Section: Miscellaneous

Original Research Article

EVALUATION OF LEARNING ENVIRONMENT OF A GOVERNMENT MEDICAL SCHOOL IN SOUTH INDIA USING DREEM QUESTIONNAIRE

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ABSTRACT

Background: Aim: The learning environment in medical schools is a critical factor influencing students' academic success and overall well-being. This study was conducted to assess student perceptions of the learning environment and describe its specific strengths and weaknesses at a government medical college in North Kerala using the Dundee Ready Education Environment Measure (DREEM) a widely used tool for assessing students' perceptions of their educational environment. **Materials and Methods:** A cross-sectional descriptive study was conducted at a government medical college in North Kerala among 412 MBBS students from all phases using Google form-based DREEM questionnaire distribution. The minimum sample size calculated was 385; using non- probability census sampling, 500 students were enrolled. Data were analysed using descriptive and inferential statistics. **Results:** The overall mean DREEM score was 107.16±21.78 out of 200, indicating a more positive than negative perception. Regarding domain scores: students' perception of learning (25.39±6.4) showed positive approach, students' perception of teachers (24.74±5.27) was moving in the right direction, students' social self-perception (17.21±4.94) was not too bad. However, students' academic self-perception (15.31±4.04) had many negative aspects with 53.6% students reporting negative scores, and students' perception of atmosphere (24.48±6.8) had many issues needing change. Significant score differences were observed between course phases, with early phases scoring higher. Female students reported more positive perceptions of teaching. **Conclusion:** While the overall environment is deemed more positive than negative, key areas such as academic self-perception and educational atmosphere require enhancement. As a relatively new institution with developing resources, focused improvements in teaching methodology, infrastructure, and student support are warranted.

INTRODUCTION

The learning environment of an institution consists of the educational environment perceived by students and teachers, including everything that happens in the classroom, institution campus, and university.[1,2] Students' perception of the study environment has shown to have a significant impact on their behavior, academic performance, and sense of well-being, which influence their motivation to learn.[3] Their previous experiences and expectations can influence their perception about the learning environment, and this may change as they are exposed more to the same environment. A positive learning environment in a medical college increases student engagement, enhances knowledge retention and improves clinical skills and professional attitudes, while a poor environment can result in reduced motivation, stress, burnout, and improper educational outcomes.[4]

Medical institutions in India face many challenges including ineffective distribution of resources, outdated curricula, and inadequate faculty development.[5] Even though government institutions provide vast clinical experience because of huge patient loads, they may have limitations in infrastructure. Another challenge noted was the lack of standardization of medical teaching across different medical colleges in the country. The introduction of Competency-Based Medical Education (CBME) by the National Medical Council in 2019 has initiated a paradigm shift, making learning more student-centered. In CBME students are encouraged to relate to relevance and self-motivation,[6] emphasizing the need for

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understanding the real-world healthcare challenges and a holistic development of the students.

Despite this progressive shift, implementation faces challenges, especially in government medical colleges, which often have large student batches, infrastructural constraints, variable faculty training, and limited psychosocial support systems.[7] These institutional factors influence students' perceptions of their learning environment, which in turn affect motivation, academic performance, and professional identity formation.

Systematic evaluation of the educational environment, particularly from the student perspective, is vital to identify strengths and gaps, guide institutional improvements, and align educational practices with CBME goals. The Dundee Ready Education Environment Measure (DREEM) questionnaire is a globally accepted and robustly validated tool for assessing five key dimensions of the educational environment: Students' Perception of Learning (SPOL), Students' Perception of Teachers (SPOT), Students' Academic Self-Perception (SASP), Students' Perception of Atmosphere (SPOA), and Students' Social Self-Perception (SSSP),[8,9]

DREEM provides actionable insights into the learning environment in medical colleges across diverse cultural and resource settings.[10]

Although many Indian institutions have utilized DREEM to evaluate their learning environments, published data remain sparse from government colleges in North Kerala.[11,12] The current study therefore assesses the perception of the learning environment in a relatively new medical college where resources are in the budding stage. The insights gained will be valuable for planning improvements to the learning environment and will support administration and faculty in reflecting on and enhancing their teaching methods.[13]

The study objectives were to assess overall and domain-specific DREEM scores, examine variation across academic phases, gender, and residence, and explore the qualitative student feedback to derive comprehensive insights that can help in future educational reforms consistent with CBME by modifying the learning environment.

MATERIALS AND METHODS

Study design and setting

This cross-sectional descriptive study was conducted at a Government Medical College in North Kerala, India, which started functioning 9 years back at the time of study.

Study population and sampling

The study population comprised all undergraduate MBBS students from Phase 1 (first year) through Phase 3 Part 2 (final year pre-internship). The minimum sample size required as per standard deviation was calculated as 385. Non-probability sampling using census method was employed, and a sample size of 500 medical students was enrolled in the study.

Inclusion and exclusion criteria

All students who were present on the day of data collection and willing to participate were included in the study.

Data collection instrument

The DREEM questionnaire consists of 50 items for assessing the educational environment in five dimensions,[8,9] A maximum of 200 points is attributed, with domain scores as follows: Perception of Learning (12 items,), Perception of Teaching (11 items), Academic Self- perception (8 items), Perception of the Atmosphere (12 items), and Social Self-perception (7 items,). Items were scored as 4 for strongly agree (SA), 3 for agree (A), 2 for uncertain (U), 1 for disagree (D), and 0 for strongly disagree (SD). The higher the score, the more positively the results can be regarded.[14] The interpretation of total scores and subscales was based on individual scores greater than 3.5 being considered positive, mean scores between 2 and 3 as areas that could be improved, and mean scores less than 2 as problematic areas.[14,15]

Ethical considerations

The study was approved by the Institutional Ethics Committee (IEC/GMCM/110). Written informed consent was obtained from all participants, and confidentiality was maintained throughout the study.

Data collection procedure

Data collection was conducted by the investigators, who explained the study and variables to students in a Google form questionnaire on DREEM, which was shared with the participants.

Statistical Analysis

The data collected by the DREEM questionnaire were analyzed both item-wise and domain- wise using SPSS version 25. One-way ANOVA was used to compare domain-wise mean scores across phases, gender, and residence. Statistical significance was set at $p < 0.05$.

RESULTS

Participant characteristics

A total of 412 students participated, yielding a response rate of 82.4%. The mean age was 21.88±1.53 years with a range of 11 years (18-29), and the majority (67.8%) were females. Majority were under CBME curriculum. Among 412 participants, detailed demographic characteristics are presented in Table 1.

DREEM scores: Overall and Domain-wise

The overall mean DREEM score was 107.16±21.78 out of 200, indicating a "more positive than negative" learning environment but with significant scope for improvement, the highest overall score was for phase 1 students. Detailed comparison of domain score grades given in Figure 1.

The domain-wise mean scores were

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- Students' Perception of Learning (SPOL): 25.39±6.4 out of 48 (positive approach)
- Students' Perception of Teachers (SPOT): 24.74±5.27 out of 44 (moving in the right direction)
- Students' Academic Self-Perception (SASP): 15.3±4.04 out of 32 (many negative aspects)
- Students' Perception of Atmosphere (SPOA): 24.48±6.8 out of 48 (many issues need change)
- Students' Social Self-Perception (SSSP): 17.21±4.94 out of 28 (not too bad)

Phase-wise comparison of DREEM scores

We compared domain-wise mean scores across phases of learning by ANOVA. Significant differences were observed in total and domain-wise DREEM scores across phases, as shown in Table 2.

Item-wise analysis

Students' Perception of Learning (SPOL): In the domain of students' perception of learning, all items had scores less than 3, meaning they demanded improvement. The highest score was for student-centered learning (2.68±1.01). Problem areas included - Teaching is often stimulating:
1.99±0.88 (problematic), Teaching time is put to good use: 1.96±0.98 (problematic), Teaching over-emphasizes factual learning: 1.65±0.85 (highly problematic).

Students' Perception of Teachers (SPOT): Key findings included: - Teachers are knowledgeable: 3.09±0.72 (positive aspect), Teachers are well prepared for classes: 2.59±0.91 (needs improvement), Teachers provide good feedback to students: 2.03±0.94 (needs improvement), Teachers are authoritarian: 1.70±0.93 (problematic).

Students' Academic Self-Perception (SASP): This domain showed the most concerning results:
- I am able to memorize all I need: 1.20±0.98 (highly problematic), Learning strategies that worked before continue to work: 1.68±1.05 (problematic), I feel well prepared for the profession: 2.01±1.06 (problematic), I am confident about passing this year: 2.57±0.97 (needs improvement).

Students' Perception of Atmosphere (SPOA): - I am able to concentrate well: 1.72±0.96 (problematic), The enjoyment outweighs the stress: 1.69±1.14 (problematic), The college is well time-tabled: 1.98±1.18 (problematic), The atmosphere is relaxed during ward teaching:
1.69±1.03 (problematic).

Students' Social Self-Perception (SSSP): - I have good friends at college: 2.89±0.94 (positive aspect), Good support system for stressed students: 1.61±1.06 (highly problematic), I rarely feel alone: 2.00±1.18 (problematic).

Phase wise and total scores of individual items of the DREEM score under each domain has been given in Table 3.

Gender and residence differences

We compared total scores and domain scores among gender, current place of residence, and phase of the course. Total scores and domain scores differed significantly across phases of the course, with comparatively better scores in early phases. Total score and students' perception of teaching were significantly better for female students (p=0.055 and p=0.008 respectively). Students attending classes from home had better perceptions of learning and atmosphere compared to hostel residents.

Academic self-perception

Among all domains, the most significant concern was academic self-perception. Over half the students (53.6%) reported negative scores in this area. Individual items such as "I am not able to memorize all," "The learning strategies adopted so far are not effective," and "I do not feel prepared for this profession" highlight the pressing need for improved teaching and learning methods.

Qualitative feedback analysis

Students highlighted areas needing improvement through their feedback, which included: Lack of extracurricular activities, lack of comfortable places to study, poor mess food quality, issues with Wi-Fi connectivity, lack of innovative teaching methods, lack of mental health support, some difficult senior teachers, lack of opportunities for social interaction, concerns about dress code policies.

Table 1: Demographic characteristics of study participants (n=412)

Characteristic	Groups	Frequency (%)
Gender	Female	280 (68)
	Male	132 (32.0)
Current place of residence	College hostel	370 (89.8)
	Home	30 (7.3)
	Private stay	12 (2.9)
Phase of MBBS course	Phase 1 (2022)	80 (19.4)
	Phase 2 (2021)	79 (19.2)
	Phase 3 Part 1 (2020)	70 (17.0)
	Phase 3 Part 2 (2019,2018)	183 (44.4)

Table 2: Domain-wise DREEM scores across phases of MBBS course

Item (Maximum score of Domain)	Total Mean (SD)	Phase 1 Mean (SD)	Phase 2 Mean (SD)	Phase 3 Part I Mean (SD)	Phase 3 Part II Mean (SD)	Level of significance
Total Score (200)	107.16 (21.78)	117.0 (19.8)	115.1 (18.36)	101.01 (24.2)	101.7 (20.4)	<0.001
SPOL (48)	25.39	29.05	27.18	23.18	23.8 (6.1)	<0.001

ISSN (O): 2687-5365; ISSN (P): 2753-6556

	(6.4)	(6.1)	(6.3)	(6.3)		
SPOT (44)	24.74 (5.27)	26.4 (5.01)	26.68 (4.4)	23.25 (6.08)	23.74 (4.9)	<0.001
SASP (32)	15.3 (4.04)	16.63 (4.09)	15.65 (3.4)	14.32 (3.06)	14.96 (3.7)	0.002
SPOA (48)	24.48 (6.8)	26.83 (6.7)	26.7 (7.1)	23.67 (7.1)	22.79 (6.6)	0.001
SSSP (28)	17.21 (4.94)	18.11 (3.9)	18.81 (4.5)	16.57 (6.2)	16.38 (4.7)	<0.001

Table 3: Phase wise and total scores of individual items of the DREEM score

DREEM score	Item	Mean score (SD)	Phase 1	Phase2	Phase3 part 1	Phase3 part 2
SPOL- (Maximum Score=48)	I am encouraged to participate during teaching sessions	2.29(0.92)	2.57(0.83)	2.59(0.82)	2.0 (1.09)	2.13 (0.83)
	The adopted teaching is often stimulating	1.99(0.88)	2.10 0.85)	2.22(0.91)	1.84 (0.91)	1.85 (0.82)
	The teaching student-centered (more self-learning)	2.68(1.01)	2.86 (0.86	2.68(0.96)	2.68 (1.02)	2.6(1.06
	Teaching helps to develop my competence	2.23(0.93)	2.76(0.67)	2.41(0.87)	1.8(0.95)	2.05 (0.91)
	The teaching is well focused	2.03(0.96)	2.58 (0.85)	2.21 (0.88)	1.84 (0.95)	1.78(0.92)
	Teaching helps to develop my confidence	2.02(0.98)	2.43 (0.85)	2.27(0.86)	1.65 (1.01)	1.86 (0.98)
	The teaching time is put to good use	1.96(0.98)	2.46 (0.81)	2.22(0.97)	1.65 (1.01)	1.73 (0.91)
	Teaching over emphasize factual learning	1.65(0.85)	2.57 (0.88)	2.35(0.8)	2.2 (0.84)	2.31(0.86)
	I am clear about the learning objectives of the course	2.17(0.98)	2.23(0.9)	2.25 (0.97)	2.0 (0.84)	2.17(1.0)
	The teaching encourages me to be an active learner	2.06(1.02)	2.46 (0.88)	2.21 (1.04)	1.75 (1.01)	1.93 (1.01)
	The importance of long term learning is emphasized over short term learning	2.38 (0.98	2.85 (0.85	2.41 (0.81)	2.28 0.95)	2.19(1.01)
	The teaching is too teacher centered	1.94(0.97)	1.88(0.97)	1.98(0.88)	2.14 (1.08)	2.16 (0.96)
	The teachers are knowledgeable#	3.09(0.72)	**3.25**(0.64)	3.01(0 .75)	2.92 (0.83)	3.13(0.67)
	Teachers adopt a patient centered approach to consulting	2.41(0.85)	2.48(0.58)	2.46(0.81)	2.18(0.92)	2.44(0.83)
	Teachers ridicule students#	2.01(0.95)	1.65 (0.98)	1.64 (0.80)	2.04 (1.05)	**2.26**(0.88)
	Teachers are authoritarian*#	1.70(0.93)	**2.38**(1.02)	2.01(0.61)	2.32(0.97)	2.37(0.87)
	Teachers have good communication skills with patients#	2.57(0.98)	2.36 (0.67)	2.74 (0.75)	2.4(0.95)	**2.65**(0.86)
	Teachers are good at providing feedback to students#	2.03(0.94)	**2.55** (0.88)	2.36(0.71)	1.84(0.95)	1.73(0.9)
	Teachers give us constructive criticism#	2.21(0.94)	**2.43** (0.72)	2.32 (0.71)	2.04 (1.08)	2.13 (0.99)
	Teachers give clear examples#	2.46(0.81)	**2.75** (0.72)	2.64 (0.64)	2.18 (0.87)	2.36(0.840)
	Teachers get angry in the class#	1.80(0.97)	**2.46**(1.04)	1.86 (0.89)	1.95 (1.02)	2.31 (0.9)
	Teachers are well prepared for their classes	2.59(0.91)	3.13 (0.72)	2.75(0.68)	2.25(1.1)	2.42 (0.58)
	The students irritate the teachers	1.85(1.01)	2.05 (0.99)	2.1 (1.06)	2.25 (1.05)	2.15 (0.97)
SASP (Maximum score 32)	The learning strategies that worked for me before, continue to work for me now (in this course)#	1.68(1.05)	1.57 (1.07)	**1.91**(0.98)	1.64(1.1)	1.65(1.02)

ISSN (O): 2687-5365; ISSN (P): 2753-6556

	I am confident about my passing this year#	2.57(0.97)	2.62 (0.89)	**2.86**(0.79)	2.67 (1.09)	2.38(0.99)
	I feel I am being well prepared for the profession#	2.01(1.06)	2.06 (1.07)	**2.48**(0.88)	1.81(1.2)	1.85(0.99)
	Last year's work has been a good preparation for this year's work#	2.03(0.98)	2.15 (0.82)	**2.48**(0.82)	1.74 (1.16)	1.89(0.97)
	I am able to memorize all I need	1.20(0.98)	1.32 (0.93)	1.31 (1.05)	1.2 (1.11)	1.15(0.91)
	I have learned a lot about empathy in this profession	2.71(0.88)	2.87 (0.70)	2.71(0.86)	2.84 (0.97)	2.60 (0.91)
	My problem-solving skills are being well developed here	2.28(0.94)	2.46 (0.84)	2.36 (0.97)	2.1 (1.03)	2.25(0.93)
	Much of what I have to learn, seems relevant to a career in healthcare#	2.71(0.83)	3.03(0.68)	2.71 (0.73)	2.55 (0.97)	2.62 (0.84)
SPOA (Maximum score=48)	I feel comfortable in the class socially	2.37(0.96)	2.4 (1.04)	2.44(0.82)	2.27 (1.12)	2.38 (0.91)
	The atmosphere is relaxed during class/seminar/tutorials	2.19(0.94)	2.31 (0.91)	2.32 (0.81)	2.05 (1.1)	2.14(0.93)
	I am able to concentrate well	1.72(0.96)	1.76 (0.65)	1.88 (0.99)	1.42 (1.01)	1.74 (0.92)
	The enjoyment outweighs the stress of the course#	1.69(1.14)	1.72 (1.2)	**2.03** (1.1)	1.72 (1.16)	1.51(1.08)
	The atmosphere motivates me as a learner#	2.19(0.94)	**2.2** (0.92)	2.2(0.89)	1.75(0.9)	1.85 (0.85)
	I find the environment as encouraging	2.02 (0.94)	2.24 (0.95	2.31 (0.91)	1.87(0.96)	1.87 (0.91)
	I feel able to ask whatever questions I want	1.77(0.99)	1.85 (1.03)	2.25 (0.94)	1.55(0.94)	1.67 (0.95)
	The atmosphere is relaxed during ward teaching	1.69 (1.03)	**2.23**(0.77	1.93 (1.01)	1.45(1.1)	1.43 (1.01)
	The college is well time- tabled	1.98(1.18)	**2.88**(0.87	2.50 (0.9)	1.91 (1.08)	1.39 (1.10)
	Cheating is a problem in this college	2.30(1.08)	1.55(1.1)	1.78(1.02)	1.48 (1.16)	1.79 (1.03)
	The atmosphere is relaxed during lectures	2.28(0.98)	2.15 (0.96)	2.46 (0.82)	2.6 (1.01)	2.15(1.0)
SSSP (Maximum score 28)	I am too tired to enjoy this course	1.98(0.86)	2.07 (0.92)	2.03 (0.89)	2.02 (0.79)	1.91 (0.86)
	I rarely feel discouraged in this course	1.86(1.05)	1.78 (1.01)	1.91 (1.08)	1.95(1.06)	1.83 (1.04)
	I have good friends at the college	2.89(0.94)	3.16 (0.80)	2.77(0.94)	271 (1.14)	2.89 (0.88)
	My social life is good	2.42(0.97)	2.65 (0.9)	2.43(0.84)	2.2 (1.2)	2.4 (0.94)
	I rarely feel alone	2.00(1.18)	2.31 (1.16)	2.15(1.1)	1.65(1.2)	1.94 (1.13)
	I live in a comfortable place	2.52(1.02)	2.52 (1.1)	2.54(0.93)	2.4 (1.2)	2.57(0.92)
	There is a good support system for students who are stressed	1.61(1.06)	2.13 (1.0)	1.81 (1.01)	1.37 (1.14)	1.39(0.98)

 # Statistically significant difference in score across phases

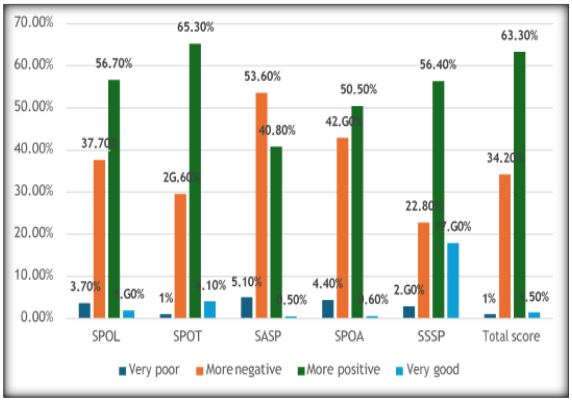

Figure 1: Comparison of domain score grades

DISCUSSION

The DREEM total score of 107.16 obtained in this study reflects a learning environment that is perceived as more positive than negative, consistent with findings from other Indian medical institutions,[16,17] However, this score indicates substantial room for improvement to achieve an optimal learning environment conducive to student motivation, academic success, and holistic development. Overall, the perception of the educational environment in Indian medical schools tends to be more positive than negative as observed in study at NRI Medical College in Andhra Pradesh with mean DREEM score 130/200,[18] and a North Indian medical college median score of with

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126/200.[19] In contrast, our institution, being relatively new and grappling with infrastructural limitations and a fluctuating faculty base, may have contributed to the lower score. Higher score such as 139 was observed in institutions that implemented comprehensive course handbooks and continuous self-assessment methods.[20]

The DREEM questionnaire domains continue to be a valuable tool in assessing students' perceptions of their learning environment, helping identify both strengths and areas needing improvement. For example, a Bangladesh-based study found that 80.6% of students had a positive learning experience, 81.2% appreciated the teaching methods, and 77.1% had a positive academic self-perception[21]. Social and environmental perceptions were also in the acceptable range (70.6%), with different patterns compared to our study.

The notably low scores in Students' Perception of Learning and Academic Self-Perception align with previous findings highlighting deficits in teaching quality and student confidence,[11,12] The decline in perception across MBBS phases reflects mounting academic and clinical demands, stress, and potential burnout as students progress - observations mirrored across India and global settings,[22,23] These findings emphasize the need for targeted interventions for senior students, including stress management and academic mentoring.

In our study, female students had higher total scores and better perception of teaching, while perception of learning and atmosphere was higher among students attending classes from home. The documented gender differences (female students rating the environment more positively) accord with earlier work suggesting gender-specific engagement styles and coping mechanisms in medical education,[16,24] The positive influence of attending classes from home may reflect emerging benefits of blended or hybrid learning modalities, particularly relevant in post-pandemic educational contexts.

As a relatively new institution established 9 years back, our medical college faces unique challenges that contextualize these findings. The resource constraints typical of developing government medical institutions, combined with the challenge of establishing educational traditions and faculty stability, likely contribute to several identified issues. The extensive clinical exposure available due to high patient loads represents a strength, but infrastructural limitations and technology gaps present ongoing challenges.

Academic self-perception revealed several negative aspects, with over half the students (53.6%) reporting negative scores, and students' perception of the atmosphere highlighted issues that require change. The qualitative feedback underscored concerns about extracurricular paucity, poor hostel mess quality, inadequate study spaces, unreliable Wi-Fi, limited psychosocial support, strict dress codes, and need for more approachable faculty.

The introduction of CBME aims to address many of the identified deficiencies through student- centred learning approaches. However, our findings suggest that successful implementation requires substantial investments in faculty development, infrastructure enhancement, and student support systems. The low academic self-perception scores are particularly concerning in the context of competency-based education, which relies heavily on student self-assessment and reflection.

The study's strengths include a large sample size, high response rate (82.4%), use of a validated instrument widely accepted in India and internationally, and comprehensive analysis across different phases and demographic variables. Limitations include its single-center cross- sectional design and convenience sampling, which may limit generalizability. The self-reported nature of DREEM responses may introduce bias, and the specific institutional context may not be representative of all government medical colleges in India.

CONCLUSION

This study demonstrates a moderately positive but suboptimal learning environment at a government medical college in North Kerala, with significant deficits in teaching effectiveness, student academic confidence, and institutional atmosphere. The learning environment reveals several gaps, especially in academic self-perception and teaching quality, which intensify in senior years and vary by gender and study environment.

While the overall environment is deemed more positive than negative, the lower scores compared to established institutions highlight the challenges faced by newer government medical colleges with developing resources. The findings underscore the urgent need for targeted interventions in teaching methodology, infrastructure development, and comprehensive student support systems to align with CBME objectives and foster confident, competent future physicians.

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Conflicts of interest

The authors declare no conflicts of interest.

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