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* **Corresponding author.**

kavyashreemb89@gmail.com

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Factors Influencing Digital Transformation in Learning in Universities with Special Reference to Karnataka State

M K Shreeharsha¹, P Nagesh², M B Kavyashree^{3*}

¹ Research Scholar, JSS Science and Technology University, Mysuru, Karnataka, India

² Professor, JSSCMS, JSS Science and Technology University, Mysuru, Karnataka, India

³ Assistant Professor, JSSCMS, JSS Science and Technology University, Mysuru, Karnataka, India

Abstract

Objectives: To examine the factors influencing Digital Transformation in Learning and their association with Digital Transformation considering professionals working in educational institutions and universities offering digital platform in learning. **Methods:** To gather the relevant data, the survey method adopted was cross sectional in nature. Reliability Analysis, Convergent Validity, Structural Equation Modelling were considered for assessing the data. Data was gathered from 316 professionals working in Karnataka Universities in India having digital platforms to enable learning. **Findings:** The model indices were found to be acceptable. The RMSEAp value was found to be less than 0.05 indicating a good model fit. Values of AVE ranged between 0.511 to 0.926 crossing the cut-off value 0.5. The path model statistics p value obtained were less than 0.05, thus proving there was an association between the factors considered in the present research. The significant factors influencing digital transformation in learning were identified with significance values as: Instructor (0.01), Learner (0.04), Course Curriculum (0.01), Evaluation (0.01) and Learning Environment (0.01). The significant values were found to be below the threshold value of 0.05, therefore proved to be the significant factors having an impact on digital learning. **Novelty:** The present research is an attempt to identify the significant factors influencing digital transformation in learning in the universities located in Karnataka State of India. The research adds further knowledge to the existing works in the similar area by focusing on the most relevant factors required for the successful execution of digital platform for learning which is currently booming in the education sector.

Keywords: Digital Transformation; Learning; Learner; Instructor; Curriculum; Evaluation; Learning Environment

1 Introduction

Digital Transformation in learning is making its prominent presence among the current academic practitioners and universities. Digital Transformation in learning process is rigid process which requires greater transformative changes with a common vision for achieving the goals⁽¹⁾. The need to accelerate the digitalization of universities has indicated the universities and educational institutions to focus on the factors leading to digital transformation⁽²⁾. While education has become an essentiality, digital learning has become a trend, allowing individuals to be more focused on learning⁽³⁾. For the purpose of attracting more audience, educational institutions are focusing on distant courses combining them with virtual learning⁽⁴⁾.

According to⁽⁵⁾, academic universities have witnessed a greater impact due to advanced technologies and are facing digital disruption.

As opined by⁽⁶⁾, even though Technology becomes a primary enabler for Digital Transformation in Learning it cannot be replaced with Instructors. The instructors are influenced through their skills, expertise, knowledge, confidence and the degree of interaction with the students over the digital platform⁽⁷⁾. According to⁽⁸⁾, the instructors' confidence, reactivity, ability to perform the tasks independently enables them to achieve the ownership of their course and helps in effective digital transformation in learning. According to⁽⁹⁾, competence in making use of Information Technology, Attitude of the learners, influence of Self-Studying are the parameters which are essential for an individual to accept online learning, thus enabling Digital Transformation at a higher acceptance rate. As reported by⁽¹⁰⁾, when cognitive, emotional and behavioral barriers are removed between the instructors and the learners, it facilitates the successful Digital Transformation in learning. Personalized digital based curriculum programs are gaining attention when designed and executed successfully⁽¹¹⁾. The author⁽¹¹⁾, also opines that the curriculum developed need to ensure that teaching and learning process is clearly defined with academic goals and objectives. Technology the evaluation process need to be initiated, for the successful execution of digital transformation in learning⁽¹²⁾. According to⁽¹³⁾, the designing, maintenance and rebuilding of the learning spaces are the primary responsibility of the educational institutions. The learning environment which enables Digital Learning among the students will have to be developed.

It is witnessed through extensive review that there are a very few studies which examine the factors influencing digital transformation in learning⁽⁸⁾. As opined by⁽¹⁴⁾, the drivers enabling digital transformation are interlinked to each other in diverse forms. Having an understanding of these is essential for institutions working towards strategies on digital transformation. Therefore, an analysis on the level of readiness of instructors and students, role of technology in Digital Transformation of learning, channel of communications, Course Curriculum and Pedagogy of teaching, Assessment techniques and the Learning Environment is essential to understand the impact of the above mentioned factors on digital transformation of learning. As indicated by⁽¹⁵⁾, organization readiness, technology, pedagogy, the instructor, student significantly impact Digital Transformation.

Post Covid Situation has thrown light for digital learning platforms which are now integrated with the educational institutions. Currently universities are bringing in digital learning platforms to ease the learning process.

The goal is to better understand the prominent factors enabling digital transformation in learning. Through the inferences gathered, with the help of literature review the below hypothesis were formulated for the research work.

1.1 Hypothesis

H₀₁: The Instructor has a significant impact on Digital Transformation in Learning.

H₀₂: The Learners Cognition, Emotions and Behavior have a significant impact on Digital Transformation in Learning.

H₀₃: The Course Curriculum has a significant impact on Digital Transformation in Learning.

H₀₄: The Evaluation Process has a significant impact on Digital Transformation in Learning.

H₀₅: The Learning Environment has a significant impact on Digital Transformation in Learning.

2 Methodology

The present study is a wise attempt to explore the factors facilitating the Digital Transformation. To fulfill the objectives of the study, five factors enabling digital transformation were considered through extensive review of literature based on their relevance and usage in academic research works. The factors considered were Instructor, Learner, Course Curriculum, Evaluation and Learning Environment.

The research is cross sectional in nature, and survey method is adopted to fetch the relevant data as it helps in examining the hypothetical relationships in an effective manner. The study responses were gathered from administrators and professors offering digital learning platforms in their institutions and universities present in Karnataka State of India. The survey was

conducted between September 2022 to January 2023. To gather the responses, a straightforward random sample procedure was used. The replies were gathered utilizing a google forms-based online surveying technique. 316 replies in total were gathered.

To check the internal consistency of the survey instrument reliability of the factors were extracted in the present study. Structural Equation Modeling was adopted to explore the relationships between independent and dependent variables. Model tests were performed to know the fit indices of the model. The model fit indices was known to be acceptable SEM and Path Analysis Statistics were performed to assess the relationship between the independent and the dependent factors considered in the study.

2.1 Scope of the Study

The present research considered faculty members/educators working in educational institutions and universities offering digital learning platforms.

2.2 Measures

For the indicated study variables, self-administered questionnaire was developed to extract the correct responses. Factors enabling digital learning: Instructor, Learner, Course Curriculum, Evaluation and Learning Environment with 24 items and Digital transformation with 6 items were developed. A Likert scale with five points, ranging from strongly agree (1) to strongly disagree (5), was used to ask the respondents for their perspectives.

Table 1. Variables of the Study

Sl No	Variables	Items
1.	Instructor	6
2.	Learner	6
3.	Independent Variables Course Curriculum	3
4.	Evaluation	4
5.	Learning Environment	3
6.	Dependent Variable Digital Transformation	6

2.3 Statistical Analysis

The information gathered was processed using SPSS Software. Reliability test was adopted to confirm the adequacy of the data; structural equation modeling was considered to examine the structural relationship between the variables.

3 Results and Discussions

3.1 Reliability Analysis

Internal consistency was assessed through the values of Cronbach's Alpha. As suggested by⁽¹⁶⁾, and also supported by the study of⁽¹⁷⁾, the threshold value for Cronbach's Alpha is 0.5. The reliability of the measures used in the current research are represented in Table 2.

Table 2. Cronbach's Alpha Coefficient for the research variables

Sl. No	Variables	No. of items	Cronbach's Alpha Coefficient
1	Instructor	6	0.772
2	Learner	6	0.825
3	Course Curriculum	3	0.833
4	Evaluation	4	0.771
5	Learning Environment	3	0.777
6	Digital Transformation	4	0.791

Table 2, represents the Cronbach's Alpha values of the variables used in the study. Since all the reliability values fall between 0.771 to 0.833, the construct of this questionnaire is reliable. In total, the evidence suggests that the scale has adequate

measurement properties.

3.2 Structural Equation Modelling

Structural Equation Model is a statistical test to explore the relation between independent and dependent variables. The test examines both the outer model and the inner model. It assesses the reliability and validity in the outer model and examines the relation between constructs using the path model which is also known as inner model.

3.3 Model Tests

Model test estimates whether a model is suitable. The values of 'p' examines whether the relationships in the model are significant. The Table 3 represents the model test evaluations.

Table 3. Model Tests			
Label	X ²	df	p
User Model	1386	284	< .001
Baseline Model	137938	325	< .001
Scaled User	1066	284	< .001
Scaled Baseline	54939	325	< .001

From the analysis (Table 3), it can be inferred that the research model is significant since the values of 'p' is less than the threshold value 0.05⁽¹⁸⁾.

3.4 Fit indices

The value of RMSEA p indicates the probability that RMSEA is less than or equal to 0.05⁽¹⁹⁾. The RMSEA p value obtained through the analysis is <0.001, thus meeting the threshold value of 0.05 and indicating the model has a good fit. Table 4 represents the fit indices values for the current research.

Table 4. Fit Indices					
95% Confidence Intervals					
Type	SRMR	RMSEA	Lower	Upper	RMSEA p
Classical	0.107	0.111	0.105	0.117	< .001
Robust Scaled	0.103	0.093	0.088	0.099	< .001

3.5 Convergent Validity

The Convergent Validity will be assessed by taking into consideration outer loadings and the AVE. Research constructs consider the AVE (Average Variance Extracted) value from 0.511 to 0.926, which considers the cut-off value to be 0.5 as suggested by⁽²⁰⁾. Therefore, convergent validity is established in the current research. Below Table 5 indicates the AVE (Average Variance Extracted) values.

Table 5. Convergent Validity						
Variable	α	Ordinal α	ω_1	ω_2	ω_3	AVE
Instructor	0.772	0.843	0.716	0.716	0.725	0.511
Learner	0.825	0.901	0.824	0.824	0.834	0.624
Course Curriculum	0.833	0.849	0.901	0.901	0.899	0.741
Evaluation	0.771	0.837	0.886	0.886	1.126	0.843
Learning Environment	0.777	0.846	0.858	0.858	0.863	0.736
Digital Transformation	0.791	0.896	0.922	0.922	1.144	0.926

3.6 Path Model

The path model represents the casual relationships between the variables. The model represented in the Figure 1 shows that there exists a significant association between the factors considered in the present study.

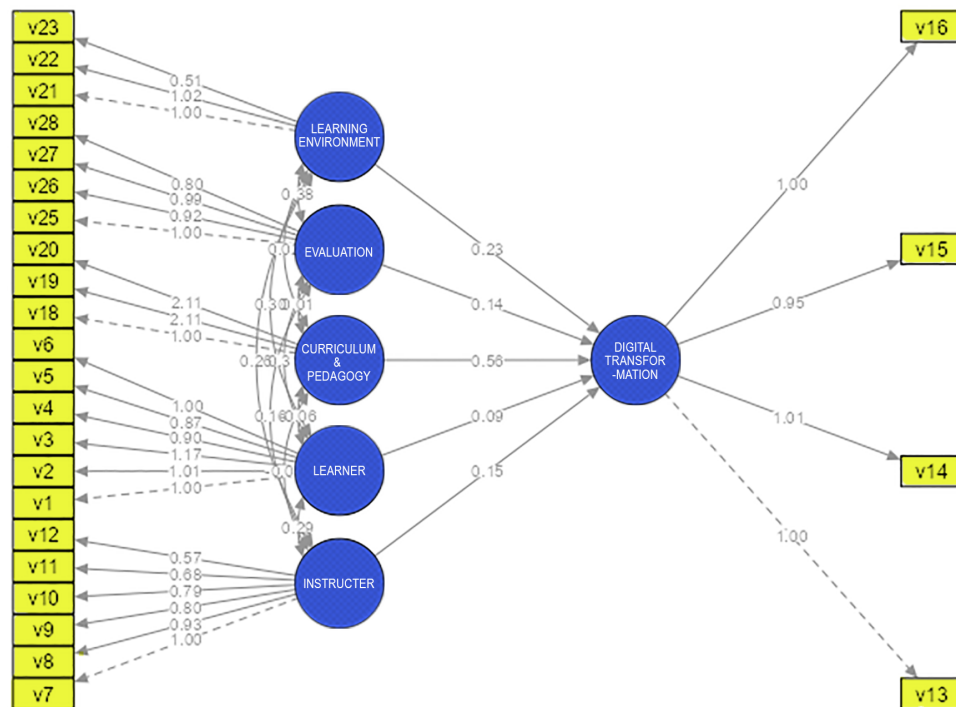


Fig 1. Path Model

3.7 Parameters Estimates

The parameter estimates summarize the effect of each predictor used in the research. The below Table 6 represents the parameter estimates.

Table 6. Parameter Estimates

Dep endent		Predictor	Estimate	SE	Lower	Upper	95% Confidence Intervals		
							β	z	p
Digital	Transfor-	Instructor	0.1505	0.0337	0.08449	0.217	0.1371	4.47	< .001
mation									
Digital	Transfor-	Learner	0.0880	0.0441	0.00157	0.174	0.0718	2.00	0.046
mation									
Digital	Transfor-	Course Curricu-	0.5579	0.0606	0.43919	0.677	0.2724	9.21	< .001
mation		lum							
Digital	Transfor-	Evaluation	0.1374	0.0305	0.07768	0.197	0.1395	4.51	< .001
mation									
Digital	Transfor-	Learning Envi-	0.2263	0.0363	0.15512	0.298	0.2282	6.23	< .001
mation		ronment							

The values of 'p' should be less than 0.05, for the acceptance of the hypothesis⁽¹⁸⁾. Since the values of 'p' in the above analysis represented in Table 5 are below the threshold value of 0.05, the hypothesis of the present research is accepted.

Instructor, Learner, Course Curriculum, Evaluation and Learning Environment are known to be important predictors of Digital Transformation. The test statistic infers that there exists a significant relationship between Instructor and Digital Transformation; Learner and Digital Transformation; Course Curriculum and Digital Transformation; Evaluation and Digital Transformation and Learning Environment and Digital Transformation.

The significant factors influencing digital transformation in learning were identified with significance values as: Instructor (0.01), Learner (0.04), Course Curriculum (0.01), Evaluation (0.01) and Learning Environment (0.01). The significant values were found to be below the threshold value of 0.05, therefore proved to be the significant factors having an impact on digital learning.

The present results of the research are in support with the previous research works in the area for the considered factors : Learner^{(15); (7); (21)}; Learner⁽¹⁰⁾; Course Curriculum⁽¹¹⁾; Evaluation⁽¹²⁾; and Learning Environment⁽¹³⁾, that the above factors have a significant influence towards digital transformation in learning.

The designing of an appropriate space enabling positive learning requires substantial efforts from the academicians to focus on innovative approaches which can be brought to the institutions⁽²²⁾. The results of the research provide insights for the academic practitioners the focal points which requires attention and efforts while transforming their education system.

The test statistics reveal that there exists a relationship between Digital Transformation and Instructor, Digital Transformation and Learner, Digital Transformation and Course curriculum, Digital Transformation and Evaluation, Digital Transformation and Learning Environment.

4 Conclusion

The present research work exposes the prominent factors that operates on the digital transformation of learning in the selected Indian Universities. The analysis successfully identified independent factors (Instructor; Learner; Course Curriculum, Evaluation; Learning Environment) and dependent factor (Digital Transformation) which will be useful for academic administrators to improve the learning process further in Indian Universities.

The research has highlighted the prominent factors influencing digital transformation in learning which may also hold good for similar institutes elsewhere across the globe. Hence, considering the global perspective, more number of universities can be considered to be the study respondents in future works. Such works can also consider other prominent factors that can influence digital transformation so that the learning process can be smooth and less affected by COVID-19 like situations. The current study has not considered the learners who are essential for the successful implementation of digital learning platforms. Therefore, further studies can also consider the viewpoints from learners in their research work.

References

- 1) Timotheou S, Miliou O, Dimitriadis Y, Sobrino SV, Giannoutsou N, Cachia R, et al. Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*. 2023;28:6695–6726. Available from: <https://doi.org/10.1007/s10639-022-11431-8>.
- 2) Hanelt A, Bohnsack R, Marz D, Marante CA. A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change. *Journal of Management Studies*. 2021;58(5):1159–1197. Available from: <https://doi.org/10.1111/joms.12639>.
- 3) Bilyalova AA, Salimova DA, Zelenina TI. Digital Transformation in Education. In: International Conference on Integrated Science, ICIS 2019: Integrated Science in Digital Age; vol. 78 of Lecture Notes in Networks and Systems. Springer, Cham. 2020;p. 265–276. Available from: https://doi.org/10.1007/978-3-030-22493-6_24.
- 4) da Motta Reis JS, Costa ACF, Espuny M, Batista WJ, Francisco FE, Gonçalves GS, et al. Education 4.0: Gaps Research Between School Formation and Technological Development. In: 17th International Conference on Information Technology–New Generations (ITNG 2020); vol. 1134 of Advances in Intelligent Systems and Computing. 2020;p. 415–420. Available from: https://doi.org/10.1007/978-3-030-43020-7_55.
- 5) Laorach C, Tuamsuk K. Factors Influencing the Digital Transformation of Universities in Thailand. *International Journal of Innovative Research and Scientific Studies*. 2022;5(3):211–219. Available from: <https://doi.org/10.53894/ijirss.v5i3.646>.
- 6) Bilyalova AA, Salimova DA, Zelenina TI. Digital Transformation in Education. In: International Conference on Integrated Science, ICIS 2019: Integrated Science in Digital Age; vol. 78 of Lecture Notes in Networks and Systems. Springer International Publishing. 2020;p. 265–276. Available from: https://doi.org/10.1007/978-3-030-22493-6_24.
- 7) Dolenc K, Šorgo A, Ploj-Vrtič M. Perspectives on Lessons From the COVID-19 Outbreak for Post-pandemic Higher Education: Continuance Intention Model of Forced Online Distance Teaching. *European Journal of Educational Research*. 2022;11(1):163–177. Available from: <https://doi.org/10.12973/euler.11.1.163>.
- 8) Van Vu D, Tran GN, Van Nguyen C. Digital Transformation, Student Satisfaction, Word of Mouth and Online Learning Intention in Vietnam. *Emerging Science Journal*. 2022;6:40–54. Available from: <https://doi.org/10.28991/ESJ-2022-SIED-04>.
- 9) Thi HP, Tran QN, La LG, Doan HM, Vu TD. Factors motivating students' intention to accept online learning in emerging countries: the case study of Vietnam. *Journal of Applied Research in Higher Education*. 2023;15(2):324–341. Available from: <https://doi.org/10.1108/JARHE-05-2021-0191>.
- 10) Alhubaishy A, Aljuhani A. The challenges of instructors' and students' attitudes in digital transformation: A case study of Saudi Universities. *Education and Information Technologies*. 2021;26(4):4647–4662. Available from: <https://doi.org/10.1007/s10639-021-10491-6>.

- 11) Importance of Digital Curriculum Development in Higher Education. 2023. Available from: <https://www.hurix.com/digital-curriculum-development-higher-education/>.
- 12) Orellana V, Cevallos Y, Tello-Oquendo L, Inca D, Palacios C, Renteria L. Quality Evaluation Processes and its Impulse to Digital Transformation in Ecuadorian Universities. In: 2019 Sixth International Conference on eDemocracy & eGovernment (ICEDEG), 24-26 April 2019, Quito, Ecuador. IEEE. 2019. Available from: <https://ieeexplore.ieee.org/document/8734373>.
- 13) Røe Y, Wojniusz S, Bjerke AH. The Digital Transformation of Higher Education Teaching: Four Pedagogical Prescriptions to Move Active Learning Pedagogy Forward. *Digital Learning Innovations*. 2021;6:1–6. Available from: <https://doi.org/10.3389/educ.2021.784701>.
- 14) McCarthy AM, Maor D, McConney A, Cavanaugh C. Digital transformation in education: Critical components for leaders of system change. *Social Sciences & Humanities Open*. 2023;8(1):1–15. Available from: <https://doi.org/10.1016/j.ssaho.2023.100479>.
- 15) Rudhumbu N, Parawira W, Bhukuvhani C, Nezandoyi J, Majoni C, Chikosha F, et al. Insight into online teaching behaviour of lecturers in Zimbabwean universities during the COVID-19 era and beyond: issues and challenges. *The International Journal of Information and Learning Technology*. 2021;38(5):518–539. Available from: <https://doi.org/10.1108/IJILT-07-2021-0104>.
- 16) Nunnally JC, Bernstein IH. Psychometric theory. 3rd ed. McGraw-Hill series in psychology; New York, USA. McGraw Hill. 1994. Available from: <https://search.worldcat.org/title/Psychometric-theory/oclc/28221417>.
- 17) Kavyashree MB, Kulenur S, Nagesh P, Nanjundeshwaraswamy TS. Relationship between Human Resource Management Practices and Employee Engagement. *Brazilian Journal of Operations & Production Management*. 2022;20(1):1–15. Available from: <https://doi.org/10.14488/BJOPM.1331.2023>.
- 18) Kock N. Hypothesis Testing with Confidence Intervals and P Values in PLS-SEM. *International Journal of e-Collaboration*. 2016;12(3):1–6. Available from: <https://www.igi-global.com/gateway/article/163226>.
- 19) Kim KH, Bentler M. Data Modeling: Structural Equation Modeling. In: Handbook of complementary methods in education research. New York. Lawrence Erlbaum Associates. 2006;p. 161–175. Available from: <https://d-nb.info/1137054514/34>.
- 20) Jr JFH, Sarstedt M, Hopkins L, Kuppelwieser VG. Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*. 2014;26(2):106–121. Available from: <https://doi.org/10.1108/EBR-10-2013-0128>.
- 21) Nguyen TH, Van QN, Tuyet MNT. An Empirical Study of Principals' Leadership Styles with Faculty Commitment. *Emerging Science Journal*. 2022;6(3):603–618. Available from: <https://doi.org/10.28991/ESJ-2022-06-03-013>.
- 22) Bond M, Marín VI, Dolch C, Bedenlier S, Zawacki-Richter O. Digital transformation in German higher education: student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education*. 2018;15:1–20. Available from: <https://doi.org/10.1186/s41239-018-0130-1>.