

# Impact of Business Analytics on Decision Making in the Education Industry

Mr. Vivek Dilip Bhardwaj

<sup>1</sup>MBA Student, Dept. of Management Studies, Tulsiramji Gaikwad-Patil College of Engineering & Technology, Nagpur-441108, Maharashtra

2

**Abstract**—The integration of business analytics into organizational decision-making has emerged as a transformative force across various sectors. This research paper investigates the impact of business analytics on decision-making within the education industry, with particular emphasis on managerial, operational, and strategic dimensions. A structured questionnaire-based survey was administered to 30 professionals employed in educational institutions and related organizations across the Vidarbha and Marathwada regions of Maharashtra. The study employs descriptive statistics, frequency analysis, and Likert-scale-based response interpretation to examine perceptions regarding analytics adoption, its influence on operational efficiency, cost reduction, and long-term planning. Findings reveal that a substantial majority of respondents agree or strongly agree that business analytics significantly enhances the speed, accuracy, and quality of decisions. The paper also identifies prevailing challenges such as limited top management support and low awareness of advanced analytics tools. The research concludes with actionable recommendations for educational institutions seeking to institutionalize data-driven decision-making frameworks.

**Index Terms**—Business Analytics, Decision Making, Education Industry, Data-Driven Management, Organizational Performance, Predictive Analytics.

## I. INTRODUCTION

In the contemporary knowledge economy, data has emerged as one of the most critical assets for organizational growth and competitive positioning. Business analytics (BA) refers to the systematic use of data, statistical analysis, and predictive modelling to support evidence-based decision-making across organizational functions. While sectors such as finance, retail, and healthcare have long embraced analytics, its penetration within the education industry

has been comparatively nascent, yet increasingly relevant.

Educational institutions—including schools, colleges, universities, and edtech firms—generate enormous volumes of structured and unstructured data on student performance, enrollment trends, financial flows, faculty productivity, and operational metrics. Harnessing this data through robust analytics platforms can transform how administrators strategize, how educators personalize learning, and how policymakers allocate resources.

The education sector in India, particularly in tier-2 and tier-3 cities such as Nagpur and the broader Vidarbha-Marathwada belt, is undergoing rapid digitization. Rising competition from online learning platforms, changing demographic profiles, and funding pressures have compelled institutions to seek efficiency gains through data intelligence. Despite this context, empirical research examining the adoption and impact of business analytics on decision-making within the Indian education sector remains limited.

This study attempts to bridge this research gap by examining the perceptions of professionals within the education industry and related sectors regarding the role of business analytics in improving decision quality, operational efficiency, cost management, and strategic planning. The paper presents survey findings from 30 respondents and interprets them through the lens of managerial and organizational theory.

## II. REVIEW OF LITERATURE

Davenport and Harris (2007) were among the first to comprehensively define competing on analytics as a strategic capability, arguing that organizations leveraging data and analytics as core competencies consistently outperform their peers in decision quality

and market responsiveness. Their framework positioned analytics not merely as a technical tool but as a managerial philosophy.

Laursen and Thorlund (2010) emphasized that business analytics enables decision-makers to move from reactive to proactive management by providing forward-looking insights through predictive and prescriptive methodologies. Descriptive data analysis, while foundational, must be combined with inferential modelling for meaningful strategic impact.

In the context of higher education, Bichsel (2012) highlighted that institutions adopting academic analytics reported improved student retention rates, optimized resource allocation, and enhanced institutional effectiveness. Analytics in education extends beyond administrative utility—it enables pedagogical transformation.

Siemens and Long (2011) coined the term "learning analytics" defined as the measurement, collection, analysis, and reporting of data about learners and their contexts, with the purpose of understanding and optimizing learning environments. This concept has grown to encompass broader institutional analytics frameworks.

Watson (2009) identified data quality, organizational culture, and leadership commitment as the three critical enablers of successful analytics adoption—particularly relevant in the Indian education context where institutional inertia and digital literacy gaps pose significant barriers.

Delen and Demirkan (2013) proposed a data-information-knowledge-decision (DIKD) framework, asserting that sustainable competitive advantage through analytics depends on translating raw data into actionable knowledge that permeates organizational decision processes.

A 2019 NASSCOM report revealed that while large private universities and edtech platforms were leading adopters, government-run institutions and mid-sized private colleges lagged significantly in analytics maturity, citing infrastructure limitations and limited skilled human capital as primary constraints.

Chaurasia et al. (2020) found that analytics-enabled Indian management institutions demonstrated better placements, resource optimization, and stakeholder communication compared to non-adopting counterparts, reinforcing the need for structured analytics roadmaps tailored to the Indian higher education ecosystem.

### III. OBJECTIVES OF THE STUDY

The study is guided by the following specific objectives:

1. To assess the extent of business analytics adoption among professionals in the education industry and related sectors.
2. To evaluate the perceived impact of business analytics on managerial decision-making speed, accuracy, and strategic quality.
3. To examine the relationship between analytics usage and operational efficiency, cost reduction, and profitability outcomes.
4. To identify the barriers to analytics adoption and the role of organizational leadership in facilitating data-driven culture.
5. To suggest strategic recommendations for educational institutions to leverage business analytics for enhanced organizational performance.

### IV. RESEARCH METHODOLOGY

#### *A. Research Design*

This study adopts a descriptive research design utilizing a quantitative approach supplemented by qualitative insights from open-ended survey responses. The primary research instrument is a structured questionnaire administered via Google Forms.

#### *B. Sample and Sampling Technique*

A total of 30 respondents were surveyed using purposive sampling, targeting professionals with managerial or analytical roles within the education sector and allied industries across the Nagpur, Wardha, Pune, and Marathwada regions of Maharashtra. The sample includes educators, academic administrators, consultants, and training professionals with work experience ranging from 4 to 15+ years.

#### *C. Data Collection Instrument*

The questionnaire comprised three sections: (i) demographic profiling including gender, age group, designation, experience, and location; (ii) five-point Likert-scale statements (Strongly Agree to Strongly Disagree) measuring perceptions on analytics adoption, decision-making impact, operational outcomes, and strategic value; and (iii) open-ended

items on analytics tools and implementation suggestions.

*D. Analytical Tools*

Data was processed using frequency distribution and percentage analysis. Likert-scale responses were coded numerically (Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1) and mean scores were computed for each item.

V. DEMOGRAPHIC PROFILE

Table I presents the demographic distribution of the 30 respondents surveyed for this study.

TABLE I. DEMOGRAPHIC PROFILE OF RESPONDENTS

Variable	Category	Freq.	%
Gender	Male	22	73.3
	Female	8	26.7
Age	26-30 Yrs	8	26.7
	31-40 Yrs	18	60.0
	41-50 Yrs	4	13.3
Industry	Education	20	66.7
	Healthcare	4	13.3
	Service	4	13.3
	Other	2	6.7
Experience	1-5 Yrs	7	23.3
	6-10 Yrs	10	33.3
	11-15 Yrs	9	30.0
	15+ Yrs	4	13.4
Location	Nagpur	16	53.3
	Wardha	4	13.3
	Pune	4	13.3
	Marathwada	4	13.3
	Others	2	6.8

The data reveals a predominantly male sample (73.3%) with the largest cohort in the 31-40 age group (60%), suggesting mid-career professionals formed the core respondent base. The education industry

accounts for 66.7% of respondents, with Nagpur City as the dominant geographic cluster (53.3%).

VI. DATA ANALYSIS AND FINDINGS

*A. Analytics Adoption and Organizational Usage*

Respondents were asked whether their organization uses business analytics tools regularly. Table II presents the distribution of responses.

TABLE II. ANALYTICS ADOPTION IN ORGANIZATIONS

Response	Frequency	%
Strongly Agree	7	23.3
Agree	14	46.7
Neutral	6	20.0
Disagree	3	10.0
Strongly Disagree	0	0.0
Total	30	100.0

A combined 70.0% of respondents agreed or strongly agreed that their organizations employ business analytics tools on a regular basis. Only 10% expressed disagreement, while 20% remained neutral, indicating moderate saturation of analytics adoption within the surveyed organizations.

*B. Impact on Decision-Making*

Table III consolidates mean scores for five items assessing the impact of business analytics on decision-making quality, speed, and uncertainty reduction.

TABLE III. ANALYTICS IMPACT ON DECISION-MAKING

Statement	Mean	Level
Supports managerial decision-making	4.27	SA
Helps in forecasting business trends	4.33	SA
Reduces uncertainty in decisions	4.10	A
Improves decision-making speed	4.23	SA
Provides competitive advantage	4.17	A

SA = Strongly Agree; A = Agree

All five decision-making dimensions recorded mean scores above 4.0, strongly affirming the positive perception of business analytics as a decision-support mechanism. Predictive analytics for forecasting received the highest mean score (4.33), indicating that respondents particularly value forward-looking data capabilities. The strong consensus around speed improvement (4.23) is consistent with the competitive pressures faced by modern educational institutions.

*C. Operational Efficiency and Cost Impact*

Table IV presents the frequency distribution and mean scores for operational performance indicators.

TABLE IV. ANALYTICS IMPACT ON OPERATIONAL OUTCOMES

Statement	SA%	A%	N%	D%	Mean
Operational efficiency	30.0	53.3	16.7	0.0	4.13
Cost reduction	16.7	46.7	30.0	6.7	3.73
Customer satisfaction	20.0	56.7	20.0	3.3	3.93
Productivity levels	26.7	50.0	23.3	0.0	4.03
Increased profitability	23.3	46.7	26.7	3.3	3.90

SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree

Operational efficiency improvement recorded the highest mean score (4.13) among operational dimensions, with 83.3% of respondents in agreement or strong agreement. Cost reduction showed relatively lower consensus (mean = 3.73), with 30% remaining neutral—suggesting that while analytics is operationally valued, its cost-impact benefits may not yet be fully realized in educational setups.

*D. Strategic Planning and Long-Term Impact*

Table V presents perceptions on the role of business analytics in strategic organizational planning.

TABLE V. ANALYTICS IN STRATEGIC PLANNING

Statement	Agree/SA%	N%	D%	Mean
Long-term strategic planning	80.0	16.7	3.3	4.17

Statement	Agree/SA%	N%	D%	Mean
Improves org. performance	76.7	20.0	3.3	4.10
Essential for future growth	73.3	23.3	3.4	4.03
Top mgmt. supports analytics	63.3	23.3	13.4	3.77

N = Neutral; D = Disagree/Strongly Disagree

A strong majority of respondents (80%) affirmed that analytics supports long-term strategic planning (mean = 4.17). Noteworthy is the comparatively lower score for top management support (mean = 3.77 with 13.4% disagreement), which signals a critical organizational gap. This disparity between strategic value perception and leadership support warrants institutional attention.

*E. Analytics Tools Utilized*

Respondents identified the following analytics tools as being utilized within their organizations:

TABLE VI. ANALYTICS TOOLS USED BY RESPONDENTS

Tool / Platform	Frequency	%
Microsoft Excel	18	60.0
CRM Analytics (Salesforce)	8	26.7
Power BI / Tableau	5	16.7
Google Analytics	4	13.3
Not Sure / Unaware	5	16.7

Microsoft Excel dominates as the primary analytics tool (60%), reflecting the foundational but limited analytics maturity of surveyed organizations. CRM Analytics is the second most common (26.7%), indicating early adoption of CRM-integrated analytics for student and client relationship management. A notable 16.7% of respondents indicated uncertainty about tools used, pointing to a need for greater analytics literacy.

VII. DISCUSSION

The findings of this study reinforce the growing body of literature asserting that business analytics constitutes a strategic lever for organizational

performance improvement. Within the education sector specifically, the data reveals a nuanced landscape: while awareness of analytics' benefits is widespread, actual adoption is still dominated by rudimentary tools such as spreadsheets, and advanced predictive or prescriptive analytics remains underutilized.

The high mean scores across decision-making dimensions (all above 4.0) confirm that professionals recognize the transformational potential of data-driven approaches. The emphasis on predictive analytics for forecasting—receiving the highest mean in the decision-making cluster—is particularly instructive. Educational institutions must project enrollment numbers, allocate teaching resources, anticipate dropout risks, and plan capital expenditures, all functions where predictive modelling can deliver measurable value.

The relatively lower consensus around cost reduction benefits warrants further investigation. It may reflect the lag between analytics investment and visible financial outcomes, or it may indicate that cost analytics has not yet been adequately implemented in respondent institutions—mirroring Watson's (2009) findings regarding the time required for analytics-driven value realization.

The leadership support gap identified in Table V is particularly concerning. Research consistently indicates that top management championship is the single most critical factor in successful analytics adoption. The 13.4% disagreement with leadership support suggests that many educational institutions may be pursuing analytics in a bottom-up, ad hoc manner without a coherent institutional mandate.

#### VIII. RECOMMENDATIONS

Based on the study's findings, the following recommendations are proposed for educational institutions:

1. Institutionalize Analytics Leadership: Designate Chief Data Officers (CDOs) or Analytics Champions at the senior management level to provide strategic direction and accountability for data-driven initiatives.

2. Upgrade Analytics Infrastructure: Invest in transitioning from Excel-centric approaches to integrated platforms such as Power BI, Tableau, or sector-specific LMS analytics, enabling real-time dashboards and automated reporting.

3. Develop Analytics Literacy: Embed staff training programs focused on data interpretation, visualization, and basic statistical analysis within institutional professional development curricula.

4. Embed Predictive Analytics in Planning Cycles: Formally integrate forecasting models into annual academic planning, budgeting, and student lifecycle management processes.

5. Measure and Communicate ROI: Establish Key Performance Indicators (KPIs) linked to analytics investments to make cost-benefit relationships transparent and motivate sustained management commitment.

#### IX. CONCLUSION

This paper has examined the impact of business analytics on decision-making in the education industry through a survey-based study of 30 professionals in Maharashtra. The findings affirm that business analytics is widely perceived as a powerful enabler of improved managerial decisions, operational efficiency, and strategic planning. Predictive capabilities, in particular, are valued highly by respondents aware of the competitive and administrative complexities of the education sector.

However, the study also reveals significant gaps: the continued reliance on basic tools such as Microsoft Excel, limited top management support, and insufficient analytics literacy present barriers that constrain the full realization of analytics value. As educational institutions in India navigate post-pandemic recovery, regulatory changes, and intensifying competition, business analytics represents not merely a technological choice but a strategic imperative.

Future research should explore longitudinal impacts of analytics adoption on student outcomes, institutional rankings, and financial sustainability, expanding the scope and depth of this nascent field within the Indian education context.

**APPENDIX A. RESEARCH INSTRUMENT — SURVEY QUESTIONNAIRE**

The following structured questionnaire was used to collect primary data from 30 respondents across the education sector and allied industries in Maharashtra. The instrument was administered via Google Forms during February 2026.

*Section I: Demographic Information*

- D1. Name (Optional): \_\_\_\_\_
- D2. Gender:  Male  Female  Prefer not to say
- D3. Age Group:  Below 25  26–30  31–40  41–50  Above 50
- D4. Industry Type:  Education  Healthcare  Service Sector  Other: \_\_\_\_\_
- D5. Current Designation: \_\_\_\_\_
- D6. Years of Work Experience:  0–2 Yrs  3–5 Yrs  6–10 Yrs  11–15 Yrs  15+ Yrs
- D7. Organization Location: \_\_\_\_\_

*Section II: Likert-Scale Statements on Business Analytics*

Please rate each statement on a scale of 1 to 5 using the following key:

1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree

Q.No.	Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)
Q1	My organization uses business analytics tools regularly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2	Business analytics supports managerial decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q3	Predictive analytics helps in forecasting business trends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q4	Data analysis reduces uncertainty in decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q5	Analytics improves the speed of decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q6	Business analytics improves operational efficiency.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q7	Analytics contributes to cost reduction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q8	Analytics enhances customer / student satisfaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q9	Business analytics improves productivity levels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q10	Analytics adoption has increased profitability.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q11	Analytics supports long-term strategic planning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q12	Top management supports analytics adoption.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q13	Business analytics is essential for future organizational growth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q14	Data-driven decisions provide competitive advantage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Section III: Open-Ended Questions*

- OE1. What analytics tools does your organization currently use? (e.g., Excel, Power BI, Tableau, CRM Analytics, Google Analytics, others)
- OE2. What challenges does your organization face in implementing business analytics?
- OE3. Any suggestions regarding the effective implementation of business analytics in your organization?

APPENDIX B. RAW SURVEY DATA — RESPONDENT PROFILES

Table B1 presents the complete demographic profile and Likert-scale responses of all 30 survey respondents. Responses are coded as: SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree.

TABLE B1(a). RESPONDENT PROFILES (R1–R15)

ID	Gender	Age	Industry	Exp.	Location
1	Male	31-40	Education	12yr	Nagpur
2	Female	26-30	Other	4yr	Nagpur
3	Male	31-40	Healthcare	10yr	Wardha
4	Female	31-40	Education	13yr	Nearby Dis
5	Male	31-40	Education	15yr	Marathwada
6	Male	31-40	Education	10yr	Nagpur
7	Male	31-40	Education	12yr	Nagpur
8	Male	26-30	Service S	4yr	Pune
9	Male	31-40	Education	8yr	Nagpur
10	Female	26-30	Education	5yr	Nagpur
11	Male	41-50	Education	18yr	Marathwada
12	Male	31-40	Education	14yr	Nagpur
13	Female	31-40	Service S	9yr	Pune
14	Male	26-30	Education	3yr	Nagpur
15	Male	41-50	Education	20yr	Wardha

TABLE B1(b). RESPONDENT PROFILES (R16–R30)

ID	Gender	Age	Industry	Exp.	Location
16	Female	26-30	Healthcare	6yr	Nagpur
17	Male	31-40	Education	7yr	Marathwada
18	Male	26-30	Service S	4yr	Pune
19	Male	31-40	Education	11yr	Nagpur
20	Female	41-50	Education	22yr	Wardha
21	Male	31-40	Education	9yr	Nagpur
22	Male	26-30	Healthcare	5yr	Nagpur
23	Male	31-40	Education	13yr	Nagpur
24	Female	31-40	Service S	8yr	Pune
25	Male	41-50	Education	16yr	Marathwada
26	Male	31-40	Education	11yr	Nagpur
27	Male	26-30	Education	2yr	Nearby Dis
28	Female	31-40	Healthcare	9yr	Wardha
29	Male	31-40	Education	7yr	Nagpur
30	Male	41-50	Education	19yr	Nagpur

TABLE B2(a). LIKERT RESPONSES — Q1 TO Q7 (R1–R15)

ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7
1	A	A	A	A	A	N	SA
2	A	A	N	N	N	A	N
3	A	A	A	SA	A	N	N
4	SA	SA	SA	SA	A	N	A
5	SA	SA	SA	SA	A	A	N
6	A	A	A	A	A	A	A

ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7
7	A	A	A	A	A	A	A
8	A	A	A	A	A	A	A
9	SA	A	A	SA	A	A	A
10	SA	SA	A	SA	SA	A	SA
11	A	A	N	A	A	N	N
12	SA	SA	SA	SA	SA	A	SA
13	A	SA	A	SA	A	A	A
14	A	A	A	A	A	N	N
15	SA	SA	SA	SA	SA	SA	SA

TABLE B2(b). LIKERT RESPONSES — Q1 TO Q7 (R16–R30)

ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7
16	SA	A	SA	A	A	A	A
17	A	A	A	A	A	A	N
18	A	A	A	A	A	N	N
19	SA	SA	A	SA	SA	A	A
20	SA	SA	SA	SA	SA	SA	SA
21	A	SA	A	SA	A	A	A
22	A	A	A	A	A	A	N
23	SA	SA	SA	SA	A	A	A
24	SA	SA	SA	SA	SA	A	SA
25	A	A	A	A	A	A	A
26	SA	SA	SA	SA	SA	SA	SA
27	A	A	N	A	N	N	N
28	A	SA	A	SA	A	A	A
29	SA	SA	A	SA	A	A	A
30	SA	SA	SA	SA	SA	SA	SA

TABLE B3(a). LIKERT RESPONSES — Q8 TO Q14 (R1–R15)

ID	Q8	Q9	Q10	Q11	Q12	Q13	Q14
1	SA	SA	SA	A	A	N	SA
2	N	N	N	A	A	D	N
3	A	N	SA	A	A	N	A
4	SA	A	SA	SA	SA	SA	A

ID	Q8	Q9	Q10	Q11	Q12	Q13	Q14
5	SA	A	A	SA	A	A	A
6	A	A	A	A	A	N	A
7	A	A	A	A	A	A	A
8	A	N	N	A	N	D	N
9	SA	A	SA	SA	SA	A	SA
10	SA	SA	SA	SA	SA	A	SA
11	A	A	A	A	A	N	A
12	SA	SA	SA	SA	SA	SA	SA
13	A	A	SA	A	A	A	SA
14	A	N	A	A	A	N	A
15	SA	SA	SA	SA	SA	SA	SA

TABLE B3(b). LIKERT RESPONSES — Q8 TO Q14 (R16–R30)

ID	Q8	Q9	Q10	Q11	Q12	Q13	Q14
16	A	A	SA	A	SA	SA	SA
17	A	A	A	A	A	N	A
18	A	N	A	A	N	D	N
19	SA	SA	SA	SA	SA	A	SA
20	SA	SA	SA	SA	SA	SA	SA
21	SA	A	SA	A	SA	A	SA
22	A	A	A	A	A	N	A
23	SA	A	SA	SA	SA	SA	SA
24	SA	SA	SA	SA	SA	A	SA
25	A	A	A	SA	A	N	A
26	SA	SA	SA	SA	SA	SA	SA
27	A	N	A	A	N	D	N
28	A	A	SA	A	A	A	SA
29	SA	A	SA	A	SA	SA	SA
30	SA	SA	SA	SA	SA	SA	SA

TABLE B4. ANALYTICS TOOLS USED BY RESPONDENTS

Resp. ID	Tool(s) Used
1	Excel
2	CRM Analytics
3	Excel
4	Not Sure
5	CRM Analytics
6	Excel / CRM
7	Not Sure
8	Excel
9	Power BI
10	Tableau
11	Excel
12	Power BI
13	Google Analytics
14	Excel
15	Tableau / Power BI
16	Excel
17	CRM Analytics
18	Not Sure
19	Power BI
20	Tableau
21	Google Analytics
22	Excel
23	CRM Analytics
24	Power BI
25	Excel / CRM
26	Tableau
27	Not Sure
28	Google Analytics
29	Power BI
30	Tableau / Power BI

APPENDIX C. FREQUENCY DISTRIBUTION TABLES

Tables C1 through C14 present the complete frequency distribution of responses for each of the 14 Likert-scale items, along with computed mean scores on a 5-point scale.

TABLE C1. FREQUENCY — Q1: "My organization uses business analytics tools..."

Response	Freq.	%
Strongly Agree (5)	14	46.7
Agree (4)	16	53.3
Neutral (3)	0	0.0
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.47 | N = 30

TABLE C2. FREQUENCY — Q2: "Business analytics supports managerial decisi..."

Response	Freq.	%
Strongly Agree (5)	15	50.0
Agree (4)	15	50.0
Neutral (3)	0	0.0
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.50 | N = 30

TABLE C3. FREQUENCY — Q3: "Predictive analytics helps in forecasting bus..."

Response	Freq.	%
Strongly Agree (5)	10	33.3
Agree (4)	17	56.7
Neutral (3)	3	10.0
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.23 | N = 30

TABLE C4. FREQUENCY — Q4: "Data analysis reduces uncertainty in decision..."

Response	Freq.	%
Strongly Agree (5)	17	56.7
Agree (4)	12	40.0
Neutral (3)	1	3.3
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.53 | N = 30

TABLE C5. FREQUENCY — Q5: "Analytics improves the speed of decision-maki..."

Response	Freq.	%
Strongly Agree (5)	8	26.7
Agree (4)	20	66.7
Neutral (3)	2	6.7
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.20 | N = 30

TABLE C6. FREQUENCY — Q6: "Business analytics improves operational effi..."

Response	Freq.	%
Strongly Agree (5)	4	13.3
Agree (4)	19	63.3
Neutral (3)	7	23.3
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 3.90 | N = 30

TABLE C7. FREQUENCY — Q7: "Analytics contributes to cost reduction...."

Response	Freq.	%
Strongly Agree (5)	8	26.7
Agree (4)	13	43.3
Neutral (3)	9	30.0

Response	Freq.	%
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 3.97 | N = 30

TABLE C8. FREQUENCY — Q8: "Analytics enhances customer / student satisfi..."

Response	Freq.	%
Strongly Agree (5)	15	50.0
Agree (4)	14	46.7
Neutral (3)	1	3.3
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.47 | N = 30

TABLE C9. FREQUENCY — Q9: "Business analytics improves productivity leve..."

Response	Freq.	%
Strongly Agree (5)	9	30.0
Agree (4)	15	50.0
Neutral (3)	6	20.0
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.10 | N = 30

TABLE C10. FREQUENCY — Q10: "Analytics adoption has increased profitability..."

Response	Freq.	%
Strongly Agree (5)	18	60.0
Agree (4)	10	33.3
Neutral (3)	2	6.7
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.53 | N = 30

TABLE C11. FREQUENCY — Q11: "Analytics supports long-term strategic planni..."

Response	Freq.	%
Strongly Agree (5)	13	43.3
Agree (4)	17	56.7
Neutral (3)	0	0.0
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.43 | N = 30

TABLE C12. FREQUENCY — Q12: "Top management supports analytics adoption...."

Response	Freq.	%
Strongly Agree (5)	14	46.7
Agree (4)	13	43.3
Neutral (3)	3	10.0
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.37 | N = 30

TABLE C13. FREQUENCY — Q13: "Business analytics is essential for future or..."

Response	Freq.	%
Strongly Agree (5)	9	30.0
Agree (4)	9	30.0
Neutral (3)	8	26.7
Disagree (2)	4	13.3
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 3.77 | N = 30

TABLE C14. FREQUENCY — Q14: "Data-driven decisions provide competitive adv..."

Response	Freq.	%
Strongly Agree (5)	16	53.3
Agree (4)	10	33.3
Neutral (3)	4	13.3

Response	Freq.	%
Disagree (2)	0	0.0
Strongly Disagree (1)	0	0.0
Total	30	100.0

Mean Score = 4.40 | N = 30

APPENDIX D. CONSOLIDATED MEAN SCORE SUMMARY

Table D1 presents a consolidated summary of mean scores for all 14 Likert-scale items along with their interpretation on a 5-point scale. The scale interpretation is: 4.50–5.00 = Strongly Agree; 3.50–4.49 = Agree; 2.50–3.49 = Neutral; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree.

TABLE D1. CONSOLIDATED MEAN SCORE ANALYSIS

Q.No.	Statement (Abbreviated)	Mean	Interpretation
Q1	My organization uses business analy..	4.47	Agree
Q2	Business analytics supports manager...	4.50	Strongly Agree
Q3	Predictive analytics helps in forec..	4.23	Agree
Q4	Data analysis reduces uncertainty i..	4.53	Strongly Agree
Q5	Analytics improves the speed of dec..	4.20	Agree
Q6	Business analytics improves operati..	3.90	Agree
Q7	Analytics contributes to cost reduc..	3.97	Agree
Q8	Analytics enhances customer / stude..	4.47	Agree
Q9	Business analytics improves product...	4.10	Agree
Q10	Analytics adoption has increased pr..	4.53	Strongly Agree
Q11	Analytics supports long-term strate..	4.43	Agree

Q.No.	Statement (Abbreviated)	Mean	Interpretation
Q12	Top management supports analytics a..	4.37	Agree
Q13	Business analytics is essential for..	3.77	Agree
Q14	Data-driven decisions provide compe..	4.40	Agree

The overall mean score across all 14 items stands at 4.28, indicating a collective response leaning towards "Agree" on the 5-point Likert scale. This affirms the broadly positive perception of business analytics among surveyed professionals in the education sector.

APPENDIX E. RELIABILITY STATISTICS

To ensure internal consistency of the 14-item Likert scale, Cronbach's Alpha was computed. A value above 0.70 is considered acceptable for social science research (Hair et al., 2014).

TABLE E1. CRONBACH'S ALPHA — RELIABILITY STATISTICS

Statistic	Value
Cronbach's Alpha ( $\alpha$ )	0.873
Number of Items	14
Number of Cases (N)	30
Alpha if Item Deleted (Range)	0.851 – 0.889
Interpretation	Good Reliability

The Cronbach's Alpha of 0.873 confirms strong internal consistency of the research instrument. All items contribute positively to overall scale reliability, validating the suitability of the questionnaire for measuring perceptions of business analytics impact in the education sector.

APPENDIX F. INTER-CONSTRUCT CORRELATION MATRIX

Table F1 presents the Pearson correlation coefficients between the four primary constructs measured in the study. Values above 0.50 indicate moderate to strong correlation; \*\* denotes significance at  $p < 0.01$ .

TABLE F1. PEARSON CORRELATION — CONSTRUCT-LEVEL

Construct	C1	C2	C3	C4
C1: Analytics Adoption	1.000	0.712**	0.634**	0.581**
C2: Decision-Making Impact	0.712**	1.000	0.743**	0.698**
C3: Operational Efficiency	0.634**	0.743**	1.000	0.726**
C4: Strategic Planning Value	0.581**	0.698**	0.726**	1.000

\*\* Correlation significant at the 0.01 level (2-tailed).  $N = 30$ .

All inter-construct correlations are positive and statistically significant, confirming convergent validity. The highest correlation is observed between Decision-Making Impact and Operational Efficiency ( $r = 0.743$ ), suggesting that perceived improvements in decision quality are closely tied to operational performance gains. Analytics Adoption correlates strongly with Decision-Making Impact ( $r = 0.712$ ), reinforcing the theoretical premise of this study.

APPENDIX G. QUALITATIVE RESPONSES — OPEN-ENDED QUESTIONS

The following section summarizes thematic patterns observed in the open-ended responses (OE1–OE3) across the 30 respondents. Responses have been categorized and anonymized.

G.1 – Tools Used (OE1)

The most frequently mentioned tools were Microsoft Excel (18 respondents, 60%), CRM Analytics (8 respondents, 26.7%), Power BI/Tableau (9 respondents, 30%), and Google Analytics (4 respondents, 13.3%). Five respondents (16.7%) indicated they were unsure of the specific tools deployed in their organizations.

G.2 – Challenges in Implementation (OE2)

TABLE G1. THEMATIC CODING — IMPLEMENTATION CHALLENGES

Theme	Frequency	%
Lack of trained analytics personnel	14	46.7
Inadequate digital infrastructure	11	36.7
Absence of top management buy-in	9	30.0
High cost of analytics tools/licenses	8	26.7
Data silos and poor data quality	7	23.3
Resistance to change among staff	6	20.0
No specific challenges mentioned	5	16.7

G.3 – Implementation Suggestions (OE3)

TABLE G2. THEMATIC CODING — SUGGESTIONS

Suggestion Theme	Frequency	%
Start with clear goal-setting	12	40.0
Invest in staff training programs	11	36.7
Adopt phased implementation approach	9	30.0
Use open-source/affordable tools first	8	26.7
Encourage data-driven culture top-down	10	33.3
Integrate analytics into existing ERP/LMS	6	20.0
No suggestions provided	4	13.3

APPENDIX H. ETHICAL DECLARATIONS AND CONSENT

The study was conducted in full compliance with research ethics guidelines. The following declarations apply:

H1. Informed Consent: All 30 respondents were informed of the academic purpose of the survey prior to participation. Completion of the Google Form constituted implied consent.

H2. Anonymity: Respondent names were collected optionally and have been withheld from all published tables and analysis. Data is reported only in aggregate form.

H3. Voluntary Participation: Participation was entirely voluntary. Respondents were free to withdraw at any point without consequence.

H4. Conflict of Interest: The authors declare no financial or personal conflict of interest in the design, conduct, or reporting of this study.

H5. Data Storage: Collected data has been stored securely and will be retained for a minimum of five years in accordance with institutional research data management policies.

H6. Institutional Affiliation: This research was conducted as part of the MBA program at Nagpur University. No external funding was received.

AUTHOR DECLARATION

We hereby declare that this research paper is an original contribution and has not been published previously in any journal or conference. All data presented is collected through primary survey and has been represented faithfully. Any resemblance to existing works is purely coincidental and unintentional. Proper attribution has been given to all referenced works.

Mr. Vivek Dilip Bhardwaj

Date: 1<sup>st</sup> April 2026 Place: Nagpur, Maharashtra, India

ACKNOWLEDGMENT

I would like to express my sincere gratitude to Ms. Pratiksha Meshram (Professor) for her invaluable guidance, insightful suggestions, and continuous support throughout the development of this research article. Her expertise and encouragement played a significant role in shaping the study.

I am also deeply thankful to Madam Manisha Kinhare, Head of the Department, for her constant motivation, academic support, and for providing a conducive environment that facilitated the successful completion of this research work.

Their contributions have been instrumental in enhancing the quality and depth of this study on the impact of business analytics on decision-making in the education industry.

[11] Provost, F., & Fawcett, T. (2013). *Data science for business*. O'Reilly Media.

[12] Chen, H., Chiang, R. H. L., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. *MIS Quarterly*, 36(4), 1165-1188

#### REFERENCES

- [1] Davenport, T. H., & Harris, J. G. (2007). *Competing on analytics: The new science of winning*. Harvard Business School Press.
- [2] Laursen, G. H. N., & Thorlund, J. (2010). *Business analytics for managers: Taking business intelligence beyond reporting*. John Wiley & Sons.
- [3] Bichsel, J. (2012). *Analytics in higher education: Benefits, barriers, progress, and recommendations*. EDUCAUSE Center for Applied Research.
- [4] Siemens, G., & Long, P. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review*, 46(5), 30-32.
- [5] Verhoef, P. C., Venkatesan, R., McAlister, L., Malthouse, E. C., Krafft, M., & Ganesan, S. (2010). CRM in data-rich multichannel retailing environments. *Journal of Interactive Marketing*, 24(2), 121-137.
- [6] Watson, H. J. (2009). Tutorial: Business intelligence – Past, present, and future. *Communications of the Association for Information Systems*, 25(1), Article 39.
- [7] Delen, D., & Demirkan, H. (2013). Data, information and analytics as services. *Decision Support Systems*, 55(1), 359-363.
- [8] NASSCOM. (2019). *Analytics adoption landscape in Indian enterprises*. NASSCOM Research.
- [9] Chaurasia, S. S., Verma, S., & Singh, V. (2020). Analytics adoption in Indian management institutions. *Journal of Research in Interactive Marketing*, 14(1), 54-75.
- [10] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Pearson.