Effective Physical Capacity Framework for Blended Learning and its Impact on Students Learning Outcomes-Enrollments

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Abstract: Blended learning based on learning Management System LMS and face-to-face teaching, which provides good opportunities for Arab Open University AOU students for participation in education process, regardless of time, place and AOU campus physical capacity. The main objective of this research is to evaluate the impacts of learning outcomes achievements that are based on face-to-face teaching and the use of LMS, student enrollment decision on physical capacity which have been modeled using online questionnaires in connection with information technology (IT) and Business students in AOU Bahrain branch. The particular focus of this paper is on the use of LMS and the impacts of blended learning on participation in education and on learning outcomes taken into consideration physical capacity. According to the results, LMS and lecture videos have become very popular among students. Moreover the use of both increases student's participation activeness. The campus's physical capacity also increased by scheduling students attendance according to 25% face-2-face lecturing using two shift morning & evening sessions for employees & housewives, so blended learning process has increased the number of student enrollments, optimized students participation and has a positive impact on completion of courses and learning outcomes.

Introduction

Arab Open University AOU conducted a holistic evaluation of its campus capacity, in light of significant projected enrollment increases. Encompassing an approximation 21,500 square meters of facilities on A'Ali district as new site campus instead of old campus in south Sehla district 2,000 square meters of facilities where physical campus area increased more than 10 times, AOU now can enroll over 900-undergraduate-learners as fresh students instead of the assigned number by higher education council HEC for AOU old campus 300 learners as new comers per academic year based on an internal research conducted by AOU IT staff. (Kananah & Al-Awadhi, 2014; Maguire & Zhang, 2007).

The University has steadily grown in population and prominence to become one of the leading higher educational institutions in kingdom of Bahrain. In particular, AOU is noted for its strength in the fields of IT & Business using the current space inventory, course scheduling data, staffing data, and historical enrollment data across the faculties, this paper evaluated the existing physical capacity (PC) of the University's new campus compared to the old one and related to the student learning outcomes (LO)-enrollment growth (EG). (Gump, 2005; Hakala & Myllymäki, 2011).

Methodology

This article examines impacts of learning outcomes achievements that are based on 25% face-to-face teaching and the use of LMS on student enrollment decision and physical capacity which have been modeled. Our task is to design and develop a general framework oriented to three research issues (students learning outcomes, enrollment growth and AOU physical capacity) following metrics oriented to specific questions that have been asked using online questionnaire of 128 students in IT & Business departments and their answers have been used to evaluate LMS usage based on the response of AOU student Bahrain branch.

An adequate reliability is measured (0.90) using Cronbach's Alpha where the degree to which a measurement technique can be depended upon to secure consistent results upon repeated application of questionnaire. Validity measure also is applied with highly correlated convergent evidence (0.65) using Campbell and Stanley's where the degree to which measurement approach or questionnaire succeeds in describing and quantifying what it is designed to measure.

Figure 1: shows the Framework of Physical Capacity (PC) based on (LO) and (EG), based on the information available at this time multiplying old campus capacity 1500 by factor 3, then, the estimated new capacity based on the available new physical campus space is 4500 students (Kerres, & deWitt, 2003; Gulbahar, & Madran, 2009).

First Research Direction: Students Learning Outcomes (LO)

- Blended-learning reinforces and enhances learning outcomes of AOU courses in spite of 25% physical attendance (Garrison, & Kanuka, 2004).
- Tutor Marked Assignments TMA as electronic copy, lectures delivered by web-ex and live video streaming improves LO.
- The concept of blended-learning will improve student's enrollment ratio, decrease physical attendance, increase campus physical capacity and Learning outcomes.
- Impact of using Learning Management System (LMS) on LO.

Second Research Direction: AOU Enrollment Growth (EG)

- Professional development of IT tools and LMS training are satisfactory to encourage students to enroll in AOU (Bonk, Kim & Zeng, 2006; Centre for Technology in Learning, 2009).
- Self motivated students (student-centered)? Initiatives needed to accommodate and increase the enrollment growth.
- AOU admission rates & fees are lower compared to other universities
- Using two shifts, morning & evening sessions for employees & housewives is better & will increase campus physical capacity and will apply students' optimum enrollment ratio.
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Third Research Direction: Physical Capacity (PC)

- Effective communication between students & staff through 25% face-2-face meeting and 75% LMS utilization (Gulbahar, & Madran, ,2009; Yam & Rossini, 2011).
- integrated resources, software, video lectures to be utilized on-line LMS regardless of the AOU campus physical capacity
- Close cooperation between all partners computing centers, e-library, faculty, register and students without need of physical campus.
- lack of physical opportunity of campus attendance
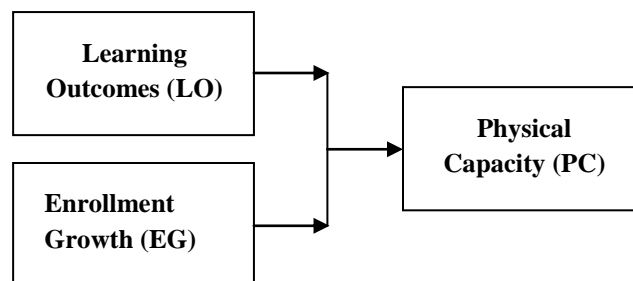
Figure 1: Framework of Physical Capacity (PC) based on (LO) and (EG)

Table-1 AOU blended learning student's optimum enrollment and the impacts on Attendance, campus physical capacity and Learning outcomes

Question	*Agree*	*Disagree*	*Possibly/ Don't Know*	
1. Do you think that blended-learning reinforces and enhances learning outcomes of AOU courses, so that you will learn more, in spite of 25% physical attendance or limited campus physical capacity?				Learning outcomes (LO)
2. Is blended-learning better for uploading students works, Tutor Marked Assignments TMA as electronic copy, lectures delivered by web-ex and live video streaming rather than actual campus physical approach which will enrich the students' learning outcomes?				
3. Will the concept of blended-learning mixed between traditional and e-learning improve student's enrollment ratio, decrease physical attendance, increase campus physical capacity and Learning outcomes?				
4. Will providing web space for lecturers to enable them to upload notes & develop more courses than included in traditional learning which will increase learning outcomes?				
5. Do you think that implemented blended-learning in AOU will enable an excellent communication between students & staff through 25% face-2-face meeting and 75% LMS utilization, which give an effective and efficient AOU campus utilization?				Physical Capacity (PC)
6. Do you think it is good that you don't have to come into physical lesson when lectures are put online, which provide students with satisfactorily integrated resources, software, video lectures to be utilized on line regardless of the AOU campus physical capacity?				
7. Is AOU blended-learning used by all staff, which has been developed with close cooperation between all partners computing centers, e-library, faculty, register and students without need of physical campus?				
8. Is AOU blended-learning lack of accuracies, interaction and feedback on online materials due to the lack of physical opportunity of campus attendance?				
9. Is the professional development of IT tools and LMS training are satisfactory to encourage students to enroll in AOU related to the concept of blended-learning compared with other universities in kingdom of Bahrain?				Enrollment Growth (EG)
10. Does blended-learning work only for self motivated students (student-centered), initiatives needed to accommodate and increase the enrollment growth.				
11. Do you think that AOU admission rates & fees are lower compared to other universities in kingdom of Bahrain, due to using blended-learning concept, which will improve enrollment.				
12. 12. Do you think face-to-face lecturing using two shifts, morning & evening sessions for employees & housewives is better & will increase campus physical capacity and will apply student's optimum enrollment ratio.				

Data Analysis

First Research Direction: Analysis of Students Learning Outcomes (LO)

The results in Fig.2(A-E) show the different metrics profile of students learning outcomes, where Fig.2-A showed that 71.9% of students agreed on the 25% physical campus attendance, 68.8% of total respondents support on line TMA shown in Fig.2-B, and over 59% of respondents satisfied with blended learning shown in Fig2-C, while in Fig.2-D of survey shows that 81% of students agreed with LMS learning outcomes, so the estimated overall learning outcomes is over 70% given in Fig.2-E respectively using excel sheets.
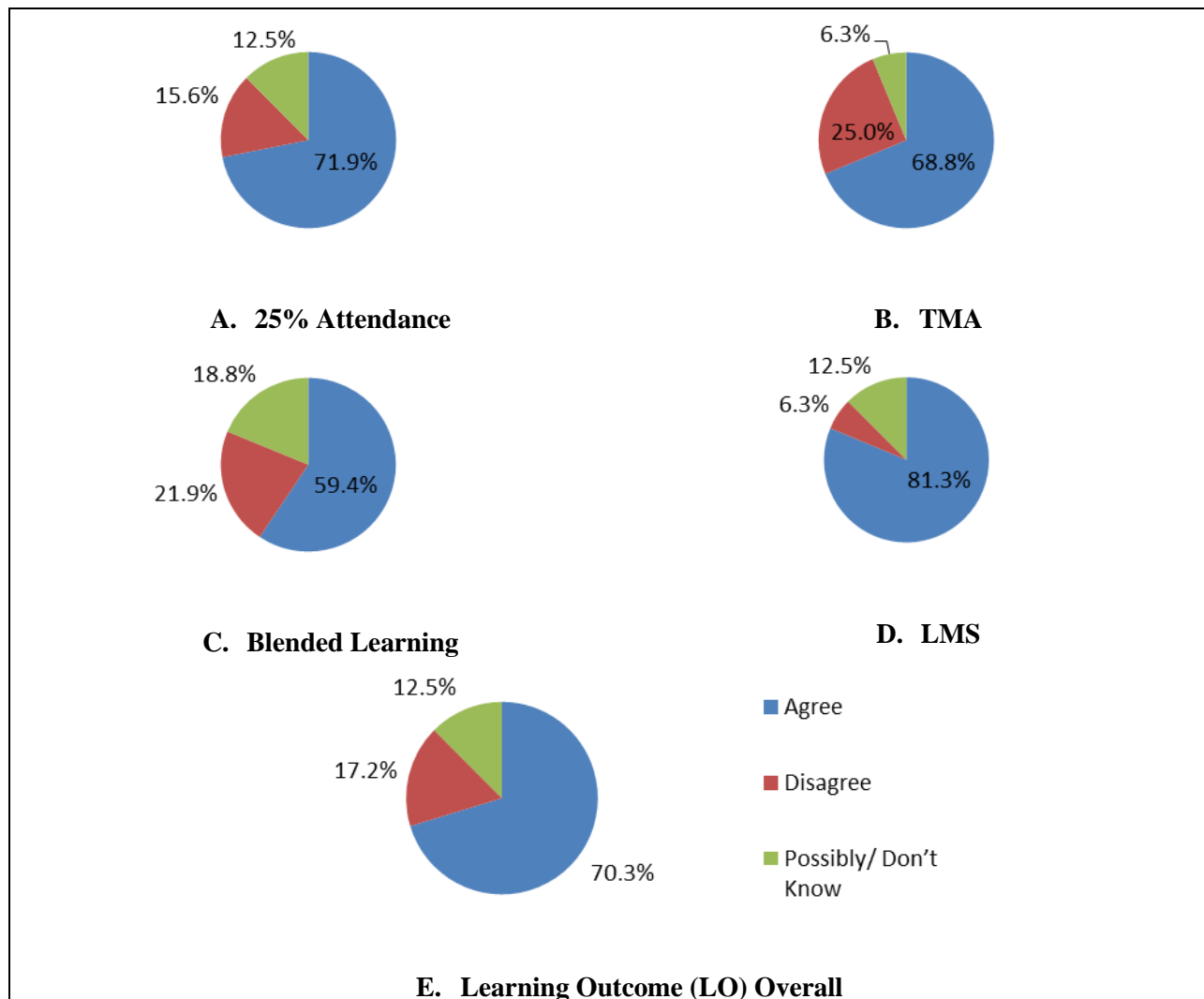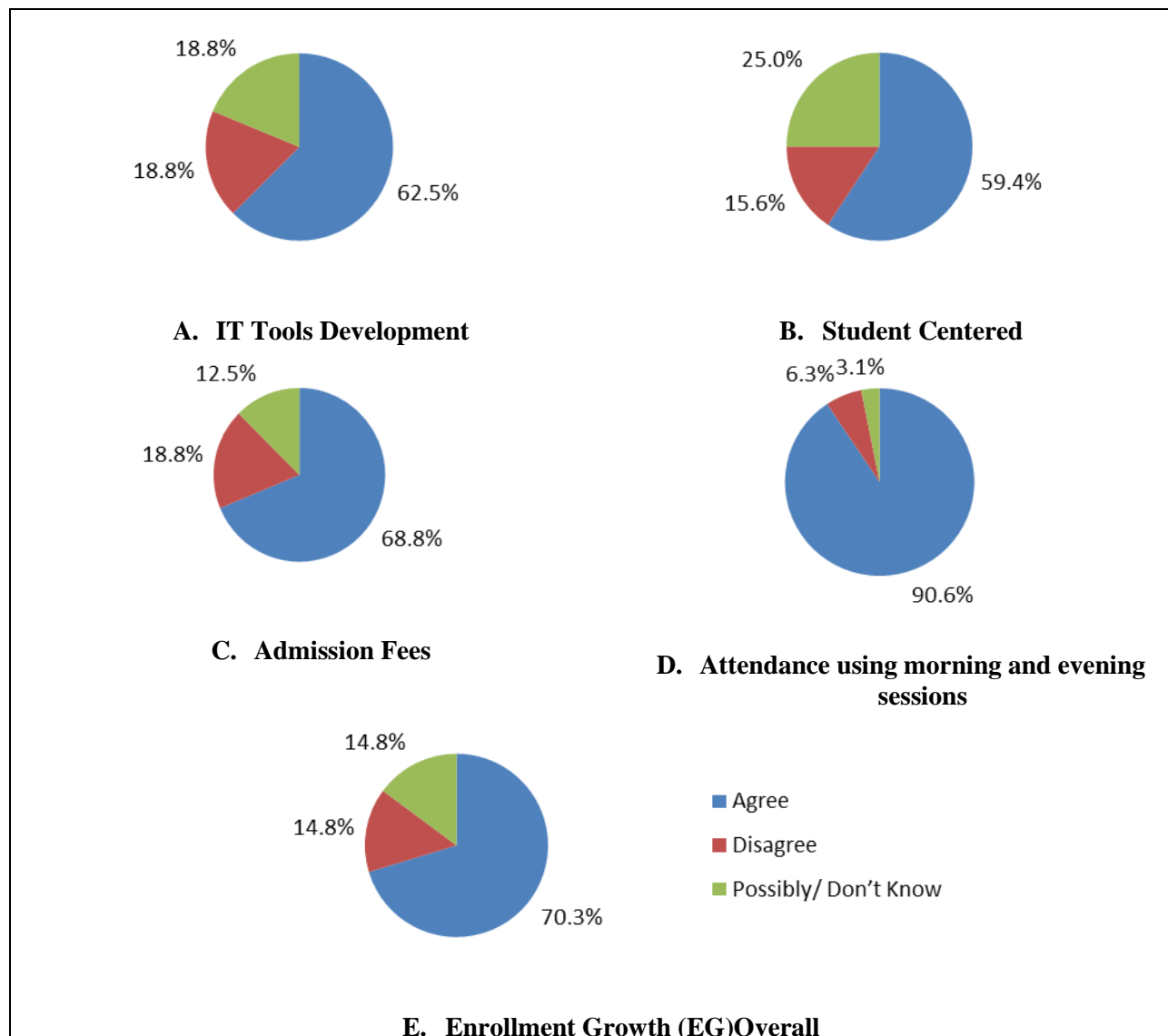

Fig.2: Learning outcomes (LO) 1ˢᵗ research direction

Second Research Direction: Analysis of Enrollment Growth (EG)

As a second indicator, Fig.3 (A-E) shows the different metrics profile of Enrollment Growth (EG). Among responders Fig.3-A shows that 62.5% of students agreed on IT Tools development, Fig.3-B indicates that 60% of students believe in student Centered approach, while Fig.3-C shows that 69% of students agreed with admission fees, Fig.3-D point out that 91% of students need face-2-face 25% attendance as morning and evening sessions, the overall enrollment metric is over 70% given in Fig.3-E respectively.

A. IT Tools Development

B. Student Centered

C. Admission Fees

D. Attendance using morning and evening sessions

Legend:
- Agree
- Disagree
- Possibly/ Don't Know

E. Enrollment Growth (EG)Overall

Fig.3: Enrollment Growth (EG) 2nd research direction

Third Research Direction: Analysis of Physical capacity (PC)

As a third indicator Fig.4 (A-E) shows the outcomes of different metrics profile of physical capacity in AOU, where Fig.4-A shows that the daily effective communication is about 86% of total respondents, Fig.4-B illustrates the integrated resources utilization & access is 60%, over 69% Fig.4-C of students developed a close cooperation between all partners computing centers, e-library, faculty, register and other students without need of physical campus. While Fig.4-D given below indicates that 50% of students lack of physical opportunity of campus attendance. Fig.4-E gives the overall lack of physical capacity metric which is over 56%.
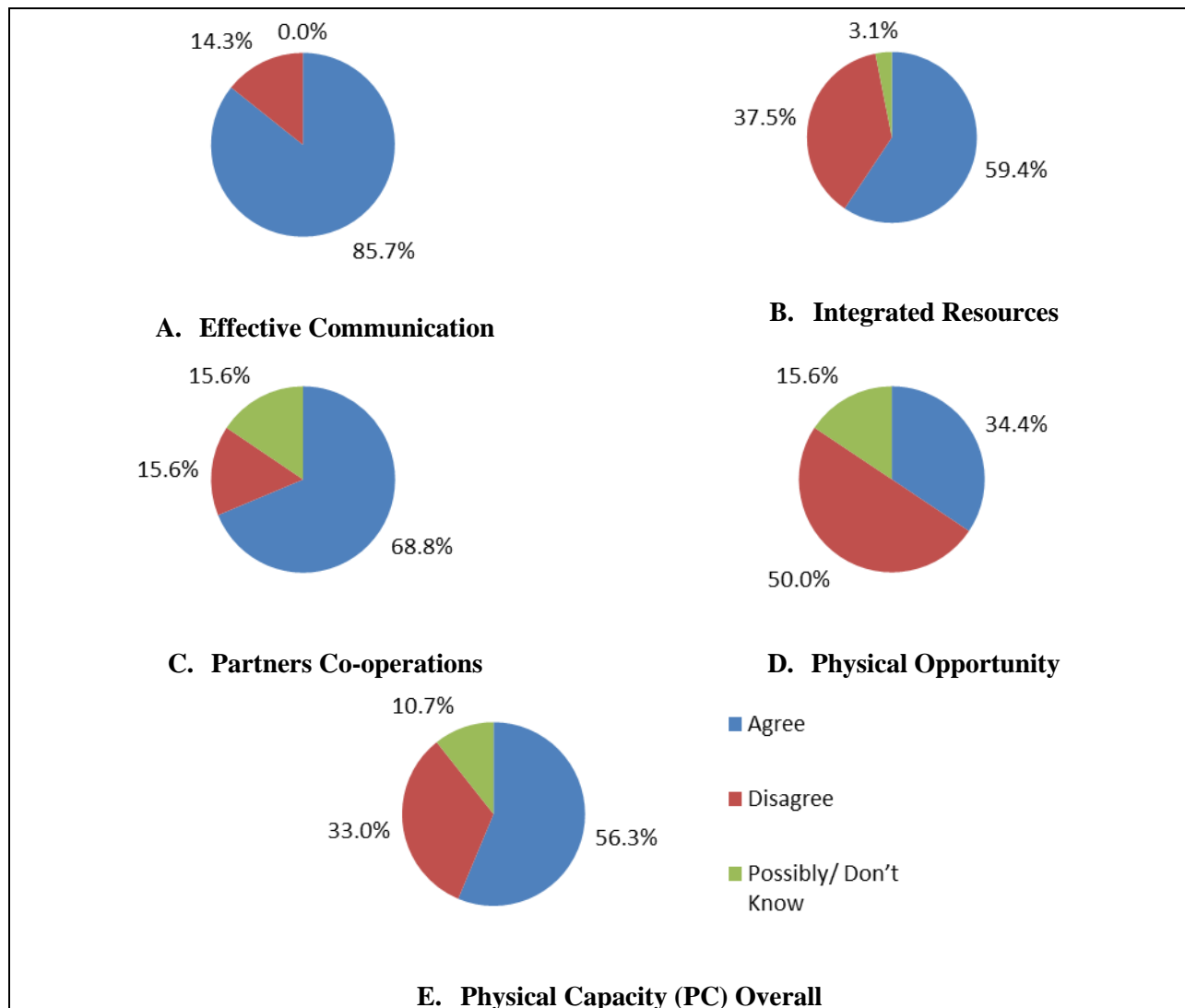

A. **Effective Communication**

B. **Integrated Resources**

C. **Partners Co-operations**

D. **Physical Opportunity**

E. **Physical Capacity (PC) Overall**

Fig.4: Physical capacity (PC) 3rd research direction

Conclusion

Based on the response 70% of students agree with LMS learning outcomes estimating that the overall is over 70% given in Fig.2-E as sum of face-2-face meeting, TMA& LMS. While 91% of students agree on face-2-face 25% attendance as morning and evening sessions, the overall enrollment metric is over 70% given in Fig.3A-E respectively. 85% are fully satisfied with daily effective communication, the percentage of integrated resources utilization & the close cooperation between all partners is estimated by 60% as shown in Fig.4A-B respectively, nearly 56 % of students in Fig.4-E give the overall lack of physical capacity metric.

This paper creates a framework to evaluate the impacts of learning outcomes achievements that is based on face-to-face teaching and the use of LMS, student enrollment decision on physical capacity which have been modeled, the framework is used for proactive planning which involves three steps: preplanning, analysis, and review were used to support the analysis associated with the methodology. The developed systematic framework uses on-line questionnaire to drive and support the analysis. Figures outcomes based three research directions (LO, EG & PC), so the developed whole methodology focused on improvement of availability, performance, consistency, and reliability of blended-learning system to improve student's enrollment. It is expected that the overall outcomes of fulfillment the questionnaire point out that the implemented blended-learning system in AOU has the following characteristics:

- The Blended-learning system is clear and concise,
- The system has built in incentives to motivate student learning outcomes compliance with LMS & face-2-face meeting,
- LMS is verifiable, enforceable and centralized by head quarter of AOU.
- System has a good control for legitimate use: access, authentication, and authorization
- There is regular backup of all critical data & disaster recovery and business continuity plan
- Enrollment of students should be increased in spite of physical capacity due to the nature of blended learning, which will not affect students learning outcomes. As a result it should be increased by 3 times.

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