

# Applying Six Sigma to Assess Quality Culture in a Senior High School: A Strategic Management Perspective

Heru Dewanto<sup>1\*</sup>, Deni Setiawati<sup>2</sup>  
<sup>1</sup>Universitas Pertamina RI, Bogor, Indonesia



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## ABSTRACT

**Objective:** This study examines the application of Six Sigma to assess quality culture in a senior high school in Bandung, with potential relevance for broader educational settings. **Method:** Employing a mixed-method case study design, the research combined interviews and Focus Group Discussions (FGDs) to identify the main dimensions of quality culture, followed by a questionnaire-based assessment involving 42 teacher respondents. Unlike conventional school quality assessments, which primarily rely on descriptive and qualitative evaluations, this study integrates the DMAIC (Define, Measure, Analyze, Improve, and Control) framework with quantitative Six Sigma metrics to establish objective benchmarks for assessing school quality culture. School performance was evaluated across eight indicators using Defects Per Million (DPM) and sigma levels. **Results:** The analysis revealed baseline sigma levels ranging from 2.14 $\sigma$  to 3.90 $\sigma$ . The lowest-performing dimensions were stakeholder involvement in developing the vision and mission 2.14 $\sigma$ , understanding of the vision and mission 2.25 $\sigma$ , and school programs that reflect social values 2.59 $\sigma$ , indicating that these dimensions require substantial improvement to strengthen the school's quality culture. **Novelty:** This study demonstrates that Six Sigma provides a practical evaluative framework by establishing baseline sigma levels as objective benchmarks for assessing school quality culture, prioritizing improvement initiatives, and supporting strategic management and continuous quality improvement in educational institutions.

## INTRODUCTION

Educational quality depends not only on curriculum design, learning facilities, or student outcomes (Manurung, 2025; Rodríguez et al., 2022). Schools also shape educational quality through the organizational environment in which teaching and learning take place, including the values, routines, and interactions that guide everyday school life (Bai et al., 2022; Ryall & Zook, 2021; Shalini et al., 2022). In this sense, schools need not only technical improvements in management and instruction, but also a strong internal culture that consistently supports quality in sustainable ways. Without such a culture, schools may carry out improvement efforts in fragmented and procedural ways or rely too heavily on individual initiatives rather than embedding improvement within the institution as a whole (Do et al., 2025; Surahman & Salmon, 2023).

Within this perspective, schools can understand quality culture as a combination of shared values, collective commitment, stakeholder participation, open communication, and continuous improvement reflected in organizational behavior and decision-making (Aruna et al., 2025; Dejanović et al., 2024; Stephens & Roszak, 2021). In educational settings, quality culture influences how school communities interpret the vision and mission, design institutional programs, and participate in achieving educational goals (Sumiran et al., 2022; Wang, 2025). A strong quality culture helps schools align institutional ideals with daily practices, whereas a weak quality culture may create inconsistencies between policy, implementation, and expected outcomes. Therefore,

examining the condition of school quality culture becomes important for understanding how far schools can sustain quality improvement efforts (Parveen et al., 2024; Shinkfield, 2024; White-Trevino et al., 2022).

In the context of the senior high school examined in Bandung, preliminary interviews and Focus Group Discussions (FGDs) revealed several organizational challenges that hindered the development of a strong quality culture. These challenges included limited stakeholder participation in developing the school's vision and mission, inconsistencies between institutional values and daily school practices, and the absence of a systematic mechanism for evaluating quality culture. As a result, school leaders found it difficult to identify priority areas for improvement based on objective evidence. These conditions highlight the need for a structured and data-driven evaluation framework capable of translating abstract cultural values into measurable organizational indicators.

Although quality management frameworks, particularly Total Quality Management (TQM) and later Six Sigma, were originally developed in manufacturing to improve organizational performance and reduce process variation, they have gradually been adapted to service sectors, including education. Within educational administration, these frameworks provide systematic and evidence-based approaches for evaluating institutional processes, identifying performance gaps, and supporting continuous quality improvement. This evolution has positioned Six Sigma as a relevant managerial approach for assessing and strengthening quality culture in educational institutions.

Six Sigma offers one approach that provides a systematic basis for assessing such conditions. Although industries and service organizations widely use Six Sigma to reduce defects and improve process quality, educational institutions can also apply its principles to support more evidence-based improvement efforts (Asnaashari & Khodabandehlou, 2024; Jing, 2025; Matindana & Sinkamba, 2026). Through the DMAIC framework (Define, Measure, Analyze, Improve, and Control), Six Sigma helps organizations identify key problems, establish baseline conditions, analyze root causes, and formulate targeted interventions (Hajji et al., 2025; Hollingshed, 2022; Mallett, 2026). In school contexts, this approach becomes particularly relevant because it allows schools to examine quality culture not only as an abstract or normative concept, but also as an organizational condition that institutions can assess through indicators, interpret through data, and use to support managerial and educational decision-making.

Despite its strong reputation in quality management, educational institutions still apply Six Sigma less frequently than organizations in other sectors. Existing studies mostly examine service quality, efficiency, student satisfaction, or improvement processes in higher education, whereas fewer studies discuss how schools can apply Six Sigma to cultural dimensions within school organizations (AlMasaeid et al., 2025; Chang et al., 2024; Shamsuzzaman et al., 2023). In particular, only limited studies have applied Six Sigma specifically to measure quality culture in secondary school settings. This limitation matters because schools need analytical approaches that can translate broad quality values into observable organizational conditions and practical priorities for improvement, especially in institutional contexts where quality culture is still developing and requires systematic strengthening.

Based on this background, this study aims to examine how a senior high school in Bandung can use Six Sigma to assess its quality culture. More specifically, the study seeks to identify the dimensions of quality culture that require priority improvement

and to demonstrate how schools can apply the DMAIC framework as an evaluative approach within educational settings. By doing so, the study contributes to discussions on educational quality improvement by positioning Six Sigma not merely as a process-improvement method, but also as a practical tool for diagnosing and strengthening school quality culture from a strategic management perspective.

## RESEARCH METHOD

This study employed a mixed-method case study design to examine how a senior high school in Bandung used Six Sigma to assess its quality culture. The study adopted the case study design because it focused on a single institutional context and sought to develop an in-depth understanding of school quality culture by integrating qualitative and quantitative data (McClunie-Trust et al., 2022; Modi et al., 2025).

The qualitative component explored the school's existing conditions, identified key issues, and formulated the dimensions of quality culture examined in the study. Meanwhile, the quantitative component measured teachers' perceptions of these dimensions through a structured questionnaire. The study used the DMAIC framework as the main analytical structure because the framework provides a systematic basis for identifying problems, establishing baseline conditions, analyzing priority weaknesses, and formulating improvement strategies within educational settings (Antony et al., 2022; Chang et al., 2024; Hajji et al., 2025; Hollingshed, 2022).

### Participants

The study involved 42 participants, consisting of the principal and teachers at a senior high school in Bandung. The researchers selected these participants because they were directly involved in the school's organizational processes and could therefore provide relevant information about the institution's quality culture. The principal participated in the qualitative stage through interviews and Focus Group Discussion (FGD), while teachers served as the main respondents in the questionnaire-based assessment. This distribution of roles allowed the researchers to combine leadership perspectives on institutional conditions with teachers' perceptions of how quality culture appeared in daily school practices.

The study employed purposive sampling to select teacher participants. Teachers were eligible to participate if they (1) were actively teaching at the school during the study period, (2) were directly involved in the school's academic and organizational activities, and (3) were familiar with the implementation of the school's vision, mission, and quality-related programs. These criteria were used to ensure that participants possessed sufficient knowledge and experience to evaluate the school's quality culture.

### Data Collection Tools

Data collection consisted of two main stages. In the first stage, interviews and a Focus Group Discussion (FGD) were conducted with the principal and other key school informants to identify the main issues related to school quality culture, clarify institutional expectations, and determine the dimensions examined in the study (Barreto & Herrera, 2023; Mabuza et al., 2021). The findings from this stage, together with the theoretical framework derived from the literature, supported the Define phase of DMAIC and provided the basis for developing the questionnaire indicators. Initially, the researchers reviewed the literature on quality culture to identify conceptual dimensions relevant to educational settings. These preliminary dimensions were

subsequently discussed and refined through interviews and the Focus Group Discussion (FGD) with school stakeholders to ensure their relevance to the school's organizational context. The qualitative findings confirmed four principal dimensions – vision and mission, religious values, academic values, and social values – which were then operationalized into eight questionnaire indicators. The eight questionnaire indicators were generated from these four principal dimensions. Each dimension was represented by two indicators to capture both stakeholders' perceptions of the values and the extent to which these values were reflected in school programs. This process ensured that the instrument was both theoretically grounded and contextually appropriate for the studied school.

The development of the questionnaire followed an iterative process in which the preliminary dimensions identified from the literature were refined through interviews and Focus Group Discussions (FGDs) with school stakeholders. The resulting indicators represented the convergence between theoretical concepts and qualitative findings, thereby strengthening the content validity of the questionnaire and ensuring that each indicator reflected the organizational context of the studied school before being administered to teacher respondents.

In the second stage, the researchers prepared and distributed a structured questionnaire via Google Forms to teachers, using a five-point Likert scale. The questionnaire consisted of eight items developed from the quality culture dimensions identified during the initial interviews and focus group discussions. These items covered four main areas, namely vision and mission, religious values, academic values, and social values.

### Data Analysis

The study carried out data analysis by integrating qualitative interpretation and quantitative measurement within the DMAIC framework. The researchers used qualitative data from interviews and FGDs to define the main problems, identify the values considered important by the school, and support the selection of questionnaire indicators. The researchers then extracted the quantitative questionnaire data into Microsoft Excel and categorized the responses into two groups: satisfied and not satisfied. The researchers categorized responses with scores of 4 (Agree) and 5 (Strongly Agree) as satisfied, and responses with scores of 1 (Strongly Disagree) to 3 (Neutral) as not satisfied. In this study, the researchers treated responses categorized as not satisfied as defects for Six Sigma measurement purposes.

The quantitative analysis focused on calculating defect-based quality performance for each questionnaire item. The researchers used the number of responses classified as defects to calculate Defects Per Million (DPM) by comparing the total number of defects with the number of tested units and the defined defect opportunities.

$$DPM = \left( \frac{\text{Number of Defects}}{\text{Total Units Tested} \times \text{Defect Opportunities}} \right) 1.000.000$$

Where:

|                      |                                                                      |
|----------------------|----------------------------------------------------------------------|
| DPM                  | = Defects Per Million                                                |
| Number of Defects    | = Total respondents categorized as “Not Satisfied” for each variable |
| Total Units Tested   | = Total number of respondents (42)                                   |
| Defect Opportunities | = 3 (responses on scales 1–3 classified as defects)                  |



The DPM values were then converted into sigma levels to determine the relative quality performance of each variable (Harolds, 2023; Simanova & Gejdoš, 2021). Variables with lower sigma levels were interpreted as priority areas for improvement and were subsequently discussed in the Improve phase to formulate targeted recommendations. Through this procedure, the study positioned Six Sigma not only as a process-improvement framework but also as an evaluative tool for measuring the current condition of school quality culture.

## RESULTS AND DISCUSSION

### *Results*

The Define phase focused on identifying the main issues related to quality culture in the studied school through an initial interview followed by a Focus Group Discussion (FGD). Rather than describing the DMAIC stage conceptually, this phase was used to clarify the specific organizational conditions that required attention and to determine the scope of the subsequent measurement process (Chen et al., 2023; Hashim et al., 2024).

The interview and FGD findings indicated four main concerns: the absence of a clearly embedded quality culture, the lack of a distinctive institutional identity, school programs that had not yet consistently reflected quality values, and limited alignment between the school's vision and mission and the values emerging in practice. These findings were used to define the analytical focus of the study and are summarized in Table 1.

**Table 1.** Identified problems and intended improvement directions

| Nu. | Identified Problems                                                                                       | Improvement Directions                                                                                       |
|-----|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 1   | The school did not yet have a strongly embedded quality culture.                                          | Strengthen a school quality culture that is reflected in shared values and daily practices.                  |
| 2   | The school lacked distinctive cultural characteristics that could represent its identity.                 | Develop a clearer set of institutional values that can serve as the school's identity.                       |
| 3   | School programs had not consistently reflected the intended quality culture.                              | Align school programs more closely with the vision, mission, and intended quality values.                    |
| 4   | The school's vision and mission were not yet fully aligned with the cultural values emerging in practice. | Review and refine the vision and mission so they are consistent with the school's developing quality values. |

The findings presented in Table 1 indicate that the school's quality culture challenges are primarily organizational rather than instructional. The identified problems consistently point to weaknesses in institutional alignment, including the absence of a well-established quality culture, an unclear organizational identity, insufficient integration of quality values into school programs, and limited alignment between the school's vision and mission and its daily practices. These findings suggest that the school's main challenge is not the absence of quality-related values, but rather the limited institutionalization of these values into sustainable organizational processes.

From a strategic management perspective, the Define phase successfully identified the critical organizational issues that require systematic improvement. These findings also provided the empirical foundation for selecting the quality culture dimensions evaluated in the subsequent DMAIC stages, ensuring that the measurement focused on

the school's most relevant improvement priorities rather than on generic quality indicators.

### Measure Phase

In the Measure phase, quality culture was assessed through a questionnaire consisting of 8 selected items derived from the dimensions identified in the Define phase. The questionnaire was distributed to teachers through Google Forms, and 42 teacher respondents completed the instrument. These items were used to capture teachers' perceptions of the school's vision and mission, religious values, academic values, and social values as measurable dimensions of quality culture. The questionnaire items used to measure these dimensions are presented in Table 2.

**Table 2.** Questions in the questionnaire

| Nu. | Variable       | Description                                              |
|-----|----------------|----------------------------------------------------------|
| 1   | A <sub>1</sub> | Understanding of the Vision and Mission                  |
| 2   | A <sub>2</sub> | Involvement in the Development of the Vision and Mission |
| 3   | B <sub>1</sub> | Religious culture is an essential value for the school   |
| 4   | B <sub>2</sub> | Are there school programs that reflect religious values? |
| 5   | C <sub>1</sub> | Academic culture is an essential value for the school    |
| 6   | C <sub>2</sub> | Are there school programs that reflect academic values?  |
| 7   | D <sub>1</sub> | Social culture is an essential value for the school      |
| 8   | D <sub>2</sub> | Are there school programs that reflect social values?    |

The questionnaire items shown in Table 2 operationalize the qualitative findings into measurable indicators representing four core dimensions of school quality culture: vision and mission, religious values, academic values, and social values. This transformation illustrates how the study translated abstract organizational concepts into observable variables that could be quantitatively evaluated using Six Sigma metrics. Consequently, the instrument enabled the assessment of both stakeholders' perceptions of institutional values and the extent to which these values had been implemented in everyday school practices.

The study extracted the completed questionnaire data into an Excel file to categorize respondents' satisfaction levels. The study categorized respondents who selected 4 (Agree) or 5 (Strongly Agree) as satisfied with the current conditions, while it categorized respondents who selected scores ranging from 1 (Strongly Disagree) to 3 (Neutral) as not satisfied with the current conditions (Sandu & Sharma, 2020). The results of the questionnaire categorization are presented in Table 3 below.

**Table 3.** Categorization of respondent satisfaction

| Nu. | Variable       | Not satisfied         |             | Satisfied             |             |
|-----|----------------|-----------------------|-------------|-----------------------|-------------|
|     |                | Number of respondents | Total Value | Number of respondents | Total Value |
| 1   | A <sub>1</sub> | 28                    | 39          | 16                    | 112         |
| 2   | A <sub>2</sub> | 32                    | 67          | 10                    | 44          |
| 3   | B <sub>1</sub> | 4                     | 12          | 38                    | 169         |
| 4   | B <sub>2</sub> | 1                     | 3           | 41                    | 183         |
| 5   | C <sub>1</sub> | 2                     | 5           | 40                    | 175         |
| 6   | C <sub>2</sub> | 3                     | 8           | 39                    | 179         |
| 7   | D <sub>1</sub> | 1                     | 2           | 41                    | 191         |
| 8   | D <sub>2</sub> | 17                    | 43          | 25                    | 116         |

As shown in Table 3, respondents reported considerably higher satisfaction with the religious and academic dimensions than with the vision and mission and social-value dimensions. This pattern suggests that religious and academic values have been more effectively institutionalized within the school's daily practices, whereas organizational alignment and stakeholder participation remain relatively weak. In particular, the high number of dissatisfied responses for A1 and A2 indicates that the school's strategic direction has not yet been fully understood or collectively developed by its members. These findings imply that strengthening institutional communication and participatory management should become priorities for improving the school's quality culture.

## Discussion

### Weak Dimensions of School Quality Culture

The results indicate that several dimensions of school quality culture still require considerable improvement, particularly those related to understanding the vision and mission, stakeholder involvement in developing the vision and mission, and school programs that reflect social values. As presented in Table 4, variable A1 obtained a sigma level of 2.25, variable A2 obtained 2.14, and variable D2 obtained 2.59. Referring to the interpretation scale shown in Table 5, these dimensions remain within the category requiring substantial development.

**Table 4.** Sigma levels for each variable

| Variable       | Sigma Level |
|----------------|-------------|
| A <sub>1</sub> | 2.25        |
| A <sub>2</sub> | 2.14        |
| B <sub>1</sub> | 3.34        |
| B <sub>2</sub> | 3.90        |
| C <sub>1</sub> | 3.64        |
| C <sub>2</sub> | 3.74        |
| D <sub>1</sub> | 3.90        |
| D <sub>2</sub> | 2.59        |

Table 4 shows substantial variation in sigma performance across the eight quality culture indicators, demonstrating that the maturity of school quality culture differs considerably among organizational dimensions. Variables related to religious and academic values achieved relatively higher sigma levels, indicating fewer quality deficiencies and more consistent implementation within the school environment. Conversely, the low sigma levels observed for A1 (2.25 $\sigma$ ), A2 (2.14 $\sigma$ ), and D2 (2.59 $\sigma$ ) indicate higher defect rates and reveal that these dimensions experience the greatest quality gaps.

Among these variables, stakeholder involvement in developing the school's vision and mission (A2) recorded the lowest sigma level, suggesting that collaborative participation in strategic planning remains limited. Similarly, the low sigma level for understanding the vision and mission (A1) indicates that institutional goals have not yet been fully internalized across the school community. These findings imply that the school's principal quality challenges lie in organizational alignment and stakeholder engagement rather than in the implementation of religious or academic values.

**Table 5.** Interpretation of quality ratings

| Quality Rating Scale | Rating Range            | Description                                                              |
|----------------------|-------------------------|--------------------------------------------------------------------------|
| 6                    | Above 5 up to 6         | Quality culture has become a distinctive characteristic of the school    |
| 5                    | Above 4 up to 5         | Quality culture has been implemented in the school                       |
| 4                    | Above 3 up to 4         | Quality culture has emerged and can be further developed                 |
| 3                    | Above 2 up to 3         | Quality culture is acceptable but still requires substantial development |
| 2                    | Above 1 up to 2         | The development of quality culture is constrained by several factors     |
| 1                    | Less than or equal to 1 | Quality culture has not yet been developed                               |

Source: Adapted from Sandu & Sharma (2020)

The interpretation framework presented in Table 5 facilitates a managerial understanding of sigma performance by translating numerical values into practical quality culture conditions. Based on this scale, the sigma levels obtained for A1, A2, and D2 fall within the category requiring substantial development, indicating that these dimensions should receive priority attention during the Improve and Control phases of DMAIC. Meanwhile, the higher sigma levels achieved by the remaining dimensions indicate that they have begun to develop into stable components of the school's quality culture, although opportunities for continuous improvement remain.

Among these findings, the issue of vision and mission appears particularly important. In the studied school, the relatively low sigma level for A1 suggests that the institutional vision and mission may not yet function as fully shared organizational references. Formally, the school already possesses institutional goals and value statements. However, based on the interview and FGD processes, these values do not always seem to be consistently translated into everyday educational practices. Some participants even implied that the vision and mission are more visible in formal documents and accreditation-related activities than in routine organizational conversations.

This condition is understandable to some extent. In many schools, institutional vision and mission statements are often formulated at the managerial level and later communicated to teachers mainly through formal channels. As a result, teachers may recognize these institutional goals without necessarily feeling deeply connected to them in practice. Over time, this can create a situation where organizational values exist symbolically but are less influential in shaping daily school culture.

The relatively low sigma level for the vision and mission dimension suggests that institutional values have not yet been fully internalized by school members. This finding is consistent with previous studies emphasizing that a shared understanding of organizational vision contributes to the development of a stronger quality culture (Sumiran et al., 2022; Stephens & Roszak, 2021). Therefore, improving communication and internalization of the school's vision and mission may strengthen the overall quality culture.

Variable A2 also reveals a similar pattern regarding stakeholder involvement in developing the vision and mission. As shown in Table 4, A2 obtained the lowest sigma level among all measured dimensions. This finding suggests that participation in institutional planning processes remains relatively limited. During the qualitative discussion, several participants described strategic decisions as matters typically



handled by school leadership rather than through collaborative organizational processes.

Within educational management contexts, however, participation is not simply a procedural matter. Schools operate through ongoing interaction among teachers, administrators, students, and other stakeholders. Because of this, collective involvement in defining institutional goals often plays an important role in strengthening organizational commitment. The low sigma level for stakeholder involvement indicates that teachers perceived limited participation in developing the school's vision and mission. This finding is consistent with previous studies emphasizing that stakeholder participation strengthens shared ownership and organizational commitment within schools (Sumiran et al., 2022).

The findings regarding variable D2 also warrant closer attention. Although respondents generally acknowledged the importance of social values, the sigma level of 2.59 indicates that programs reflecting these values remain relatively weak compared with those in the religious and academic dimensions. Interestingly, based on the interview and FGD findings to stem from rejection of social values themselves. Rather than the values themselves, the main challenge seems to come from how the school turns these values into sustainable programs and everyday practices.

During the interview process, several participants explained that socially oriented activities were typically held only during specific events or external initiatives. In other words, social engagement already exists, but it has not yet become a structured and continuous component of the school's organizational culture. This finding is quite interesting because it shows that cultural values may already be present at the individual level while remaining less visible at the institutional-program level.

### **Implications for School Quality Improvement**

The findings of this study suggest that strengthening school quality culture requires more than simply formally defining institutional values. The greater challenge lies in ensuring that these values are consistently communicated, practiced, and maintained in everyday school activities.

Regarding variable A1, the school may need more systematic efforts to reinforce understanding of the vision and mission across the school community. At present, the institutional goals appear to function primarily as formal references rather than operational guides shaping educational activities. More consistent communication through meetings, orientation programs, school forums, and internal discussions could help strengthen shared understanding among teachers and staff. At the same time, institutional goals need to be more clearly translated into practical programs and organizational routines so that school members can connect abstract statements to concrete educational activities (Dionne et al., 2004; Hadi et al., 2024).

The results related to A2 also indicate the importance of strengthening participatory approaches within school management. In practice, involving teachers and stakeholders in discussions about institutional priorities can help reduce the gap between formal policies and everyday educational realities. Participation may also strengthen collective ownership because stakeholders tend to support organizational goals more actively when they feel included in decision-making. Of course, full participation in every strategic decision may not always be realistic in school organizations. Nevertheless,

providing greater space for dialogue and contribution could still improve institutional alignment.

The findings regarding D2 imply that social values require stronger organizational support through more structured, sustainable programs. Community-service activities, outreach initiatives, student collaboration projects, and other forms of social engagement could become important mechanisms for embedding these values more visibly within school culture. If consistently implemented, such programs may gradually strengthen the school's social identity and make social values more tangible in everyday institutional practices.

### **Sustainability Through Control Mechanisms**

Another important issue emerging from this study concerns sustainability. In educational institutions, organizational culture rarely changes quickly. Schools may introduce various improvement programs, but their long-term impact often depends on how consistently teachers, school leaders, and stakeholders sustain these efforts over time rather than on short-term interventions alone.

The Control phase, therefore, becomes particularly important for maintaining improvement efforts for variables A1, A2, and D2. Schools may need periodic evaluations concerning stakeholders' understanding of institutional goals, participation in organizational planning, and continuity of social-value programs. Such monitoring does not necessarily require highly formal procedures. Relatively simple mechanisms such as internal surveys, reflective meetings, and routine program evaluations may already provide useful feedback regarding whether improvement initiatives remain visible and effective.

From a management perspective, continuous monitoring is important because school culture develops gradually through repeated organizational experiences. In this context, sustainability may be just as important as the initial improvement strategy itself. Without consistent reinforcement, improvements in organizational culture can easily become temporary or fragmented.

### **Contribution of Six Sigma in Educational Contexts**

This study shows that schools can adapt Six Sigma as an evaluative approach to assess quality culture in educational settings. Although Six Sigma is traditionally associated with industrial and manufacturing sectors, the findings suggest that its analytical framework can also provide meaningful insights for educational management.

By applying the DMAIC approach and sigma-level analysis, the study translated relatively abstract aspects of school culture into measurable indicators and identified priority dimensions for improvement, particularly those related to institutional alignment and the implementation of social values. In educational settings, this kind of measurement can help schools evaluate organizational conditions more systematically rather than relying only on general assumptions.

At the same time, this study shows that quantitative analysis alone may not be sufficient to understand the complexity of school culture. The qualitative findings from interviews and FGDs were important for explaining the contextual meaning of the numerical results. For this reason, combining qualitative and quantitative approaches became necessary to understand not only which dimensions were weak, but also why these conditions emerged in the school context.

In this sense, the study's contribution lies not merely in applying Six Sigma in education, but also in demonstrating how structured managerial approaches can be integrated with contextual educational analysis to support comprehensive school quality improvement.

## CONCLUSION

**Fundamental Findings:** (1) This study demonstrates that Six Sigma can be effectively applied to assess school quality culture by integrating the DMAIC framework with quality culture assessment in a senior high school in Bandung. (2) The findings identified three priority dimensions requiring improvement, namely stakeholders' understanding of the school's vision and mission, stakeholder involvement in developing the vision and mission, and the implementation of school programs that consistently reflect social values. (3) Through sigma-level analysis, the study translated abstract dimensions of school quality culture into measurable organizational indicators, enabling schools to identify priority areas for improvement based on objective evidence. (4) Overall, these findings indicate that strengthening school quality culture requires not only formal institutional policies but also effective communication, stakeholder participation, and the consistent implementation of organizational values through everyday school practices. **Implications:** (1) Theoretically, this study extends the application of Six Sigma beyond its traditional industrial context by demonstrating its usefulness as an evaluative framework for assessing school quality culture in educational settings. (2) Practically, the findings provide school leaders and educational managers with an evidence-based approach for identifying priority areas for improvement, establishing measurable quality benchmarks through sigma-level analysis, and supporting strategic decision-making for continuous quality improvement. **Limitations :** (1) This study was conducted in only one senior high school in Bandung; therefore, the findings may not be generalizable to other educational institutions with different organizational characteristics. (2) In addition, the quantitative assessment relied solely on teachers' perceptions and did not include other educational stakeholders, such as students, parents, or school supervisors. Consequently, the findings should be interpreted within the context of the studied institution. **Future Research:** (1) Future studies should apply the Six Sigma approach in different educational contexts to determine whether similar patterns of school quality culture emerge across institutions with diverse organizational characteristics. (2) Researchers are also encouraged to investigate additional dimensions of school quality culture beyond the four dimensions examined in this study. (3) Furthermore, future research should employ quasi-experimental or longitudinal research designs to evaluate the long-term effectiveness of implementing the DMAIC framework in educational institutions. (4) Specifically, future studies could examine whether improvements in school quality culture are associated with measurable outcomes such as student academic achievement, teacher organizational commitment, school climate, stakeholder satisfaction, and student attendance. (5) Longitudinal investigations are also needed to assess changes in sigma levels and quality culture indicators following improvement initiatives, thereby providing stronger evidence regarding the sustainability and long-term impact of Six Sigma-based quality management in educational institutions.

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**\*Heru Dewanto (Corresponding Author)**

Universitas Pertahanan RI, Bogor, Indonesia  
Kawasan IPSC Sentul, Jl. Anyar, Sukahati, Kec. Citeureup, Kabupaten Bogor, Jawa Barat 16810, Indonesia  
Email: [dewanto.heru@idu.ac.id](mailto:dewanto.heru@idu.ac.id)

**Deni Setiawati**

Universitas Pertahanan RI, Bogor, Indonesia  
Kawasan IPSC Sentul, Jl. Anyar, Sukahati, Kec. Citeureup, Kabupaten Bogor, Jawa Barat 16810, Indonesia  
Email: [deni.setiawati@idu.ac.id](mailto:deni.setiawati@idu.ac.id)

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