DEVELOPING EDUCATIONAL INFRASTRUCTURE: ROLE OF GOVERNMENTAL SCHOLARSHIPS, TECHNICAL TRAINING AVAILABILITY AND R&D IN EDUCATION

Waleerak Sittisom
Suan Sunandha Rajabhat University, Bangkok, Thailand
E-mail: waleerak.si@ssru.ac.th

Received 19 April 2019; accepted 3 March 2020; published 30 May 2020

Abstract. The importance of various kinds of factors such as government-provided scholarships, availability of technical training and the expenditure on R&D sector in driving and enhancing the educational infrastructure of a country cannot be denied. The motive behind the conduction of this study was to study and investigate the detailed impacts of these variables on the quality of education in Asia. In order to pursue this objective, the author has collected data for 26 years from ten Asian countries very reliable sources and databases. After data gathering process, unit root tests were used by the research to find out the order of integration of variables. After this, the co-integrated relationships were studied with the help of co-integration tests and finally the most important test, ARDL model was applied to find out the short-run relationships and the long-run relationships between the variables. The results obtained from these tests indicated that all these variables have positive significant impacts on the educational quality. The author has identified various theoretical, practical and policy making benefits of this study and also mention some limitations and suggestions for removal of these limitations.

Keywords: better quality of education; governmental scholarships; technical training availability; R&D in Education; Asia


JEL Codes: H40, O15

1. Introduction

The quality of education has captured the attention of policy makers in Asia since long. Many countries in the continent are striving to improve the educational quality in order to pave the way of sustainable development and prosperity for the country. However, there is little harmony about the effective way to achieve it. In Asia, most of the development is concentrated towards East Asian countries, whereas South Asian countries are lagging behind in walk of development. The reason may attribute to the poor quality of education in that region. Addressing the issue of relatively poor-quality education has become the matter of urgency to exploit the potential of human resource by providing the quality education. Different studies on the quality of education in Asia has been conducted which has captured the impact of various variables like improvement of curriculum and diffusion of quality education to students (Zhang, Wang, Min, Chen, & Huang, 2016). More, over importance of quality education has been also emphasized in various studies. (Dlouhá & Burandt, 2015; Ghislandi & Raffaghello, 2015; Hopkins, 2015; Zhang et al., 2016). Building quality educational infrastructure is equivalent to building a valuable human capital for sustainable development (Dinda, 2016; Pelinescu, 2015; TyndorfJr & Glass, 2017). In order to set towards the path of sustainable growth and prosperity it’s pre-requisite to focus on the educational quality of the country (Atalay, 2015; Elliott, Rhoades, Jackson, & Mandernach, 2015; Kruss, McGrath, Petersen, & Gastrow, 2015; Girdzijauskaite, Radzeviciene, & Jakubavicius, 2019).
This paper aims to investigate the impact of government scholarship, technical training, and R&D on the educational quality in Asia. Government scholarship facilitates the equitable access of higher education to students and also increased the enrollment in reputable programs and foreign degrees (Cosentino, Fortson, Liuzzi, Harris, & Blair, 2019). Scholarship programs importance in low income strata of Asia cannot be negated because it provides opportunity to deserving and capable students to get degrees from notable institutes of the world. Moreover, lack of proper technical training availability in Asian institution also affects the quality education because advancement of technology has revolutionized all walk of business and industries; education is also not exception to this. Distinguished colleges and universities are inclined towards inculcating the technical training into students as well as teachers to improve the student’s quality of understanding. In addition, R&D in education also facilitates the rate of innovative transformation in education which raise the standard of quality education (Serdyukov, 2017). In Asia, the quality of education has been stagnant relative to other OCED and development countries. The reason is that government focus on other priority sector due to budgetary constraints. The dilapidating quality of education is not just a matter of concern in Asia but also a Global issue (Haseeb et al., 2020). Addressing this issue has become vital; otherwise it may have disastrous impact on the quality of student’s learning. Although this issue has been addressed in various studies, but particularly no study has been conducted for quality education in Asia by employing government scholarship, technical training, and R&D. Moreover, no studies have employed the regression model on explaining the impact of education quality with aforementioned variables. Novelty of this study is to employ the multivariate panel data model to explain the quality education, particularly for Asia. This study has following objectives:

- To analyze the impact of Government scholarship on quality education in Asia.
- To determine the role of technical training in education quality of Asia
- To explore the effect of R&D on quality education in Asia

Different studies conducted on quality education has positive policy implication (Dinda, 2016; Pelinescu, 2015; TyndorfJr & Glass, 2017). The studies enable the policy makers to consider the importance of quality education during formulating policies for education system. Moreover, the past studies are source of adequate theoretical knowledge and practical frameworks. This study will also contribute in the same lines. This study is arranged as follows: Section two of the study discusses the literature review; section three comprises on methodology; section four discusses results and finding. The last section concludes the empirical findings of the study and recommends the policy in the light of the results.
2. Literature Review and Quality Education Framework

The quality of education refers to the quality infrastructure, learned faculty member, and student’s learning and performance. Research has been done on many aspects to help improve entities like classroom environment to improve academic outcomes (Madrid, Ahmed & Kumar, 2019) to enhance quality education. A decade ago, the quality of education was connected with the number of enrollments in primary or secondary institute. But the growing importance of human capital role in fostering the sustainable development of the country and as well as nourishing the society has shifted the debate from number of enrolment to quality of learning in education (Masino & Niño-Zarazúa, 2016). Various theoretical and empirical studies have discussed various dimension of quality of education. (Masino & Niño-Zarazúa, 2016) identified the three drivers which affect the quality education: (1) supply side policy intervention emanate from human and physical resources; (2) policies to incentivize the teachers and inter-temporal choices of students and households; (3) diffusion of knowledge, decentralization, and participation of community. Few studies have ascribed quality education to student satisfaction. (Ali, Zhou, Hussain, Nair, & Ragavan, 2016) also indicated in their studies that good educational quality means higher level of student satisfaction and loyalty with the institution. The student satisfaction model of quality education takes student satisfaction with education and learning as key component of measuring education quality. This study filled gap in the literature by exploring the empirical and theoretical research of the studies which explore the impact of government scholarship, technical training and R&D on the quality of education.

a. Government Scholarship and Quality Education

The provision of merit based scholarship enables the students to focus on their research studies. Akareem and Hossain (2016) also empirically identified that student’s status of scholarship also affects their perception about the quality of education. The scope of their study was limited to the top five universities of Bangladesh from where they took the sample of 432 students to analyze their perception towards quality education. The results of their research indicate that there is positive association between the odds of doing research and scholarship. Furthermore, the student holding positive scholarship status set high standards of education quality as compared to those who are not holding scholarship. (Qayyum, Zipf, Gungor, and Dillon (2019) inferred that financial status affects the persistence of distance education program and have high completion rates. They used the Chi-square analysis and logistic regression to explore the relationship between scholarship and distanced degree completion rate. The results illustrates that probability of persistence in studies is higher for student getting small financial aid or scholarship with high financial need. Howard (2018) conducted a survey to investigate the impact of financial aid on the education program of nine community colleges of Chicago. The study also confirmed the positive role of financial aid and scholarship on student’s attrition rate, academic achievement, and retention rates. Furthermore, the study also aimed to aware the administration of community college about the effective role of financial aid and scholarship on the education program of institutions. Thus, on the basis of discussed literature we can build following hypothesis:

H1: There is a significant impact of government scholarship on the quality of education.

b. Quality of Education and Research and Development

The evolving innovation and R&D in education system also raise the standard and quality of education. The reputation of education institutes is majorly built on the research activities in institute. Pandya (2016) also mentioned in his study that higher education in India is less competitive and devoid of appropriate culture due to absence of quality research and development. However, higher education of India holds rich history but due to lack of required research it doesn’t seem to as effective as it were during post war era. His study focused on the quality of research rather than the quantity of research articles produced in higher education of India. Moreover, Walker (2017) proposed in his study that teaching schools which are the strategic partners of private organizations and universities deliver high quality training and skill to school staff. According to him the research and development practice are among the key six pillars of quality teaching in education institute.
Arimoto (2016) explained in his study that Japanese academics have relatively greater acknowledgment of researchers rather than teachers. The Japanese has opted the full-fledged model of research orientation in academics unlike USA which academic involves both teaching and research. Moreover, he also indicates that the research and development in higher education will merely be fruitful when government is able to diffuse the useful research to society to make them more socially utilized. There are various factors which obstruct the research and development in diffusion of quality education. One of those factors are dearth in funds to finance the research and development expenditures (Cirera, Pacchioni, & Maloney, 2017). Thus, in the light of literature we can design following hypothesis:

H2: There is a significant impact of research and development on quality of education.

c. Quality of Education and Technical training

Technical training of faculty has crucial role in steering the quality of education. The fundamental provision of knowledge and information to students are the teachers. Various non-government organization and NGOs are involved in proving the technical training to teachers to improve the quality of education delivered at their ends. The importance of well trained and well-aware teacher in raising the standards of education cannot be negated. Various studies support that technically trained teachers are the most valuable resource in educational organization which significantly improves the quality of learning at institute (Chalmers & Gardiner, 2015; Condon, Iverson, Manduca, Rutz, & Willett, 2016; Steinert et al., 2006). Boudera (2016) proposed in his study of the Algerian education system that teacher is the most responsible person of the diffusion of quality education to students. He investigated the role of teaching quality due to lack of technical training of teachers deteriorate the quality of education in Algeria. Students may suffer from the poor technical knowledge of his teacher. He further illustrates that the Algerian education system also at the verge of risk due to deteriorating teachers’ quality standards.

Ödalen, Brommesson, Erlingsson, Schaffer, and Fogelgren (2019) also supported that the technical training courses of teachers in universities have desirable consequences on the participant. To empirically infer the results, they took the panel data set of 183 teachers of six dominant universities of Sweden.

Moreover, technically trained resource in academic institutes will opt the e-learning application which eventually improves the satisfaction of the students. Violante and Vezzetti (2015) also mentioned in their studies that e-learning (web-based leaning) model improves the student satisfaction with the education quality of institutes. They conducted a survey to find the student satisfaction with use of 3D medical device and inferred that student are more satisfied with education system employing technical learning techniques. Hence, on the basis of abovementioned studies we can generate following hypothesis:

H3: There is a significant impact of technical training diffusion on quality of education.

d. Methodology

In this section, the author will discuss the methods that were used for data collection and the processes through which this data was tested through to gain the results for this research.

e. Data

The author has used a multivariate framework for conducting this research. The data was calculated against three independent variables, number of government scholarships (GS), the amount of technical training provided (TT) and the level of R&D used in educational institutes (RD), and the dependent variable, quality of education (QE). Moreover, two control variables are also used in this study which are population growth (PG) and literacy rate (LR). The data has been collected for the time period 1990-2016 i.e. for 26 years which is sufficient to apply the ARDL technique on the time series. This data has been collected from 10 Asian countries; Pakistan, India, China, Iran, Iraq, Japan, Jordan, Nepal, Bangladesh and Lebanon and it is panel data.
f. Model Specification

In this study, the relationship between quality of education and the role played by the governmental scholarships, technical training availability and R&D in education is investigated by incorporating literacy rate and population growth in the function. R&D and technical training available are measured through the amount of money spent for these variables in the educational sector of the selected countries. Similarly, the government scholarships are also measured in terms of the amount of money that was spent in the scholarships awarded to students of the country by their government. Literacy rate is measured in terms of percentage of children that have education above secondary level and population growth is measured by difference in population on year to year basis. In their study, Terziev and Can (2017), argued that the increase in the population affects the quality of education and the literacy rate in a country negatively. In another study, Kapur and Perry (2015), mention that the state plays an important role in increasing the literacy rate and quality of education in their country by providing governance facilities and interventions in the educational field and through opportunities as government funds and scholarships. Noaman, Ragab, Madbouly, Khedra, and Fayoumi (2017) mentioned the importance of technically innovative advancements in the educational institutes for improving the educational quality. Gil-Flores, Rodriguez-Santero, and Torres-Gordillo (2017) also discussed how the availability of technology affects quality of teaching and educational environment of the classroom. On the basis of these discussions, the following empirical model can be developed for the quality of education:

\[ Q_E_t = \beta_0 + \beta_1 G_S_t + \beta_2 TT_t + \beta_3 RD_t + \beta_4 PG_t + \beta_5 LR_t + \epsilon_t \]

Where \( Q_E_t \) represents educational quality, in terms of students passing in secondary and higher examinations with a percentage above 70%, \( G_S_t \) represents the money spent for scholarships, constant of 2013, \( TT_t \) is the expenditure in technical training in dollars, \( RD_t \) is the expenditure in R&D in dollars, \( PG_t \) is the population growth, \( LR_t \) is the literacy rate is the percentage of population having education above secondary level and \( \epsilon_t \) is the error term that should be white noise. In order to reduce the existence of potential heteroscedasticity, which is the possibility of that the variability of a variable is not equal across the range of values of a second variable that predicts it, all the variables highlighted in equation (1) are transformed in the natural logarithms. The series have been changed to per capita by dividing it with the population series. The proposed econometric model can be written in log form I as given below:

\[ \ln Q_E_t = \beta_0 + \beta_1 \ln G_S_t + \beta_2 \ln TT_t + \beta_3 \ln RD_t + \beta_4 \ln PG_t + \beta_5 \ln LR_t + \epsilon_t \]

Where \( \beta_0 \) is a constant and the terms \( \beta_i \) (where i represents 1, 2, 3…..) are the long-run elasticity values with respect to government scholarships, technical trainings, R&D expenditures, population growth and literacy rate. The Equation (2) is checked for the possibility of having a long-run relationship among the natural logarithm for all the variables.

\[ g. \ \text{Estimation Methodology} \]

\[ i. \ \text{Unit root test} \]

The unit root testing is used for the analysis of stationary data for the determination of the appropriateness of the designed model for the study. This study uses the LLC unit root test (Bornhorst & Baum, 2006) which indicates the stationarity in data.

\[ ii. \ \text{Bound test of co-integration:} \]

Pesaran, Shin, and Smith (2001) proposed the use of panel ARDL to investigate the existence of co-integration which has been used in this study. The bounds test is a flexible test as compared to other tests. Pesaran et al. (2001) have argued in their research that the ARDL model gives a better performance when the samples are small and the dependent and independent variables can be easily identified using the ARDL model. It is used for examining the
long-run relationships by selection of optimal lag length. To analyze that there is long-run relationship between
variables, the Wald test of joint significance or F-test is used in equation (3).

\[ \Delta \ln Q_E = \beta_0 + \sum_{i=0}^{p} \beta_i \Delta \ln Q_E_{t-i} + \sum_{k=0}^{q} \beta_k \Delta \ln GS_{t-k} + \sum_{t=0}^{m} \beta_t \Delta \ln TT_{t-t} + \sum_{m=0}^{n} \beta_m \Delta \ln RD_{t-m} + \]
\[+ \sum_{l=0}^{n} \beta_l \Delta \ln PG_{t-l} + \pi_{QE} \Delta \ln Q_E_{t-1} + \pi_{GS} \Delta \ln GS_{t-1} + \pi_{TT} \Delta \ln TT_{t-1} + \]
\[\pi_{RD} \Delta \ln RD_{t-1} + \pi_{PG} \Delta \ln PG_{t-1} + \pi_{LR} \Delta \ln LR_{t-1} + \nu_t \]

(3)

Where \( \nu_t \) represents error and \( \Delta \) indicates short. In Wald test, significance of all the short-run differentiated variables
is zero. If the F-statistic values are higher than upper bounds then null hypothesis is rejected, showing that a long-
run relationship exists. If the values lie in the middle for F-statistics, then co-integration results inconclusive, while
if they are below middle value, it shows absence of a long-run relationship. After the identifying co-integration, the
ARDL framework can help to estimate the level of elasticity present in the long-run and short-run coefficients using
equations (4) and (5).

\[ \ln Q_E = \alpha_1 + \sum_{i=1}^{p} \varphi_1 \Delta \ln Q_E_{t-i} + \sum_{k=1}^{q} \omega_k \Delta \ln GS_{t-k} + \sum_{t=1}^{m} \vartheta_1 \Delta \ln TT_{t-t} + \]
\[\sum_{m=1}^{s} \vartheta_m \Delta \ln RD_{t-m} + \sum_{n=1}^{u} \vartheta_n \Delta \ln PG_{t-n} + \sum_{o=1}^{n} \vartheta_o \Delta \ln LR_{t-o} + \mu_t \]

(4)

\[ \ln \Delta Q_E = \gamma_0 + \sum_{i=1}^{p} \gamma_1 \Delta \ln Q_E_{t-i} + \sum_{k=1}^{q} \gamma_2 \Delta \ln GS_{t-k} + \sum_{t=1}^{m} \gamma_3 \Delta \ln TT_{t-t} + \sum_{m=1}^{s} \gamma_4 \Delta \ln RD_{t-m} + \]
\[\sum_{n=1}^{u} \gamma_5 \Delta \ln PG_{t-n} + \sum_{o=1}^{n} \gamma_6 \Delta \ln LR_{t-o} + \psi ECT_{t-1} + \mu_t \]

(5)

where \( ECT_{t-1} \) is error correction term, which should be negative, with coefficient 0 or 1. These two equations are used to estimate the long and short-run elasticity.

3. Results and Analysis

As mentioned in the previous section, the author has used the LLC unit root test for probing the integration order
as well as making sure that the variables are stationary, and the results of this test are presented in the table 1 in
detail. The values for level and first difference series have been given in the table. The importance of unit root tests
in the research process of time series data cannot be ignored. These tests let the author know the order of integration
due to these tests. Looking under the level column, it can be seen that all variables have rejected the null hypothesis except of the
variable of technical training, while applying the first integration makes all the variables to reject the null hypothesis.
This can be summarized as the fact that the data in the level-series was non-stationary and by application of first
difference, this become stationary and the other orders of integration for various variables can also be identified in
this way. The results can be concluded in such a way that the level section contains non-stationary data while the
application of first difference makes it stationary.

<table>
<thead>
<tr>
<th>Table 1. LLC unit root</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constructs</strong></td>
</tr>
<tr>
<td>GS</td>
</tr>
<tr>
<td>TT</td>
</tr>
<tr>
<td>RD</td>
</tr>
<tr>
<td>PG</td>
</tr>
<tr>
<td>LR</td>
</tr>
<tr>
<td>QE</td>
</tr>
</tbody>
</table>

In this table, * represents that the rejection is one percent significant, ** shows that rejection is five percent significant, *** shows that rejection is ten percent significant.
Table 2. Cointegration Test

<table>
<thead>
<tr>
<th>O.P.L. length (A.I.C)</th>
<th>(2,0,0,0,0,0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Stat. (Bound Test)</td>
<td>29.3852***</td>
</tr>
<tr>
<td>C.V</td>
<td>1% 5% 10%</td>
</tr>
<tr>
<td>L.B.C.V.</td>
<td>3.45 2.43 1.89</td>
</tr>
<tr>
<td>U.B.C.V.</td>
<td>4.87 4.01 3.62</td>
</tr>
</tbody>
</table>

In this table, *represents the significance level at 10%. The optimal lag is selected using the A.I.C test result.

In the table 2, the co-integration test results are given. O.P.L., C.V, L.B.C.V and U.B.C.V are the optimal lag length, the critical value, lower bound and upper bound critical value respectively. The optimal lag length was selected for the AIC criteria which is shown in the second row of the table 2. F-statistics computed for A.R.D.L verifies that co-integration exists. Similarly bound critical values also ensure co-integration. The value of F-statistics is much higher than the upper bound critical values, which highlights the fact that the null hypothesis is rejected and the long-run association in the model is also intensified.

Table 3. Panel ARDL Estimation Results

<table>
<thead>
<tr>
<th>Run Long Results</th>
<th>B</th>
<th>t-value</th>
<th>Summary &amp; Diagnostic Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>QE</td>
<td>1.842***</td>
<td>-</td>
<td>R² 0.721***</td>
<td></td>
</tr>
<tr>
<td>QE (-1)</td>
<td>0.238</td>
<td>-</td>
<td>Adj. R² 0.693***</td>
<td></td>
</tr>
<tr>
<td>QE (-2)</td>
<td>1.264***</td>
<td>-</td>
<td>D.W. 1.95</td>
<td></td>
</tr>
<tr>
<td>GS</td>
<td>0.259</td>
<td>4.263**</td>
<td>X²SC 4.375 (0.356)</td>
<td></td>
</tr>
<tr>
<td>TT</td>
<td>0.274</td>
<td>3.455***</td>
<td>X²W 1.495 (0.659)</td>
<td></td>
</tr>
<tr>
<td>RD</td>
<td>0.243</td>
<td>5.409**</td>
<td>X²AR 2.593 (0.089)</td>
<td></td>
</tr>
<tr>
<td>PG</td>
<td>0.290</td>
<td>4.306**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LR</td>
<td>0.022</td>
<td>1.398**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2.487</td>
<td>9.388***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Short Run Results</th>
<th>B</th>
<th>t-value</th>
<th>Summary &amp; Diagnostic Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GS</td>
<td>0.387</td>
<td>3.496**</td>
<td>R² 0.704***</td>
<td></td>
</tr>
<tr>
<td>TT</td>
<td>0.295</td>
<td>3.394**</td>
<td>Adj. R² 0.674***</td>
<td></td>
</tr>
<tr>
<td>RD</td>
<td>0.322</td>
<td>4.397**</td>
<td>X²SC 2.295 (0.298)</td>
<td></td>
</tr>
<tr>
<td>PG</td>
<td>0.287</td>
<td>2.958**</td>
<td>X²W 4.984 (0.852)</td>
<td></td>
</tr>
<tr>
<td>LR</td>
<td>0.209</td>
<td>3.474**</td>
<td>X²AR 3.472 (0.066)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows the results for both the long-run and short-run coefficients, where quality of education is taken as the dependent variable. The long-run elasticity of government scholarships on the quality of education positive and statistically significant. It implies that a 1% rise in government scholarships leads to an increase of quality of education by 25.9% by keeping other factors constant. These findings are replicated in other studies as well (Kapur & Perry, 2015; Noaman et al., 2017). Similarly, all other variables in the above table show positive significant impacts, 1% rise of technical training indicates the increase of education quality by 27.4% and 1% rise of research and development indicates the increase of education quality by 24.3%. Previous studies also support these findings (Hopkins, 2015; Kuo, Wang, & Yeh, 2018; Saidi & Mongi, 2018).
4. Discussions and Conclusions

a. Discussions

The purpose of the researcher for conducting this study is to investigate the role that the resources like the provision of scholarships by the government, the availability of technical training to the instructors and the students and the research and development expenditure plays in the improvement of the educational infrastructure of a country and the quality of education in the context of ten countries in Asia. For this purpose, the author developed several hypotheses in this study which were then tested through various approaches and tests so that their status could be ensured. The first hypothesis claimed that the provision of scholarships by the government can help in enhancing the infrastructure of the educational sector of a country. The results and simulations showed that this hypothesis is valid and this variable has a significant positive impact on educational quality. Similar results have been seen in past studies (Abdulkadiroglu, Pathak, & Walters, 2015; Akareem & Hossain, 2016). The second hypothesis claimed that technical training of teachers and other staff members of an educational institute impact the quality of education provided. This hypothesis too, was accepted as valid. The results showed that technical training puts a positive impact on the level of educational quality. Moreover, these results can also be confirmed through literature and research presented in the past (Asongu & Nwachukwu, 2016; Beynaghi et al., 2016; Foroudi, Jin, Gupta, Melewar, & Foroudi, 2016). The third hypothesis mentioned that if the institutes make policies for expenditure in research and development, then the educational quality is improved. Results showed this hypothesis to be accepted and having positive, significant impact, which is also seen in past researches (Chen, Chen, & Padró, 2017; Park, Lee, Jin, Shen, & Kim, 2015). In addition, the author has considered two control variables of population growth and literacy rate. Growth in population is negatively while literacy rate is positively affecting control over other variables. Thus, the results as a whole show that the educational infrastructure of a country can be improved through provision of scholarships, technical training and the R&D expenditure.

b. Conclusions

Education is of vital importance for the development of any country. A strong educational infrastructure and a quality education system ensures that the country will have economic stability through various factors. In the current study, the impact of various variables has been tested in order to improve the educational quality of Asian countries that have been selected for research. These variables include the governmental funds and scholarships, technical training opportunities and the expenditure in R&D. For this purpose, 26 years data was collected from ten countries in Asia about the purported variables and certain tests and techniques were run on that data. These tests include unit root test, co-integration test and A.R.D.L model. The results obtained from all these tests have been presented in different tables in the previous chapters. According to these results, the impact of scholarships by the government, the technical training and R&D expenditure all have been found significant on educational quality. The impact of both the control variables is also significant. This study has various theoretical, practical and policy making implications and various limitations that can be overcome by approaching different recommendations given by the author.

c. Implications

This study has been found to have various implications context of theory, practice and policy making. As the main purpose of this study was to find the impact that scholarships provided by the government, the technical training facilities and the expenditure on research and development have over the quality of education and the educational infrastructure of a country, all the implications of this study are in the context of this purpose. The first and foremost importance and implication is of theoretical nature in the existence of complete literature about the crucial concepts of importance of scholarships and funding by the government, the technical training provision and indulgence in research and development by institutes. This literature can be helpful to peer researchers and authors in their future studies and also by the general people for increase in their knowledge and information. In addition, this research provides a guideline to the organizations of the academic institutes for developing plans and projects that can
increase the technical adoption through provision of technical training in form of tutorials and seminars as well as providing the guidance for the increase of R&D expenditure. Moreover, this study teaches the importance of government policies and encourages the government to indulge in policies involving provision of scholarships to their students. This way, educational quality of the country can be enhanced.

d. Limitations and Future research recommendations

There is always a chance of betterment and scope of improvement in any study. Despite all the hard work and improvements, there remain some of the loopholes in all the researches that must be fulfilled by other future researchers. In this study the author has identified and described some of the limitations that are associated with this research work. The first and the most important limitation that the author has recognized lies in the sample size of the research which is really small and can be increased by the future researchers in their studies so that a broader view can be obtained. In addition, this study is region specific i.e. Asia, however, other researchers may collect time series data from multiple regions of the world like GCC, MENA, ASEAN countries etc., so that the same aspects of the research may also be considered in other regions of the world. Moreover, the tests that have been used by the author are limited and different tests are available for time series data that can be effectively employed in other researcher’s studies. In the last, this study has focused on some of the variables that have been discussed in the whole study; however the other researchers may take other variables, like the socio-cultural impacts, the impact of teacher training, the impact of innovation in the academic institute, etc., under consideration and focus.

References


**Waleerak SITTISOM** is a Lecturer of Suan Sunandha Rajabhat University, Thailand. Her research areas are Business Administration, Supply Chain Management, and Logistic.

**ORCID ID:** orcid.org/0000-0002-9667-3730

This work is licensed under the Creative Commons Attribution International License (CC BY). http://creativecommons.org/licenses/by/4.0/

---