



EURASIAN JOURNAL OF EDUCATION AND PSYCHOLOGY

2026; I (I): 10-15

Published online 06.01.2026 (<https://eurasiancampus.edu.journals.lk/>)



A Study on the Zone of Proximal Development (ZPD) and Scaffolding in Learning Management System (LMS) for MBA Students

Vignesh M.

Department of Management Studies, The American College, Madurai, Tamilnadu , India.

Email address:

vignesh.madurai@gmail.com

To cite this article:

Vignesh M., A Study on the Zone of Proximal Development (ZPD) and Scaffolding in Learning Management System (LMS) for MBA Students. *Eurasian Journal of Education and Psychology*. Vol.1, No.1, ISSN 3121-4363, pp.10.

Received: 31 03, 2026; **Accepted:** 18 05, 2026; **Published:** 01 07, 2026

Abstract: The radical change in the learning materials would be a challenge both for students and teachers nowadays. In order to accomplish a learning task, students have to seek information and teachers must update themselves. However, they are left in the information divide. Ultimately the students must depend on the "meta-information". Hence needed a well-structured learning management system (LMS) to facilitate the learning process. And as a novice, students must be inculcated by the teachers based on their Zone of Proximal Development (ZPD) and scaffolding. This paper investigates the significance of the role of the Zone of Proximal Development (ZPD) in Learning Management Systems (LMS) for college students. With a sample size of 122, the study assesses the significance of scaffold digital learning environments in relation to students' engagement, academic performance, and self-directed learning. Descriptive, correlation, and regression analyses were used in the study. The analysis of the data revealed a significant positive correlation between scaffolding strategies in LMS platforms and students' academic performance. The ZPD can be integrated with the role of more knowledgeable others (MKO) to facilitate the learning process. Thus, this study deals with the educational psychology.

Keywords: Higher Education, Digital Learning, MKO, Student Performance, student engagement

1. Introduction

The integration of Learning Management Systems (LMS) in higher education has transformed the learning process. The theoretical foundation of this transformation is rooted in Vygotsky's Zone of Proximal Development (ZPD), which emphasizes the gap between what learners can do independently and what they can achieve with guidance. Scaffolding, as an instructional technique, provides structured support to bridge this gap. The zone of proximal development (ZPD), a fundamental theory developed by Lev Vygotsky (1978), "represents the difference between what a learner can do with the guidance of a more knowledgeable other and what the learner can do alone." This theory, as a construct, has significantly impacted the way teaching, learning, and testing are viewed.

In this context, scaffolding, a metaphorical term of ZPD, developed by Wood, Bruner, and Ross (1976), "represents the temporary supports that teachers provide to bridge the gap between what a learner can do and what the learner can potentially do."

2. Literature Review

2.1 Zone of Proximal Development

The zone of proximal development (ZPD) is a key concept in cognitive development, which Lev Vygotsky (1978) proposed as an essential area of cognitive development. Vygotsky (1978) proposed that the ZPD is "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined by problem solving under adult guidance or in collaboration with more capable peers" (p. 86).

The ZPD was also operationalised in educational research through dynamic assessment, dialogic instruction, and collaborative problem-solving (Lantolf & Thorne, 2006). Modern understanding of the ZPD assumes that it is not only a cognitive gap but also a dynamic and intersubjective space, which is socially constructed (Daniels, 2016).

Wood et al. (1976) extended Vygotsky's framework by conceptualising scaffolding as a process in which a tutor adapts support to the learner's evolving competence. Effective scaffolding is characterised by contingency (responsiveness to learner needs), fading (gradual

withdrawal of support), and transfer of responsibility to the learner (van de Pol et al., 2010).

Empirical research has documented positive effects of scaffolding on academic achievement across diverse domains including literacy, mathematics, and science (Pea, 2004; Reiser, 2004).

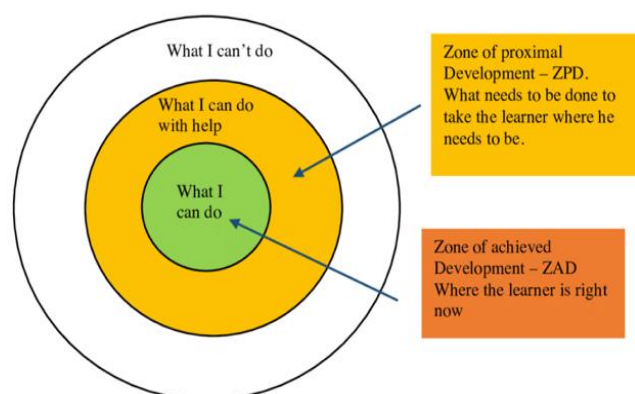
The "zone of proximal development" (ZPD), which is one of the most fundamental concepts developed by Lev Vygotsky (1978), refers to the "distance between the actual developmental level as determined by independent problem solving and the level of potential development." Wood et al. (1976) expanded Vygotsky's theory.

Cronbach's alpha (α) is the most commonly utilized measure of internal consistency in educational and psychological research (Cronbach, 1951). The More Knowledgeable Other (MKO), can be explained as any person with profound subject knowledge or skills who can assist the learners to learn things through their zone of proximal development. He can be other than a teacher as friend, colleague or peer member. (Abtahi, 2017).

2.2 Scaffolding

There is a large amount of variety in the way that the scaffolding metaphor is both understood and put into practice in education research, with some researchers stating that "some educators use scaffolding to refer to a broad range of unrelated things" (Hammond, 2002, p.2). In broad terms, scaffolding can also be described as "a way of helping children and young people develop their knowledge and skills" (Rasmussen, 2001, p.570).

Figure 1: Illustrative diagram explaining the zone of proximal development and the zone of achieved



development with scaffolding

(Source: Andragogy Theory – Malcolm Knowles)

Objectives of the Study

- To analyze the role of ZPD in LMS-based learning.
- To examine the impact of scaffolding on student engagement.
- To evaluate the relationship between scaffolding and academic performance.
- To assess the effectiveness of LMS in facilitating guided learning.

Limitations of the Study

The sample size is very much restricted to 122 students only. As MBA (Master of Business Administration) is a programme with heterogenous background, the perception and adaptability of the students differ. The apprehending ability of the students may differ.

Hypotheses

H1: Scaffolding in LMS has a significant impact on student academic performance.

H2: There is a positive correlation between ZPD-based learning and student engagement.

H3: LMS features significantly predict self-regulated learning.

3. Research Methodology

The research design was descriptive and analytical. The sample size taken was 122 postgraduate business (Master of Business Administration) students and the sampling technique was convenience sampling. A purposive sample was done. Three groups as for the scaffolding was done as, i) control (n = 40), ii) low Scaffold (n = 41), and iii) high Scaffold (n = 41).

4 Results and Discussion

4.1 Reliability statistics

A Cronbach's Alpha of 0.89 indicates high internal consistency.

Table 1 - Frequency distribution

Course	Male	Female	Total
I MBA	36	29	65
II MBA	32	25	57
Total	68	54	122

4.2 Descriptive Statistics by Instructional Group

Table 2 - Descriptive Statistics

Group	n	ZPD Mean	ZPD SD	Scaffold Mean	Scaffold SD	Total N
Control	40	3.71	1.38	2.73	1.52	122
Low Scaffold	41	3.12	1.33	4.25	0.66	122
High Scaffold	41	2.77	1.58	2.35	1.04	122
Total	122	3.19	1.47	3.11	1.39	122

Interpretation: It has been clearly shown that the high scaffold group has better results.

4.3 Item-Level Descriptive Statistics and Reliability Indices

Table 3 - Item-Level Descriptive Statistics and Reliability Indices (N = 122)

Item	Description	Subscale	M	SD	rit	α D
Q1	Teacher identifies learning gap	ZPD	3.41	1.59	0.481	0.913
Q2	Appropriate challenge level	ZPD	3.22	1.61	0.641	0.902
Q3	Learner potential recognition	ZPD	3.25	1.58	0.791	0.890
Q4	Guided participation quality	ZPD	3.08	1.62	0.895	0.881
Q5	Independent task performance	ZPD	3.01	1.56	0.947	0.877

Q6	Scaffold clarity	Scaffolding	3.27	1.53	0.944	0.878
Q7	Scaffold fading	Scaffolding	3.08	1.54	0.890	0.882
Q8	Contingent support	Scaffolding	3.12	1.53	0.763	0.892
Q9	Peer scaffolding	Scaffolding	2.94	1.53	0.615	0.903
Q10	Feedback quality	Scaffolding	3.14	1.49	0.354	0.919

* *M* = mean; *SD* = standard deviation; *rit* = corrected item-total correlation; *αD* = Cronbach's alpha if item deleted.

Interpretation

Among the ZPD, the parameter Guided participation quality has the highest standard deviation, which means it has a strong impact of the teachers on the learning management system towards the students. Out of the scaffolding parameters, the standard deviation is high and equal for scaffold clarity, contingent support and peer scaffolding which signifies all the three parameters are pertinent.

4.4 Paired t-test on the LMS usage

Table 4 – Paired t-test

Variable	Mean	Sample size (N)	SD	Std. Error mean
Before LMS usage	3.21	122	0.74	0.067
After LMS usage	3.89	122	0.68	0.062

Table 5 - Paired samples test

Pair	Mean diff.	SD	Std. Error Mean	t	Df	Sig.(2-tailed)
Before usage-after usage	-0.68	0.59	0.053	-12.83	121	0.000

Interpretation

The mean score was increased from 3.21 (before LMS) to 3.89 (after LMS), which strongly indicates that there is an improvement in learning outcomes after LMS adoption. Also, the mean difference (-0.68) shows a substantial positive shift in the students' performance/engagement with the LMS. The t-value (-12.83) is large, and the p-value ($0.000 < 0.05$) indicates that the difference is statistically significant. Thus, it can be concluded that the improvement is not due to chance.

4.5 Descriptive Statistics

Table 6 – Descriptive Statistics

Variable	Mean	Std. Deviation
Scaffolding	3.92	0.68
ZPD Alignment	3.85	0.72
Learner's engagement	4.01	0.64
Academic performance	3.78	0.70

Interpretation

Out of the four variables, the standard deviation for the ZPD alignment is high.

4.6 Correlation Analysis

Table 7 - Pearson Correlation

Variable	Scaffolding	ZPD	Engagement	Performance
Scaffolding	1	0.62**	0.68**	0.71**
ZPD	0.62**	1	0.65**	0.67**
Engagement	0.68**	0.65**	1	0.73**
Performance	0.73**	0.67**	0.73**	1

** $p < 0.01$

Interpretation

There is a strong positive correlation between scaffolding and academic performance ($r = 0.71$), indicating that enhanced support mechanisms in LMS improve student outcomes.

4.7 Regression Analysis

Dependent Variable taken is Academic Performance

Predictor	Beta value	t-value	Significance
Scaffolding	0.42	5.12	0.000
Engagement	0.36	4.45	0.000
ZPD Alignment	0.28	3.67	0.001

$R^2 = 0.64$

Interpretation:

The model explains 64% of the variance in academic performance. Scaffolding emerges as the strongest predictor.

The above findings clearly evince the Vygotsky's theoretical framework, highlighting that LMS platforms incorporating scaffolding techniques significantly enhance learning outcomes. Features such as guided modules, peer discussion forums, and adaptive feedback align well with ZPD principles. The process of scaffolding has a significant impact towards the academic performance of the MBA students. ZPD-based learning enhances the student's participation and involvement. In no doubt, learning management system (LMS) features promotes self-learning principles. For an effective LMS tutoring, the faculty must identify the level of understanding of the students and must deploy the degree of scaffolding accordingly. A real-time feedback mechanism must be adopted for a effective system. A collaborative learning environment can be implemented to facilitate the flexibility of the learning process.

5. Conclusion

The study confirms that the integration of ZPD and scaffolding in LMS creates a more effective and engaging learning environment for MBA students. Institutions should focus on designing LMS platforms that support guided learning to maximize student potential. LMS platforms can be diversify the stereotypic book reading. Also, ZPD will enhance the level of confidence among the students. The degree of scaffolding has a positive impact. Higher the degree of scaffolding creates better learning environment and it may induce the receptivity of the learners and reduce the frustration. Not only the teachers, the more

knowledgeable others (MKO) can be helpful in assisting the students.

References

- Abtahi, Y. (2014) 'Who/what is the more knowledgeable other?', *For the Learning of Mathematics*, 34(3), pp. 14–15.
- Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences*. 2nd edn. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cronbach, L. J. (1951) 'Coefficient alpha and the internal structure of tests', *Psychometrika*, 16(3), pp. 297–334.
- Daniels, H. (2016) *Vygotsky and Pedagogy*. 2nd edn. London: Routledge.
- George, D. and Mallery, P. (2003) *SPSS for Windows Step by Step: A Simple Guide and Reference*. 4th edn. Boston: Allyn & Bacon.
- Hammond, J. (ed.) (2002) *Scaffolding Teaching and Learning in Language and Literacy Education*. Newtown, Australia: PETA.
- Lantolf, J. P. and Thorne, S. L. (2006) *Sociocultural Theory and the Genesis of Second Language Development*. Oxford: Oxford University Press.
- Nunnally, J. C. (1978) *Psychometric Theory*. 2nd edn. New York: McGraw-Hill.
- Nunnally, J. C. and Bernstein, I. H. (1994) *Psychometric Theory*. 3rd edn. New York: McGraw-Hill.
- Pea, R. D. (2004) 'The social and technological dimensions of scaffolding and related theoretical concepts for learning, education, and human activity', *Journal of the Learning Sciences*, 13(3), pp. 423–451.
- Rasmussen, J. (2001) 'The importance of communication in teaching: A systems-theory approach to the scaffolding metaphor', *Curriculum Studies*, 33(5), pp. 569–582.
- Reiser, B. J. (2004) 'Scaffolding complex learning: The mechanisms of structuring and problematizing student work', *Journal of the Learning Sciences*, 13(3), pp. 273–304.
- van de Pol, J., Volman, M. and Beishuizen, J. (2010) 'Scaffolding in teacher–student interaction: A decade of

research', *Educational Psychology Review*, 22(3), pp. 271–296.

Vygotsky, L. S. (1978) *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.

Wood, D., Bruner, J. S. and Ross, G. (1976) 'The role of tutoring in problem solving', *Journal of Child Psychology and Psychiatry*, 17(2), pp. 89–100.