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Availability, Utilization, and Relevance of School's Data for Efficient Leadership Toward Data-Driven Culture in a Selected Vocational College in Jiangsu China

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Abstract: This study examines the availability, utilization, and relevance of school data in fostering a data-driven culture for leadership in a vocational college in Jiangsu, China. Using a quantitative research design, it investigates teachers' perceptions of data practices, identifies areas for improvement, and explores relationships among key variables. Findings indicate that data availability is generally high, with strong access to student records and behavior data, but gaps exist in integrating nationwide assessments and aggregated survey responses. While data utilization is effective in supporting institutional operations, areas such as empirical data use and curriculum evaluation require attention. The relevance of data is widely recognized for enhancing personalized learning and lesson planning; however, its application in curriculum assessment and tracking student progress scored lower. Significant differences were noted in data utilization based on teaching experience and grade levels, with mid-career teachers and those teaching higher grades demonstrating higher confidence in data practices. Strong positive correlations were observed among availability, utilization, and relevance of data, underscoring their interconnectedness. To address these findings, strategies were proposed, including enhanced access to external data sources, targeted professional development, modernized technological infrastructure, and the establishment of collaborative frameworks. A general implementation plan outlines a phased approach for integrating these strategies, focusing on preparation, capacity building, infrastructure development, and policy formulation. The study underscores the critical role of data in improving leadership efficiency, teaching practices, and institutional outcomes, offering practical recommendations for fostering a sustainable data-driven culture in educational institutions.

Keywords: Data-Driven Culture; Data Availability; Data Utilization; Data Relevance; Educational Leadership; Vocational College; Quantitative Research; Professional Development; Technological Infrastructure; Curriculum Evaluation.

1. Introduction

Using data to inform decision-making processes at the university and classroom contexts/stages is essential and integral in the postmodern setup of schools and universities. University administrators utilize student outcomes data to engage accountability reporting demands, instruct academic objectives, and assess the efficacy of these core concepts. School administrators depend mainly on student data from national assessment tests, even though local assessment data use and conventional assessment data use are declining to be ordinary. They may also make use of attendance records, dropout and graduation data, and discipline records to improve their understanding of the student's progress and achievements.

Educational leaders utilize data to aid respective students and faculty members and to lead the efforts of university administrators in improving the school culture and methodologies. More specifically, educational leaders use data to analyze individual student demands and set students in categories, mediations, plans, and classrooms. They may also utilize student assessment data in assessing overall student development and growth, to adjust learning opportunities for specific students, set students in small Learning Cells (LCs) or short-term intervention programs, set students in classrooms or academic programs, and allow them to or exit them from courses such that their skills and interests are matched and/or aligned; or wherever academic space they will involve and commit themselves.

Developing educator's and educational leaders' usage of data should be dealt in concurrence with related procedures to bolster the curriculum and upgrade the approaches and interference adopted in the name of students' progress and growth. Through data usage in recognize student necessities, guide adjustments in instructions, inspire students, train mentors, assess plans and resolutions, and connect with parents and all stakeholders, educational leaders can guarantee that the other course of action they take to ameliorate student learning are more productive and helpful.

The capacity to deliver standard professional development is integral in empowering educational leaders with the suitable tools to guide the schools' programs and policies productively. Following this, approaches of professional engagement for educational leaders that include methodologies of mentoring, networking, and researching perhaps be probable to better instructional management and specifically affect the amount of time educational leaders allocate on the facets of teaching and learning in universities and academic institutions (Gumus & Bellibas, 2016).

Furthermore, this research aims to understand how educational leaders in different leadership positions at Jiangsu Vocational College of Electronics and Information in Jiangsu Province, China, are utilizing and establishing data practices and data-driven cultures.

In China, data use in education is utilized for a wide variety of uses by educational leaders and teachers. Many of the

major topics regarding data use in education range from the types of data available to be used, how data is mined and organized for analysis, and how data is used in the decision-making process. Along with topics regarding data use, the barriers to data use along with the data literacy are essential to note because data use can become a complicated matter without the proper training, technical infrastructure, or budget. Principals have the most influence in schools regarding how to use data, technology, and establishing a data-driven culture. Thus, research states that educational leaders, such as principals, must be data literate in order to develop a culture of building capacity in data use within schools and school districts.

Due to the explosion of technology and software available for educators to use, in turn, educational leaders have many responsibilities regarding their own data use as well as implementing school-wide and district-wide data initiatives for other educational leaders and teachers to utilize.

2. Statement of the problem

The aim of this study is to examine the availability, utilization, and relevance of school data in fostering an efficient data-driven culture for leadership in a vocational college in Jiangsu, China. It aims to identify gaps in current data practices and propose strategies to enhance leadership efficiency, teaching effectiveness, and institutional outcomes through improved data use.

It sought to answer the following:

(1)What is the profile of the teacher respondents in terms of:

1)sex

2)years of service

3)grade level handled

4)educational attainment

(2)What is the assessment of the teacher respondents in terms of:

1)availability of school's data

2)utilization of school's data

3)relevance of school's data

(3)Is there a significant difference in the assessment of the teacher respondents when their profile is taken as a test factor?

(4)Is there a significant relationship between the availability, utilization, and relevance of the data?

(5)Based on the results of the study, what strategies can be developed to enhance the culture in the school subject?

3. Hypothesis

Ho1 There is no significant difference in the assessment of the teacher respondents when their profile is taken as a test factor

Ho2 There is no significant relationship between the availability, utilization, and relevance of the data.

4. Scope and Delimitation of the study

The research focuses on the many aspects of implementing data at schools. These topics include building a shared vision, and capacity, and establishing accountability measures to ensure that data use is being utilized by teachers and leaders alike. Therefore, while several of the studies reviewed point towards a correlation between educational leader data use and student achievement, there is a need within the field to provide a detailed analysis of why this phenomenon is occurring because data use encompasses a wide range of practices and variables within schools and districts.

This study had several delimitations that were strategically placed by the researcher. These delimitations included the decision to incorporate a wide variety of participants under the all-encompassing term "educational leaders" to participate in this study. The researcher used the term "educational leaders" as a label to encompass a wide range of participants who have leadership responsibilities in their job capacities with each grade level in all Schools in Jiangsu Vocational College of Technology and Information.

The teacher respondents of the study will be taken using simple random from the 250 teachers in Jiangsu Vocational College of Electronics and Information in Jiangsu Province, China.

5. Research Design

The purpose of this study was to understand the relationships between data use, data use confidence, and self-efficacy. This study utilized two research methods. The first research method employed was quantitative. This chapter provided details on the following aspects of the study: research design, participants, instrumentation, data collection, and data analysis.

The study utilized a correlational research design. According to Lunenberg and Irby (2008), a correlational research design determines a relationship between two or more quantifiable variables in addition to measuring the magnitude of the relationship between the variables. To fulfill the purpose of this study, a correlational research design was used to determine if the following measures were related to one another: educational leadership efficacy and data use confidence; educational leadership efficacy and data use; data use and data use confidence; educational leadership efficacy and student achievement; data use confidence and student achievement; and data use and student achievement.

6. Results, Analysis, and Interpretation

6.1. Profile of Teacher Respondents

Table 1. presents the demographic profile of teacher respondents in terms of their sex, years of service, grade level and educational attainment.

Profile	Frequency	Percentage
Sex		
Male	122	48.8%
Female	128	51.2%
Total	**250**	**100%**
Years of Service		
1-5 years	59	23.6%
6-10 years	72	28.8%
11-15 years	63	25.2%
16 years and above	56	22.4%
Total	**250**	**100%**
Grade Level Handled		
Grade 1	75	30.0%
Grade 2	59	23.6%
Grade 3	71	28.4%
Grade 4	45	18.0%
Total	**250**	**100%**
Educational Attainment		
Bachelor's Degree	90	36.0%
Masteral	86	34.4%
Doctorate	**74**	29.6%
Total	250	100%

Table 1 presents the profile of the teacher respondents as follows:

Age. One hundred twenty-eight (128) or 51.2% of the teacher respondents are female in comparison to one hundred twenty-two (122) or 49.8% male teacher respondents. In other words, this study is dominated by female teacher respondents. Lastly, this part has accumulated a mean of 1.51 and a standard deviation of 0.50

Years of Service. Seventy-two (72) or 28.8% of the teacher respondents have 6-10 years of service, on the other hand, sixty-three (63) or 25.2% of them have spent 11-15 years of service, moreover, fifty-nine (59) or 23.6% of the respondents have a short year of service of 1-5 years, lastly, only fifty-six (56) or 22.4% of the teacher respondents have spent the longest years of service of 16 years and above. Overall, this portion has obtained a mean of 2.46 with a standard deviation of 1.08.

Grade of Level. Seventy-five (75) or 30% of the teacher respondents belong to grade 1, while seventy-one (71), or 28.4% of them are Grade 3 teachers, furthermore, fifty-nine (59), or 23.6% of them belong to grade 2 level, lastly, only forty-five (45) or 18% of the teacher respondents are grade 4 teachers. Hence, a mean of 2.34 with a standard deviation of 2.09 was obtained in this portion.

Educational Attainment. A majority of ninety (90) or 36% of the teacher respondents have with bachelor's degree, on the other hand, eighty-six (86) or 34.4% of them have earned a master's degree, while only seventy-four (74) or 29.6% of the teacher respondents have earned a doctoral degree. Henceforth, a total mean of 1.94 with a standard deviation of 0.81 was accumulated in this part.

6.2. Assessment of the Availability of School's Type of Data by the Teacher

The following tables present the assessment of the availability of the school's

type of data by the teacher respondents

(1) Assessment of the Teacher Respondents

Table 2. presents the assessment of the availability of the school's type of data by the teacher/staff respondents.

Availability	Mean	Standard Deviation	Verbal Description/ Interpretation		Rank
1. University-administered assessments are available.	3.31	.61	Agree	High	9
2. Student retention histories are available.	3.39	.61	Agree	High	8
3. Student course enrolment histories are available.	3.42	.62	Agree	High	6
4. University-wide aggregated survey responses from students are available.	3.40	.55	Agree	High	7
5. Nationwide assessments are available.	3.23	.73	Agree	High	10
6. Student participation in supplementary education programs is available.	3.48	.50	Agree	High	5
7. Student behavior data is available.	3.52	.50	Strongly Agree	Very High	4
8. Student grade reports are available.	3.57	.50	Strongly Agree	Very High	1
9. Results obtained from a systematic review of students' progress are available.	3.53	.50	Strongly Agree	Very High	3
10. Participation records in after-school programs and extracurricular activities are available.	3.54	.50	Strongly Agree	Very High	2
Composite Mean	**3.44**	**.22**	**Agree**	**High**	

As shown in Table 5, teacher respondents strongly agree that student grade reports are available which garnered the highest assessment of 3.57 interpreted as a very high relationship. Similarly, teacher respondents also strongly agree to the following statements: participation records in after-school programs and extracurricular activities are available with a mean of 3.54 with a standard deviation of 0.50, results obtained from a systematic review of students' progress are available and a mean of 3.53 with a standard deviation of 0.50 and student behavior data is available with a mean of 3.52 and standard deviation of 0.50 all interpreted as very high. In contrast, teacher respondents only agree to the following statements: student participation in supplementary education programs is available, student course enrollment histories are available, university-wide aggregated survey responses from students are available, student retention histories are available and university-administered assessments are available with a mean and standard deviation of 3.48 and 0.50, 3.42 and 0.62, 3.40 and 0.55, 3.39 and 0.61 and 3.31 and 0.61 respectively, all interpreted as high. However, though teacher respondents agree that nationwide assessments are available, it garnered the lowest assessment of 3.23 with a standard deviation of 0.73 still interpreted as high. To summarize, an average weighted mean of 3.44 with a standard deviation of 0.22 indicates that teacher respondents have a relationship in terms of the availability of the school's type of data based on their assessments.

In the 1980s, universities were encouraged to commit to TQM by integrating their school operations and courses into this systematic approach using data to evaluate their institution and progress it towards continuous improvement (Waddock & Bodwell, 2004). Currently, TQM is widely accepted due to its management principles. Most importantly, data use within TQM is critical to how organizations can ensure productivity, efficiency, and quality control. Student Achievement and School Improvement Student achievement and school improvement are fundamental to understanding how progress is made in education.

Table 3. presents the assessment of the utilization of the school's type of data by the teacher respondents.

Utilization	Mean	Standard Deviation	Verbal Description/ Interpretation		Rank
1. The University gathers data in order to support its missions and procedures.	3.45	.50	Agree	High	8.5
2. Data management accords, including the adequate uses of data, are based on the University's missions and requirements.	3.49	.50	Agree	High	6
3. The University and its employees are responsible for their operation of data.	3.55	.50	Strongly Agree	Very High	2.5
4. Using data accordingly helps the University benefit.	3.50	.50	Agree	High	5
5. Exploiting data (through administrative surveillance, and others) conveys consequences and boosts risk.	3.52	.50	Strongly Agree	Very High	4
6. By using the data relevant to and necessary for a school-related procedures, you help lessens the risk innate in data usage.	3.46	.50	Agree	High	7
7. Using unnecessary data, mainly sensitive data, can develop risk.	3.58	.49	Strongly Agree	Very High	1
8. Before beginning to utilize data, it is better to analyze the motive of data usage.	3.55	.50	Strongly Agree	Very High	2.5
9. In order to utilize data, it is recommended to have empirical experience and understanding of university procedures and data.	3.07	.82	Agree	High	10
10. The collection of such data and knowledge will make it easier to advance accurate methods and authentication processes.	3.45	.51	Agree	High	8.5
Composite Mean	**3.46**	**.20**	**Agree**	**High**	

As shown in Table 5, teacher respondents strongly agree that using unnecessary data, mainly sensitive data, can develop risk which received the highest assessment of 3.58 with a standard deviation of 0.49 interpreted as very high. Similarly, teacher respondents also agree that the University and its employees are responsible for their operation of data, before beginning to utilize data, it is better to analyze the motive of data usage and exploiting data (through administrative surveillance, and others) conveys consequences and boosts risk with a mean and standard deviation of 3.55 and 0.50, 3.55 and 0.50, lastly, 3.52 and 0.50 respectively, interpreted as very high. On the other hand, teacher respondents only agree that using data accordingly helps the University benefit, data management accords, including the adequate uses of data, are based on the University's missions and requirements, by using the data relevant to and necessary for school-related procedures, you help lessens the risk innate in data usage, the University gathers data to support its missions and procedures and the collection of such data and knowledge will make it easier to advance accurate methods and authentication processes and obtained a mean and standard deviation of 3.50 and 0.50, 3.49 and 0.50, 3.46 and 0.50, 3.45 and 0.50, 3.45 and 0.51 respectively, interpreted as high. However, though teacher respondents agree that to utilize data, it is recommended to have empirical experience and understanding of university procedures and data, it received the lowest assessment of 3.07 with a standard deviation of 0.82, still interpreted as high. Generally, an average weighted mean of 3.46 and a standard deviation of 0.20 indicates that teacher respondents agree and have a very high relationship in terms of utilization of the school's type of data.

When utilizing data systems and data warehouses in education, there are a variety of different software tools that can be used. Many of these software tools take the form of Student Information Systems (SIS). SISs can be defined as "electronic data systems whereby a collection of programs supports the digital storage, manipulation, and extraction of information from a database" (Means, Gallagher, & Padilla, 2007). Therefore, time can be saved by educators through having access to a variety of student data within their school's SIS. Functions of SIS. There are many functions of SIS's to help educators amplify their practice To foster this to a great degree in schools, educational leaders are advised to develop organizational structures to influence what type of data teachers can analyze in addition to organizing a shared vision that involves a plethora of goals for data use (Schildkamp, Karbautzki, Vanhoof, 2013).

7. Conclusion

7.1. Profile of the Teacher Respondents

The respondents were predominantly mid-career teachers, emphasizing the value of engaging educators with varying levels of experience to ensure diverse perspectives in data utilization practices. While a significant portion held bachelor's degrees, the findings suggest opportunities for further academic advancement to equip educators with advanced skills for data-driven decision-making and educational innovation.

7.2. Assessment of the Availability, Utilization, and Relevance of Data

Teachers recognized the accessibility and utility of school data in enhancing classroom practices and student outcomes. However, while data is broadly available, its effective use remains dependent on clear guidelines, ethical considerations, and capacity-building initiatives. The relevance of data in fostering individualized learning and improving pedagogical strategies highlights its potential for addressing diverse educational needs and driving overall institutional improvement.

7.3. Significant Differences in Assessments based on Profile Variables

Perceptions of data availability, utilization, and relevance were generally consistent across demographic factors, although notable differences emerged based on years of experience and grade levels taught. These findings underscore the importance of tailoring professional development programs to address specific needs, ensuring that all educators, regardless of experience or role, are equally equipped to engage with data effectively.

7.4. Relationship between Availability, Utilization, and Relevance of Data

The positive relationship between data availability, utilization, and relevance reinforces the importance of a well-integrated data infrastructure. Making data readily accessible not only promotes its use but also enhances its perceived value in educational processes, highlighting the critical role of robust systems and leadership in fostering a data-driven culture.

8. Recommendations

8.1. Improve Data Availability and Accessibility

To address the gaps in data availability, particularly nationwide assessments (mean = 3.23) and university-wide survey responses (mean = 3.40), the institution should prioritize partnerships with national education agencies to ensure seamless integration of external datasets. A centralized, user-friendly data repository should be developed to provide all stakeholders easy access to key data types, including student records, surveys, and assessments. Regular updates and maintenance of the data systems will ensure their accuracy, relevance, and usability.

8.2. Strengthen Utilization of Data Across Stakeholders

Given the challenges in utilizing empirical data (mean = 3.07) and aligning data use with institutional goals (mean = 3.46), tailored training programs should focus on building teacher confidence in data interpretation and application. This includes providing structured guidelines on ethical and effective data utilization, as well as practical workshops for teachers and leaders. Mentorship programs should be introduced, pairing experienced data users with teachers requiring additional support, particularly those with 16+ years of experience or those new to the profession.

8.3. Enhance the Relevance of Data in Teaching and Leadership

Low scores in using data for curriculum assessment (mean = 3.02), tracking student progress (mean = 3.06), and modifying classroom instruction (mean = 3.07) indicate the need for improvement. The institution should adopt formative assessment tools that provide real-time insights into student performance, enabling teachers to identify trends and gaps. Professional development programs should emphasize how to leverage these insights to refine teaching strategies, improve curriculum delivery, and tailor interventions to meet diverse student needs.

8.4. Foster a Data-Driven Leadership Culture

Leadership plays a critical role in cultivating a data-driven culture. Leaders should actively use data in strategic planning and decision-making, modeling best practices for educators. Training sessions should be conducted to enhance leaders' capacity to interpret data, set data-informed goals, and promote collaborative data practices. Regular data review meetings involving leaders and staff will ensure alignment across departments and foster a sense of shared accountability.

8.5. Establish a Comprehensive Data Policy

A clear data policy should outline roles, responsibilities, and ethical considerations for data use. This policy should address concerns about risks associated with handling unnecessary or sensitive data, as reflected in the high concern (mean = 3.58) regarding this issue. The policy should include detailed protocols for data privacy, security, and usage, ensuring compliance with regulations and fostering trust among stakeholders.

8.6. Invest in Technological Infrastructure

To improve the overall efficiency and effectiveness of data practices, the institution should upgrade its technological infrastructure. This includes adopting advanced data management platforms with analytics capabilities and integrating external data sources, such as national assessments. Reliable IT support and regular updates will maintain system functionality and user satisfaction.

8.7. Promote Collaboration and Continuous Improvement

Collaboration among teachers and administrative units is essential for maximizing the potential of data use. Regular cross-departmental meetings and data-sharing workshops can encourage innovative approaches to analyzing and applying data insights. Feedback mechanisms, such as surveys and focus group discussions, should be established to gather input from stakeholders, ensuring continuous improvement in data systems and practices.

8.8. Tailor Support for Teachers based on Experience and Roles

Significant differences in data utilization and relevance were observed among teachers based on years of experience and grade levels taught. Targeted support should be provided to senior teachers, helping them adapt to evolving data practices through peer mentoring and specialized training. Teachers handling higher grades, who demonstrated higher engagement with data, should be involved in sharing best practices to encourage a more uniform adoption of data-

driven approaches across all grade levels.

8.9. Leverage Data for Holistic Student Development

While data for grouping students (mean = 3.48) and using it to practice empathy (mean = 3.42) scored moderately high, these areas can be further enhanced. Advanced analytics tools should be introduced to simplify student grouping based on academic and behavioral indicators. Training programs should also focus on interpreting non-academic data, enabling teachers to design interventions that address both academic and emotional needs of students.

8.10. Monitor and Evaluate Data Practices

A structured system for monitoring and evaluating data practices should be implemented to assess the impact of data-driven initiatives on teaching efficacy and student outcomes. Key performance indicators (KPIs) should measure the effectiveness of data use, providing insights for refining strategies and fostering accountability among educators and leaders.

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