ORIGINAL ARTICLE

The Influence of Class Teachers' Leadership Behavior and Personal Characteristics on Student Academic Performance: A Study of Fuzzy Set Qualitative Comparative Analysis Citing H Middle School as a Case Study

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Abstract. *Leadership behavior of classroom teachers has a significant impact on students' academic success. However, little empirical research on this subject has been undertaken in China. By developing truth tables and doing necessary computations, this study examines the influence of differential combinations of parameters connected to class teachers' qualities and leadership behavior on student academic performance. It has been discovered that the democratic leadership behavior displayed by class teachers is the most popular among students and is helpful to student academic achievement; the numerous combinations of linked characteristics have varying effects on student academic performance. The study compensates for a dearth of empirical research on the subject and sheds light on the process by which class teacher leadership influences student academic progress.*

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Literature Review and Questions

China has been adopting the class teacher system throughout the country since 1949. In China, a class teacher is expected to oversee both the overall management of the class and the teaching of a single subject. Each class teacher applies their own distinctive leadership style to student management. Teacher leadership behavior has long been a source of contention in Western countries, coining the term "Teacher Leadership" in educational literature in the 1950s (Lieberman & Miler, 2004). Lambert and Harris (2003) argue that teacher leadership's objective is to help and encourage students to acquire self-directed learning skills. Wu and Dai (2008) assert that teachers provide an example for pupils and influence them through their excellent moral character and knowledge. After reviewing prior research on teacher leadership, this study defines class teacher leadership as the all-encompassing effect a teacher can exert on students through the integration of personal teaching experience, expertise, teaching skills, and class management competence.

Based on the fundamental variable of "power," Lewin, an American management scientist, divides teacher leadership into three categories: democratic, autocratic, and laissez-faire (Lewin, White, & Lippitt, 1939). Silins and Mulfold find that extensive follow-up research indicates that teacher leadership is directly related to student academic progress (Mulford & Kendall, 2004). According to Wu's research, laissez-faire leadership is detrimental to student academic attainment, but democratic and autocratic leadership are good. However, further analysis reveals that the benefit of autocratic leadership is limited to the current course, whereas democratic leadership contributes to the overall learning of students (Wu & Chen, 1978).

There is a debate regarding whether the personal attributes of teachers have an effect on student academic progress. Huang and Xin (2007) conducted a study to demonstrate that gender, duration of service, educational level, discipline, and qualifications of teachers have no significant effect on student academic performance. Nonetheless, Zhang and her colleagues report that student academic achievement varies by class and that teachers' gender, length of service, commitments, and suitability of their disciplines for their posts all contribute significantly to student academic achievement after conducting a study of the influence of teachers' personal characteristics on student school results using hierarchical linear modeling and extensive survey data on student academic achievement (Zhang, 2012).

Due to the diversity of class management systems in other countries and in Taiwan, the majority of research on this topic focuses on teacher leadership rather than class teacher leadership. While discussions on class teacher leadership are prevalent on the mainland, most of them are theoretical in nature. The scant amount of extant empirical research mostly uses regression analysis to analyze the association between class teacher leadership and student academic achievement, excluding multi-angle examinations of significant elements in various combinations. Given that academic achievement is not only a reflection of students' efforts in learning but also of the effectiveness of class management and teacher leadership behavior (Zhu, 2008), investigations into the influencing mechanisms of various combinations of relevant factors are critical for class management and teaching efficiency improvement. To accomplish this, we use fuzzy

set qualitative comparative analysis (fsQCA) to examine the terminal exam results of 24 grade seven classes at Lianyungang H Middle School and, using truth tables, summarize the influencing mechanisms of various combinations of class teachers' personal characteristics and leadership behavior.

Research Design

Investigation Subjects and Processes

The subjects of the research are class teachers and students from 24 seventh-grade classes at Lianyungang H Middle School. H Middle School, a nine-year private boarding school, has long been ranked first in the district in terms of student academic achievement, despite the fact that its tangible and intangible conditions are not up to par with those at other district schools. Additionally, students at this school come from typical socioeconomic families and are entitled to more time for sports and recreation than their peers at other schools. Thus, the school's academic advantage cannot be explained solely by resource advantages and students' time investment in studying. We make the cautious assumption that the lead originates from the school's distinctive management methods and culture.

In April 2019, we performed two four-day investigations into the school life of students and the routine administration of class teachers at H Middle School. To confirm the validity of our findings, we used two cameras to capture classroom observations and as many instances of teacher-student interaction as feasible. To ascertain the leadership styles of the 24 class teachers, 1,293 questionnaires were sent to all seventh-grade students, and 1,105 effective ones were extracted after screening. Additionally, we interviewed the 24 class teachers to elicit additional demographic characteristics and examples of good classroom management and instruction. The studies enabled us to comprehend the school's distinctive management practices and culture, as well as to gather data for our subsequent examination of the school's academic accomplishment advantage.

We collect the average scores on each class's second semester terminal exams and utilize them as a dependent variable in this study. Each academic year, the institution reorganizes its classes. To maintain equity, the school makes an effort to balance students' average academic levels and the overall strength of the teachers assigned to each class. However, each class may have only one class teacher, and they may differ, providing an ideal control situation and enabling us to conduct important studies of the correlations between class teachers' qualities and student academic attainment using a consistent baseline.

Research Instruments and Methodology

The Teacher Leadership Behavior Questionnaire (hereinafter referred to as the TLBQ) was developed by Professor Wu of Taiwan Normal University for the purpose of assessing seventh graders' perceived and expected classroom teacher leadership behavior. This questionnaire is a customized scale of teacher leadership behavior developed by Wu in consultation with Lewis' theory of leadership behavior (Wu & Chen, 1978). The

scale is a highly reliable and valid instrument that has gained widespread acceptance in academia. This scale has been cited in over 2000 publications as a research instrument.

Professor Wu approved the questionnaire's use in this study and the investigation's findings. Our questionnaire divides class teacher leadership behavior into three categories: democratic, autocratic, and laissez-faire leadership, each of which is comprised of 20 questions. Each question has a score associated with it if the answer is "yes," but not if the answer is "no." The total scores for each category include both perceived and expected class teacher leadership behavior. The category that receives the highest scores is the leadership style that the class teacher is supposed to exhibit.

As mentioned previously, the predominant methodology used in current empirical studies of teacher leadership is correlation analysis based on regression techniques, which makes it difficult to conduct a detailed analysis of the combinatorial factors and influencing mechanisms affecting the effects of teachers' personal characteristics and leadership behavior on student academic performance. The current study attempts to compensate for this shortcoming by utilizing qualitative comparative analysis (QCA), a method of research pioneered by Ragin, a sociologist, in 1980. The purpose of this method is to derive combinations of correlated factors from case studies using truth tables (Du, 2017). In comparison to regression analysis, QCA is more focused on the sufficient and necessary conditions necessary for the achievement of a research result and is less susceptible to the negative effects of autocorrelation and multicollinearity. Additionally, QCA places a premium on examining the combinatorial factors underlying a social phenomenon. As a result, it has been applied in a wide variety of fields in China and other countries, including sociology, political science, and managerial economics. However, QCA is almost entirely absent from educational research in China. As a result, it should garner increased interest from the Chinese educational community.

QCA is composed of three fundamental techniques: fussy set QCA (fsQCA), crisp set QCA (csQCA), and multi-value QCA (mvQCA). Considering the sample size, this study opts for fsQCA as the primary technique. By establishing sufficient and necessary relationships between explanatory and outcome variables, researchers can investigate the multifactor combinations influencing a particular case using fsQCA (Ragin & Pennings, 2005). A specific result is believed to be the result of a number of influencing factors, and the purpose of fsQCA is to define the causal relationship between the relevant influencing factors and the specific result. In fsQCA, a case can be thought of as a collection of conditions and results. By examining the effects of various combinations of conditions on the results, researchers can determine which conditions are sufficient and which are necessary for the outcome variables (Ragin, 2009). fsQCA examines the relationship between explanatory and outcome variables using consistency and coverage indicators. Using consistency indicators, we can determine whether an explanatory variable is a sufficient or necessary condition. Typically, when the consistency of the explanatory variable exceeds 0.8, it can be considered a sufficient condition for the outcome variable. When the explanatory variable's consistency is greater than 0.9, it is considered a necessary condition for the outcome variable. After determining the consistency of the results, the coverage indicator is used to determine the degree of explanation for a combination of causal factors (Gao et al., 2018).

Selection and Treatment of Variables

Academic achievement is influenced by a variety of factors. Based on the analysis of the existing literature and sample, this study selects five condition variables, or independent variables, among which class teachers' leadership behavior is the most important. The four demographic characteristic variables are class teachers' gender, subject, length of service, and marital status. The average of each class's scores is used as the outcome variable, or dependent variable.

We collect data on the independent variables via questionnaires and in-depth interviews. The application of Wu's TLBQ yields data on the leadership behavior of 24 class teachers in grade seven at H middle school (**Table 1**), indicating that all of them practice democratic leadership, albeit at varying levels of proficiency. This is a completely unexpected result that has never been observed in any of our previous studies. In class, we always encountered a certain number of teachers exhibiting autocratic leadership behavior in the schools we investigated previously. Autocratic leadership is even prevalent among class teachers in some schools. According to our interviews, the majority of the 24 class teachers at H Middle School is relatively young and has enjoyed harmonious relationships with their students. As a result, we assume that democratic leadership behavior on the part of class teachers results in fruitful teacher-student relationships. Additionally, prior research indicates that harmonious teacher-student relationships are critical for increasing student academic achievement (Zhou, Gu, & Yao, 2018). Given this, we propose another hypothesis: that class management under democratic leadership contributes to H Middle School's position as the district's top performer in terms of student academic achievement.

The A-E difference refers to the score difference between the actual and expected values for each category of class teacher leadership behavior in **Table 1**. A positive A-E difference indicates that the class teacher's actual leadership behavior exceeds students' expectations in this category, whereas a negative A-E difference indicates that the class teacher's actual leadership behavior falls short of students' expectations. Interestingly, despite the fact that all 24 class teachers receive the highest score for democratic leadership behavior, the majority of classes report a negative A-E difference for this category, indicating that despite democratic leadership behavior's predominance in class management in grade seven, it has fallen short of students' expectations. Students anticipate that their teachers will conduct class management in a more democratic manner.

Variables are coded as shown in **Table 2** for ease of expression in the following discussion.

Empirical Analysis and Discussion

Calibration of Variables

Calibration of variables is a critical step in qualitative comparative analysis, but is not required in regression analysis. Calibration of continuous variables is carried out in fsQCA in order to convert them to membership scores between 0 and 1 (Pan, 2018). Calibration anchors should be chosen with regard to the study's theoretical principles and sample data distribution. Typically, the 10% quantile, 20% quantile, and upper quantile serve as candidates for the first anchor, the mean and median values serve as

Table 1. The results of Class Teacher Leadership Behavior Questionnaire.

Class	Types of Value	Autocratic	Laissez-Faire	Demo-Cratic
1	Actual value	412	149	783
	Expectation value	326	208	821
	A-E difference	86	-59	-38
2	Actual value	289	53	692
	Expectation value	227	90	727
	A-E difference	62	-37	-35
3	Actual value	404	83	768
	Expectation value	240	168	843
	A-E difference	164	-85	-75
4	Actual value	500	87	737
	Expectation value	297	192	860
	A-E difference	203	-105	-123
5	Actual value	310	85	616
	Expectation value	240	185	742
	A-E difference	70	-100	-126
6	Actual value	481	201	865
	Expectation value	405	306	890
	A-E difference	76	-105	-25
7	Actual value	375	115	914
	Expectation value	330	135	904
	A-E difference	45	-20	10
8	Actual value	433	126	972
	Expectation value	342	199	1004
	A-E difference	91	-73	-32
9	Actual value	529	230	799
	Expectation value	429	258	851
	A-E difference	100	-28	-52
10	Actual value	598	90	758
	Expectation value	291	202	986
	A-E difference	307	-112	-228
11	Actual value	640	83	711
	Expectation value	335	191	972
	A-E difference	305	-108	-261
12	Actual value	519	125	905
	Expectation value	348	174	997
	A-E difference	171	-49	-92
13	Actual value	366	92	902
	Expectation value	298	129	934
	A-E difference	68	-37	-32
14	Actual value	436	120	869
	Expectation value	253	171	1027
	A-E difference	183	-51	-158
15	Actual value	335	75	875
	Expectation value	255	147	914
	A-E difference	80	-72	-39

16	Actual value	429	239	857
	Expectation value	361	280	838
	A-E difference	68	-41	19
17	Actual value	444	93	838
	Expectation value	248	165	901
	A-E difference	196	-72	-63
18	Actual value	431	85	984
	Expectation value	355	144	1004
	A-E difference	76	-59	-20
19	Actual value	518	97	916
	Expectation value	340	200	961
	A-E difference	178	-103	-45
20	Actual value	365	103	990
	Expectation value	291	139	984
	A-E difference	74	-36	6
21	Actual value	378	110	903
	Expectation value	306	166	926
	A-E difference	72	-56	-23
22	Actual value	351	137	892
	Expectation value	313	189	919
	A-E difference	38	-52	-27
23	Actual value	519	157	657
	Expectation value	281	225	893
	A-E difference	238	-68	-236
24	Actual value	457	140	657
	Expectation value	349	181	824
	A-E difference	108	-41	21

Table 2. Variable Coding and Descriptions.

Types of Variables	**Variables**	**Variable Codes**	**Meaning And Descriptions**
Condition Variables	Leadership behavior	DEMOCRACY	Level of democracy (low,medium, high)
	Gender	GENDER	male/female
	Subject	SUBJECT	Key subject/non-key subject
	Length of teaching	Length	Length of teaching (short, medium, high)
	Marital status	MARRIAGE	Married/unmarried
Outcome Variable	Average scores of each class	SCORE	Average scores (low, medium, high)

Table 3. Quantile Analysis of Continuous Variables.

		Average Scores	Levels of Democracy	Length of Teaching
N	Valid	24	24	24
	Missing	0	0	0
Mean values		556.83	0.60	2.38
Median values		559.95	0.60	1.00
Percentiles	10	541.15	0.55	1.00
	20	551.20	0.58	1.00
	25	552.20	0.59	1.00
	30	553.90	0.59	1.00
	50	559.95	0.60	1.00
	70	562.30	0.61	2.50
	75	563.08	0.61	3.00
	80	563.50	0.61	4.00
	90	566.35	0.62	6.00

Data source: Output results by software SPSS.

Table 4. Calibration Anchors for All Variables.

		Anchors		
Variable Types	**Variables**	**Full Non-membership**	**Median Point**	**Full Membership**
Condition variables	DEMOCRACY	0.5	0.60	0.62
	GENDER	0.00		1.00
	SUBJECT	0.00		1.00
	LENGTH	1.00	2.38	6.00
	MARRIAGE	0.00		1.00
Outcome variable	SCORE	541.15	556.83	566.35

Data source: Analysis results by software SPSS.

candidates for the second anchor, and the 90% quantile, 80% quantile, and lower quantile serve as candidates for the third anchor (Ragin, 2014). **Table 3** illustrates the quantiles of variables in the current study.

Based on the characteristics of the sample data distribution in this study, we chose the 10% quantile, the mean, and the 90% quantile as the first, second, and third anchors, respectively. The calibration anchors for each variable are illustrated in **Table 4**.

Except for the three dichotomous variables (GENDER, SUBJECT, and MARRIAGE), the other three raw variables (DEMOCRACY, LENGTH, and SCORE) must be calibrated and converted to membership scores in the range of 0 to 1. Democracyfz,

lengthfz, and scorefz are the regenerated codes that represent them. The following are the calibration formulas for the three variables:

(1) democracyfz = calibrate (DEMORACY, 0.549792, 0.595870, 0.619352)
(2) lengthfz = calibrate (LENGTH, 1, 2.38, 6)
(3) scorefz = calibrate (SCORE, 541.150, 556.825, 566.350)

Following calibration, all variables are represented by membership scores ranging from 0 to 1, as illustrated in **Table 5**.

Truth Tables

Ragin suggests that a consistency threshold of 0.75 is the "minimum requirement" for admission, 0.8 is "acceptable," and 0.85 is "very acceptable" (Ragin, 2005). We define the consistency threshold as 0.8 and the frequency threshold as 1, after consulting Ragin's research and examining the distribution characteristics of the sample cases included in this study (Du, 2017). When a case meets the consistency threshold of greater than 0.8, the outcome variable "average score" is coded as 1 (scorefz = 1). Otherwise, it is represented by the value 0 (scorefz = 0). "Scorefz = 1" indicates academic performance improvement; "Scorefz = 0" indicates academic performance decline. The distribution of truth tables for improved and degraded academic performance is shown in **Tables 6** and **7**.

Analytical Results

Empirical analysis using fsQCA generates three types of solutions: complex, intermediate, and parsimonious. In a complex solution, configurations do not undergo simplification, resulting in the greatest number of factor combinations. When a complex solution is incorporated into the path analysis process, the results become extremely intricate. In comparison, the process of simplification inherent in the parsimonious solution tends to include all logical remainders without evaluating their validity, resulting in a simplified solution that is likely to be inconsistent with theories or actualities; another consequence is that it may eliminate numerous indispensable and necessary conditions. Whereas the intermediate solution, based on the researcher's theoretical and practical knowledge, will incorporate the relevant logical remainder into the results. In comparison to complex and parsimonious solutions, the intermediate solution has a significant advantage in that it prevents the elimination of necessary conditions, that is, any superset integral to the result and relevant necessary conditions (Du, 2017). fsQCA 3.0, designed by Ragin et al., was used to process the data in this article. **Tables 8** and **9** illustrate the intermediate solutions to the empirical analysis of improved and degraded student academic achievement.

According to **Table 8**, teachers can positively influence student academic achievement via three distinct pathways, with an overall consistency of 0.89. The first configuration (~lengthfz * MARRIAGE * SUBJECT) indicates that a married class teacher in charge of a key subject (in the context of China's basic education, dominant subjects such as mathematics, Chinese, English, physics, and chemistry are referred to as "key subjects," while others are referred to as "non-key subjects") and with a short

Table 5. Membership Scores of the Set after Variable Calibration.

Classes	Average Scores	Levels of Democracy	Gender	Subjects	Lengths of Teaching	Marital Status
CASEID	scorefz	democracyfz	GENDER	SUBJECT	lengthfz	MARRIAGE
Class1	0.81	0.38	0.00	1.00	0.30	0.00
Class2	0.96	0.47	0.00	1.00	0.05	0.00
Class3	0.87	0.91	0.00	1.00	0.30	1.00
Class4	0.77	0.72	1.00	0.00	0.79	1.00
Class5	0.68	0.69	1.00	1.00	0.79	1.00
Class6	0.89	0.63	0.00	1.00	0.05	0.00
Class7	0.44	0.79	1.00	0.00	0.99	1.00
Class8	0.50	0.89	0.00	1.00	0.05	0.00
Class9	0.88	0.95	0.00	0.00	0.63	0.00
Class10	0.35	0.95	0.00	1.00	0.63	0.00
Class11	0.82	0.96	1.00	1.00	0.05	1.00
Class12	0.98	0.94	0.00	1.00	0.05	0.00
Class13	0.78	0.90	0.00	1.00	0.05	0.00
Class14	0.64	0.79	0.00	1.00	0.05	1.00
Class15	0.13	0.64	0.00	0.00	0.05	0.00
Class16	0.12	0.53	1.00	0.00	0.79	1.00
Class17	0.01	0.73	0.00	1.00	0.05	0.00
Class18	0.37	0.53	1.00	0.00	1.00	1.00
Class19	0.02	0.45	0.00	1.00	0.05	0.00
Class20	0.77	0.27	1.00	1.00	0.05	1.00
Class21	0.95	0.22	0.00	1.00	0.05	1.00
Class22	0.93	0.05	0.00	1.00	0.05	0.00
Class23	0.27	0.04	0.00	0.00	0.05	0.00
Class24	0.25	0.02	1.00	0.00	0.30	0.00

Data source: Results processed by software fsQCA.

Table 6. The Truth Table for Improved Academic Results When Scorefz = 1.

Ideal Cases	Level of Democracy	Length of Teaching	Marital Status	Subject	Gender	Number of Cases with Membership Score > 0.5	Con-sistency
Class 9	1	1	0	0	0	1	1.00
Class 21	0	0	1	1	0	1	1.00
Class 20	0	0	1	1	1	1	1.00
Class 5	1	1	1	1	1	1	0.99
Class 3 & 14	1	0	1	1	0	2	0.91
Class 11	1	0	1	1	1	1	0.91

Data source: Results processed by software fsQCA.

Table 7. The Truth Table for Degraded Academic Results When Scorefz = 0.

Ideal Cases	Level of Democracy	Length of Teaching	Marital Status	Subject	Gender	Number of Cases with Membership Score > 0.5	Consistency
Class 1, 2, 19, & 22	0	0	0	1	0	4	0.78
Class 10	1	0	0	1	0	1	0.74
Class 6, 8, 12,13 & 17	1	0	0	1	0	5	0.71
Class 4, 7, 16, & 18	1	1	1	0	1	4	0.64
Class 15	1	0	0	0	0	1	0.51
Class 24	0	0	0	0	1	1	0.36
Class 23	0	0	0	0	0	1	0.33

Data source: Results processed by software fsQCA.

Table 8. Empirical Analysis of Improved Student Academic Achievement When Scorefz = 1.

Configuration	Raw Coverage	Unique Coverage	Consistency
~lengthfz*MARRIAGE*SUBJECT	0.29	0.20	0.87
democracyfz*lengthfz* ~MARRIAGE*~SUBJECT*~GENDER	0.05	0.05	1.00
democracyfz*MARRIAGE*SUBJECT*GENDER	0.12	0.03	0.92
Solution Coverage: 0.37			
Solution Consistency: 0.89			

Data source: Results processed by software fsQCA.

Table 9. Empirical Analysis of Degraded Student Academic Achievement When Scorefz = 0.

Configuration	Raw Coverage	Unique Coverage	Consistency
~lengthfz*~MARRIAGE*~GENDER	0.48	0.16	0.67
~democracyfz*~lengthfz*~MARRIAGE*~SUBJECT	0.05	0.02	0.34
democracyfz*lengthfz*MARRIAGE*GENDER	0.29	0.00	0.64
democracyfz*lengthfz*MARRIAGE* ~SUBJECT*GENDER	0.12	0.12	0.64
Solution Coverage:0.62			
Solution Consistency: 0.59			

Data source: Results processed by software fsQCA.

tenure is beneficial for improving student academic performance. The second configuration (democracyfz * lengthfz * ~MARRIAGE * ~SUBJECT * ~GENDER) implies that an unmarried female class teacher who has taught a non-core subject for many years and possesses supreme democratic leadership capability can help raise student academic achievement. Configuration three (democracyfz * MARRIAGE * SUBJECT * GENDER) demonstrates that a married male class teacher in charge of a critical subject and possessing a high capacity for democratic leadership has a beneficial effect on student academic attainment.

As per **Table 9**, teachers can have a negative effect on students' academic achievement in four ways, with an overall consistency of 0.59. The first configuration (~lengthfz * ~MARRIAGE * ~GENDER) indicates that an unmarried female class teacher with a short tenure has a detrimental effect on student academic performance. Configuration two (~democracyfz * ~lengthfz * ~MARRIAGE * ~SUBJECT) indicates that an unmarried class teacher with a low capacity for democratic leadership, a short tenure, and responsibility for a non-core subject can have a detrimental effect on student academic achievement. Configuration three (democracyfz * lengthfz * MARRIAGE * GENDER) implies that a married male class teacher with a high capacity for democratic leadership and oversight of a critical subject may be detrimental to student academic achievement. Configuration four (democracyfz * lengthfz * MARRIAGE * ~SUBJECT * GENDER) suggests that a married male class teacher with a strong capacity for democratic leadership and extensive experience teaching a non-core subject may have a negative impact on student academic achievement.

Discussions

The empirical findings in **Tables 8** and **9** indicate that seven distinct combinations of factors are associated with student academic performance. We discover that the variable "democracy level" is included in every combination, regardless of whether it is associated with increased or decreased academic achievement. As a result, we can conclude that the influence of classroom teachers' democratic leadership behavior on student academic performance is contingent upon additional factors. It varies depending on the unique combination of conditions.

In terms of other variables, the marital status and length of service of class teachers have a significant effect on student academic performance. Unmarried class teachers with relatively short tenures exhibit insufficient maturity and consistency in their leadership behavior. As a result, they are unable to communicate with students as effectively as married class teachers with extensive teaching experience. This may have a detrimental effect on students' academic performance. Additionally, different combinations of gender and leadership behavior have varying effects on student academic performance. Related configurations indicate that female class teachers with a high capacity for democratic leadership have a greater positive effect on student academic performance than their male counterparts, which may be explained by gender characteristics such as caution and rigor.

fsQCA is the primary methodology used in this study. It circumvents the sample size constraints inherent in quantitative and qualitative analysis and compensates for the shortcomings of traditional causality analysis. In traditional qualitative research,

findings are derived solely from questionnaires and superficial interviews conducted following observations and are almost certainly influenced by the researchers' subjectivity, making it difficult to conduct in-depth analysis of the issue's inherent mechanisms. On the other hand, in QCA, sample selection is more flexible in response to the uniqueness of the cases, and scientific deduction can also be used to ensure the objectivity and robustness of the conclusions. In comparison to Statistical Product and Service Solutions (SPSS) as a quantitative analysis tool, QCA can enquire more objectively and comprehensively into the complexity of causal relationships, thereby ensuring the validity of investigation results.

Moreover, we would like to point out a weakness in our study, namely the relatively low consistency in our empirical analysis of degraded student academic achievement, which impairs the validity and robustness of our conclusion in this area. We intend to expand our research on this aspect of the subject in the future in order to provide school administrators with additional resources for selecting appropriate class teachers.

Conclusions and Suggestions

Conclusions

The following major conclusions are drawn as a result of sample and data collection: variable selection and calibration; the creation of truth tables; and empirical analysis of the results.

1. Democratic teacher leadership is a successful and popular mode of classroom management. The results of the questionnaire and subsequent analysis indicate that democratic leadership behavior ranks highest, while laissez-faire teacher leadership ranks lowest. The majority of students at H Middle School anticipate their class teachers exercising democratic leadership. In regular class management, teachers here use a democratic leadership style to interact with students and allow students to exercise discretion, which helps develop students' ability to learn independently and self-directedly. Democratic leadership behavior on the part of classroom teachers has been shown to be an effective means of fostering an excellent school and class climate and increasing students' self-motivation to learn.
2. Overall, class instructors with insufficient service time are detrimental to student academic performance. However, when key-subject teachers serve as class teachers concurrently, the element of service time has little effect on student academic performance. According to research on classroom teacher development, classroom teachers often go through stages of adaptation, exploration, creation, and sustained development during their careers (Qi, 2013). When young class teachers are still in the discovery period, their leadership conduct is insufficiently consistent to have a good effect on student academic performance. Additionally, we discover disparities in the focus of work and expectations for students between key-subject instructors and non-key-subject teachers through interviews with class teachers. The former places a higher premium on classroom discipline and academic accomplishment, whereas the latter places a higher premium on students' mental and physical wellness. This may account for why key-subject teachers can have a greater impact on students' academic progress.

3. Except for male teachers with extended tenures, only class teachers with a high level of democracy can contribute positively to student academic performance. Teachers with a high level of democracy are more willing to disrupt the typical teacher-dominated classroom structure and urge pupils to participate more actively in classroom activities. They are frequently excellent listeners and cultivators of optimal teacher-student connections, which are crucial for improving student academic success (Ning, 2016). Additionally, our findings indicate that classes taught by female teachers have higher average test scores than classes taught by male teachers. This could be because female instructors are better at managing the degree of democracy and being more severe with pupils when necessary, whereas male instructors tend to allow themselves too much leeway when exercising democratic leadership. This explains why a high degree of democracy in class management by male teachers with long tenure is detrimental to student academic performance advancement.
4. The effect of marital status and gender on academic achievement varies according to how they interact with other factors. In general, married female teachers can have a greater impact on students' academic performance.

Suggestions

Based on the multifactor combinations identified through empirical analysis and the difficulties expressed during interviews, this paper makes numerous recommendations for maximizing the influence of class teacher leadership behavior in enhancing student academic achievement.

1 It is strongly suggested that experienced teachers be appointed as class teachers. Class teachers with extensive teaching experience are capable of managing democratic leadership effectively in order to optimize class management and so contribute to the improvement of student school results.

2 A mentoring program or a pattern of double-class teachers might be created to assist those new and inexperienced class teachers in swiftly growing. Not only does the mentorship program or double class teacher pattern relieve class teachers of their responsibilities, but it also provides students with appropriate support to improve their academic level.

3 To promote teacher-student interactions, democratic class teacher leadership should be strongly fostered in schools. According to a previous study, democratic and fair-minded teachers are capable of persuading pupils to exert greater effort in their learning and achieve greater success (Pekrun, 2009). Democratic teacher leadership conduct may completely activate students' initiative in learning and aid in their development of self-efficacy and self-esteem, equipping them with the bravery to confront problems in learning and the capacity to achieve continuous academic progress.

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