



The Internal Efficiency of the College of Engineering and Information Technology

Zorayda C. Gavino and Mathew Jun P. Mariani

Received: 25 Nov 2022; Received in revised form: 16 Dec 2022; Accepted: 22 Dec 2022; Available online: 31 Dec 2022
©2022 The Author(s). Published by Infogain Publication. This is an open access article under the CC BY license
(<https://creativecommons.org/licenses/by/4.0/>).

Abstract— The study examined the College of Engineering and Information Technology's efficiency. Delivering better educational services within the limits of available resources is considered internal efficiency. It tried to assess the college's social, cultural, and economic subsystems. A survey was employed to gather data. The 150 respondents were college seniors. It received 35 responses from the ag and c & e departments. Forty-five replies came from civil engineering. Seventy-five (75) were from IT. These were chosen at random. Internally, the college's social, cultural, and economic subsystems were ranked and counted. The college's social subsystem is efficient. The teachers are far more capable. The communication flow is much better in college. The company is in a good mood. Each of the four functions is well stated. However, the ruling system is reasonable. CEIT's cultural component also works well. More detailed, achievable, and relevant to the school, community, and country's growth. They are found globally. The courses have been considerably enlarged, upgraded, and streamlined. Diverse instructional methodologies are employed. Co-curricular activities should be adequate, useful, and motivating. The same goes for teaching aids, reading materials, audio-visual equipment, and recorded video lectures. The college's economic structure is moderately efficient. The available resources are heavily exploited to create labs, libraries, and other facilities and train teachers.

Keywords— internal efficiency, quality service, students

I. INTRODUCTION

Education is a critical component of any economy. Education benefits include the development of human capital, which is significant for both the corporate and public sectors. Despite increased government investment in education, many pupils are disadvantaged due to dropouts, absenteeism, and repetition. This results in waste, which has an adverse effect on the internal efficiency of schooling (Mutegi, 2019). The efficiency of educational institutions is crucial in the justification of resource allocation and utilization in the context of educational institutions. However, the utilization of resources and students' movement through the educational system at various levels of education and programs are areas where some developing countries are experiencing efficiency problems (Okinyi et al., 2021).

Emerging cultures, new technological equipment, and technology reaffirm the importance of knowledge acquisition in daily life, notably in the economic realm and particularly in the developing world. The educational system is a not-for-profit enterprise. Given its enormous impact on economic efficiency, measuring it has become challenging. In general, it is considered that a country's social and economic development is contingent upon the level of education attained by its citizens and that investing in higher education is an investment in the country's economic prosperity. It was discovered that investment in education and scientific research benefits economic growth, regional competitiveness, and individual progress (Gundi et al., 2020).

Increased access to higher education helps countries construct globally competitive economies by fostering the development of new ideas and technologies

and the development of a highly educated, productive, and adaptable labor force. On the other hand, higher education must be efficient, which means that it must produce high outcomes with relatively low inputs for this to be successful. When assessing the efficiency of higher education, it is often necessary to consider the fact that educational production is a multi-product in nature. This has been done in previous research in the field of higher education in the past (Figurek et al., 2019).

Apart from that, there is considerable debate over how to improve the quality of education. While there is significant pressure to perform specific actions to gain outcomes, we truly understand your desire for educational quality. Also, where do you want to accompany it? The state is implementing policies in education that are more quality-oriented. Nevertheless, these policies are not implemented per budget due to significant resource shortfalls. To achieve social and economic development in the country, it is necessary to foster a quality culture within educational institutions and increase support for effective research to resolve issues affecting public and private organizations. It is vital to cultivate a management culture of excellence to accomplish social and economic progress (Milagros et al., 2020).

The internal efficiency of higher education is typically defined as the ratio of input to direct output within the higher education system or schools, or, more specifically, as the relationship between input and output within the higher education system or schools. For the most part, this efficiency allows schools and universities to more efficiently distribute their resources to students (Yu et al., 2020).

The HEI is a socio-cultural macrosystem with social, cultural, and economic subsystems. The social subsystem includes organizational structures that show how people and jobs are grouped. Organizational structures are usually illustrated through charts. Social interaction and communication flow through these structures. The cultural subsystem includes a combination of the vision, mission, goals, objectives, values, traditions, beliefs, ways of thinking, and behavior that differentiate the college from other colleges.

The economic subsystem includes financial and material resources that the college uses. For the college to operate efficiently and effectively, adequate and quality resources have to be. Teachers and students should maximize these.

The college's internal process is the sum of how the college does its work to pursue its objectives. This includes its internal organizational structure and logical arrangements, technology or methods, and various

interacting components such as teachers, students, books, equipment, quality standards, and evaluation methods. If the school produces quality graduates, it must have an efficient and effective internal subsystem with all the social, cultural, and economic subsystems functioning well.

Statement of the problem

Higher education institutions (HEIs) can significantly alter a country's economy. However, there is a paucity of scientific methodologies for measuring higher education institutions' internal efficiency to determine which HEIs are working optimally. Efficiency is a specific outcome that can be evaluated intuitively or explicitly through evaluative actions. As a result, the College of Engineering and Information Technology's internal efficiency will be analyzed in this study.

Additionally, the importance of efficiency in education has received increased attention from governments and multilateral organizations in recent years, which is promising. Numerous variables contribute to this increasing inefficiency of interest (Vaiciukevit, 2019). The government provides a sizable share of funding for public colleges. For the foreseeable future, they will almost certainly continue to be a significant source of government spending. As a result, it is critical to assess and monitor the effectiveness of these institutions of higher learning. Efficiency is commonly mentioned in national education planning documents, yet these documents rarely state explicitly whether efficiency is the ultimate goal or merely a means to an end (Abbott & Doucouliagos, 2009).

Objective of the study

Generally, the study investigated the internal efficacy of the College of Engineering and Information as to cultural, social, and economic subsystems. Specifically,

A. Social Subsystem

- Determined if there is a healthy atmosphere and observance of discipline.
- Identified if the college has a well-defined system of planning and organizing.
- Determined how adequate and competent the teachers are.
- Investigated if there is an effective flow of communication in the organization, such as staffing, directing, and controlling.

B. Cultural Subsystem

- Determined if the goals are clearly formulated, defined, attainable, relevant to KSU, community, and national development

goals, and widely and adequately disseminated.

- Studied if the curricula are comprehensive, enriched, updated, and properly implemented.
- Determined the teaching strategies to be innovative, flexible, evocative, and value-oriented.
- Identified if the co-curricular activities are adequate, functional, and encouraging.

C. Economic Subsystem

- It is determined if the financial resources are sufficient and wisely used.
- Determined if there is wise management of available resources such as laboratories, libraries, buildings, and training.
- Check to see if the facilities are adequate and have smooth financial transactions.
- Determined if the resources are maximized.

The significance of the study

The findings may justify the exploration of other output streams to increase the value-added by each HEI to the local economy, cultural and social subsystems. For instance, such outputs could result from expanded access to specialized programs, research incentives, job development, and labor income. Each HEI may wish to consider expanding its programmatic and enrollment goals to boost its effect on economic, cultural, and social subsystems. Accurate comparison data should be used as a set of guidelines/suggestions and should avoid becoming excessively strict and prescriptive. Efforts must be made to closely monitor the outcomes of efforts to improve the efficiency of educational systems that are regarded as falling short of expectations.

Furthermore, the findings from this research will aid future efforts to improve educational efficiency. It can significantly eliminate the ambivalence that has historically characterized educators' reactions to the efficiency idea and its application to different degree programs. It may assist other researchers in researching the elements impacting the internal efficiency of school systems, and it may inspire parents of kids to become knowledgeable about the issues affecting school internal efficiency.

II. REVIEW OF RELATED LITERATURE

According to Kupriyanova et al. (2018), efficiency has several interpretations, views, and

engagement levels. Higher education's unique character involves balancing efficiency, effectiveness, and value. For universities, efficiency is a way to achieve their aims rather than a response to diminished public funding. Having said that, effective plans necessitate skilled individuals and advanced technology. Institutions can improve process efficiency with long-term public investment and autonomy. The reinvention of efficiency necessitates continual dialogue with internal and external stakeholders (e.g., employing peer learning and benchmarking). Clear communication is essential to manage expectations about various efficiency agendas. Institutions and politicians should be aware of the limitations of efficiency metrics' replicability, transferability, and measurement. Efficiency measures are often "one-off" operations that quickly deplete their saving or optimization potential.

In general, it appears that the size of an institution affects its efficiency: the more students or faculty, the more efficient it is. This variable can be a rough proxy for university interdisciplinarity. The importance of faculty composition must also be considered while evaluating efficiency. This finding has significant policy implications and can help managers of particular HEIs enhance their performance (Wolszczak-Derlacz & Parteka, 2011).

Furthermore, college affordability and institutional accountability are critical challenges in higher education for various stakeholders, including students, teachers, administrators, and lawmakers. College affordability is determined by the cost of providing higher education, whereas accountability is determined by the institution's efficiency and effectiveness in terms of teaching, research, and service outputs. Allocative efficiency is attained when a corporation adjusts its input mix in such a way that the least expensive inputs are employed to generate the same amount of output. Allocative efficiency does not always indicate that the input mix is optimal. Technical efficiency is accomplished when a business or institution, such as a college or university, maximizes its outputs by utilizing its combination of inputs (e.g., faculty, staff, capital equipment) and outputs (e.g., degrees, research, service). Economic efficiency exists when a corporation or organization is both allocatively and technically efficient (Titus & Eagan, 2016).

According to Wakoli et al. (2019), efforts must be implemented to improve school infrastructure, facilities, and resources and thus increase internal efficiency. This is because proper facilities enable more meaningful learning and teaching. For greater internal efficiency, physical facilities such as classrooms, laboratories, libraries,

workshops, and furniture and fittings are necessary. Resources are crucial to the running of technical education institutes. It is possible that learning will not occur due to a lack of resources.

III. METHODOLOGY

The location of the research

The study was conducted at the College of Engineering and Information Technology, Bulanao campus.

Research Design

The study used a descriptive survey design in which no variables were modified or controlled but were examined instead. The analysis was conducted using the individuals' responses to the indicators investigated. Descriptive survey research designs are used in early and exploratory investigations to collect data, summarize, present, and evaluate them for the purpose of clarification. (Ileuma, 2017; Obinga et al., 2017).

Respondents of the study

The respondents of the study were graduating students from the College of Engineering and Information Technology. Seventy-five fourth-year students from information technology were selected randomly, forty from the major in Civil Engineering and thirty-five from Computer Engineering and Agricultural Engineering. They were likewise selected at random, composed of the 150 respondents to the study.

Instrumentation

A five-point questionnaire was the primary tool employed in gathering the needed information.

The items in the questionnaire were rated by respondents using a 5-point Likert scale with the following descriptive values:

| Arbitrary Value | Limit | Description |
|-----------------|-----------|-------------|
| 5 | 4.21-5.00 | Very much |
| 4 | 3.41-4.20 | Much |
| 3 | 2.61-3.40 | Moderate |
| 2 | 1.81-2.60 | Less |
| 1 | 1.00-1.80 | Not at all. |

Data Gathering

The researchers then used Google Form to distribute questionnaires with brief introductions to the study. Additionally, the researchers verified that responders were informed that confidentiality would be

maintained. The researchers allowed respondents sufficient time to respond to all items in the questionnaire and monitored submissions frequently. Finally, the researchers retrieved the responses immediately upon completion. Along with delivering surveys, the researcher employed an observation list to observe the physical and material facilities available at the university. According to Mugenda (2003), a greater than 50% response rate on questionnaires is deemed acceptable.

Data Analysis

Data were analyzed using descriptive analysis techniques such as frequency count, percentages, and weighted mean (Charles, 2018; & Gbolahan, 2017).

IV. RESULTS AND DISCUSSION

SOCIAL SUBSYSTEM

The social subsystem of the College of Engineering and Information is much more efficient, as shown by the total obtained mean of 3.41

There are six indicators for the social subsystem: teachers, organizational climate, communication flow, organizing, staffing, and controlling. Of these indicators, communication got the highest mean with 3.52, which is interpreted as very efficient. The students claimed that they were provided with adequate and correct information with a mean of 3.71 and that they knew the plan of activities in the department with a mean of 3.33, which are both interpreted as very efficient. Whenever there is information to be disseminated, the dean calls for a faculty meeting in the department, and the teachers, in turn, disseminate the information to the students. The information is given in classrooms during class hours and during off-class hours, such as in the students' organizations by their advisers and during informal talks with their teachers.

The second highest means of 3.48 each were obtained for the teachers, organizational climate, and staffing indicators. The respondents said the dean and teachers provided them with correct information, with a mean of 3.62. This jibes with what they claimed earlier about efficient communication. The teachers are prepared when they enter classrooms with a mean of 3.59. The teachers in the department are reasonably sufficient in number, as evidenced by a mean of 3.53. The teachers are prompt in entering their classes, and they dismiss the classes on time with a mean of 3.47. The teachers are aware that a checker is monitoring the late entrance to class and the early dismissal of classes.

The respondents also claimed that their classrooms were extremely crowded, as evidenced by an

obtained mean of 3.34. This is because many of their classes have more than 55 students.

As to organizational climate, the students said their teachers respect them with a mean of 3.85, interpreted as much as the admission policies are challenging to attract them to the department with a mean of 3.81. They are provided with activities that encourage unity with a mean of 3.67, followed by the policy on admission that is open to all alike with a mean of 3.59. Students feel there is no discrimination with this response when they enroll at the CEIT. The students likewise said they have high regard for their teachers, with a mean of 3.53. They said that their teachers manifest desirable values and teach them in their learning with a mean of 3.52. The students feel that there is a friendly atmosphere among the teachers with their response of 3: 46. The teachers who profess dignity both in and outside classrooms got a mean of 3.44, which is interpreted as much. The students feel at ease with their dean and teachers, as shown by a mean score of 3 out of 41. "Students' potentials are not recognized," with a descriptive rating of 3.39, "the dean gives more time in attending students' needs," with a rating of 3.38, "there are enough designated officials for the department," with a rating of 3.35, "the dean and teachers are consistent in the implementation of rules and policies," with a rating of 3.22, and "I have my own copy of the student handbook," with a rating of 3.07.

On staffing, the students experienced that their teachers were being observed by their dean, and they were asked to evaluate their teachers every semester with a mean of 3.67 each. This is followed by hiring competent part-time teachers with a mean of 3.21 and the hiring of quality teachers with a mean of 3.15. Both fall within the descriptive rating of moderate.

With a mean of 3: 45, the students responded that activities are scheduled at a convenient time. Activities in the department are planned at a time when students are expected to be present, and the schedule varies from time to time so as not to disrupt classes.

The sub-indicator on controlling got the lowest mean of 3.07, described as moderate. While the students said that their suggestions are given much recognition, with a mean of 3.41, they also responded with a moderate rating, as "disciplinary measures are being explained to us" with a mean of 3.29, "our school provides proper hearing of school problems" with 3.13, "sanctions on students' misconduct are given without bias" with 3.21, and "suggestion boxes are found in school" with 2.29.

CULTURAL SUBSYSTEM

The internal efficiency of CEIT along the cultural subsystem is described as much as evidenced by the total mean of 343. Of the five indicators, the highest mean was obtained along with goals, with a mean of 3.60. The students claim they are very aware of the school's mission, goals, and objectives, with a mean of 3.73. With the plan of the department to submit itself for accreditation, the students have been lectured on the vision, mission, goals, and objectives of the school. The vision, mission, and goals are much simpler and attainable, as reflected by a mean of 3.58, and the teachers and dean make the students aware of the goals and objectives as shown by a mean of 3.53. The goals and objectives are made known to students with a mean of 3.53. At least with 3.51, the goals and objectives are discussed in clear, simple terms.

The second in rank is the sub-indicator on curriculum content, with a mean of 3.54, followed by teaching strategies with a mean of 3.45. Both are described as much. The students claim that the course subjects are sufficient enough to provide their needed knowledge, values, and skills, with a mean of 3.64. The courses offered are the needs of society, with a mean grade of 3.62. Through the course offerings, the interests and abilities of students are developed, as shown by the mean of 3.55. Students' learning makes them better in daily life with a mean of 3.48. The least of 3.31, which is described as moderate, is "I see that changes are being made to improve the curricula." The students do not usually sit down during curriculum enrichment exercises; hence, their perception of this subsystem is moderate.

With a mean of 3.45, the third indicator is associated with teaching strategies, which are interpreted as effective. Three sub-indicators were obtained and described as much in this indicator. Teachers give critical, analytical, and logical questions with a mean of 3.59, and students are encouraged to use their acquired skills to improve the quality of their lives and those of others with the same mean of 3.39. This is followed by the presence of the school organ, with a mean of 3.53. The lowest is along "the teachers take into consideration that students have different capabilities, with a mean of 3.31, which means moderate description.

The sub-indicator on instructional resources scored a mean of 3.33 and was described as moderate.

The students recognize that buying books and reading materials is much easier, with a mean of 3.59. The teachers make use of audio-visual materials and facilities much more than the mean of 3.56. The other sub-indicators all obtained moderate descriptions. Our school has basic audio-visual materials with a mean of 3.33, the school provides adequate athletic materials with a mean of 3.20,

and laboratory materials are complete with a mean of 2.84. Both fall under the description of "moderate."

The next indicator is co-curricular activities, which has a mean of 3.26, or moderately effective. The students claim the school offers a functional guidance office with a mean of 3.8. The school program encourages students to practice their political rights and responsibilities in the community with 3.62. The guidance counselor keeps in contact with the students with a mean grade of 3.41. The school canteen provided nutritious foods with the same description of 3.41 as well.

The indicators with a moderate description are a long list of jobs that are posted on the bulletin boards for the graduates with a mean of 2.67 and the presence of a school bookstore with a fair price with a mean of 2.36.

ECONOMIC SUBSYSTEM

The respondents perceived the economic subsystem of the CEIT as moderately efficient, as evidenced by the obtained mean of 3.40. Of the three sub-indicators, the utilization of resources obtained the highest with a mean of 3.76, which is interpreted as much more efficient. The students said they make it a point to use and maximize whatever resources are available in the school. The allocation of funds obtained the second-highest mean, with 3.49 described as much more efficient. With a mean of 3.78, the students claimed the school uses discovered for its intended purposes. They see that the school gives funds for the training of teachers with a mean of 3.57. They claim the school gives attention to expanding buildings with 3.56 as the mean. The school is moderate in buying laboratory materials, as reflected by a mean of 3.03.

Acquisition of funds comes next with a mean of 3.41. The students observe that there is a spacious and organized accounting office where they pay their fees with a mean of 3.43. The school has a computerized program at the finance and registrar's offices that makes payment of fees systematic and efficient. The collection of student fees runs smoothly. The students observe the transaction of business at the finance office. Whenever they go for assessment and payment of fees, the students just fall in line and wait for their names to be called. In a short time, the information they need comes out of the computer units as the clerks enter the data.

The sub-indicator with the least obtained mean is on the use of funds, with a mean of 2.92, or moderately efficient. Students are unaware of how funds are spent at the college. They are only interested in the student development fund and the tuition fees collected from them.

They have little knowledge of the larger funds provided by the national government, which explains their cautious attitude toward the use of funds.

a total average weighted mean of 3.41, which falls within the much more efficient description. It is safe to conclude that the internal efficiency of the College of Engineering and Information Technology is described as highly efficient.

It also shows that of the three subsystems of CEIT understudy, the cultural indicator ranked first with a mean of 3.43, which is interpreted as much more efficient. The social subsystem ranked second with a mean of 3.41, or much more efficient, while the third in rank is the economic subsystem, with a 3.40 interpreted as moderately efficient.

For the social subsystem, communication is ranked first, followed by teachers, organizational climate, and staffing as the second. The next in rank is organizing and then controlling, the least in rank. The efficiency of the social subsystem of a school is determined by the adequacy and competence of the teachers, the effectiveness of the communication flow; the health of the organizational climate; and a well-defined system of planning, organizing, staffing, directing, and controlling. It is concluded that the CEIT teachers are far more adequate and competent. The flow of communication in the department is very effective. Planning, staffing, and organizing are well defined. However, control is only moderately defined.

The cultural efficiency of a school is determined by a clear formulation of goals that are attainable, relevant, and widely disseminated to all concerned; comprehensive, enriched, and properly implemented curricula; innovative and value-oriented teaching strategies; and adequate and available reading materials—instructional resources and audio-visual aids; and adequacy of encouraging and functional co-curricular activities. For the cultural subsystem of the CEIT, findings showed that goals ranked first, followed by curricular content as second; teaching strategies as third; instructional resources as fourth; and co-curricular activities as fifth.

It is concluded that the cultural subsystem of CEIT is much more efficient. The goals of the school are clearly defined, attainable, and widely disseminated. The curricular content is very comprehensive and adequately implemented. The teaching strategies are very innovative, evocative, and value-oriented. However, instructional resources, reading materials, and audio-visual aids are moderately adequate and available. The same is true with co-curricular activities, which are moderately adequate, functional, and encouraging.

The economic efficiency of a school is determined by the adequacy and wise use of financial resources; the wise usefulness and allocation of available resources such as for laboratory, library, buildings, and training of personnel; the adequacy of facilities and smooth financial transactions; and the maximized use of resources. In the CEIT, utilization of funds ranked first, followed by allocation of funds. The third in rank is adequate financial facilities and smooth financial transactions, and the fourth in rank is the use of funds.

V. CONCLUSION

On the basis of the findings, it can be inferred that the CEIT's internal efficiency is quite efficient. Efficiency is high in the social and cultural subsystems but moderate in the economic subsystem. Additionally, resource consumption is maximized. There is a far more prudent allocation of available resources, more suitable financial facilities, and more seamless financial activities. There are appropriate financial facilities and a well-functioning financial system. However, the expenditure of funds is prudent. Furthermore, the dean and faculty should study policies and regulations and then increase their cooperation to ensure that they are consistently distributed. The office of student affairs and student advisers should collaborate with deans to organize more meaningful co-curricular events in which students can participate. Creating and implementing avenues for discussing student problems and needs is necessary.

REFERENCES

- [1] Abbott, M., & Doucouliagos, C. (2009). Competition and efficiency: overseas students and technical efficiency in Australian and New Zealand universities. *Education Economics*, 17(1), 31–57. <https://doi.org/10.1080/09645290701773433>
- [2] Bochelyuk, V. (2019). Socio-Psychological Features of Improving Management Efficiency by Educational Institutions. *Вісник ХНПУ імені Г. С. Сковороди "Психологія"*, 57, 19–30. <https://doi.org/doi.org/10.5281/zenodo.1184156>
- [3] Charles, W. (2018). Influence of Selected Socio-cultural Practices on Internal Efficiency in Selected Public Technical Training Institutes in Baringo County, Kenya. *Africa Journal of Technical & Vocational Education & Training*, 3(1), 113–127.
- [4] de la Torre, E. M., Agasisti, T., & Perez-Esparrells, C. (2017). The relevance of knowledge transfer for universities' efficiency scores: an empirical approximation on the Spanish public higher education system. *Research Evaluation*, 26(3), 211–229. <https://doi.org/10.1093/reseval/rvx022>
- [5] Figurek, A., Goncharuk, A., Shynkarenko, L., & Kovalenko, O. (2019). Measuring the efficiency of higher education: case of Bosnia and Herzegovina. *Problems and Perspectives in Management*, 17(2), 177–192. [https://doi.org/10.21511/ppm.17\(2\).2019.13](https://doi.org/10.21511/ppm.17(2).2019.13)
- [6] Gbolahan, S. (2017). School Production Variables and Internal Efficiency of Public and Private Junior Secondary Schools in Oyo State. *Afro Asian Journal of Social Sciences*, 7(3), 1–11.
- [7] Gundić, A., Županović, D., Grbić, L., & Baric, M. (2020). Conceptual Model of Measuring MHEI Efficiency. *Education Sciences*, 10(12), 385. <https://doi.org/10.3390/educsci10120385>
- [8] Ileuma, S. (2017). School Related Factors as Predictors of Internal Efficiency of Public University Students in South-West, Nigeria. *African Research Review*, 11(2), 251–261. <https://doi.org/10.4314/afrr.v11i2.19>
- [9] Joseph, O., & Kennedy, I. (2017). Analysis of Teachers' Qualifications on the Internal Efficiency of Primary Schools in Central Equatoria State, South Sudan. *Kampala International University Research Journal*, 6, 1–13.
- [10] Kupriyanova, V., Estermann, T., & Sabic, N. (2018). Efficiency of Universities: Drivers, Enablers and Limitations. *European Higher Education Area: The Impact of Past and Future Policies*, 603–618. https://doi.org/10.1007/978-3-319-77407-7_36
- [11] Milagros, V. M., Bertha, Ítalo, T. D., Ciro, Rosario, M. Z., Jessica, Agosto, G. T., Ricardo, & Pedro, C. S., Wilmer. (2020). Characterization of the internal efficiency of public university students using indicators of educational quality models. *PalArch's Journal of Archaeology of Egypt / Egyptology*, 17(6). <https://hdl.handle.net/11537/26694>
- [12] Mutegi, G. N. (2019). *Determinants of Internal Efficiency in Public Primary Schools in Maara Sub -County, Tharaka - Nithi County, Kenya.* <https://ir-library.ku.ac.ke/bitstream/handle/123456789/21932/Determinants%20of%20Internal%20Efficiency.pdf?sequence=1>
- [13] Namuchana, M., & Masaiti, G. (2021). View of Internal Efficiency Indicators in Education. *Zambian Journal of Educational Management, Administration and Leadership*, 1(1). <https://www.mines.unza.zm/index.php/ZJEMAL/article/view/218/198>
- [14] Obinga, P. O., Waita, K. J., & Mbugi, N. M. (2017). Relationship between Physical Resources and Internal Efficiency of Public Secondary Schools in Tana River County, Kenya. *European Journal of Education Studies*, 3(7), 469–510. <https://doi.org/10.5281/zenodo.825788>
- [15] Okinyi, R. A., Nyerere, J. K. A., & Kariuki, S. I. (2021). Internal Efficiency of Public Vocational Training Centres in Kenya. *African Educational Research Journal*, 9(2), 375–384. <https://eric.ed.gov/?id=EJ1297097>
- [16] Titus, M. A., & Eagan, K. (2016). Examining Production Efficiency in Higher Education: The Utility of Stochastic Frontier Analysis. *Higher Education: Handbook of Theory and Research*, 441–512. https://doi.org/10.1007/978-3-319-26829-3_9

- [17] Vaiciukevičiūtė, A. (2019). Assessing economic impact and efficiency of higher education institutions [Dissertation]. In *dspace.vgtu.lt*. <http://dspace.vgtu.lt/handle/1/3796>
- [18] Wolszczak-Derlacz, J., & Parteka, A. (2011). Efficiency of European public higher education institutions: a two-stage multicountry approach. *Scientometrics*, 89(3). <https://doi.org/10.1007/s11192-011-0484-9>
- [19] Yu, B., Meng, Z., & DONG, N. (2020). Efficiency of Educational Resource Allocation---Taking a Local University in China as an Example. *International Journal of Innovation and Research in Educational Sciences*, 7(4), 294–301.