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Competency-Anchored Financial Resilience: Sustaining Practical Material Procurement in an Indonesian Private Vocational High School

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Abstract

Vocational high schools that train students in Culinary Arts and Fashion Design spend part of their budget on materials that are consumed in every practical session. When market prices rise faster than fixed per-student funding, the continuity of hands-on training is put at risk. This study examines how a private vocational school in Kudus Regency, Indonesia, sustained the procurement of practical materials by integrating financial planning with alternative financing. A qualitative single-case design was used. Data came from interviews with six informants, 12 observation sessions, and analysis of school budget plans, unit-cost worksheets, and production unit records. They were analyzed through an interactive model with source and method triangulation. The findings show three mechanisms that were activated in sequence as price pressure increased. Competency-based unit-cost planning absorbed ordinary price changes. Margins from the teaching factory catering and garment units covered larger shortfalls. Emergency support from the governing foundation and the regrouping of practical classes into smaller supervised groups formed the final response. Throughout this sequence, the competency targets that students had to achieve were held constant. The study synthesizes these findings into a Competency-Anchored Cascading Resilience Model. The model implies that school leaders and foundations should plan costing, production income, and institutional support as one coordinated system rather than as separate funding sources.

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INTRODUCTION

Practical learning in vocational high schools (*Sekolah Menengah Kejuruan*, SMK) depends on materials that are used up during training and whose prices schools cannot control. In Culinary Arts and Fashion Design, every session consumes ingredients, fabrics, and accessories, so the cost of instruction follows the market rather than the school calendar. Research on vocational training treats these consumables as a condition of skill acquisition rather than a minor expense **(Omonovich et al., 2026; Özer & Suna, 2022; Putra, 2023)**. Studies of technical colleges have examined whether workshop facilities are adequate for practical skills acquisition **(Ngelu et al., 2026; Olawale & Jonathan Ojo, 2023; State & Johnbull, 2022)**, and others have proposed frameworks for specifying the consumables that training requires **(Adameji & Kelechi Reko E., 2022)**. Evidence from Ethiopia also shows that training materials shape graduate employability through cooperative training **(Attah & Ndubuisi-Okolo, 2026; Biqa et al., 2025)**. Indonesian schools have felt this pressure directly, as annual inflation in volatile food prices reached 10.33% in March 2024 **(Sari et al., 2026)**. Public funding leaves little room to respond, because the regular School Operational Assistance (BOS) grant is fixed per student for a full budget year **(Susilawati et al., 2023)**. The gap between moving prices and fixed allocations is therefore a management problem, and the way schools handle it bears directly on the quality of psychomotor training.

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Research on educational finance has repeatedly found that institutions handle the tension between financial and academic demands by keeping the two apart. In Malaysian public universities, **Wedayanti dan Pulungan (2023)** showed that bursaries, corporate strategy divisions, and faculties allowed academic and financial logics to coexist through compartmentalization and loose coupling. This arrangement secured institutional legitimacy but left the two logics largely separate. **Bertheussen (2025)** reached a more critical conclusion in a Norwegian university faculty. There, soft budget constraint practices grew out of a dysfunctional department structure and centralized, non-transparent financial management, while competing academic, bureaucratic, and business logics weakened financial discipline. Studies of vocational education approach the same problem from the opposite direction. **Daryanto et al. (2025)** modeled teaching factory implementation in Central Java SMK around school management, human resources, marketing, workshops, laboratories, learning patterns, and industry relations, yet financing did not appear as a distinct dimension of their model. **Huang et al. (2023)** studied 52 Chinese vocational colleges between 2018 and 2023. They found that an adaptive governance capacity framework explained the effectiveness of performance-based funding far better than conventional principal-agent models. Read together, these studies agree that governance arrangements shape how money supports learning. However, they examine either finance or pedagogy at the level of whole institutions or systems, and none follows how a school protects the daily supply of practical materials when prices change.

This body of work leaves a specific gap. The literature presents compartmentalization as a coping strategy and treats teaching factories mainly as a pedagogical model. As a result, the possibility that a school can deliberately link budgeting, commercial income, and institutional support to protect instruction has received little empirical attention. Vocational financing studies also tend to work at the level of provincial policy or institutional performance indicators, which leaves the school-level decisions behind each practical session largely invisible. The present study addresses this gap in context, focus, and method. Its context is a private, foundation-governed SMK in Kudus Regency that operates without *Badan Layanan Umum Daerah* (BLUD) status and runs two of the most consumable-intensive programs, Culinary Arts and Fashion Design. Its focus is the procurement of practical materials under price volatility, a problem that sits between financial administration and instructional design and is rarely examined as such. Its method combines interviews with six actors, 12 workshop and outlet observations, and analysis of RKAS documents, unit-cost worksheets, and production unit records across one full semester. This combination allows financial decisions to be traced to the practical sessions they affected. The novelty of the study lies in examining how one school turns separate financial instruments into a single, sequenced response anchored in the competencies students must master.

This study accordingly pursues three objectives. The first is to analyze how unit-cost-based financial planning is synchronized with the material requirements of competency-based practical learning. The second is to explore how alternative financing operates through teaching factory production units and support from the governing foundation. The third is to examine the organizational strategies the school uses to keep practical learning running when material prices exceed its projections. Pursuing these objectives at the level of a single school complements system-level research on vocational financing. It also extends the institutional logics literature, which has so far documented the separation of financial and academic concerns more often than their integration. Academically, the study offers an account of financial resilience that places instructional organization inside the financial system rather than treating it as a downstream consequence of funding. Practically, it gives principals, financial officers, and foundation managers in private vocational schools a concrete picture of how competency-level costing, production income, and foundation support can be coordinated before a price shock reaches the workshop.

The central argument of this study is that financial resilience in vocational schools is better understood as a managerial capability than as a stock of reserve funds. The study follows the

capability-based view of organizational resilience proposed by **Erhabor dan Reis (2026)**, which treats resilience as a process unfolding through anticipation, coping, and adaptation. It then asks how these stages appear in the everyday management of practical materials. The inquiry focuses on how administrators and department heads convert competency targets into cost estimates and how they decide when production unit income or foundation support is needed. It also examines how teachers reorganize practical classes when resources tighten. Particular attention is given to the conditions that trigger each decision and to the people who make it, since the sequence of responses matters as much as the responses themselves. A qualitative single-case design suits this aim because these decisions are embedded in documents, routines, and conversations that aggregate financial indicators cannot capture. The following section describes how this design was carried out in the field.

The urgency of this inquiry comes from the recurrence of price shocks rather than from any single episode. Volatile food inflation rose sharply in early 2024 and climbed again at the end of 2025 **(Sari et al., 2026)**. Schools that offer consumable-intensive programs therefore face this pressure as a routine condition of operation, not as an exceptional event. Private vocational schools are particularly exposed because they lack the financial flexibility that BLUD status gives some public vocational schools **(Triani et al., 2026)**. How such a school sustains practical learning under these conditions is therefore a question of direct concern to school leaders and to the foundations that govern them. The remainder of the article presents the research method, reports the findings in three themes, discusses them in relation to earlier studies, and closes with conclusions, limitations, and recommendations.

RESEARCH METHOD

This study used a qualitative approach with a single-case study design to examine how financial planning and alternative financing mechanisms were integrated in the procurement of practical materials at a vocational school **(Dasinapa, 2025; Shofi, 2026; Wery & Kothakota, 2026)**. A qualitative approach was chosen because the research questions asked how and why administrators made budgeting and procurement decisions. Such questions can only be answered through participants' own accounts and the context in which those decisions were made. The case study design allowed managerial policies, leadership practices, and operational strategies to be examined in depth within a bounded system **(Parrilli & Calabretta, 2025; Zaro & Kïrïakos, 2021)**. The case was a private vocational high school (SMK) in Kudus Regency, Central Java, Indonesia. It was selected for two reasons: it runs two programs with a high consumption of single-use practical materials, Culinary Arts and Fashion Design, and it operates teaching factory units connected to both. The unit of analysis was the school's financial management system, including the decisions, budget adjustments, and leadership practices of administrators, department heads, and production unit managers. Fieldwork lasted six months and covered one complete semester of financial planning and execution. The researcher served as the primary instrument of data collection and analysis and maintained an empathetic yet critical stance during field interactions **(Chin & Amer Nordin, 2026)**. To limit researcher bias, reflexive field journals were kept throughout the study, and emerging interpretations were checked continuously against both informant accounts and financial documents **(Parrilli & Calabretta, 2025)**.

Data were collected through semi-structured in-depth interviews, non-participant observation, and document analysis **(Finet et al., 2026; Maina, 2025)**. Six informants were selected through purposive sampling based on their direct involvement in budgeting, procurement, and the management of revenue-generating units. They were the principal, the chief administrative and financial officer, the heads of the Culinary Arts and Fashion Design departments, and the managers of the catering and garment production units. Interviews followed a protocol covering unit-cost calculation, budget adjustment, alternative revenue, and foundation support. Each interview lasted between 45 and 90 minutes, was audio-recorded, and was transcribed verbatim.

Sample sufficiency was judged against the criterion of data saturation, which was reached when the sixth interview produced no new categories on unit-cost planning or cross-subsidization. Observations were conducted in 12 sessions across the culinary laboratories, the fashion workshops, and the production unit outlets. They focused on how commercial production and student practice were scheduled and how materials were distributed and used. Document analysis used a structured checklist to examine the Rencana Kegiatan dan Anggaran Sekolah (RKAS), competency-based curriculum maps, unit-cost worksheets, production unit financial records, and other institutional financial documentation **(Ahmed, 2025; Tarmo & Kimaro, 2021)**. These documents were used to verify interview statements and to trace how planning decisions were recorded in the school's own records. The informants, the focus of each interview, and the observation and documentary sources linked to each informant are presented in **Table 1**.

Table 1. Research Informants and Corresponding Data Sources

Code	Position	Interview focus	Linked observation and documents	Theme informed
KS	Principal	Leadership decisions, coordination with the foundation, and priority given to practical continuity	Institutional financial documentation; workshop observations	1, 3
BK	Chief administrative and financial officer	Unit-cost calculation, RKAS preparation, and contingency provisions	RKAS; unit-cost worksheets	1
KP1	Head of the Culinary Arts department	Ingredient lists, procurement requests, and responses to price changes	Competency maps; culinary laboratory observations	1
KP2	Head of the Fashion Design department	Material use, group reorganization, and teacher supervision	Fashion workshop observations	3
MU1	Manager of the catering production unit	Catering orders, commercial margins, and support for practice materials	Production unit financial records; outlet observations	2
MU2	Manager of the garment production unit	Garment orders and allocation of remaining income	Production unit financial records; workshop observations	2

Source: Research data, compiled by the authors.

Table 1 shows that every informant's account could be checked against at least one source of a different type, and this structure formed the basis for the source and method triangulation applied during analysis. Accounts of budgeting from KS, BK, and KP1 were compared with the RKAS and unit-cost worksheets. Statements from MU1 and MU2 were compared with production unit records and observations of the outlets, and KP2's account of regrouping was compared with observations of workshop organization. The data were then analyzed using an interactive model with three concurrent activities: data condensation, data display, and conclusion drawing and verification. In the condensation stage, interview transcripts, observation notes, and documents were coded in first and second cycles. Coding moved from descriptive codes for specific practices to broader categories and themes related to financial integration and institutional resilience **(Nasution et al., 2025; Tamrakar et al., 2021)**. In the display stage, the condensed data were arranged in matrices that compared categories across informants and data sources. These matrices helped reveal patterns such as the sequence in which the financial mechanisms were activated. In the final stage, preliminary conclusions were verified repeatedly against the raw data before being formulated as the three themes reported in the findings. Trustworthiness was established through several procedures **(Mahirah, 2024)**. Credibility was supported by prolonged engagement, triangulation, and member checking, in which interview summaries and interpretations were returned to key informants for confirmation. Dependability and confirmability were supported by an audit trail of raw notes, coding schemes, and analytic memos. Transferability was supported by a detailed description of the research context.

RESULT AND DISCUSSION

Results

Analysis of the interview transcripts from six informants, 12 observation sessions, and the school's financial documents produced three interrelated themes. Together, they explain how the school kept practical learning in Culinary Arts and Fashion Design running when raw material prices rose beyond the initial budget projections. Informants did not describe these mechanisms as separate strategies that operated in parallel. Instead, they described them as successive layers of financial protection. Each layer was called upon when procurement pressure reached a level that the previous one could no longer absorb. Contingency provisions built into the unit-cost plan handled ordinary price fluctuations. Contributions from the teaching factory production units covered costs that exceeded these routine allocations. Supplementary funding from the governing foundation, together with changes in the organization of practical classes, formed the final response when internal resources were insufficient. The core mechanism of each theme, the condition under which it was activated, and the evidence on which it rests are summarized in **Table 2**.

Table 2. Layered Mechanisms Sustaining Practical Material Procurement

Theme	Core mechanism	Activation condition	Main evidence
Competency-based unit-cost planning	Per-student calculation of fixed and variable material costs derived from practical competency targets and integrated into the RKAS	Routine financial planning and ordinary material price fluctuations	Interviews with KS, BK, and KP1; RKAS documents; competency maps; unit-cost worksheets
Teaching factory cross-subsidization	Allocation of financial contributions from catering and garment production to practical material procurement	Procurement costs exceeding available contingency provisions	Interviews with MU1 and MU2; production unit financial records; observations of commercial and instructional activities
Foundation liquidity and workshop regrouping	Supplementary financial support from the foundation combined with reorganization of practical learning groups	Financial pressure exceeding routine allocations and production unit contributions	Interviews with KS and KP2; institutional financial documentation; observations of workshop organization

Source: Research findings synthesized from interviews, field observations, and institutional documents.

Table 2 shows that the three mechanisms differ less in purpose than in the level of pressure each was meant to absorb. All three served the same goal of keeping scheduled practical sessions running, yet each was activated only when the one before it reached its limit. This sequence matters for how the findings should be read. Production unit income did not replace unit-cost planning, and foundation support did not replace production unit income. Each layer remained in operation while the next one added capacity, so the school's response grew in proportion to the severity of the price increase. The table also shows that every theme draws on more than one type of evidence. Interview accounts from different informants are combined with planning documents, financial records, or workshop observations. As a result, each mechanism can be examined both through the accounts of the people who operated it and through the records it produced. The following sections examine each layer in turn, beginning with the planning system that formed the school's first line of defense.

Translating Competency Maps into Per-Student Unit Costs

At the observed school, unit-cost analysis went beyond the administrative task of preparing and justifying annual expenditure allocations. Financial planning was tied directly to the practical competencies specified in the Culinary Arts and Fashion Design curricula. The school did not set material expenditure solely from aggregate departmental budget ceilings. It identified the materials needed to achieve each competency and converted these needs into per-student cost estimates. The process began with the competencies students were expected to complete during the academic

period. Each competency was then translated into a list of required materials, estimated quantities, and the corresponding expenditure. In Culinary Arts, these calculations mainly concerned the consumable ingredients used in food preparation and production. In Fashion Design, they covered fabrics, threads, and other materials required for cutting, sewing, and garment construction. Financial administrators consolidated these departmental requirements into the annual *Rencana Kegiatan dan Anggaran Sekolah* (RKAS). This created a direct link between instructional activities, material procurement, and the institutional budget. The chief financial officer described how this link was established:

"We begin by examining the practical competencies that students are expected to achieve. Each department identifies the materials required for every practical activity, including the estimated quantity per student. We then calculate the costs using the prevailing market prices and incorporate them into the school budget plan. This approach helps us identify which materials require additional funding when prices increase." (BK)

The financial officer's account shows that the cost of practical learning was built upward from the material needs of individual competencies, not downward from a fixed budget ceiling. In this arrangement, unit costs were working figures that administrators used to decide how much each practical activity required. They were not merely numbers prepared for reporting. The calculation also separated relatively predictable operating expenditures, such as equipment maintenance and workshop utilities, from variable expenditures on materials whose prices moved with the market. This separation mattered because a sudden rise in the price of ingredients or fabric could directly threaten the financial feasibility of a scheduled practical session, whereas fixed costs rarely did. The final sentence of the officer's statement points to the practical value of the approach: it allowed the administration to identify in advance which materials would need additional funding when prices rose. The head of the Culinary Arts department explained how these calculations were then applied in departmental procurement:

"Before conducting practical sessions, we prepare a list of ingredients based on the competencies being taught and the number of students participating. This list becomes our reference when requesting materials from the financial administration. When ingredient prices increase, we coordinate with the administration to adjust procurement without changing the competencies that students must achieve." (KP1)

The department head's account complements the financial officer's explanation by showing how competency-based calculations worked at the instructional level. The ingredient list served as the department's procurement reference, so purchasing needs were agreed with the financial administration before practical activities took place. The statement also indicates that price changes were handled through coordination between the department and the administration, not through unilateral cuts by either side. Adjustments affected procurement arrangements but left unchanged the competencies students were required to achieve. The competency target thus acted as a fixed reference point, while the means of procurement remained flexible. Document analysis of the RKAS, the curriculum competency maps, and the unit-cost worksheets provided a further basis for examining this arrangement. These documents connected practical competency requirements with material identification, expenditure estimates, and institutional budget allocations. The components of the unit-cost calculation applied to practical material planning in both departments are summarized in **Table 3**.

Table 3. Competency-Based Unit-Cost Calculation Framework for Practical Learning

Planning component	Culinary Arts	Fashion Design	Financial implication
Practical competency	Food preparation and production competencies	Cutting, sewing, and garment construction competencies	Defines required practical activities
Material identification	Ingredients and supporting consumable materials	Fabrics, threads, and sewing accessories	Establishes procurement requirements

Planning component	Culinary Arts	Fashion Design	Financial implication
Quantity estimation	Materials estimated according to competency and student participation	Materials estimated according to garment activities and student participation	Provides the basis for per-student cost calculations
Unit price determination	Estimated purchasing prices for required ingredients	Estimated purchasing prices for required fabrics and accessories	Converts material quantities into financial requirements
Variable cost calculation	Consumable ingredient expenditure	Consumable fabric and sewing material expenditure	Identifies expenditure exposed to price fluctuations
Fixed cost consideration	Workshop equipment maintenance and utilities	Sewing equipment maintenance and workshop utilities	Identifies relatively predictable operating costs
Contingency planning	Provision for changes in ingredient prices	Provision for changes in fabric and accessory prices	Supports adjustments during market volatility
RKAS integration	Consolidation of Culinary Arts practical material requirements	Consolidation of Fashion Design practical material requirements	Synchronizes competency targets with institutional financial planning

Source: Analytical synthesis of RKAS documentation, competency maps, unit-cost worksheets, and informant accounts.

Table 3 shows that the planning process followed the same sequence in both departments. It moved from the competency to be taught to the materials it required, then to the quantities and prices of those materials, and finally to their consolidation in the RKAS. Because the structure is parallel across the two departments, competency-based costing appears to have been an institutional procedure rather than the initiative of a single department head. The table also makes clear where the financial risk was located. Variable costs for ingredients, fabrics, and sewing materials were exposed to market price changes, while maintenance and utility costs remained comparatively stable. Contingency provisions were attached specifically to these volatile components. This explains how the school could respond to ordinary price increases without reopening the entire budget. Read alongside the interviews, the table shows that the two accounts describe the same documented procedure from two administrative positions. The financial officer described building costs from competencies, and the department head described using material lists for procurement.

Field observations of the workshops showed why this planning procedure had to be closely coordinated with the timing of practical activities. In Culinary Arts, consumable ingredients had to be available in line with the preparation and production activities scheduled for each competency. In Fashion Design, fabrics and related materials likewise had to match the specific stages of garment production, from cutting to assembly. These operational demands made coordination between departmental planning and financial administration essential for keeping practical sessions on schedule. The competency-based plan also supported the early detection of procurement shortfalls. Because estimated material requirements were recorded for specific practical activities, administrators could assess which competencies would be affected when the price of a particular material rose. Procurement decisions could therefore be reconsidered before a financial constraint interrupted a scheduled session. Without this, the problem would surface only after students and teachers had arrived at a workshop without the materials they needed.

The findings also show that this planning mechanism had clear limits. Contingency provisions could absorb ordinary increases in material costs, but larger price movements could exceed the routine budgetary flexibility available to the school. Competency-based unit-cost planning therefore functioned as the first layer of financial protection, not as a complete solution to procurement vulnerability. This theme addresses the first research objective by showing how the school synchronized its financial planning with practical instructional requirements. Competency-based calculations connected curriculum targets, departmental procurement needs, and institutional budgeting decisions within a single procedure used by both administrators and department heads. When price increases could not be accommodated through this initial

mechanism, however, the school needed resources outside its routine allocations. Informants consistently pointed to the school's own production units as the next source of such resources, and their role is examined in the following theme.

Teaching Factory Margins as an Internal Price Buffer

The second theme concerns the role of school-based production units in generating alternative financial resources for practical material procurement. The school ran catering and garment production units as part of its vocational learning activities and used their commercial contributions to increase its financial flexibility. These units therefore served two functions at once. They gave students opportunities to take part in production-oriented practical work, and they generated additional income that could support the purchase of instructional materials. The catering unit offered the clearest illustration of this arrangement. External catering orders produced commercial revenue and also created occasions to connect production activities with the competencies developed in the Culinary Arts program. Through this arrangement, practical learning, market-oriented production, and financial support for educational operations were brought together within a single unit. The Catering Production Unit Manager explained how income from these commercial activities helped address shortfalls in material procurement:

"The commercial orders from external catering don't just generate profit; they directly cover raw material shortfalls for student practice sessions. When prices of ingredients like butter or eggs surge, the unit's net margin absorbs the shock so students don't have to pay extra fees or cancel lab sessions." (MU1)

The manager's statement identifies two connected contributions of the catering unit. First, commercial production generated financial resources that supplemented the school's regular budget allocations. Second, these resources protected practical learning from sudden increases in ingredient prices, with butter and eggs cited as the items most affected. The statement is explicit about who would otherwise have borne the cost. Without the unit's margin, rising prices would have been passed on to students as additional fees or absorbed by the curriculum through cancelled laboratory sessions. Field observations of production activities provided contextual support for this account. The catering unit operated in close connection with the practical learning environment, where food preparation and production formed part of the competencies students were developing. Commercial production was therefore organized around activities relevant to vocational instruction, and the resulting income was directed back toward material procurement. In this sense, the unit was not a separate business attached to the school. It functioned as an extension of the curriculum that also generated revenue.

A comparable mechanism was identified in the garment production unit attached to the Fashion Design program. The unit provided sewing and garment production services to external customers while supporting practical learning in clothing construction and related competencies. Its commercial operations generated additional income that could help finance the materials required for practical instruction. As with the catering unit, the financial contribution of these activities reduced the school's exclusive dependence on routine public funding. The Garment Production Unit Manager described this relationship as follows:

"Our garment production unit receives sewing and clothing orders from external customers. These activities provide opportunities for students to apply their practical skills while generating additional income for the school. After covering production expenses, part of the remaining income can be used to support the purchase of fabrics and other materials needed for practical learning." (MU2)

This account reinforces the finding that commercial production served both educational and financial objectives. Like the catering unit, the garment unit gave students contact with real production processes while contributing resources for the purchase of practical materials. The manager's wording is more cautious than that of the catering manager, however. Only part of the remaining income, after production expenses were covered, could be used for practical learning.

The two units also differed in their operational characteristics and material requirements. Catering depended heavily on food ingredients that were consumed during production and were sensitive to frequent price changes. Garment production, by contrast, relied on fabrics, sewing accessories, and other materials used in clothing construction. These differences shaped the procurement risks each unit faced and the type of financial support each could provide. The production unit financial records confirmed that revenue from both units was linked to the school's efforts to meet practical material needs. The precise proportion of net profit allocated to educational expenditure, however, could not be determined from the available evidence. The operational and financial contributions of the two units are compared in **Table 4**.

Table 4. Teaching Factory Contributions to Practical Learning and Material Procurement

Aspect	Catering production unit	Garment production unit
Commercial activity	External catering orders and food production services	Sewing services and garment production orders
Associated vocational program	Culinary Arts	Fashion Design
Practical competencies supported	Food preparation, processing, presentation, and production quality	Cutting, sewing, garment assembly, and finishing
Principal material requirements	Food ingredients and consumable production materials	Fabrics, threads, and garment production accessories
Source of supplementary income	Margins generated through catering activities	Margins generated through garment production
Educational contribution	Connects culinary practice with commercial production	Connects fashion competencies with commercial garment production
Procurement resilience function	Additional support when ingredient prices increase	Additional support when fabric and sewing material prices increase
Institutional benefit	Reduced dependence on routine allocations for practical materials	Greater flexibility in financing practical material requirements

Source: Research findings synthesized from production unit manager accounts, financial records, and operational observations.

Table 4 shows that the two production units followed the same basic logic despite differences in activity, materials, and associated program. In each case, a commercial service was matched to the competencies of a specific vocational program. The margin it generated was then available to support the materials consumed by that same program. This pairing is significant because it kept the financial benefit of each unit close to the instructional area most exposed to its particular price risk. Catering income responded to rising ingredient prices, and garment income responded to rising fabric prices. The table also indicates that the units mattered not only because they generated income but because the school could redirect that income toward educational expenditure. Since commercial activities were tied to vocational competencies, income generation and practical learning were pursued within the same institutional framework. The financial role of the units thus supported their educational function and did not replace it with purely commercial objectives.

The findings also show that production unit revenue depended on commercial performance. The income available in any period was shaped by production volume, operating costs, and external demand. The units therefore could not be expected to generate sufficient resources under all conditions, particularly when sharp increases in raw material prices coincided with narrow commercial margins. Within these limits, the teaching factory mechanism constituted a second layer of financial protection. When routine allocations and contingency provisions were insufficient, the school could draw on resources generated through catering and garment production to support practical material procurement. This theme addresses the internal dimension of the second research objective. School-based production reduced exclusive reliance on routine public funding while integrating commercial activity with competency-based instruction. Because internally generated income had operational limits, the school also required external support and adaptive management during periods of more severe procurement pressure, which are the focus of the third theme.

Foundation Liquidity and Workshop Regrouping under Price Surges

The third theme concerns the school's response to procurement pressure that neither routine planning nor production unit contributions could absorb. Two complementary mechanisms were used at this stage: supplementary financial assistance from the governing foundation and adjustments to the organization of practical workshops. These measures addressed different aspects of financial vulnerability but shared the objective of keeping practical learning running. Observations of workshop activities showed how closely material use was tied to instructional organization. In Fashion Design, materials had to be distributed and used according to the stages of cutting, sewing, and garment construction. The way student groups were formed and supervised therefore influenced how much material each session consumed. Under financial constraints, the school placed greater emphasis on smaller, more closely supervised groups to encourage careful material use and reduce waste. This arrangement was an instructional response to procurement pressure, not a decision to abandon any of the practical competencies students were expected to achieve.

The first component of this response was financial assistance from the governing foundation. As a private vocational institution, the school operated within a governance structure in which the foundation provided institutional backing and took part in meeting the school's financial needs. When material prices rose beyond the available provisions, the administration could coordinate with the foundation to obtain supplementary resources. This channel was not a routine budget line. It was a form of support activated when the school's own planning and production income proved insufficient. The school principal explained the importance of foundation support for maintaining the continuity of practical learning:

> "When material prices increase beyond what we have planned and the school's available funds are insufficient, we coordinate with the foundation to find additional financial support. The foundation understands that practical learning cannot simply be stopped because materials have become more expensive. Our priority is to ensure that students can continue their practical activities while we adjust the financial arrangements." (KS)

The principal's statement shows how institutional governance shaped the school's capacity to respond to financial pressure. Foundation assistance provided an additional source of support when regular budget resources and internally generated income could not fully cover unexpected procurement needs. The statement also reveals a shared understanding between the school and the foundation that practical learning should not stop simply because materials had become more expensive. This shared priority allowed the school to manage financial constraints through coordination with its governing body, without relying solely on cuts to instructional expenditure. The foundation's role thus went beyond general organizational oversight and strengthened the school's flexibility in managing deficits caused by market price fluctuations. The second component of the response involved reorganizing practical learning to improve material efficiency. The school adopted smaller groups with closer teacher supervision, particularly in activities where materials were prone to waste during preparation and production. This approach was especially relevant to Fashion Design, where cutting errors and inefficient fabric use could raise material expenditure. The head of the Fashion Design department explained the rationale for this adjustment:

> "When fabric and sewing material prices increase, we reorganize practical activities into smaller groups so that teachers can supervise students more closely. This helps us control material usage and reduce unnecessary waste during cutting and sewing activities. We still focus on the competencies that students must achieve, but we manage the learning process more carefully so that the available materials can be used efficiently." (KP2)

The department head's account clarifies why dividing practical classes into smaller groups could improve financial efficiency. The aim was not to reduce the amount of material allocated to each student but to improve the organization and supervision of material-intensive activities. Closer supervision allowed teachers to monitor preparation procedures, material handling, and the

execution of practical tasks more carefully. In garment production, accurate cutting and sewing procedures were essential for avoiding unnecessary material consumption, and closer guidance helped students follow these procedures and avoid costly mistakes. Practical activities in Culinary Arts similarly required careful ingredient preparation and handling, particularly when raw material prices were high. The school's response therefore amounted to a form of instructional engineering, in which workshop organization was adjusted to the availability and cost of practical materials. The differences between practical learning organization under routine conditions and during periods of material price pressure are compared in **Table 5**.

Table 5. Organization of Practical Learning under Routine Conditions and Material Price Pressure

Aspect	Routine conditions	During material price pressure
Student group organization	Groups formed according to regular instructional arrangements	Smaller groups formed to allow closer supervision
Material allocation	Based on planned practical competency requirements	Adjusted to available materials and procurement constraints
Teacher supervision	Regular monitoring of practical activities	More intensive supervision of preparation and production procedures
Material utilization	Follows routine practical learning procedures	Greater emphasis on efficiency and avoidance of waste
Financial support	Routine RKAS allocations, contingency provisions, and production unit income	Procurement adjustments and supplementary foundation support
Instructional objective	Achievement of scheduled practical competencies	Continued development of practical competencies despite financial constraints

Source: Analytical synthesis of school leadership and department head interviews, field observations, and institutional financial management procedures.

Table 5 shows that the school's response to price pressure involved changes on both the financial and the instructional sides of practical learning. The instructional objective, however, remained the same under both conditions. Group size, material allocation, supervision, and financial support all shifted when prices rose, but the target of competency achievement did not. This pattern indicates that the school treated competency standards as fixed and adjusted everything else around them. The table also shows how the two mechanisms in this theme complemented each other. Foundation assistance addressed the financial dimension of procurement vulnerability by increasing the resources available to the school. Workshop regrouping addressed the operational dimension by improving how materials were used during learning activities. The principal's account emphasized the priority of instructional continuity, and the department head's account described the operational adjustments that served this priority. Together, these perspectives show that financial decisions and pedagogical organization were connected parts of a single managerial response, not separate domains of school administration.

The evidence for this theme also has limits that should be stated clearly. It supports the presence of adaptive instructional arrangements but does not provide quantified comparisons of individual hands-on practice time, material savings, or student performance before and after regrouping. The findings therefore establish the institutional strategy and its intended contribution to learning continuity without claiming a measured improvement in instructional efficiency. This theme addresses the research objective concerning organizational responses to market price volatility. The school mitigated substantial procurement pressure by combining supplementary foundation financing with adaptive workshop management. Foundation support strengthened its capacity to cover unexpected material costs, while instructional regrouping offered an operational strategy for using materials more carefully within the resources available. The theme also completes the second research objective by showing how the foundation partnership operated as the external counterpart to production unit income.

Taken together, the three themes show that resilience in practical material procurement rested on the integration of competency-based financial planning, internally generated commercial revenue, and institutional support combined with instructional adaptation. Each mechanism addressed a different dimension of procurement vulnerability. Competency-based unit-cost

planning linked curriculum requirements to expenditure allocations and allowed the school to anticipate how a specific price change would affect a specific competency. Teaching factory cross-subsidization added resources beyond routine allocations through catering and garment production that remained tied to vocational instruction. Foundation support and adaptive workshop organization provided a further response when financial pressure exceeded what regular planning and commercial income could absorb. At that stage, the foundation supplied additional funds, while smaller supervised groups reduced material waste.

The integration of these mechanisms indicates that the school's financial resilience did not depend on a single funding source or administrative procedure. The school combined expenditure planning, alternative revenue generation, collaborative governance, and instructional adaptation, and each element gained value from its relationship to the others. Precise competency-level costing showed where production income or foundation funds were needed. In turn, those additional resources and the regrouping of classes gave the plan room to adjust when prices moved beyond its projections. The school did not respond to market price volatility mainly through expenditure cuts. It drew on several financial and instructional resources at once to keep practical learning running. The findings thus point to a layered arrangement in which administrative precision and operational adaptability worked as complementary parts of institutional resilience. The theoretical significance of this arrangement is examined in the Discussion.

Discussion

The findings show that the school sustained material-intensive practical learning not through any single financing source but through a sequence of mechanisms that were activated as procurement pressure increased. This pattern can be read through the capability-based view of organizational resilience proposed by **Bertheussen (2025)**, which distinguishes anticipation, coping, and adaptation as successive stages of a resilient response. Competency-based unit-cost planning corresponds to anticipation, since it allowed administrators to identify in advance which competencies were exposed to particular price changes. Teaching factory margins correspond to coping, because they absorbed shortfalls once those changes had occurred. Foundation support and workshop regrouping correspond to adaptation, as they involved changes in both resource arrangements and instructional organization when the first two stages proved insufficient. Previous studies have generally examined budgeting, revenue generation, and community support as separate topics (Mwayesh Asadi, 2025). In comparison, this study shows how the three operate as one system within a single school. The finding is also consistent with Huang et al. (2025), whose study of Chinese vocational colleges found that an adaptive governance capacity framework explained the effectiveness of performance-based funding far better than conventional principal-agent models. In the present case, the decisive factor was likewise not the amount of money available but the school's capacity to decide which resource to mobilize and when.

The first mechanism extends current understanding of unit-cost analysis in Indonesian schools. Earlier studies have largely approached unit cost as a calculation of educational expenditure per student (Mwayesh Asadi, 2025), and **Erhabor dan Reis (2026)** examined educational planning and budgeting in a center-of-excellence vocational school. Compared with these studies, the present findings show unit cost operating at a finer level and serving a different purpose. Costs were built from the materials required by each competency. The resulting worksheets served as procurement references for department heads and as an early warning instrument for the financial officer. This difference matters because a school budget can be accurate in aggregate yet still fail to show which practical sessions are at risk when a specific input becomes more expensive. The finding also offers a partial response to the concern raised by **Wedayanti dan Pulungan (2023)** that increased funding does not always translate into improved learning. In this school, the link between money and learning was made explicit at the planning stage, since each budget line could be traced back to a competency that students were expected to achieve. **Erhabor dan Reis (2026)** describe principals optimizing BOS funds under bureaucratic

constraints, and the present case suggests that competency-level costing is one practical way of carrying out such optimization.

The second mechanism supports and refines research on teaching factories as sources of school income. **Yamin (2026)** reported that teaching factory activities at a public vocational school in Kendal were funded mainly through government grants, with additional capital drawn from product sales whose profits were divided according to a set percentage. **Triani et al. (2026)** found in Bengkulu that the financial autonomy granted by BLUD status improved vocational quality when it was supported by participatory governance and managerial competence. Compared with these public-school cases, the private school in this study had neither BLUD status nor a dependable grant base for its production units, yet it still channeled commercial margins toward practical materials. What distinguished the arrangement was not the size of the income but its targeting: catering margins responded to ingredient prices and garment income to fabric prices within the same programs. The findings also bear on the risk of mission drift that **Sahijwani (2026)** identifies in hybrid organizations pursuing social and commercial goals at once. The evidence here does not indicate such drift, because production remained tied to competencies taught in the curriculum. However, the garment manager's more cautious account shows that the balance depends on commercial performance. Together with the absence of data on profit proportions, this means the tension should be regarded as managed rather than resolved. This reading also aligns with **Parlina dan Rahmadi (2026)**, who linked the resilience of culinary micro-enterprises to strategic entrepreneurship, and it suggests that school production units face a similar exposure to market conditions.

The third mechanism invites comparison with research on community-based school management and adaptive leadership. Studies of community-based education management have shown how non-governmental stakeholders sustain the organizational resilience of religious and community schools **(Agyemang et al., 2023)**. The present findings extend this view to a vocational setting. Here, the foundation's contribution was not general patronage but a specific financial response triggered only after the internal layers had been exhausted. This sequencing is relevant to the problem of soft budget constraints, which **Bertheussen (2025)** examined in the financial management of a public university faculty. A soft budget constraint arises when an organization expects its deficits to be covered from outside, and such an expectation can weaken internal financial discipline. At this school, foundation support came last and depended on the prior use of contingency provisions and production income, so it appeared to complement internal discipline rather than replace it. The regrouping of practical classes adds a pedagogical dimension that most financing studies leave out. Research on vocational resources has tended to focus on the availability and adequacy of workshop facilities (Huang et al., 2025) or on how consumables should be specified and selected **(Omonovich et al., 2026)**. Compared with these studies, the present case shows that the organization of instruction itself can be adjusted to reduce material waste. This supports the view that adaptive leadership in vocational institutions involves restructuring how work is carried out, not only securing additional resources (Parlina dan Rahmadi 2026).

Taken together, these comparisons point to a pattern that previous studies have not clearly described. **Bertheussen (2025)** found that the central problem in partnership-based teaching factory financing was not the adequacy of funds but the weak integration among financing, production, partnership, governance, and learning. The present case offers an empirical counterpoint by showing what such integration can look like in practice. Three features stand out. First, the competency target functioned as a fixed anchor that was not traded off against cost, while procurement arrangements, revenue sources, and group organization were allowed to change. Second, the three financing layers were activated in sequence according to the intensity of price pressure instead of being used simultaneously or interchangeably. Third, the unit-cost plan served as the signal that indicated when the next layer was needed, connecting the administrative and pedagogical sides of the school. These features are synthesized in the Competency-Anchored Cascading Resilience Model presented in **Figure 1**.

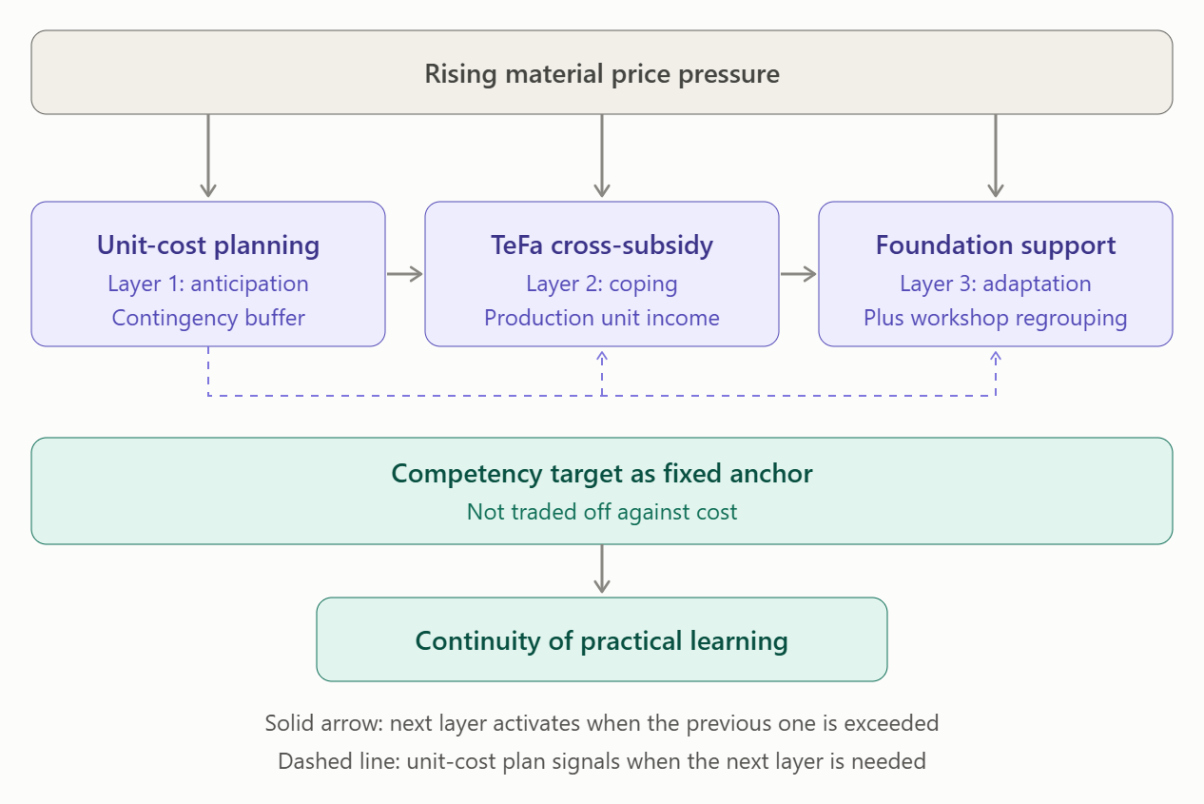


Figure 1. Competency-Anchored Cascading Resilience Model for Practical Material Procurement in Vocational Schools
Source: Authors' synthesis of research findings.

Figure 1 shows that resilience in this model does not reside in any single layer but in the movement between layers. Rising price pressure activates each successive layer, while the competency anchor at the base remains unchanged and continuity of practical learning is protected at every level. The dashed line from the unit-cost plan shows that the same planning instrument both absorbs ordinary fluctuations and signals when production income or foundation support must be mobilized. The model differs from existing accounts in two ways. It treats internal budgeting and external fundraising as connected stages of a single response, which addresses the governance fragmentation identified in the Introduction. It also places instructional design inside the financial system rather than outside it. The specific contribution of this study lies in this second point. For the field of education and learning, the model shows that financial management can function as a component of learning design, since decisions about costing, revenue, and group organization were all made with reference to the competencies students had to master. In this sense, the study points to a transformation in how vocational schools understand their financial role: from passive recipients of public funds to institutions that actively protect the conditions of practical learning. For school leaders and foundations, the model offers a practical sequence for responding to price volatility without reducing students' hands-on training.

CONCLUSION

This study set out to explain how a private vocational school sustains practical material procurement when prices exceed its plans. The findings answer the three research objectives. Competency-based unit costing linked the budget to practical needs. Teaching factory margins and foundation support provided alternative financing. The regrouping of practical classes allowed the school to adapt without lowering its competency targets. These conclusions rest on a single private, foundation-governed school and on two programs. They therefore cannot be generalized to public

or BLUD schools or to programs with different material profiles. The available records did not reveal the share of production profit allocated to practical materials. The study also did not measure material savings, hands-on time per student, or learning outcomes before and after regrouping, and the foundation's view was captured only through the principal. Future research should compare several public and private schools, follow them across more than one price cycle, and include foundation representatives and students. Quantitative or mixed-methods designs could then test the proposed model and measure the efficiency gains that this study could only describe.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article. The authors have no financial, institutional, or personal relationships with the participating school, its governing foundation, or any other party that could have influenced the design, data collection, analysis, interpretation, or reporting of this study.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

During the preparation of this manuscript, the authors used Claude (Anthropic) to assist with language editing, restructuring of sections, searching for and checking related literature, formatting references in APA style, and drafting the layout of Figure 1. The tool was not used to generate research data, interview quotations, observation records, or financial documents. All empirical material reported in this article comes from the authors' own fieldwork. The authors reviewed, verified, and revised all AI-assisted content, checked every cited source against its original publication, and take full responsibility for the accuracy, originality, and integrity of the published work.

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