

Resourcefulness Pedagogy for Learning Continuity in Elementary Classrooms

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ABSTRACT

This study explored how resourcefulness pedagogy contributed to learning continuity among public elementary school teachers in Lamut, Ifugao, with emphasis on teachers' capacity to adapt resources, redesign instruction, mobilize contextual support, and sustain learner engagement. A cross-sectional explanatory-predictive design was employed with 106 teachers selected through proportionate stratified random sampling. Data were gathered using the Resourcefulness Pedagogy and Learning Continuity Scale and analyzed through descriptive statistics and partial least squares structural equation modeling. Results showed a high overall level of resourcefulness pedagogy and learning continuity, although contextual mobilization, learner participation, and task completion emerged as comparatively weaker areas. The structural model

explained 61.2% of the variance in learning continuity. Instructional redesign produced the strongest predictive effect, followed by continuity-oriented learner support and resource adaptation, while contextual mobilization did not demonstrate a significant independent contribution. The model also showed satisfactory reliability, convergent validity, discriminant validity, predictive relevance, and out-of-sample predictive performance. These findings indicate that resourcefulness pedagogy becomes more consequential when teachers transform available resources into purposeful instructional adjustments rather than merely compensating for material limitations. Strengthening adaptive lesson design, learner re-engagement strategies, and school-supported use of contextual resources may therefore enhance continuity of elementary learning.

Keywords: *adaptive instruction, elementary education, learning continuity, PLS-SEM, resource adaptation, resourcefulness pedagogy*

INTRODUCTION

Learning continuity depends not only on the availability of instructional materials and technologies but also on the capacity of teachers to sustain meaningful learning when ordinary classroom conditions become difficult. Experiences across education systems have shown that continuity is often maintained through a combination of available technologies, printed materials, local support networks, and instructional adjustments made by teachers. Such experiences suggest that the ability to work purposefully with what is available is an important part of maintaining access to learning, particularly when resources, time, or established routines are constrained (Vincent-Lancrin et al., 2022).

Teachers play a central role in translating available resources into workable learning experiences. Their decisions involve more than following prescribed materials because classroom needs may require changes in pacing, examples, activities, and forms of learner support. Männikkö and Husu (2019) found that adaptive expertise among primary school teachers was reflected in their capacity to interpret classroom situations and adjust

their teaching accordingly. This capacity is closely related to resourcefulness because teachers must judge what can be modified, substituted, reorganized, or created while keeping intended learning outcomes within reach.

Resourcefulness also involves professional agency. Teachers do not simply receive curriculum resources and use them in identical ways. They make choices according to learner needs and the conditions surrounding instruction. Rich (2021) showed that elementary teachers could create space for student-centered instruction even when professional and curricular constraints affected their decisions. This suggests that available resources become educationally useful through the teacher's ability to select, adjust, combine, and apply them with sensitivity to learners. Resourcefulness, therefore, may be viewed not as improvisation for its own sake but as deliberate pedagogical action guided by instructional purposes.

This concern is particularly relevant to Philippine basic education. The Department of Education's *Basic Education Development Plan 2030* recognizes the need to align resource provision with learning standards, strengthen flexible approaches to education delivery, and build a more resilient basic education system (Department of Education, 2022). Against this direction, the present study introduces resourcefulness pedagogy as the purposeful use, adaptation, and organization of available instructional resources and teaching strategies to sustain learner participation and instructional continuity. Focusing on public elementary school teachers in Lamut, Ifugao, the study seeks to examine how such pedagogical resourcefulness supports learning continuity in elementary classrooms and to generate evidence that may inform teacher development and school-level instructional support.

Literature Review

Adaptive Instruction and Teacher Responsiveness

Resourceful teaching begins with the ability to adjust instruction according to what learners actually need rather than adhering rigidly to a predetermined lesson. Parsons et al. (2018), in their synthesis of research on instructional adaptation, found that effective teachers modify content, strategies, pacing, and classroom interactions in response to learners' academic, linguistic, cultural, and social needs. Such adaptations require teachers to notice difficulties as they emerge and make appropriate instructional decisions. Vaughn (2019) similarly observed that teachers adapted reading instruction based on learners' specific needs while maintaining the intended instructional goals. These findings position adaptability as an important element of resourcefulness pedagogy because continuity of learning depends partly on teachers who can alter the route of instruction without losing sight of what learners are expected to achieve.

Teacher Agency and Pedagogical Decision-Making

Resourcefulness also rests on teachers' capacity to make informed professional choices. Teacher agency refers to the ability to act purposefully within the opportunities and limitations of a particular teaching environment. Tao and Gao (2017) found that teachers exercised agency through individualized decisions shaped by professional experience, identity, and changing curricular demands. Their findings show that teachers do not respond to instructional requirements in identical ways because they interpret problems and possible solutions through accumulated professional knowledge. For resourcefulness pedagogy, this form of agency matters because teachers may need to determine which strategies should be retained, modified, combined, or replaced when classroom circumstances interfere with planned instruction. Resourceful practice therefore requires professional judgment alongside creativity, since instructional adjustments must remain connected to legitimate learning purposes.

Resource Adaptation and Teacher Design Capacity

Instructional resources gain value through the ways teachers select and reshape them for classroom use. Pepin, Gueudet, and Trouche (2017) described teacher design capacity as the ability to understand, transform, and use curriculum resources in ways that serve instructional purposes. Their work showed that teachers engage in

design when they adapt existing materials, combine different resources, or create instructional arrangements suited to their learners. This perspective closely supports resourcefulness pedagogy because the availability of materials alone does not guarantee effective instruction. Teachers must recognize what a resource can contribute and determine how it can be adjusted when its original form does not fully match learner readiness, classroom conditions, or lesson objectives. Resourcefulness may therefore be reflected in thoughtful adaptation rather than dependence on either abundant materials or constant creation of new ones.

Learning Continuity under Unequal Conditions

Learning continuity becomes more demanding when learners and schools have unequal access to technology, materials, family support, and other educational resources. Cahapay (2021), examining the Philippine Basic Education Learning Continuity Plan, argued that learning delivery needs to be matched with the actual resources available to learners rather than relying on a single mode of instruction. Colicol and Colicol-Rodriguez (2025) likewise found that socioeconomic conditions, school location, digital access, and parental education influenced the implementation of learning continuity measures in Philippine communities. Their study also identified teachers as important actors in monitoring learners, supporting home-based learning, and responding to gaps in available teaching resources. These findings strengthen the need to examine resourcefulness pedagogy as a practical means through which elementary teachers can sustain learning despite differences in classroom and learner circumstances.

METHODS

Research Design

The study employed a cross-sectional explanatory-predictive research design supported by partial least squares structural equation modeling (PLS-SEM). The design was selected because the study sought not only to describe resourcefulness pedagogy and learning continuity but also to determine the predictive contribution of resourcefulness-oriented teaching practices to sustained classroom learning. Resourcefulness pedagogy was treated as a multidimensional construct reflected through resource adaptation, instructional redesign, contextual mobilization, and continuity-oriented learner support. Learning continuity represented the teachers' capacity to maintain learner access, participation, and completion of instructional requirements despite limitations affecting ordinary classroom processes. The predictive orientation provided a stronger analytical basis for identifying the teaching practices that contributed most meaningfully to continuity.

Research Locale

The study was conducted in Lamut, Ifugao, among public elementary teachers under the Schools Division of Isabela. The municipality provided an appropriate setting because elementary instruction was delivered across communities with varying access to instructional materials, connectivity, transportation, and locally available learning resources. These conditions allowed resourcefulness to be examined as an everyday pedagogical practice rather than solely as a response to emergency situations.

Participants and Sampling Technique

The participants were 106 public elementary school teachers actively engaged in classroom instruction in Lamut, Ifugao. The sampling frame was anchored on the documented district personnel count of 146 elementary teaching personnel occupying Teacher I, Teacher II, Teacher III, Master Teacher I, and Master Teacher II positions. The sample of 106 was determined using finite-population sample estimation at a 95% confidence level and 5% margin of error. Proportionate stratified random sampling was applied to preserve representation across the elementary teaching units in the municipality. Only teachers with direct instructional responsibilities during the conduct of the study were included, while school heads serving primarily administrative functions and nonteaching personnel were excluded.

Research Instrument

Data were gathered through the Resourcefulness Pedagogy and Learning Continuity Scale (RPLCS) developed specifically for the study. The instrument contained two major sections. The Resourcefulness Pedagogy Scale measured resource adaptation, instructional redesign, contextual mobilization, and continuity-oriented learner support, while the Learning Continuity Scale assessed sustained learning access, learner participation, instructional follow-through, and task completion. Responses were recorded using a five-point agreement scale.

The initial item pool underwent content validation by five experts in elementary education, curriculum and instruction, educational research, and instrument development. The instrument obtained an S-CVI/Ave of .94, indicating strong overall content validity, while retained items recorded I-CVI values from .80 to 1.00. Following expert review, the revised instrument was pilot-tested with 30 public elementary school teachers who were not included in the final study. The pilot administration yielded an overall Cronbach's alpha of .918 for the RPLCS. The Resourcefulness Pedagogy Scale obtained $\alpha = .906$, while the Learning Continuity Scale obtained $\alpha = .889$, demonstrating strong internal consistency.

Data Gathering Procedure

Permission to conduct the study was secured from the appropriate education authorities before the administration of the instrument. After authorization had been obtained, eligible teachers were informed of the purpose, scope, voluntary nature, and confidentiality provisions of the research. The questionnaires were distributed using coded forms without requiring names or other direct identifiers. Completed responses were retrieved, checked for completeness, encoded, and subjected to data screening before statistical analysis. Responses were stored in a password-protected dataset accessible only for purposes directly related to the study.

Data Analysis

The data were analyzed through a two-stage PLS-SEM procedure. Descriptive statistics, particularly the mean and standard deviation, were first computed to summarize the observed levels of resourcefulness pedagogy and learning continuity. The measurement model was then evaluated through indicator reliability, Cronbach's alpha, composite reliability, average variance extracted, and the heterotrait-monotrait ratio. After satisfactory measurement quality had been established, the structural model was examined using standardized path coefficients, coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2). Statistical significance of structural paths was determined through 10,000-sample bootstrapping at the 5% significance level. Model predictive ability was further examined through PLSpredict, allowing the analysis to determine whether resourcefulness pedagogy demonstrated meaningful out-of-sample predictive power for learning continuity. This approach provided evidence concerning both statistical explanation and practical prediction.

Ethical Considerations

The study observed voluntary participation, informed consent, confidentiality, anonymity, and the participants' right to withdraw without penalty. No personally identifying information was included in the analytical dataset. The collected data were used only for the stated research purpose, stored securely, and reported in aggregated form to prevent the identification of individual teachers.

RESULTS AND DISCUSSION

Table 1. *Level of Resourcefulness Pedagogy among Public Elementary School Teachers*

Dimension	Mean	SD	Interpretation
Resource Adaptation	4.08	0.51	High
Instructional Redesign	3.89	0.56	High
Contextual Mobilization	3.34	0.68	Moderate

Continuity-Oriented Learner Support	3.76	0.58	High
Overall	3.77	0.49	High

Scale: 4.21 to 5.00 = Very High; 3.41 to 4.20 = High; 2.61 to 3.40 = Moderate; 1.81 to 2.60 = Low; 1.00 to 1.80 = Very Low.

Table 1 presents a generally high level of resourcefulness pedagogy, with an overall mean of 3.77. Resource adaptation obtained the highest mean of 4.08, indicating that teachers were particularly capable of modifying available materials, activities, and instructional arrangements when usual resources did not fully meet classroom needs. Instructional redesign and continuity-oriented learner support were also high. In contrast, contextual mobilization registered only a moderate level at 3.34. This suggests that teachers were more capable of adjusting resources already within their immediate reach than of drawing systematically on community resources, local expertise, partnerships, or other support beyond the classroom. The pattern supports the view that teachers' competence in adapting instruction contributes to their ability to respond to changing teaching demands, although adaptation may vary depending on the resources and support available to them (König et al., 2020).

Table 2. *Level of Learning Continuity in Elementary Classrooms*

Dimension	Mean	SD	Interpretation
Sustained Learning Access	3.66	0.61	High
Learner Participation	3.29	0.69	Moderate
Instructional Follow-Through	3.58	0.63	High
Task Completion	3.35	0.67	Moderate
Overall	3.47	0.55	High

Table 2 shows that learning continuity was generally high, although important weaknesses remained. Sustained learning access received the highest mean of 3.66, followed by instructional follow-through at 3.58. These results indicate that teachers were generally able to keep instruction accessible and maintain the progression of lessons. However, learner participation obtained a mean of 3.29, while task completion reached only 3.35, both interpreted as moderate. The findings reveal that providing continued access did not automatically result in consistent learner engagement or completion of assigned work. This distinction is important because continuity involves more than keeping instruction available. Earlier evidence from K to 12 teachers also showed that maintaining teaching during disrupted conditions required additional preparation and support, particularly when teachers had to alter established instructional practices (Trust & Whalen, 2020).

Table 3. *Reliability and Convergent Validity of the Measurement Model*

Construct	Indicator Loading	Range	Cronbach's α	Composite Reliability	AVE
Resource Adaptation	.738 to .861	.842	.887		.611
Instructional Redesign	.721 to .854	.835	.884		.605
Contextual Mobilization	.714 to .848	.814	.871		.575
Continuity-Oriented Learner Support	.744 to .879	.856	.901		.646
Sustained Learning Access	.733 to .866	.838	.886		.608
Learner Participation	.718 to .853	.821	.877		.589
Instructional Follow-Through	.729 to .872	.846	.892		.623
Task Completion	.716 to .859	.827	.880		.595

Table 3 presents satisfactory measurement quality across all constructs. Indicator loadings ranged from .714 to .879, while Cronbach's alpha coefficients ranged from .814 to .856. Composite reliability values ranged from .871 to .901, demonstrating strong internal consistency. Average variance extracted ranged from .575 to

.646, indicating that every construct explained more than half of the variance in its indicators. These results satisfied accepted PLS-SEM criteria for indicator reliability, internal consistency, and convergent validity, supporting the use of the constructs in the succeeding structural analysis (Hair et al., 2022).

Table 4. *Heterotrait-Monotrait Ratios among the Constructs*

Construct	RA	IR	CM	CLS	SLA	LP	IF	TC
RA	1.000							
IR	.721	1.000						
CM	.648	.706	1.000					
CLS	.743	.781	.697	1.000				
SLA	.689	.756	.601	.798	1.000			
LP	.611	.682	.654	.729	.762	1.000		
IF	.667	.735	.622	.784	.812	.741	1.000	
TC	.593	.659	.608	.711	.747	.796	.774	1.000

Note. RA = Resource Adaptation; IR = Instructional Redesign; CM = Contextual Mobilization; CLS = Continuity-Oriented Learner Support; SLA = Sustained Learning Access; LP = Learner Participation; IF = Instructional Follow-Through; TC = Task Completion.

Table 4 indicates that all HTMT values remained below the .85 criterion. The highest coefficient was .812 between sustained learning access and instructional follow-through, while the remaining coefficients ranged from .593 to .798. The results indicate that the dimensions were related but remained empirically distinct from one another. Resourcefulness pedagogy and learning continuity could therefore be examined as multidimensional constructs without evidence that any two dimensions measured essentially the same concept.

Table 5. *Structural Model Predicting Learning Continuity*

Predictor	β	t-value	p-value	95% CI	f^2	Decision
Resource Adaptation → Learning Continuity	.241	2.845	.005	[.075, .399]	.078	Significant
Instructional Redesign → Learning Continuity	.364	4.386	<.001	[.197, .522]	.169	Significant
Contextual Mobilization → Learning Continuity	.108	1.492	.136	[-.035, .252]	.027	Not Significant
Continuity-Oriented Learner Support → Learning Continuity	.296	3.641	<.001	[.137, .451]	.113	Significant

Model statistics: $R^2 = .612$; Adjusted $R^2 = .596$; $Q^2 = .401$; predictor VIF range = 1.36 to 1.92. Bootstrapping = 10,000 samples.

Table 5 presents the central finding of the study. The four resourcefulness dimensions collectively explained 61.2% of the variance in learning continuity, indicating substantial explanatory capacity. Instructional redesign emerged as the strongest predictor, $\beta = .364$, $p < .001$, followed by continuity-oriented learner support, $\beta = .296$, $p < .001$, and resource adaptation, $\beta = .241$, $p = .005$. These results suggest that continuity was strengthened most when teachers went beyond substituting materials and deliberately reorganized activities, instructional sequences, modes of delivery, and learner support according to emerging needs.

A contrasting result emerged for contextual mobilization. Although teachers' use of local and community resources contributed positively to the model, its independent effect was not statistically significant, $\beta = .108$, $p = .136$. This finding is consistent with its moderate descriptive rating in Table 1. It suggests that external resources became useful to learning continuity only when they were effectively transformed into actual instructional arrangements. Thus, the main concern was not simply whether resources existed within the community, but whether teachers could integrate them meaningfully into classroom practice. The positive Q^2 value of .401 further indicated that the model possessed meaningful predictive relevance.

Table 6. *PLSpredict Assessment of Learning Continuity*

Prediction Target	Q ² predict	PLS-SEM RMSE	Linear Model RMSE	Result
Access to lesson materials	.314	.572	.614	PLS-SEM lower
Alternative learning channels	.268	.604	.639	PLS-SEM lower
Regular learner participation	.221	.651	.690	PLS-SEM lower
Re-engagement after missed activities	.198	.673	.708	PLS-SEM lower
Completion of lesson sequence	.291	.593	.628	PLS-SEM lower
Follow-up of unfinished work	.244	.621	.655	PLS-SEM lower
Timely task completion	.217	.646	.681	PLS-SEM lower
Completion despite resource limitations	.228	.635	.669	PLS-SEM lower

Table 6 shows positive Q²predict values for all eight learning continuity indicators, ranging from .198 to .314. More importantly, the PLS-SEM root mean square error was lower than the corresponding linear-model error for every prediction target. The strongest predictive performance appeared in continued access to lesson materials, while re-engagement after missed activities remained the most difficult outcome to predict. Following the PLSpredict framework, consistently lower prediction errors than the linear benchmark provide evidence of strong out-of-sample predictive capability (Shmueli et al., 2019).

Taken together, the results showed that resourcefulness pedagogy substantially supported learning continuity, but its dimensions did not contribute equally. The strongest advantage came from teachers' ability to redesign instruction and provide continuity-oriented learner support. At the same time, moderate learner participation, moderate task completion, and the weak independent contribution of contextual mobilization revealed areas that required attention. The findings therefore suggest that resourcefulness should not be reduced to the availability or substitution of instructional materials. Its stronger pedagogical value appeared when teachers converted available resources into purposeful instructional adjustments capable of keeping learners engaged and progressing through required learning tasks.

CONCLUSION

Resourcefulness pedagogy was an important contributor to learning continuity in elementary classrooms, particularly through instructional redesign, continuity-oriented learner support, and resource adaptation. Teachers were generally able to sustain access to instruction and maintain lesson progression, although learner participation, task completion, and contextual mobilization remained comparatively weaker areas. These findings indicate that resourcefulness becomes more effective when teachers move beyond the simple use of available materials and deliberately reorganize instruction according to learner needs and classroom conditions. It is therefore recommended that schools strengthen professional development on adaptive lesson design, flexible instructional planning, and learner re-engagement strategies, while also expanding mechanisms that help teachers connect community-based resources with classroom instruction. School leaders may further support these efforts by providing structured opportunities for teachers to share locally developed materials and successful continuity practices, while future studies may examine the model across other elementary settings to determine whether the identified relationships remain consistent under different school conditions.

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