THE INFLUENCE OF HOMEWORK DESIGN QUALITY AND TEACHER FEEDBACK EFFICIENCY ON PERCEIVED ACADEMIC BURDEN AMONG JUNIOR HIGH SCHOOL STUDENTS FROM PUBLIC JUNIOR HIGH SCHOOLS IN LICANG DISTRICT, QINGDAO CITY, SHANDONG PROVINCE, CHINA

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ABSTRACT
This study examined the influence of homework design quality (HDQ) and teacher feedback efficiency (TFE) on students' perceived academic burden (PAB) among junior high school students under China's "Double Reduction" policy. The research specifically focused on Chinese language homework assigned by classroom teachers over the preceding month, aiming to clarify how homework quality and teacher feedback jointly shape students' subjective feelings of academic pressure amid policy implementation. A quantitative cross-sectional research design was adopted. Data were collected via self-reported questionnaires from students at three public junior high schools in Licang District, Qingdao City, Shandong Province. After screening invalid responses, 406 valid questionnaires were retained, representing an effective response rate of 95.98%. Descriptive statistics, Pearson correlation analysis, hierarchical regression and multiple regression analysis were used to test the research hypotheses. The regression results indicated that both homework design quality ($\beta = -.411$, $p < .001$) and teacher feedback efficiency ($\beta = -.280$, $p < .001$) served as significant negative predictors of perceived academic burden, jointly explaining 33.1% of the variance in PAB ($R^2 = .331$). All six sub-dimensions of the core variables showed statistically significant effects, and all eight proposed research hypotheses were fully supported. These findings demonstrate that scientifically well-structured and differentiated homework tasks, paired with timely, targeted and instructive teacher feedback, effectively mitigate junior high students' subjective academic burden. This study adds empirical evidence for optimizing Chinese homework practices and advancing the grounded implementation of the "Double Reduction" policy in compulsory education.
Keywords: Homework Design Quality, Teacher Feedback Efficiency, Perceived Academic Burden

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INTRODUCTION

Academic burden among students in compulsory education has remained an important issue in China. Jiang and Saito (2024) state that reducing academic burden is a complex policy issue because it is associated not only with the amount of schoolwork but also with broader expectations surrounding educational achievement and competition. In response, the Chinese government introduced the "Double Reduction" policy in 2021, which aims to reduce excessive homework and off-campus tutoring while strengthening the quality of school education (General Office of the Central Committee of the Communist Party of China, & General Office of the State Council, 2021). The Ministry of Education of the People's Republic of China (2021) emphasizes that effective homework should be scientifically designed according to students' learning needs. Accordingly, Homework Design Quality (HDQ), including goal orientation, differentiation, and diversity, may influence students' Perceived Academic Burden (PAB). Xu (2023) states that homework quality and feedback quality are important dimensions of students' homework experiences, while Li et al. (2024) state that homework time has a nonlinear relationship with academic outcomes among Chinese junior high school students.

Teacher Feedback Efficiency (TFE), including timeliness, specificity, and guidance, may also influence PAB. The Ministry of Education of the People's Republic of China (2021) requires teachers to review homework carefully, provide timely feedback, and offer targeted guidance, and Xu (2023) further states that simply providing more feedback may not be sufficient if the quality of that feedback is low. PAB, including learning pressure, time burden, and psychological fatigue, reflects students' subjective experience of academic demands (Zhao et al., 2024). Despite growing research on homework time and academic pressure, limited attention has been given to the relationships among HDQ, TFE, and PAB among junior high school students in public junior high schools in Licang District, Qingdao City, Shandong Province, China. Therefore, this study employed a quantitative research design involving Grade 7 to Grade 9 students from three public junior high schools in this context, focusing on homework assigned by students' Chinese teachers during the past month, and examined the influence of HDQ and TFE on PAB.

Research Objectives for this study are following.

1) To examine the influence of homework design quality on perceived academic burden among junior high school students.

2) To investigate the influence of teacher feedback efficiency on perceived academic burden among junior high school students.

Research Hypotheses

H1: Homework design quality has a significant negative influence on perceived academic burden among junior high school students.

H2: Teacher feedback efficiency has a significant negative influence on perceived academic burden among junior high school students.

H1a: Goal orientation of homework has a significant negative influence on perceived academic burden.

H1b: Homework differentiation has a significant negative influence on perceived academic burden.

H1c: Homework diversity has a significant negative influence on perceived academic burden.

H2a: Timeliness of homework feedback has a significant negative influence on perceived academic burden.

H2b: Specificity of homework feedback has a significant negative influence on perceived academic burden.

H2c: Guidance provided through homework feedback has a significant negative influence on perceived academic burden.

LITERATURE REVIEWS

Homework Design Quality

Homework Design Quality refers to the scientificity and rationality of teachers' systematic design of homework goals, content, forms, difficulty, and quantity, operationally defined in this study by goal orientation, differentiation, and diversity. Xu (2023) states that homework quality is an important dimension of students' homework experiences, indicating that the quality of homework design, rather than quantity alone, shapes students' homework experiences. Wang, Qin, and Xin (2024) similarly found that scientifically optimized homework design can effectively reduce students' academic burden while maintaining learning outcomes.

Teacher Feedback Efficiency

Teacher Feedback Efficiency refers to the effectiveness, value, and timeliness of teachers' evaluation and feedback on students' homework completion, defined by timeliness, specificity, and guidance. Research indicates that the effectiveness of feedback depends on its quality rather than its quantity: Xu (2023) states that simply providing more feedback may not be sufficient if the quality of that feedback is low, and Hattie and Timperley (2007) emphasize that useful feedback must clarify what is to be achieved and how to improve. Zulkifli et al. (2025) reported that students' perceptions of homework-related experiences are significantly associated with their stress and burnout levels, and Zheng, Luo, and Liu (2023) further demonstrated that teacher feedback plays a critical role in facilitating students' self-regulated learning.

Perceived Academic Burden

Perceived Academic Burden refers to students' subjective feelings and psychological experiences of learning pressure, time investment, and psychological consumption, measured in this study by learning pressure, time burden, and psychological fatigue. Jiang and Saito (2024) state that academic burden is connected not only to the amount of schoolwork but also to broader expectations surrounding educational achievement, suggesting that students receiving similar homework may experience different levels of burden. A systematic review by Zulkifli et al. (2025) confirmed that academic stress and burnout are prevalent among secondary school students.

Homework Design Quality, Teacher Feedback Efficiency, and Perceived Academic Burden

Homework with clearly defined learning goals, differentiated requirements, and varied task formats may be perceived as more manageable than repetitive assignments, and timely, specific feedback may help students correct errors efficiently. Under the "Double Reduction" policy, improving homework design and feedback practices is expected to reduce academic burden (Chen & Lin, 2024; Wang et al., 2024; Zheng, 2024). Therefore, homework design quality and teacher feedback efficiency are expected to have significant negative influences on perceived academic burden.

Research Gap and Conceptual Framework

Despite growing research on homework time and academic pressure, limited attention has been given to Homework Design Quality and Teacher Feedback Efficiency simultaneously as predictors of Perceived Academic Burden among junior high school students in Licang District, Qingdao City, Shandong Province, China. Therefore, the present study investigates these two variables in relation to Perceived Academic Burden, with eight hypotheses (H1, H2, H1a-H1c, H2a-H2c) derived from the conceptual framework.

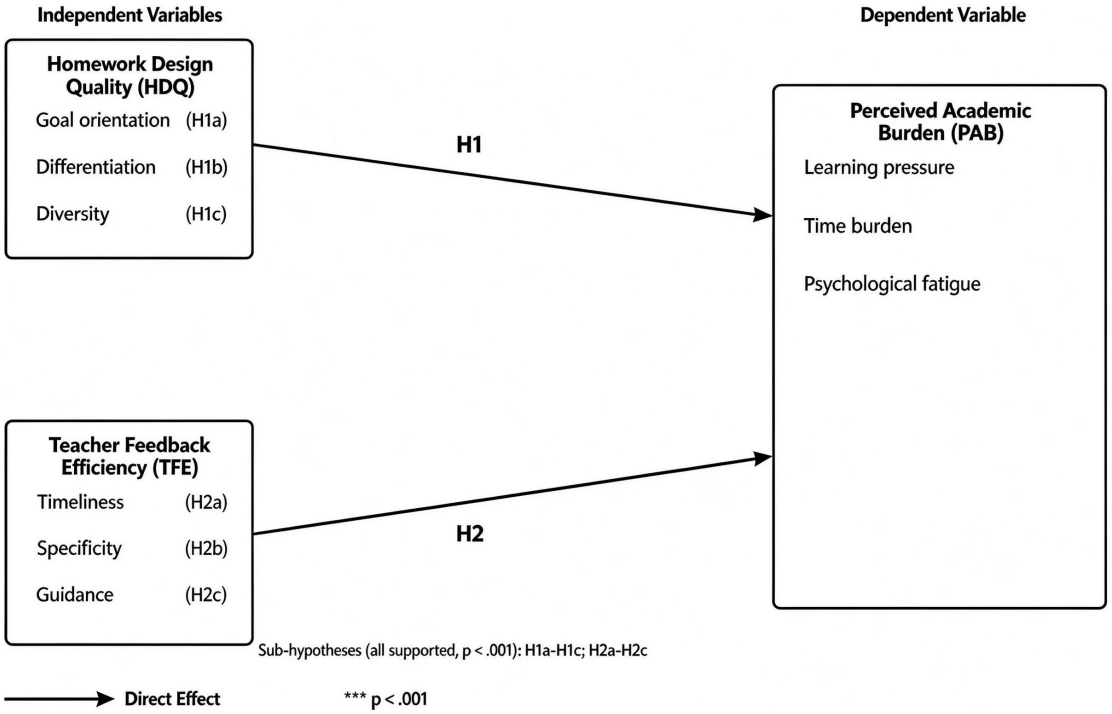

Figure 1 Conceptual framework adapted from Cognitive Load Theory (Sweller, 1988).

RESEARCH METHODOLOGY

This study adopted a quantitative research approach to examine the influence of homework design quality and teacher feedback efficiency on perceived academic burden among junior high school students. A total of 423 students from Grades 7 to 9 in three public junior high schools (Qingdao No. 61, No. 63, and Junfeng Road) in Licang District, Qingdao City, Shandong Province participated, representing a total population of 12,607 students. The required sample size was determined using Yamane's (1973) formula (minimum 388 valid), and 460 questionnaires were distributed using quota sampling. Quota sampling was selected to ensure balanced representation across grade levels within each school, with proportional allocation for Grade 7, Grade 8, and Grade 9 respondents, accounting for developmental differences in students' learning maturity and experiences with Chinese homework.

Data were collected using a structured questionnaire comprising four sections: demographic information; Homework Design Quality (HDQ), 15 items (goal orientation, differentiation, diversity); Teacher Feedback Efficiency (TFE), 15 items (timeliness, specificity, guidance); and Perceived Academic Burden (PAB), 9 items (learning pressure, time burden, psychological fatigue). All items referred to homework assigned by the respondent's Chinese teacher during the past month and were rated on five-point Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was validated by three experts in educational measurement and Chinese curriculum instruction and piloted with 30 non-sampled students; minor wording revisions were made after the pilot test to eliminate ambiguous expressions. Cronbach's alpha of the formal survey (N = 406) ranged from 0.766 to 0.896, indicating acceptable reliability for social science research.

The questionnaire was distributed on-site in classrooms; participation was voluntary, anonymous, and confidential, with informed consent obtained from both school administrators and student participants prior to data collection. Students were clearly informed that their responses would only be used for academic research and would not affect their school grades. After screening for incomplete responses, straight-lining patterns, and logically inconsistent answers, 17 invalid questionnaires were excluded, yielding 406 valid questionnaires (approximately 135 per school; 95.98%). Data were analyzed using JAMOVI

Statistics, including descriptive statistics, reliability testing, Pearson correlation analysis, hierarchical multiple regression for H1 and H2 (controls in Step 1, predictors added in Step 2), and multiple regression for the six sub-hypotheses, with significance established at $p < .05$. Demographic variables such as grade level, gender, and school were entered as control variables in the first block of hierarchical regression to rule out their confounding effects on the relationship between the core study variables.

RESEARCH RESULTS

Respondent Demographic Characteristics

A total of 406 junior high school students participated in this study. Of the respondents, 204 (50.2%) were female and 202 (49.8%) were male, indicating a relatively balanced gender distribution. Regarding grade, 138 (34.0%) participants were in Grade 7, followed by 135 (33.3%) in Grade 8 and 133 (32.8%) in Grade 9, indicating a relatively balanced distribution across the three grades. In terms of school, 136 (33.5%) participants were from Qingdao No. 61 Middle School, 136 (33.5%) from Qingdao No. 63 Middle School, and 134 (33.0%) from Junfeng Road Middle School, indicating that respondents were evenly distributed across the three sampled schools. The balanced distribution of gender, grade, and school supports the use of these demographic variables as control variables in the regression analyses.

Descriptive Statistics of Study Variables

Table 4.1 Descriptive Statistics of Study Variables

Variable	M	SD	Level
Homework Design Quality	3.50	.437	High
Teacher Feedback Efficiency	3.45	.429	High
Perceived Academic Burden	2.65	.533	Moderate

From Table 4.1, homework design quality was high ($M = 3.50$, $SD = 0.437$); teacher feedback efficiency was high ($M = 3.45$, $SD = 0.429$); perceived academic burden was moderate ($M = 2.65$, $SD = 0.533$).

Measurement Model Assessment

The measurement model was evaluated by examining item loadings and internal consistency reliability using exploratory factor analysis and reliability analysis in jamovi. All 39 items loaded clearly onto their corresponding nine factors, with all factor loadings exceeding 0.40, indicating acceptable item loadings. Internal consistency reliability was supported by Cronbach's alpha values ranging from 0.766 to 0.896 across the nine sub-dimensions. Similarly, the Kaiser-Meyer-Olkin (KMO) values for the three scales were 0.858 (homework design quality), 0.855 (teacher feedback efficiency), and 0.727 (perceived academic burden), all exceeding the recommended threshold of 0.70, and Bartlett's test of sphericity was statistically significant ($\chi^2 = 2842$, 2728, and 1747; $df = 105$, 105, and 36; $p < .001$), indicating satisfactory sampling adequacy for factor analysis. Overall, the measurement model demonstrated acceptable item loadings, satisfactory internal consistency reliability, and satisfactory sampling adequacy, supporting its use for subsequent correlation analysis, regression analysis, and hypothesis testing.

Table 4.2 Reliability of Questionnaire

Variable	Number of Items	α
Homework Design Quality	15	.811
− Goal Orientation	5	.792
− Differentiation	5	.852
− Diversity	5	.894
Teacher Feedback Efficiency	15	.803
− Timeliness	5	.779
− Specificity	5	.846
− Guidance	5	.892
Perceived Academic Burden	9	.766
− Learning Pressure	3	.766
− Time Burden	3	.859
− Psychological Fatigue	3	.896

Item-total correlation analysis was conducted for all 39 items. All corrected item-total correlations exceeded the recommended 0.30 threshold, and no item deletion would substantially increase the Cronbach's α values reported in Table 4.2. All 39 items were therefore retained.

Table 4.3 KMO and Bartlett's Test Results

Test	Measure	Value
KMO Test	KMO	.858; .855; .727
Bartlett's Test	Approx. Chi−Square	2842; 2728; 1747
	df	105; 105; 36
	Sig.	<.001

Note. The three values correspond to homework design quality, teacher feedback efficiency, and perceived academic burden scales, respectively.

Table 4.4 Summary of Factor Loadings (Pattern Matrix)

Dimension	Items	Loading Range
Goal Orientation	A1-A5	.695-.786
Differentiation	B1-B5	.693-.812
Diversity	C1-C5	.759-.851
Timeliness	D1-D5	.648-.766
Specificity	E1-E5	.715-.770
Guidance	F1-F5	.762-.841
Learning Pressure	G1-G3	.597-.841
Time Burden	H1-H3	.742-.859
Psychological Fatigue	I1-I3	.787-.897

Note. Only loadings > |0.4| shown.

Correlation Analysis

Pearson correlation analysis showed that the sub-dimensions of homework design quality and teacher feedback efficiency were positively intercorrelated (r = .12-.17) and negatively correlated with the dimensions of perceived academic burden (r = −.15 to −.28). These correlation patterns were consistent with the research hypotheses, providing a basis for the subsequent regression analyses.

Hypothesis Testing: Main Hypotheses

Table 4.5 Multiple Regression Results (Main Hypotheses, DV = Perceived Academic Burden)

Variable	b	Std. Error	β	t	Sig.	Tolerance	VIF
Step 1: Control Variables							
(Constant)	2.674	.084		31.920	<.001		
Gender (Male = 1)	.059	.053	.055	1.104	.270	1.000	1.00
Grade	−.021	.032	−.031	−.632	.528	1.000	1.00
Sch61 (No. 61 = 1)	−.013	.065	−.012	−.204	.839	.746	1.34
Sch63 (No. 63 = 1)	−.026	.065	−.023	−.395	.693	.746	1.34
R=.066, R^2=.004, Adj.R^2=−.006, SEE=.535, F=.44, Sig.>.05							
Step 2: Independent Variables							
(Constant)	5.638	.225		25.076	<.001		
Gender (Male = 1)	.075	.044	.070	1.711	.088	.998	1.00
Grade	−.030	.027	−.045	−1.109	.268	.999	1.00
Sch61 (No. 61 = 1)	−.017	.053	−.015	−.322	.748	.746	1.34
Sch63 (No. 63 = 1)	−.020	.054	−.018	−.380	.704	.746	1.34
Homework Design Quality	−.501	.053	−.411***	−9.395	<.001	.876	1.14
Teacher Feedback Efficiency	−.348	.054	−.280***	−6.396	<.001	.878	1.14
R=.575, R^2=.331, Adj.R^2=.321, SEE=.439, ΔR^2=.327, F=32.90, Sig.<.001							

*Note. ***p < .001. SEE = Standard Error of the Estimate.*

Hypothesis Testing: Sub-Hypotheses

Table 4.6 Multiple Regression Results (Sub-Hypotheses H1a-H1c, DV = Perceived Academic Burden)

Variable	b	Std. Error	β	t	Sig.	Tolerance	VIF
(Constant)	4.988	.203		24.618	<.001		
Control Variables							
Sch61 (No. 61 = 1)	−.019	.056	−.016	−.334	.739	.745	1.34
Sch63 (No. 63 = 1)	−.030	.056	−.027	−.540	.590	.746	1.34
Grade	−.028	.028	−.044	−1.022	.307	.997	1.00
Gender (Male = 1)	.070	.046	.066	1.541	.124	.994	1.01
Independent Variables (Sub−dimensions)							
Goal Orientation (H1a)	−.319	.045	−.310***	−7.091	<.001	.955	1.05
Differentiation (H1b)	−.182	.033	−.242***	−5.555	<.001	.955	1.05
Diversity (H1c)	−.167	.031	−.234***	−5.369	<.001	.958	1.04

Model (controls + GO, DF, DV): R = .525, R^2 = .276, Adj. R^2 = .263, SEE = .458, F = 21.67, p < .001							

Table 4.7 Multiple Regression Results (Sub-Hypotheses H2a-H2c, DV = Perceived Academic Burden)

Variable	**b**	**Std. Error**	**β**	**t**	**Sig.**	**Tolerance**	**VIF**
(Constant)	4.646	.215		21.591	<.001		
Control Variables							
Sch61 (No. 61 = 1)	−.017	.059	−.015	−.296	.767	.744	1.34
Sch63 (No. 63 = 1)	−.016	.059	−.014	−.277	.782	.745	1.34
Grade	−.020	.029	−.031	−.695	.487	.999	1.00
Gender (Male = 1)	.053	.048	.049	1.096	.274	.993	1.01
Independent Variables (Sub−dimensions)							
Timeliness (H2a)	−.292	.048	−.277***	−6.048	<.001	.959	1.04
Specificity (H2b)	−.165	.035	−.216***	−4.713	<.001	.960	1.04
Guidance (H2c)	−.123	.032	−.174***	−3.799	<.001	.963	1.04
Model (controls + TL, SP, GD): R = .445, R^2 = .198, Adj. R^2 = .184, SEE = .482, F = 14.07, p < .001							

*Note. ***p < .001. SEE = Standard Error of the Estimate.*

All six sub-dimensions significantly negatively predicted perceived academic burden (H1a: β = −.310; H1b: β = −.242; H1c: β = −.234; H2a: β = −.277; H2b: β = −.216; H2c: β = −.174, all p < .001), supporting H1a-H1c and H2a-H2c.
The hypothesis-testing results showed that all eight hypotheses (H1, H2, H1a-H1c, H2a-H2c) were supported.

Summary of Hypothesis Testing

Table 4.8 Summary of Hypothesis Testing Results

Hypothesis	**Proposed Relationship**	**β**	**t−value**	**p−value**	**Result**
H1	Homework design quality → Perceived academic burden	−.411	−9.395	<.001	Supported
H2	Teacher feedback efficiency → Perceived academic burden	−.280	−6.396	<.001	Supported
H1a	Goal orientation → Perceived academic burden	−.310	−7.091	<.001	Supported
H1b	Differentiation → Perceived academic burden	−.242	−5.555	<.001	Supported
H1c	Diversity → Perceived academic burden	−.234	−5.369	<.001	Supported
H2a	Timeliness → Perceived academic burden	−.277	−6.048	<.001	Supported

Hypothesis	Proposed Relationship	β	t−value	p−value	Result
H2b	Specificity → Perceived academic burden	−.216	−4.713	<.001	Supported
H2c	Guidance → Perceived academic burden	−.174	−3.799	<.001	Supported

DISCUSSION AND CONCLUSION

The findings of this study demonstrate that homework design quality (HDQ) and teacher feedback efficiency (TFE) play an important role in shaping perceived academic burden (PAB) among the junior high school students investigated, with all eight hypotheses supported. HDQ had a significant negative effect on PAB ($\beta = -.411$, $p < .001$), supporting H1, indicating that goal-oriented, differentiated, and diverse homework reduces unnecessary cognitive load (Sweller, 1988) and perceived burden; among its sub-dimensions, goal orientation exerted the strongest influence ($\beta = -.310$), followed by differentiation ($\beta = -.242$) and diversity ($\beta = -.234$), supporting H1a-H1c. When homework tasks are clearly aligned with learning objectives, students can understand the purpose of each assignment instead of completing repetitive, meaningless drills. Differentiated homework matching varied student proficiency levels prevents advanced learners from wasting time on simple exercises while avoiding overwhelming struggling learners with overly demanding tasks. Diverse homework forms, moving beyond written exercises alone, further relieve monotony and mental exhaustion. Such well-designed homework prevents the accumulation of extrinsic cognitive load that does not contribute to knowledge construction, which is central to cognitive load theory.

TFE also significantly negatively predicted PAB ($\beta = -.280$, $p < .001$), supporting H2, as timely, specific, and instructive feedback helps students correct errors efficiently (Hattie & Timperley, 2007); among its sub-dimensions, timeliness was the strongest predictor ($\beta = -.277$), followed by specificity ($\beta = -.216$) and guidance ($\beta = -.174$), supporting H2a-H2c. Delayed feedback loses its corrective value and lets misconceptions persist, forcing students to spend extra time reworking confusing content. Generic comments such as “good” or “needs improvement” offer little actionable information. In contrast, targeted, guiding feedback points out concrete gaps and suggests improvement strategies, empowering students to adjust their learning and lowering the pressure of repeated failure. This aligns with Hattie and Timperley’s feedback framework, which highlights that effective feedback answers three core questions: Where am I going? How am I going? Where to next? Zong et al. (2025) further noted that feedback that is specific and actionable is more likely to be accepted by students than generic comments.

These findings have practical implications under the "Double Reduction" policy: schools and teachers should design goal-oriented, differentiated, and diverse homework and deliver timely, specific, and instructive feedback to reduce students' perceived burden (Chen & Lin, 2024). Instead of simply cutting homework quantity, educators should prioritize upgrading homework quality and feedback quality. School administrators may offer regular professional training for Chinese language teachers, focusing on differentiated homework design and evidence-based feedback skills, rather than only imposing rules to limit homework duration. Overall, HDQ and TFE together explained 33.1% of the variance in PAB, providing empirical evidence for burden-reduction practices responsive to students' actual learning experiences. However, these findings should be interpreted with caution, as the detailed limitations and directions for future research are discussed in the following section.

Limitations and Future Research

Despite its contributions to understanding the determinants of perceived academic burden (PAB) under the "Double Reduction" policy, this study has several limitations. The cross-

sectional design restricts causal inference, and reliance on self-reported data introduces common method bias; the sample is limited to three public junior high schools in Licang District, Qingdao, and focuses only on Chinese-language homework; finally, HDQ and TFE together explain only 33.1% of the variance in PAB, leaving other influential factors unexamined. Future research should employ longitudinal, multi-source designs across broader regions and subjects to provide more robust evidence for optimizing homework design and feedback practices.

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