality

Variables	Source of Variation	SS	df	MS	F	*P*-value
Level of study /sleep duration	Between Groups	357.18	3	119.06	183.39	0.02
	Within Groups	186.32	287	0.64		
	Total	543.50	290			
Types of institutions / sleep quality	Between Groups	651.93	4	162.98	291.27	0.03
	Within Groups	21.05	286	0.07		
	Total	672.98	290			

SS=Sum of Square, **MS**= Mean of Square, **df**= degree of freedom

Having the research questions at the back of mind, a total of 22 codes were extracted from the interview transcript using the empathic coding approach (an approach of coding that allows finding meaning in one's interview transcript). From these, the relational features of the codes were used to formulate eight categories. From these categories, only two themes (influence of sleep duration and sleep quality on academic performance) were generated (tables 7 and 8).

Table 7 shows that participants of the study believe that morning schedule examination helps them manage their sleep duration properly, and they found it of benefit compared to examinations in the afternoon or evening. Participant 10 notes that:

"Morning exams (examinations) help a lot. If I have a morning exam, I always try to read through the night, sleep around 3 a.m., and set my phone alarm to 6 a.m. I will do all the necessary in the morning then go for the exam by 8 a.m. All the stuff I read would still be fresh and morning is kind of fresh to engage in mental exercise."

Participant 2:

"Morning examination is simply the best."

Participant 7:

"I like to read through the night and write an exam in the morning."

Participant 8:

"There are many factors that determine my sleep pattern. I look at my examination timetable and plan myself even ahead of time. I plan my sleep time and ensure it is favorable for me. However, I find morning examination advantageous."

Table 7 also shows that LIS undergraduates do have an intake of caffeinated substances and liquid. This is evident in the use of Nescafe and intake of energy drinks. Participant 1:

"I take Nescafe to stay awake."

Participant 11:

"I buy Nescafe in packs when the exam is approaching."

Participant 5:

"I drink Fearless to be awake and mix it sometimes with I won't like to say….(laughs)."

The study findings also show that the examination period significantly affects sleep duration but coursework does not.

Participant 3:

"My sleeping time reduces during the examination period. However, I enjoy my sleep when there is no exam."

Participant 8:

"I try to manage my time well, but it still affects sleep.

Participant 6:

"I have foregone my sleep for exam countless times."

Findings of the interview show that sleep duration influences academic performance positively. Some of the participants have the following to say:

Participant 9:

"Sleep duration has a positive influence on my academic performance."

Participant 3:

"It affects performance but to an extent. It depends on one's capacity to keep up with the drowsiness that comes after depriving oneself of sleep."

The findings show that participants have adequate sleep quality when there is no examination (table 8). Participant 7 stated that:

"I sleep very well when there is no exam."

Participant 9:

"I enjoy sleep when examinations are not ongoing."

Results show that participants experience poor sleep quality during the examination. It was expressed by Participant 1:

"Sleep quality is usually poor when it is exam period."

Participant 11:

"I barely sleep well when it is exam period."

It was further shown that some students barely have a restful sleep on their bed. This is evident in the response of Participant 4 as follow:

"I barely sleep on my bed when it is examination period."

The findings of the study show that poor sleep quality negatively influences academic performance.

Participant 2:

"The result of poor sleep quality is bad for academic performance."

Participant 12:

"Results are negatively usually affected when there is no normal sleep."

Table 8 also showed that the aftermath of poor sleep quality is usually debilitating and could sometimes lead to the students falling sick, especially when they had poor sleep quality during the examination. Participant 8 noted:

"It is usually difficult for me after the exam (examination) as I sometimes need bed rest to be fully back to myself."

Participant 15:

"I do go home to my parents after exam period because the stress and lack of proper sleep are most likely going to affect me after the exam."

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Table 7. Categories and Codes for influence of sleep duration on academic performance

Categories	Codes	Code weights
Favorable morning examination	Morning exams (examinations) is beneficial	8
	Night reading	11
Use of caffeinated substances and liquid	Drinks Lucozade Boost	2
	Drink Nescafe to stay hyperactive through night	5
	Drinks Fearless to be awake	4
Examination affects sleep duration	Reduced sleep hours during examination	11
	Time management	6
	Timetable affects sleep habits	4
	Inadequate sleep duration	9
	Repeated sleepless nights	8
Coursework does not affect sleep duration	I enjoy my sleep when there is no exam	11
	No sleep deprivation	12
Sleep duration positively influences academic performance	Positive influence	11
	Influence to an extent	4
	It helps my results	10

Source: Authors' Fieldwork (2021)

Table 8. Interview table on the influence of sleep quality on academic performance

Categories	Codes	Code weights
Adequate sleep quality without examination	Good sleep quality without examination	12
	Poor sleep quality during the examination	10
	Poor sleep quality during a test (continuous assessment)	6
Poor sleep quality during the examination	Barely sleep on bed during the examination	6
	Nap during the examination	8
	Poor sleep quality during the examination	10
Sleep quality negatively influences academic performance	Negative effect of poor sleep quality	8
	Difficulty in the aftermath of poor sleep quality	5

Source: Authors' Fieldwork (2021)

Discussion

Results revealed that most of the LIS undergraduates had 6 hours of sleep or more. This is similar to the findings of studies that claimed more than half of students aged between 13-18 years had more than 6 hours of sleep (21,22). However, Agu et al. found that undergraduates of medical/health students in Nigeria sleep for less than 6 hours (24). This shows that there is a difference in the sleep duration of students in different fields. This may be owing to the differences in the academic pressure in the fields. It was further shown that the students always or often had a nap during the examination. Asarnow et al. found that more than three-quarters of adolescents sleep for less than nine hours (23). The difference in the findings may be owing to the national representative of the study sample. The study further shows that LIS undergraduates rarely or never go to bed early during the examination, and they always or often wake up early. However, it was shown that the students

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rarely or never sleep early when there is no examination, but only about half of them wake up early. Most of the students never or rarely had a nap when there was no examination, but the majority did when there was an examination.

Results of the study show that majority of the LIS undergraduates had good sleep quality without examination. However, according to studies, a high percentage of medical students have poor sleep quality (13,26,27). As mentioned earlier, this difference is due to differences in the context of the studies. The medical students have less time to sleep and experience poor sleep quality due to the workload resulting from hospitals clinical training. It was found that LIS undergraduates had poor sleep quality during the examination. This supports the findings of Pensuksan et al. (15) and Mah et al. (22). The results show the emotion and frenzy that comes with examination among LIS undergraduates, as they tend to sacrifice their sleep quality when the examination is ongoing. The findings of the study show that academic success is a factor associated with sleeping habits. Gender and scheduled examination time-table are associated with sleeping habits. It was revealed that academic success and gender are associated with sleeping habits, as in the previous studies (14,16). It was also shown in this study that general health is associated with sleeping habit, which is similar to the finding of the other studies (12,16,22,23). It was revealed that stress level is associated with sleeping habits, which is similar to the findings of Wondie et al. (13) and Saat et al. (16) that focused on medical/health sciences students. The study found that socioeconomic factor is associated with sleeping habits, which is akin to the finding of Seun-Fadipe and Mosaku (10) and Saat et al. (16).

It was shown that there is a statistically significant effect of the institution types on the sleep quality of LIS undergraduates in Nigeria. It was also shown that there is a statistically significant effect of levels of study on the sleep duration of LIS undergraduates in Nigeria. The study shows that LIS undergraduates prefer to take examinations in the morning as they think it is more advantageous. The study results show that the intake of caffeinated drinks is prevalent among LIS undergraduates to enhance their sleeplessness. The finding is the same as that of Chinawa et al. (28) and Agoha et al. (29), as they found that students were in the habit of using caffeine to influence their sleeping hours. This study also found that the examination period affects sleep duration, but coursework does not. It was also shown that sleep duration positively influences academic performance. This is similar to the findings of other studies (28,29,32) that indicated sleep-deprived students had a poor academic performance.

The findings of this study show that LIS undergraduates have an adequate sleep when there is no examination. However, when there is an examination, they do not have good sleep quality. It was found that sleep quality negatively affects academic performance, which is similar to Saat et al. (16), which shows the reality of undergraduates nursing students in Turkey. However, Seun-Fadipe and Mosaku (8) found that sleep quality has a significant association with the academic performance of undergraduates of Obafemi Awolowo University, Nigeria, which is a federal university. The other studies by Jalali et al. (35) and Agoha et al. (29) respectively revealed that sleep quality did not significantly affect student academic performance in medical students in Kermanshah University of Medical Sciences in Iran and a private university in Nigeria.

Conclusion

This study explored LIS students' perspectives on sleeping habits and academic performance. It can be concluded that the students do not partake in night reading except during examination periods. LIS educators in Nigeria can motivate the students to always carry out night reading since it has been established that it has a positive relationship with their academic performance. It was also established that the students had adequate sleep quality, which is commonplace when there is no examination as well. However, it has been shown that medical/health sciences students in Nigeria had poor sleep quality (24). This suggests that the academic pressure on LIS undergraduates is not as much as that of medical/health science students. LIS undergraduates do not enjoy their sleep when there is an examination. This may primarily be due to the students' habit of partaken in late-night reading during examination periods. It was concluded that students think that gender, academic success, general health, examination timetable, stress level, and socio-economic factors are related to students' sleeping habits. LIS educators should endeavor to ensure undergraduates do not stress themselves more than what would affect their sleeping habits negatively, and the students should ensure they are in good health condition whenever their examination period is approaching. They may visit the school clinic for general health medical check-ups. It is recommended that university management consider scheduling LIS undergraduates' examinations to the morning on the timetable. Moreover, LIS students should ensure they abstain from excessive use of caffeinated drinks, and they should adequately plan their time during the examination period to afford adequate sleep. Lastly, awareness should be raised on the importance of sleep in academic activities.

Declarations

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Conflicts of Interests

The authors declare no potential or actual competing interestin the study.

Ethical statement

The authors assured the participants that their responses were solely for academic purposes and will not be revealed to any lecturer or university authority.

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Authors' contributions

Ismail Adeyemi contributed to the conception and design of the study, collection of data, data analysis responsibility, and read the final report for grammar checking. At the same time, Kabir Sulaiman reviewed related literature and read the final report for grammar checking.

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