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# Assessing Resilience in Educational Institutions: A Regional Study

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**Abstract -** *Educational institutions are subject to many pressures. Adaptive capability and planning foresight (resilience) measures familiar in industrial enterprises were assessed for their usefulness in educational institutions. A business sector questionnaire was modified and tested for validity (Cronbach's α). Participants (N=258) were faculty and administrators from four tertiary institutions across three countries who volunteered to respond on a five point Likert scale. The independent factors of adaptive capability exerted significant influences on the dependent planning foresight variable. Institutions could improve their resilience by adopting remedial solutions suggested by the research literature. The adaptation of a non-educational organization instrument for educational institutions, as done in this study, would facilitate improvement of resilience and take advantage of the human, social and psychological capital held by its faculty. The research indicated that structural changes and directed leadership initiatives could improve resilience scores.*

**Keywords:** *Adaptive capability, planning foresight, resilience, educational institutions*

## INTRODUCTION

Tertiary institutions are functioning in a rapidly changing and competitive environment. The introduction of comparative systems of ranking internationally and nationally has introduced a new dimension. This means that universities can be compared in terms of their impact on the world of knowledge, their connection with industry and the community, and other strengths. National governments have responded to this global phenomenon with their own initiatives to bring some of their universities into the elite category. This has meant that more rigorous quality requirements have been placed on universities in general in order to lift the national standard and induce a rethink of their purpose and focus.

These developments mean that institutions need to be able to adapt creatively to the changing needs of clients but also to movements in national and international factors that impact their viability. In line with other businesses, resilience is a key feature displayed by successful institutions.

Universities are businesses involved in the production and dissemination of knowledge. They are subject to pressures arising from government policies, inter-government relationships, changes in the popularity of career destinations, public perceptions of performance on quality indicators, demographic changes occurring on account of an aging population, online course offerings, supply issues with goods and services, and other factors [1, 2]. The ability of an organization to function efficiently, handle competitive pressures acceptably, and emerge from testing situations better prepared to meet future challenges is a measure of its resilience. Positive outcomes are achieved following a thorough understanding of the business environment operating and the adoption of strategic initiatives aimed at tapping into the strengths and creative potential of its employees and forming community, national, and other linkages that give opportunity to form productive associations [3].

Competitive advantage is associated with leadership characteristics, the operational and communication strategies adopted, knowledge of the operating environment, links developed with relevant entities, strategies adopted to stimulate creativity, decision making and a number of other features favouring the development of organizational resilience [3]. The adoption of a unique suite of dynamic strategies by an organization, refined continually through market and institution analysis, will prepare it to function more efficiently and allow it to utilize the social capital found among those present in the organization.

In seeking to increase the resilience of any organization, harnessing individual capabilities to

emphasize the ideological identity of the institution will tax the creative abilities of all but will contribute to the collective efficiency [4]. The constructive sense making and drive towards efficiency can be achieved only by taking advantage of the social capital available [5].

## OBJECTIVES OF THE STUDY

The primary objective was to modify a questionnaire used in industry and test its validity in assessing adaptive capability and planning foresight in tertiary educational institutions. The second objective was to assess whether planning foresight outcomes were influenced by the performance of an institution on the adaptive capability measures selected.

## RESEARCH METHODS AND DESIGN
### Research Questionnaire

The instrument developed was adapted from foundational work completed by McManus [6], as refined by Stephenson [7], to measure organizational resilience. The instrument contained 62 questions covering items to assess adaptive capability and planning foresight.

Questions covered a range of topics (Table 1). Some explanation of the terms used is warranted. Under **Adaptive Capability**, the following aspects were investigated: Silo Minimization questions assessed moves made to maximize information and academic exchanges within and between organizations; the Internal Resource item assessed attitudes towards the adequacy and access of individuals to resources; Information and Knowledge dealt with sharing of knowledge and information and its availability in times of crisis; the Leadership issues addressed the professionalism displayed by top management, the acceptance of decisions made, the fit between goals and performance, and the adequacy of strategic decision making; Innovation and Creativity questions dealt with the level of encouragement and utilization of creative and novel approaches to problem solving; Decision Making questions dealt with the rapidity of responses and the delegation of authority; and Situation Monitoring questions dealt with the ease with which internal issues could be raised with senior management, the level of active listening, and the level of monitoring undertaken by management of movements in education generally.

Under **Planning Foresight**, the following items were assessed: Strategic Vision questions considered the existence of a vision statement and whether it reflected aspirational values; Planning Strategies considered medium and long term plans, whether they were consistent with the vision statement and what contingency plans were devised and operational; Participation: Exercise questions considered preparedness for emergencies; Proactivity questions sought to assess the forward looking nature of the institution to emerging issues and unexpected challenges; External Resource items considered cooperative agreements formed and active links maintained with other organizations relevant to dealing with crises or emergency situations; and Recovery Priorities items dealt with plans, priorities, resource allocation, and awareness of lines of responsibilities during a crisis or recovery operation.

**Table 1. Indicators Investigated under Adaptive Capability and Planning Foresight**

| Indicator Assessed | No. Questions |
|---|---|
| **Adaptive Capability** | |
| Silo Minimization | 4 |
| Internal Resources | 3 |
| Faculty Engagement | 5 |
| Information & Knowledge | 5 |
| Leadership | 6 |
| Innovation & Creativity | 3 |
| Decision Making | 3 |
| Situation Monitoring | 6 |
| **Planning Foresight** | |
| Strategic Vision | 2 |
| Planning Strategies | 7 |
| Participation: Exercises | 3 |
| Proactivity | 6 |
| External Resources | 4 |
| Recovery Priorities | 5 |

### Scoring Procedure

Responses were recorded on a five-point Likert scale (strongly disagree; 1.0-1.49: disagree; 1.50-2.49: undecided; 2.50-3.49: agree; 3.50-4.49: strongly agree; 4.50-5.00). The reliability of the institutional resilience questionnaire was tested using 32 volunteers at two private universities to assess the internal consistency of questions. Cronbach's alpha coefficients were calculated and adjustments made to the questionnaire as required.

### Institution Selection and Respondents

The questionnaire was made available in English, Bahasa Indonesia and Thai for use with four non-profit institutions operating in Indonesia, Philippines, and Thailand. Faculty members and administrators were invited to complete the questionnaire. Responses were given voluntarily, with no rewards being offered. Identities were anonymous and institutions were identified by code letters (A to D).

### Analysis of Data

Data were subjected to calculations using Cronbach's alpha, multiple regression, and beta correlation. The null hypothesis adopted was that planning foresight is not dependent on the factors listed under adaptive capability.

### RESULTS AND DISCUSSION

Preliminary analysis of each category of questions among 32 volunteers indicated that all items could be retained. The questionnaire items as a whole returned a Cronbach's alpha value of 0.939, indicating excellent internal consistency (values $\geq 0.70$ are regarded as acceptable). Inter-institutional comparisons were undertaken to highlight the positives and to emphasize that superior performance was perhaps within the grasp of all institutions (Table 2).

**Table 2. Scores Obtained from Four Institutions on Measures Dealing with Adaptive Capability**

| Indicator Assessed | Institution | | | |
|---|---|---|---|---|
| | **A** (*N*=85) | **B** (*N*=54) | **C** (*N*=72) | **D** (*N*=47) |
| Silo Minimization | 3.60±0.768 | 3.77±0.721 | 3.90±0.787 | 3.50±0.674 |
| Internal Resources | 3.62±0.664 | 3.81±0.681 | 3.99±0.618 | 3.69±0.600 |
| Faculty Engagement | 3.71±0.612 | 3.91±0.694 | 4.03±0.645 | 3.52±0.594 |
| Information & Knowledge | 3.61±0.677 | 3.90±0.717 | 3.91±0.806 | 3.54±0.667 |
| Leadership | 3.52±0.701 | 3.80±0.853 | 3.94±0.757 | 3.40±0.760 |
| Innovation & Creativity | 3.39±0.867 | 3.75±0.843 | 3.90±0.776 | 3.58±0.760 |
| Decision Making | 3.63±0.616 | 3.77±0.741 | 3.88±0.913 | 3.43±0.742 |
| Situation Monitoring | 3.57±0.770 | 3.85±0.755 | 4.00±0.787 | 3.62±0.600 |
| **Mean Score** | 3.56±0.628 | 3.82±0.750 | 3.95±0.677 | 3.54±0.559 |

An overall score for each variable above 3.75 was taken to indicate an acceptable performance in a particular area. On this basis, adaptive capability in institutions B (3.82±0.750) and C (3.95±0.677) returned satisfactory mean scores, but A (3.56±0.628) and D (3.54±0.559) fell short. This is taken to indicate that universities A and D had issues that, if recognized and addressed, could enable them to become resilient institutions in the future.

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The existence of **Silos** (minimization not occurring) was identified in two institutions (A and D). Failing to communicate effectively constitutes a roadblock to innovation and creativity and functions to increase running costs. Educational institutions frequently encounter silo mentalities on account of the organizational structure. Deficiencies in communication lead to suboptimal performances throughout an organization [8].

**Faculty Engagement** and decentralization of decision making received low scores in the same two institutions. Faculty engagement must be considered alongside innovation and creativity. For example, faculty may be engaged in various decision making exercises, but is their time usefully occupied? And does the more senior management take notice of their decisions?

Experiencing professional autonomy and the associated intellectual stimulation is linked to motivation, job satisfaction, less stress and burnout, professionalism and empowerment [9, 10]. Stimulating positive thinking improves both job satisfaction and resilience [11, 12]. From our experience, faculty marginalization leads to disinterest in the well-being of the institution, with academics focusing on their careers and job opportunities elsewhere.

**Internal Resources, Information and Knowledge, and Leadership** issues came in for notice in two institutions (A and D). Few advances are possible in the absence of determined and transformational leadership. Woodridge [13] indicated, from a broad range study, that transformational leaders are open to investigating new business models, they establish the strengths of entities present in the institution, and find the optimum balance between top-down and a bottom-up collegial culture. Not surprisingly, the most spectacular successes in tertiary

institutions have been associated with the wise choice of leaders at all the critical levels within an institution as shown by examples taken in South Korea. In one well-known university, greater autonomy was given to department/faculty heads through granting them authority to make faculty appointments and holding them responsible for performance in their areas. Initiatives in empowering the middle level managers and holding faculty accountable for reaching output targets for tenure proved highly successful. These initiatives enabled the strategic vision statement to be attained through using innovative approaches [14].

**Innovation and Creativity** were not particularly encouraged in two institutions (A and D). In the example taken from South Korea above, increasing the level of identification of employees with the success of the enterprise was found to be a vital undertaking. Those who fail to identify may remain silent, afraid of adverse consequences, or they may judge the organization as indifferent to their ideas [14, 15]. Taking advantage of the human capital (what you know), social capital (who you know), and psychological capital (who you are, in other words—confidence, hope, optimism, resilience) present in an organization will have implications for its economic performance. These qualities can be developed and enhanced through adopting suitable management practices [16]. Capitalization on the human capital held in an organization can lead to greater efficiency, improvements in competiveness, and customer satisfaction. Failure to capitalize on the creativity and innovative concepts held by employees will predispose to detrimental outcomes [17].

According to the literature, identifiable impediments to creating a more resilient organization frequently are inefficient hierarchical structures that inhibit **Decision Making** and responsibility sharing [18, 19]. Shared decision-making can deliver gains in institutional resilience and confer considerable benefits for faculty morale as well as giving economic benefits [20, 21]. In well-considered decentralizing arrangements, the decision-making processes are shortened and less time is spent in committees. Time saved can be used in the production of creative teaching materials, research projects, publications or community activities.

**Situation Monitoring** was acceptable in two institutions (B and C). None of the institutions surveyed were listed in international rankings. Nevertheless, teaching institutions, whatever their level of operation,

need to be aware of international trends. Alertness in this area can assist in facilitating exceptional performances on the global stage [22].

We now turn our attention to the scores obtained on measures dealing with **Planning Foresight**. The mean scores obtained for all indicators under planning foresight showed the same general pattern of high and low scores among the four institutions as under adaptive capability. Planning foresight data indicated that only one institution (C–4.07±0.598) returned a mean score above the set benchmark of 3.75 (Table 3).

**Table 3. Scores Obtained from Four Institutions on Measures Dealing with Planning Foresight**

| Indicator Assessed | Institution | | | |
|---|---|---|---|---|
| | **A** (*N*=85) | **B** (*N*=54) | **C** (*N*=72) | **D** (*N*=47) |
| Strategic Vision | 4.27±0.793 | 4.45±0.516 | 4.71±0.458 | 4.27±0.615 |
| Planning Strategies | 3.63±0.690 | 3.82±0.608 | 4.20±0.593 | 3.65±0.598 |
| Participation : Exercises | 3.58±0.766 | 3.33±0.906 | 3.78±0.922 | 3.32±0.786 |
| Proactivity | 3.34±0.711 | 3.67±0.624 | 3.96±0.712 | 3.48±0.575 |
| External Resources | 3.43±0.672 | 3.47±0.779 | 3.90±0.739 | 3.53±0.589 |
| Recovery Priorities | 3.57±0.692 | 3.70±0.614 | 4.05±0.723 | 3.46±0.591 |
| **Mean Score** | 3.57±0.589 | 3.71±0.551 | 4.07±0.598 | 3.56±0.461 |

This indicates that administration in the lower scoring institutions might give higher priorities in areas of planning and implementation in order to improve the satisfaction level of employees and hence the resilience of their institutions. **Strategic Vision** in all four institutions received high scores (mean values 4.27 to 4.71), indicating that respondents reflected awareness and pursued their duties according to the formalized vision/mission statement. The scores under this heading were high, unlike those recorded under the other headings dealing with planning foresight. Having a detailed strategic vision does not guarantee success. It does provide institutions with a device to focus corporate thought and action and to ensure that consistency is maintained in the process of making decisions [23]. The data obtained in this section, where low scores generally were obtained, may indicate that the vision statements were not being realized to their fullest extent.

Defining the core focus of an institution and highlighting its unique contribution requires continual revisiting and refinement to ensure that the vision is realized. Rather than attempting to compete on a broad front, investing in areas delivering the greatest returns

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and which enhance the identity of the institution are logical emphases [18, 19]. At the national level, tertiary institutions often are viewed as functioning as the powerhouse for achieving national competeiveness. However, there is an alternative view that suggests that universities might focus on their unique contribution, such as service to society in order to maximize human development and to preserve the natural harmonies with nature. It has been proposed that attention to these challenges might also be used to assess quality.

Identifying the core contribution of an institution and having an awareness of international trends are absolute necessities [19]. Institutions cannot operate in isolation from trends occurring nationally and globally. This may be illustrated through a comparison of the development of university systems in Malaysia and Singapore. The latter has shown a stellar performance on the global stage, which has not been matched in Malaysia. One of the factors responsible for the success of Singapore's educational system has been to encourage a creative environment through management initiatives [22]. Their creative initiatives ensured that the vision statements were realized.

Proactivity scores were low in three institutions, with institutions A and D showing the greatest potential for improvement. Slow growth of an institution could be related to failure to adapt rapidly to market trends and to respond quickly to other pressures. Alternatively, a somewhat similar result might result from an inability to collaborate with other organizations to take advantage of opportunities or to minimize unfavourable challenges. Highly successful organizations invariably are led by administrators with good foresight and who encourage creativity [22]. Wise selection and training of leaders at all levels in an institution would be beneficial.

Only one institution (C) showed a strongly developed capacity to deal with external threats through having well-developed recovery priorities and knowledge of external resources by already having arrangements with other organizations that might assist in recovery when crises occurred (Table 3 and reference to specifics in the questionnaire). The responses overall (mean values 3.56–3.71) indicated that there was room for a greater alertness to threats present in both the natural and competitive environments. In preparing for a crisis, involvement of faculty and staff in seeking solutions to everyday tasks constitutes vital preparatory work in ensuring that strategic acting occurs when a crisis appears [24].

Solutions sought to the rapidly changing external environment may involve program changes, addition of attractive curriculum options, adoption of competitive pricing arrangements, and implementation of attractive promotional advertising [25]. In the rapidly changing and competitive environment of tertiary institutions, national and international trends must be monitored and administrators must rethink their focus and marketing strategies.

**Table 4. Correlation Coefficients Obtained between the Adaptive Capability Factors and the Total Planning Variable**

| Model summary University | R Institution (Selected) | Institution (Unselected) | R square | Adjusted R square | Std. error of the estimate |
|---|---|---|---|---|---|
| All | 0.865[a] | | 0.748 | 0.740 | 8.257 |
| A | 0.927[a] | 0.817 | 0.859 | 0.844 | 6.317 |
| B | 0.873[a] | 0.832 | 0.762 | 0.719 | 7.952 |
| C | 0.828[a] | 0.862 | 0.685 | 0.645 | 9.528 |
| D | 0.864[a] | 0.815 | 0.746 | 0.692 | 6.938 |

[a] *Represents Predictors: Items under Adaptive Capability (Table 2).*

The relationship between the independent adaptive capability variables and total planning is shown in Table 4. The correlation coefficient for all universities combined was 0.865. This indicates that when there is an increase in the overall adaptive capability parameters an increase in planning foresight might be anticipated as well. ANOVA data of overall variance indicated a significant correlation between the independence factors of adaptive capability variables and the dependent planning foresight variable with a *p* value of 0.000. Hence, the null hypothesis was rejected on the basis of the analyses performed, which indicated that adaptive capability factors have a significant influence on planning foresight. There are complex linkages among the concepts listed under adaptive capability. An experienced analysist would not lightly dismiss the significance of either decision making or faculty engagement, as the latter contributes to silos (minimization not occurring). Leadership decentralization initiatives impact on decision making and creativity.

Among the independent variables (i.e., Silo Minimization, Internal Resources, Information and Knowledge, Leadership, Innovation and Creativity, and Situation Monitoring), internal resources showed the highest positive beta correlation with planning

foresight with a *p* value of 0.000 (Table 5). A predictor variable greater than 1 unit is taken to indicate an expected improvement in the planning outcomes by the beta coefficient value where the measurement is indicated as being significant. When the correlation statistics is a positive and there is an overall increase in the adaptive capability scores there will also be an increase in the planning foresight score.

Almost all the other factors showed a positive correlation with planning foresight, which indicates that a multi-faceted approach would be required to improve the planning indicators. Internal resource allocation alone was significant across institutions (data not shown) with the highest value being shown in institution C and the lowest in A (Table 2).

**Table 5. Beta Correlation Scores between Adaptive Capability Factors and Total Planning for All Universities (*N*=258)**

| Adaptive Capacity Factors | β Correlation | Significance |
|---|---|---|
| Silo Minimization | 0.570 | 0.047 |
| Internal Resources | 2.011 | 0.000 |
| Faculty Engagement | 0.236 | 0.446 |
| Information and Knowledge | 0.728 | 0.005 |
| Leadership | 0.550 | 0.022 |
| Innovation and Creativity | 0.871 | 0.018 |
| Decision Making | -0.499 | 0.213 |
| Situation Monitoring | 0.694 | 0.004 |

A more in-depth understanding of the dynamics of an organization by their teachers and outside professionals might be expected to enable identification of areas in an institution that could be managed more efficiently to give the organization greater resilience. Certainly, improving the level of internal resource management may not always lead to better planning outcomes. Encouragingly, the difficulties imposed by resource limitations can be overcome, at least partially, by involving faculty in creative solutions to achieve greater efficiencies. Improvement in overall performance and planning outcomes would require major managerial initiatives. Representative initiatives capable of giving improved resilience have been identified in the literature [26–29].

Seeking efficiencies at all levels and running a student-focused operation is another significant initiative key to running a financial stable, resilient university. For instance, the principles underlying Lean (Toyota production system) involve identifying and adhering to the Strategic Vision; avoiding unnecessary expenditure of time, effort, resources, and the occurrence of errors; and develop the capabilities of employees, establish teams, and linkages with respect suppliers. Achieving efficiencies is a challenging and continual undertaking and requires devoted leadership [26–28]. Tertiary and other educational institutions are businesses and might learn from the industrial sector how to adopt strategies for continual improvement. Movement down this pathway requires a change in culture, which inevitably must begin with the leadership [28]. Elements measured in this study particularly relevant to Lean are: Strategic Vision, Planning Strategies, Proactivity, Leadership, Silo Minimization, Faculty Engagement, Information and Knowledge, Innovation and Creativity, Decision Making, and Situation Monitoring.

Lean uses the human capital available (Faculty Engagement), decentralizes decision making (Proactivity), and contributes to the creation of a positive, forward-looking organization (Silo Minimization, Innovation and Creativity). The value of each individual is emphasized and work satisfaction is improved. The process represents an initiative to optimize process flow [29, 30]. Six Sigma, on the other hand, seeks to find and eliminate the cause of inefficiencies in a process responsible for poor quality outcomes (Situation Monitoring). It is primarily designed to reduce process defects/variation in an effort to improve quality. It does not focus primarily on achieving a highly stable and capable process. It is a more challenging and expensive to implement as a first strategy as compared with Lean [31]. The two approaches (Lean and Sigma) may be combined to create a more efficient and resilient institution [32].

**CONCLUSION**

The adapted questionnaire used in this study was able to provide data indicating the adaptive capability and planning foresight possessed by educational institutions. The data highlighted areas where difficulties were being experienced by the faculty and where the human capital they held was not being fully utilized. These deficiencies, if rectified, could enable the institutions to operate in a more efficient and collegial manner. The approach taken in this study of tertiary establishments could be used to assess teaching institutions more generally.

Institutions naturally differed in their strong points. Institutions A and D possessed fewer strong features compared to B and C; the latter was the most resilient. Adaptive capability areas falling below a score of 3.5 were noted in Leadership (D), Innovation and Creativity (A), and Decision Making (D). Planning foresight areas falling below a score of 3.5 were noted in Proactivity (A, D), Participation Exercises (B, D), External Resources (A), and Recovery Priorities (D). The identification of institutional strengths and niche market opportunities would undoubtedly lead to structural changes, a drive for efficiencies, and effective use of the human capital available in the organization. Such goals would undoubtedly be on the agenda of transformational leaders.

In some tertiary educational circles Lean or other efficiency oriented processes have been applied to most functions, which include teaching and research. Indications are that efficiency strategies are in a growth phase in higher education. Each institution will adopt its own model, but whatever one chosen, facilitators or external consultants appear to be required for success. Lean is about adopting a philosophy that considers how people relate to each other and work as a team to solve problems and achieve efficiencies through structured communication. The aim is to optimize the organization's value-adding practices. Perhaps a model to study is that of University of St. Andrews in the United Kingdom that has now run Lean for over ten years [27, 33].

## LIMITATIONS OF RESEARCH

The research reported focused on organizations not seeking ranking status outside their country of origin. It is expected that institutions seeking international rankings would show a greater focused attention on features contributing to resilience scores. This should be further studied.

The general nature of many of the questions asked identified the general area of the problem. The more specific nature of issues might be obtained through targeted interviews, which is the challenge remaining for institution leaders.

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