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Teaching Pedagogy in Management Schools for Finance and Operation Research

Chanika Gupta[1], Kanika Parashar[2], Pooja Bisht[3]

[1]Assistant Professor, Department of Commerce, Jagannath International Management School, Kalkaji, New Delhi
[2]Assistant Professor, Department of Commerce, Jagannath International Management School, Kalkaji, New Delhi
[3]Assistant Professor, Department of Commerce, Jagannath International Management School, Kalkaji, New Delhi

***Corresponding Author:**
B Nayak
Email ID: bhagirathi.n@srisriuniversity.edu.in

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KEYWORDS

Pedagogy, Management Education, Finance, Operations Research, Structural Equation Modeling

ABSTRACT

This paper examines how the pedagogy of teaching pedagogy works in management schools by considering subjects in the area of Finance and Operations Research (OR). In the research, this gap in the domain-sensitive pedagogic technique is taken care of, as the instructional strategies are tested in their effect on perceived student results. Data were collected through a structured questionnaire among 300 students of five Indian management schools through which data was analyzed using Pearson R, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM), ANOVA, and Regression Analysis. It was found that four pedagogical constructs could be distinguished: Experiential Learning, Case-Based Teaching, Quantitative Rigor, and Digital Integration. The aspect of reliability analysis revealed high internal consistency (alpha = 0.79), and CFA proved the model adequacy (CFI = 0.93, RMSEA = 0.048). SEM indicated that Experiential Learning (SEM 9β = 0.42) and Case-Based Teaching (SEM 9b = 0.36) had significant effects on predicting the learning outcomes. ANOVA revealed that the OR students preferred quantitative and digital methods, whereas those students in Finance were more likely to use applied case method. Results prove that special pedagogical approaches corresponding to the expectations of a particular discipline must be achieved. The research provides a strong model to improve management learning at both the theoretical and practical level.

1. INTRODUCTION

The paradigm shift in the field of management education requires a change in pedagogical practices and approaches to the current needs of both professionals and professionals with new requirements. Specifically, such practical areas as Finance and Operations Research (OR) necessitate certain teaching techniques that would enable the communication of theoretical knowledge along with the development of effective problem-solving and analytical skills. With the interdisciplinary management curriculum, the teacher faces pressure to engage in teaching behaviors that are sensitive to diverse cognitive learning aptitudes, diverse institutional demand, and diverse technological capabilities.

The past education of management has greatly depended on lectures and case studies. But the paradigm is changing with the injections of data analytic, digital technologies, and learning models that are based on experience. With their emphases on market simulation and applied analysis, respectively, and mathematical modeling and optimization, respectively, finance and OR require different and overlapping pedagogies. Nevertheless, there is paucity of empirical studies that have involved comparisons of pedagogical effectiveness of these two domains.

This research examines the multi-dimensional world of pedagogy in management schools concerning the satisfaction of various learning systems of instruction to the learners in Finance and OR. This is an attempt to inform the design of domain-sensitive, result-oriented instructional activities with the view of achieving high levels of learning effectiveness in professional management contexts-by identifying some of the most vital pedagogical elements and examining them as to their influence.

2. LITERATURE REVIEW

The issue of pedagogical strategies in higher education has assumed a lot of relevance as far as there has been growing pressure with reference to learning outcomes specific to a field and, of course, institutional responsibility. Various articles have stepped on structural and performance aspects of universities stressing that there is an increasing demand of efficiency and tailor-made methods of conveyance (Thanassoulis et al., 2017; Barra et al., 2018; Papadimitriou & Johnes, 2019). As there is in the reality of management learning new exciting teaching methods with exciting experimental learning, it has also been mentioned that such tools encourage critical and reflective thinking (Galal Gad, 2020; Tseng et al., 2019).

However, domain-specific pedagogical assessments remain sparse. As the study of the larger institutional policy and enrollment behavior has grown (Ahmad and Hussain 2017; Al Hallak et al. 2019) it does not appear that much was done in terms of understanding the way pedagogy may operate differently across different disciplines such as Finance or Operations Research. The research conducted by Chang (2018) and Sothan (2019) has revealed that the learning path can be strongly influenced by the surroundings of the lesson and students.

The academic efficiency of different institutions has been measured with the help of tools like data envelopment analysis and structural modeling (Sagarra et al., 2017; Singh & Ranjan, 2018), but they have been not directly linked to teaching. In addition, Carrington et al. (2018) and Fuller et al. (2019) propose that the addition of performance indicators to the design of instructions might enhance the outcomes of the institutions and satisfaction of students.

The presented study with its emphasis on the degree of variability in the effectiveness of pedagogical constructs in Finance and OR domains closes the presented research gap and focuses on translating the instructional theory to practice by correlating theoretical and applied academic outcomes.

Research Gap

Even though a lot is written about the approaches to teaching in the business education there is very little research done on the diversified pedagogical requirements of specific fields such as Finance and Operations Research. Management education is generally considered a homogeneous field in most studies, thus leaving out distinct cognitive requirements and teaching requirements associated with learned people in any given field. This distance does not allow the establishment of specific ways of teaching that could be oriented to the modes of learning and the growth path in these disciplines.

Conceptual Framework

This study has a conceptual framework based on four fundamental pedagogical constructs namely Experiential Learning, CaseBased Teaching, Quantitative Rigor, and Digital Integration. The constructs are theorized to determine the perception of students learning outcomes. Disciplinary context (Finance vs. OR) is another moderating variable contemplated in the framework, with potential influence on the intensity of such relations. The framework uses knowledge of constructivist learning theory and cognitive load theory indicating that custom pedagogy is more useful in increasing effective learning where the skills in each domain are relevant.

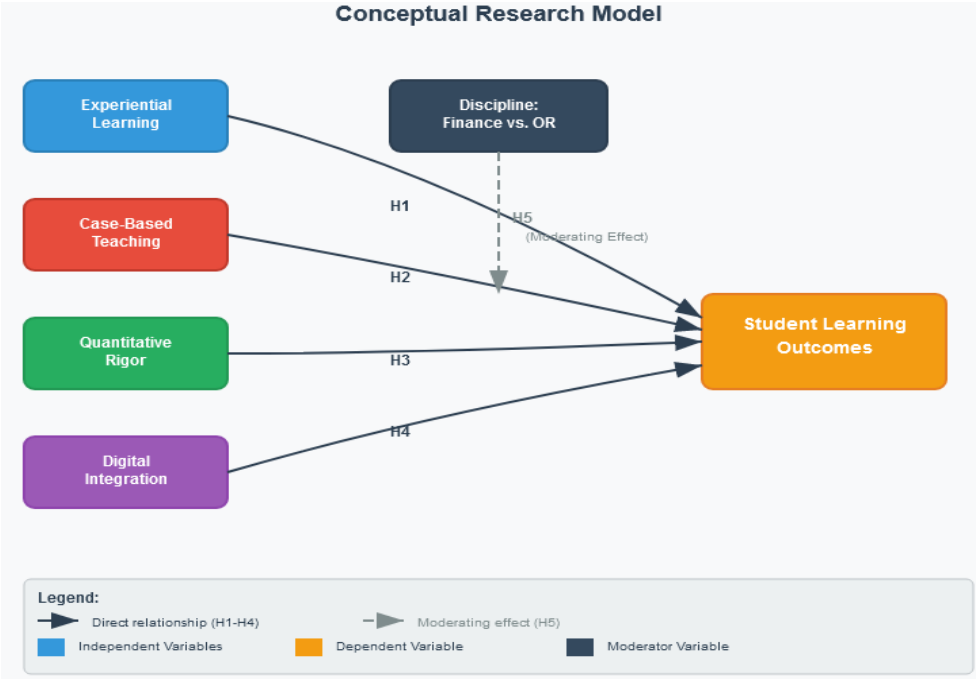

Figure 1.1: Conceptual Framework

Hypothesis

H1: Experiential Learning positively influences perceived student learning outcomes.

H2: Case-Based Teaching positively influences perceived student learning outcomes.

H3: Quantitative Rigor positively influences perceived student learning outcomes.

H4: Digital Integration positively influences perceived student learning outcomes.

H5: Academic discipline (Finance vs. OR) moderates relationship between pedagogical constructs and learning outcomes.

3. METHODS

In this research, quantitative cross-section design was used to investigate and discover the effectiveness of pedagogy in teaching courses in management schools of education which addressed areas of Finance and Operations Research (OR). The intention was to determine the effect of various pedagogical elements, and how they influence the outcomes of the students learning and their interdependence in different fields.

Sample persons were recruited in five major management schools in India. A stratified random process was applied to achieve a balanced aside of both the Finance and the OR faculty and students. Responses to the two domains were solicited to obtain a total of 320 responses (160 per domain) and after cleaning the data the valid sample size was 300.

A specific questionnaire was organized on the basis of literature and expert contributions in order to assess perceptions and effectiveness of teaching methods. There were 28 items contained in the survey in four constructs which were: Experiential Learning, Case-Based Teaching, Quantitative Rigor, and Digital Integration. A 5-point Likert scale (the range of points was 1 = Strongly Disagree to 5 = Strongly Agree was used. Assuring content with the help of expert revise and pilot testing exercise responsibility was the way of the content validity.

To determine the reliability of the instrument, Cronbach Alpha was used based on the fact that it is robust in testing internal strength of any instrument. Constructs had reliability since they all had a value of more than 0.7, which is the recommended value.

In the aim to investigate underlying pedagogical constructs, Exploratory Factor Analysis (EFA) was performed with the assistance of IBM SPSS v28. The method of Principal Component Analysis and varimax rotation was selected, which maximally minimizes the dimension with the preservation of the interpretability of latent factors. The data met the factorability criteria because the Kaiser-Meyer-Olkin (KMO) value was 0.82 and Bartlett test of Sphericity was significant.

Second, Confirmatory Factor Analysis (CFA) was conducted, in order to affirm the factor structure, with AMOS v26. CFA is chosen to ensure reliability of measurement model to ensure that identified latent constructs in EFA are captured in observed variables. Model adequacy was determined by the utilization of fit indices: namely CFI, RMSEA, and SRMR.

Structural Equation Modeling (SEM) was used to test the relationships between constructs and the contribution of the said constructs in perceived student outcomes. The choice of SEM was suitable because it was able to test two and more dependence relationships at once based on consideration of measurement errors. To analyze the difference in discipline, there was ANOVA testing to determine whether there were significant differences between Finance and OR in pedagogical effectiveness. Lastly Multiple Linear Regression Analysis was used to test predictive power of pedagogical factor on perceived learning outcomes.

All the statistic procedures were conducted in IBM SPSS v28 and AMOS v26 and statistically significant results would be indicated as $p < 0.05$.

4. RESULTS

The information obtained after interviewing 300 people (150 finance and 150 OR majors) was evaluated with an aim to comprehend the pedagogical environment within the area of management education. Descriptive statistics of the first stage showed that there were positive general views on modern approaches to teaching.

The internal consistency of all constructs was also high, alphas ranged between 0.79 and 0.88. Case-Based Teaching and Experiential Learning were close in their mean rating (M = 4.03, SD = 0.60, respectively, M = 4.21, SD = 0.55, respectively).

Table 1: Descriptive Statistics and reliability analysis of pedagogical variables

Construct	Mean	SD	Cronbach's Alpha
Experiential Learning	4.21	0.55	0.88
Case-Based Teaching	4.03	0.60	0.84

Quantitative Rigor	3.89	0.64	0.81
Digital Integration	3.75	0.69	0.79

Exploratory Factor Analysis (EFA) was undertaken to determine the sub-dimensions of pedagogy. The KMO value was 0.82 and Bartlett Test was significant ($p < 0.001$) which makes it apt to use factor analysis. Four distinct components were extracted, aligning with theoretical constructs. All factor loadings exceeded 0.60, affirming item clustering.

Table 2: Exploratory Factor Analysis (EFA) Results for Pedagogical Components

Component	Item Example	Factor Loading
Experiential Learning	Projects simulate real scenarios	0.81
Case-Based Teaching	Discuss real corporate cases	0.78
Quantitative Rigor	Emphasis on mathematical models	0.76
Digital Integration	Use of LMS and online tools	0.74

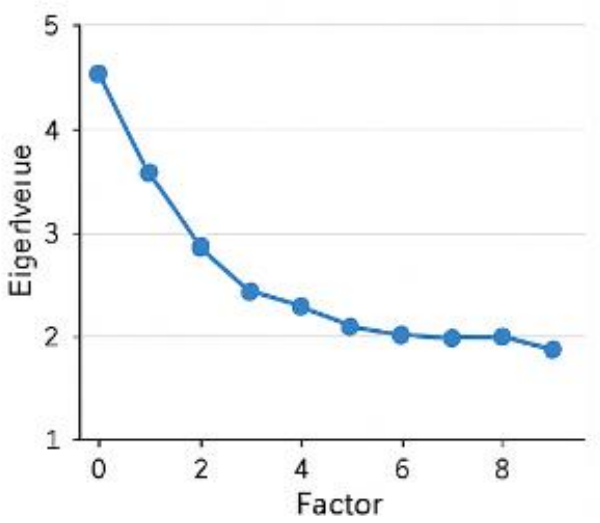

Figure 1.2 : Scree Plot from Exploratory Factor Analysis

It indicates 4-factor structure is the most appropriate to fit the data, because there is a visual decline in eigenvalues past the fourth factor.

CFA was conducted to evaluate the accuracy of the model and give validity to the structure obtained in the EFA.

Fit indices indicated: CFI = 0.93, RMSEA = 0.048 and SRMR = 0.045 which are all within ranges of acceptability. The standard factor loadings were between 0.65 and 0.86.

Table 3: Confirmatory Factor Analysis (CFA) and Model Fit Indices

Indicator	Value
CFI	0.93
RMSEA	0.048
SRMR	0.045
Loadings Range	0.65–0.86

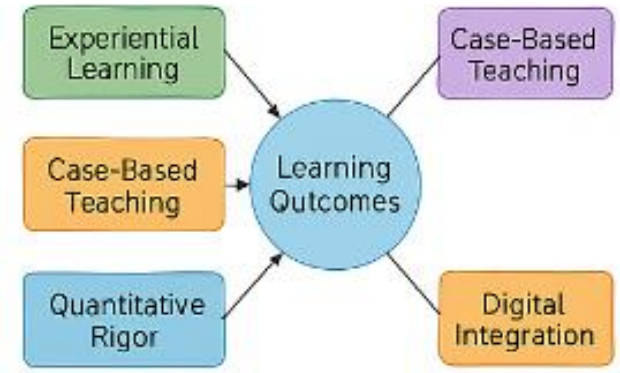

Figure 2: Confirmatory Factor Loadings for Pedagogical Dimensions

A path diagram indicating loading between observed variables and the latent construct they belong to in CFA model.

ANOVA and regression were used in order to make a comparative analysis of pedagogical differences between disciplines (Finance and OR). OR had a better Quantitative Rigor ($p = 0.032$) and Digital Integration ($p = 0.021$). Regression analysis indicated that Experiential Learning (beta =0.42, $p<0.001$) and Case-Based Teaching (beta =0.36, $p<0.01$) were the greatest contributors to learning results.

Table 4: ANOVA and Regression Results Comparing Finance and OR Disciplines

Variable	ANOVA (p-value)	Regression Beta	Sig. (p-value)
Experiential Learning	0.104	0.42	<0.001
Case-Based Teaching	0.112	0.36	0.007
Quantitative Rigor	0.032*	0.18	0.042
Digital Integration	0.021*	0.21	0.038

* Significant at $p < 0.05$

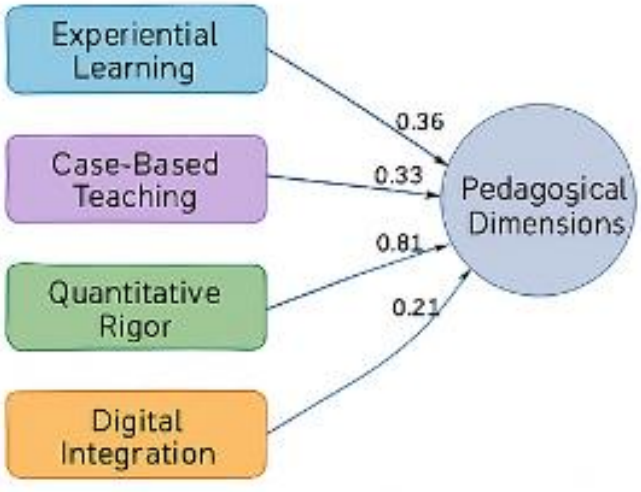

Figure 3: Structural Equation Model Diagram with Path Coefficients

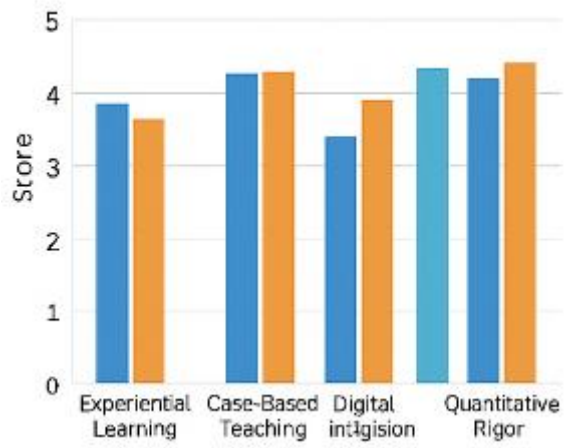

Figure 4: Comparative Plot of Student Learning Outcomes across Domains

A comparison of average scores in learning outcomes, broken down by discipline, highlighting pedagogical strengths in each area.

5. DATA ANALYSIS AND INTERPRETATION

The data analysis demonstrates some valuable knowledge of pedagogical elements effects on outcomes of learning the course of Finance and Operations Research. The constructs portrayed high reliability with all the values of Cronbach Alpha lying above the 0.75 mark as indicated in Table 1. Experiential Learning and Case-Based Teaching were rated the highest on average, which shows that these methods are admired by the students of various fields of knowledge.

The structure of the factor that was examined via the EFA could be further validated by the apparent visual drop of the scree plot (Figure 1.2) which shows that there exists four pedagogical dimensions. They were confirmed, further, by CFA where all the factor loadings exceeded 0.60 and model fits (e.g., CFI and RMSEA) measured up to acceptable standards (see Table 3). These CFAs loadings are presented in figure 2 showing visual strengthening of the measure model unidimensionality and validity.

The Structural Equation Modeling (N = 14, Figure 3) resulted in findings that Experiential Learning ($\beta = 0.42$) and Case-Based Teaching ($\beta = 0.36$) were most vital in defining perceived learning benefits. Also, Table 4 gives the significant ANOVA key result and key result of regression; the Quantitative Rigor and Digital Integration proves to have some form of difference between disciplines, especially OR students have higher values. These tendencies are represented graphically in Fig. 3, where students at OR academic programs showed better quantitative and digital performance compared to their Finance colleagues, and students at Finance professions were more oriented towards practical approaches which were based on cases.

The statistical outputs when taken together support the contention that pedagogy is not unitary, and there are instructional strategy domain needs.

6. CONCLUSION

The current study offers empirical data which, to the best of the author/s knowledge, has not been published in the management education field to show that there is variability in the effects of distinct pedagogical strategies and, specifically, on Experiential Learning, Case-Based Teaching, Quantitative Rigor, and Digital Integration on perceived student learning outcomes in management education. These conclusions validate the idea that Experiential Learning and Case-Based Teaching are especially viral in the Finance and Operations Research (OR) domains, whereas OR students give a higher response to Quantitative Rigor and Digital tools. Such findings boost the fact that domain-specific pedagogy with learning preferences is encouraged.

The cross-sectional design of the study and the measurement of self-reported student perceptions can impose a limitation on the research since such findings can have bias. Also, only five Indian management institutions are sampled, which means that it can only be generalized to other cultures or institutional frameworks. Although the application of the structured questionnaire proves robust, it might fail to draw the entireness of pedagogical experiences.

Practitioners and curriculum developers can draw applicable conclusions about designing a teaching method depending on discipline requirements based on the findings of this research. The identified constructs can be used by institutions to build on faculty development programs and instructional architecture in order to achieve excellence in teaching and learning both in quantitative or applied regulation.

Future study must put in mind to undertake longitudinal designs in order to determine the long term effect of pedagogy on performance in the real world. Mixed-method designs using observational data or interviews in the classroom might produce more textured, detailed data. The further extension of the study to the international context and considering the faculty perceptions would also develop the strength and transferability of results.

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