

The reality of continuous improvement of education technology in the light of the Kaizen methodology

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Introduction and research problem

The world today sees many advanced big changes which through it determined by the progress of peoples. It has translated this enormous development extent to meet the needs and desires of the beneficiaries under this development in many fields; especially in the field of education best classes, where education has become an important area for community progress in developed countries as it meets many of the diverse needs of individuals. Which in turn reflect on the society which react to these individuals in it, and needs always education to renew its tracks so that learners provide them with creative skills plans for them to possess at the end of each stage of education to meet the challenges of the world highly competitive, and to meet those challenges had to identify the factors that help to raise the level of learners and work to improve this level and improve on an ongoing basis through the preparation of educational institutions and the implementation of various programs and activities offered by learners.

The educational institutions are the cornerstone for achieving quality performance to improve the education system in all its elements, the implementation of strategies to achieve goals through planning, implementation, evaluation and access to the desired educational outcomes, to develop education and achieve quality. The preparation of the teacher of the things that you need to define the steps and criteria to complete its preparation to the fullest and look constantly to the needs of the labor market and its requirements in order to determine the objectives of the design of programs and decisions that contribute to the development and improvement and development of professional and personal skills, which is reflected to the

professional performance to reach the required levels as we live in a world of increasing the knowledge so much nowadays.

It's new in various fields, and the contention of science, knowledge and skills that cannot be dispensed with by the teacher in his career so we get to the competition, quality and innovation in education. (90: 1)

The continuous improvement requires the development of quality improvement in their daily work, woven into the daily work fabric, improvement constant cannot be separate, concentrates on operations, and requires it not to do the work differently, but rather to do a different job, a situation practice problems as producers and elements of the system, or work on the development of the proposed solutions. (7: 6-5) which calls for the adoption of a new methodology to achieve educational quality standards, and supports continuous processes such as Kaizen methodology optimization, because the competition is no longer limited to the development of competitive only strategies, but extended to the need for continuous development based on the available resources. (30: 5)

Kaizen is a Japanese word meaning *continuous change* or *continuous improvement* for the better, and the kaizen theory is focused on the introduction of improvements in small products and services to help reduce costs and reduce losses and wastage in the materials continuously to reach the desired results, rather than encouraging the work of changes and large island. Strategy kaizen or theory Kaizen continuous improvement will be described differently, the kaizen strategy developed primarily for the development of institutions and companies, knowing that it is possible to apply to individuals, Kaizen strategy based on the optimization simple in your life over many steps daily, so you cannot deny their steps or ignore the implementation of the steps of their small size, the final outcome after the application of the theory of kaizen long-term stunning, huge achievements without feeling any effort. (8)

Continuous improvement using Kaizen is a pioneering idea to get rid of waste in operations, where the kaizen principle that all employees in the organization have continued right to development, through small steps, have a great impact in the future, every action is implemented can be improved, and each process must contain waste, whether it was physically, incorporeally, intellectually, and to reduce this waste even small proportions, producing an added value to the process as a whole. (2: 29)

Search depends on the descriptive method which is based on the description of kaizen methodology and techniques applied in educational work, and

monitoring information related to this application, access to the findings and recommendations. Considering that the application of the Kaizen methodology in the educational context is still new and rare, the use of the descriptive approach is the entrance to the definition of the subject and to the attention of researchers in this educational field study methodology and methods compared to other existing or pave the way for improvements in the way the educational systems work.

(4: 66) (14: 3)

Considers the researcher that this study derives its importance from the prevailing approach of society towards change and continuous development of society in general and education in particular, and summarizes the importance of the study:

- Improving the way of thinking in addressing the issues of education, and out of the typical
- Strengthening the base to find solutions to problems on an ongoing basis, especially the problems of small hindering for good performance or big problems that do not find solutions to them since time distant
- Strengthening which requires action starter to build appropriate mechanisms to achieve the efforts of educational institutions and the goals of cost.
- To promote interaction between the educational institution and the community beneficiary of its services
- Consolidate the belief in the importance of change constantly, and continuous learning experiences and attitudes that

These different conditions that help achieve learning is high quality and can be elaborated as follows:

- The student's ability to retain knowledge of how long
- The student's ability to see relationships between old knowledge and new knowledge
- The student's ability to moulding new knowledge and discover the future and see the different relationships between the identifier student's ability to apply his own of knowledge to solve problems in the student's desire to learn more.

The focus of systematic kaizen to improve performance and work environment and commitment to the principle that everyone has the continuing right of development, and also help reduce waste in time and effort, and work seamlessly streamlines and check the principles of consulting and democracy and held accountable for causing the problems, and ensure that

no repetition of the error occurs and the events of changes in reality so as to ensure cruise the work. (4: 72-85)

In this sense the idea of research to know came to reality the school for the students of specialized education in the light of the Kaizen methodology in order to identify strengths and weaknesses and to identify actions to improve and develop specialization program requirements of education according to the needs of student's specialized education and society.

Through the work of the researcher, Department of Curriculum and Teaching Methods of Physical Education noted the weak turnout of students in the fourth band to join specialized education program compared to other disciplines programs (Sports Training Division - Sports Administration Division) because of the large number of teaching loads and tasks assigned to them by other sections falling within the program of education according to overall list of what has had a negative impact of non-Iqbal students to specialized education, which is one of the most important disciplines within the college, and the belief in the importance of the role played by the college to prepare graduates of teachers outstanding women to meet the deficit needs of the school community the various stages of this profession, and to find out the strengths and weaknesses of the program and improve it and develop it to suit the requirements of society and tendencies of college students and educational needs and psychological, prompting the researcher to launch the idea of this research.

Aim of the research:

The research aims to identify the reality of continuous improvement of educational technology in the education program in the light of the Kaizen methodology.

Search question:

What is the reality of continuous improvement of educational technology and educational program in the light of the Kaizen methodology?

Search Terms:

Continuous Improvement:

A process that aims to develop various production activities, in addition to developing the production elements of materials, machines and personnel, provided that this is done on an ongoing basis, within the quality management

process that includes meeting the appropriate material and moral incentives for this process.(9)

Educational Technology:

Educational technology is represented in the theories and applications used in designing resources and processes, and striving to develop them, and then use them in an organized manner in order to achieve the effectiveness of learning. (10)

Methodology (kaizen)

The Japanese word Kaizen (改善), Kai (改) means change, Zen (善) means good, and in the English language is the progressive improvement or continuous, kaizen is a methodology focused on the process and the results of both, and Kaizen is the process when done in true in the workplace eliminates hard work unnecessarily, whether mental or physical, where the disposal of waste and losses in operations (16: 6)

Research procedures

- **Research methodology:**

The researcher used the descriptive analytical approach to the appropriateness of the nature of the study as the most appropriate in the light of its objectives.

- **Society and the research sample:**

The research sample represents 120 female students from the strength of the community (190) student phase Bachelor Division (Education), Department of Curriculum and Teaching Methods of Physical Education

- **Means of data collection:**

The researcher has a series of steps to collect data for research as follows:

1. Analysis of scientific references and previous studies: where reference scientific references and specialized studies and theses and doctoral degrees in the field of teaching methods of physical education and the quality of education and methodology Kaizen quality in order to prepare axes and phrases questionnaires in question.

2. Personal interview: The use of the personal interview style with experts in the field of teaching methods of physical education and heads of unit ensure quality faculty, past and present, and the coordinators of the standard of teaching and learning and evaluation Quality Assurance Unit faculty and professors existing academic standards format standard programs (education) College and agent for Graduate Studies the number (25) members have been

stipulated, but less experience teaching undergraduate for 15 years and to take advantage of their expertise in the preparation of questionnaires in question, facility (1).

3. The questionnaire: In the light of theoretical readings and previous studies and through personal interviews designed the questionnaire in question to identify the educational process quality phase Bachelor Division (Education) has been the design of the questionnaire for the beneficiaries of the Bachelor Division Program (Education), Department of Curriculum and teaching methods of education and sports so as follows:

Basic procedures for building questionnaires

The first stage

It consisted of theoretical readings and personal interviews. **The researcher did the following:**

1. Identify the main axes of the proposed questionnaires in question.
2. Setting phrases corresponding to the content of axes forms of opinion poll suggested that measure the quality of the educational process phase Bachelor Division (Education), Department of Curriculum and Teaching Methods of Physical Education in the light of the Kaizen methodology for quality.
 - Were identified main themes consisting of the questionnaire consisted of (7) axes and her words facility (2), it has been presented to the gentlemen experts set out their names facility (1) to determine the most appropriate axes consisting of a questionnaire and phrases appropriate for each axis shows the table (1) the initial characterization of the axis and phrases questionnaire students towards the quality of the educational process (in the light of the Kaizen methodology) phase Bachelor Division (Education), Department of curriculum and Teaching Methods of Physical Education, Faculty of Physical Education for Girls in Cairo, Helwan University in the initial image.

Table (1)

Initial description of the axes and phrases of the female students' questionnaire towards continuous improvement of educational technology (in light of the Kaizen methodology) at the undergraduate level, Division (Education), Department of Curricula and Methods of Teaching Physical Education.

M	Questionnaire's focus	number of phrases
1	The reality of continuous improvement of educational technology in the education program	6

The second phase

In which the questionnaires under consideration were presented to a number (25) experts in the field of physical education teaching methods and the quality of teaching and learning annex (1), and it was stipulated in their selection:

- 1- Specializing in the methods of teaching physical education, or working in the quality assurance unit at the college.
- 2- Experience in the field of teaching for the bachelor's stage, in the "Education" section, not less than (15 years), in order to identify the appropriateness of the axes and phrases related to the quality questionnaires of the educational process, and to give the experts the opportunity to delete, add or modify any phrase.

This phase was implemented from 2/5/2021 to 10/5/2021.

This stage resulted in the following:

1. Phrases that achieved less than (80%) of the expert opinions were excluded. The majority of the experts agreed on the axes included in the questionnaire about the quality of the educational process, in order to fit these axes with the objectives of the study.
2. The questionnaire was processed by an expert opinion poll, and its axes and phrases were settled.
3. Some expressions have been modified by experts.
4. Some axes and some phrases have been reformulated based on the opinions of experts.

Table (2) shows the final description of the axes and phrases of the questionnaires of the female students' opinions on the quality of the educational process (in light of the Kaizen methodology) at the bachelor's stage (Education) Division, explaining the phrases that have been changed, added or reformulated, annex (3).

- The researcher has made all the complete modifications and the scale has become valid for application.

Table (2)

The final description of the axes and phrases of the female students' questionnaire towards continuous improvement of educational technology (in light of the Kaizen methodology) at the undergraduate level, Division (Education), Department of Curricula and Methods of Teaching Physical Education.

M	Questionnaire axes	number of phrases	Added or paraphrased phrases
1	The reality of continuous improvement of educational technology in the education program	6	(2,5,6)

The expert opinion poll questionnaires were analyzed about the axes and phrases of the opinion poll questionnaires about the quality of the educational process at the postgraduate level in the light of the Kaizen methodology, where the phrases with less than (80%) agreement were excluded and accordingly the questionnaire phrases were settled.

Third level

The researcher conducted the exploratory study in order to identify the extent of the applicability and to ensure the validity of the opinion poll questionnaires to determine the quality of the educational process.

At the bachelor's level, the (Education) division, the extent, possibility, ease of their application and their clarity, on the members of the survey sample, which consisted of (40) distributed as follows: (5) members of the teaching staff in the Department of Curricula and Methods of Teaching Physical Education, and (35) female students at the Bachelor's level (Education) division in the same department And that was from 12/5/2021 to 22/5/2021, where the ease of use of the questionnaires and their suitability were verified by subjecting them to scientific transactions as follows:

Scientific Transactions of the Questionnaire:

The researcher calculated the scientific parameters of the questionnaire as follows:

First: Calculation of honesty:

(a) The validity of the content (content) by the arbitrators:

Where the questionnaire was presented as previously in the steps of building on experts (arbitrators) in the field of teaching methods to calculate the validity of the content (content) by expressing an opinion on the appropriateness of the axes and phrases of the academic reality questionnaire for the education program in the light of the Kaizen methodology.

Table (3)

Percentages of experts' opinions on the axes and phrases of a questionnaire survey of female students' opinion towards the reality of continuous improvement in educational technology at the undergraduate level in the "Education" program in the Department of Curricula and Teaching Methods of Physical Education

N=25

M	Axes and phrases	number of approvers	Percentage of expert opinions
The reality of continuous improvement of educational technology in the education program		25	100%
As one of the students of the education program, I see that:			
1	The teaching halls have data show devices or an .interactive whiteboard to display scientific materials	24	96%
2	.Modern technology methods are used in teaching	25	100%
3	The college has internet networks to facilitate the .learning process	25	100%
4	There are educational technologies to support e-learning in college	25	100%
5	The media of educational technology is used to reduce .learning time	25	100%
6	Diversity is made in the use of educational techniques .in the educational process	25	100%

Table (3) shows the percentage of experts' opinions on the axes and phrases of the female students' survey questionnaire towards the reality of continuous improvement of educational technology at the undergraduate level in the (Education) program in the Department of Curriculum and Teaching Methods of Physical Education.

(B) The validity of the internal consistency

To calculate the internal consistency of the questionnaire, the researcher applied it to a sample of (35) female students, (5) faculty members specializing in curricula and teaching methods, with a total of (40) female students and faculty members from the research community and from outside the basic sample, where the correlation coefficients were calculated between the degree of each The phrase and the total score for the axis to which it belongs, as well as the correlation coefficients between the score of each axis and the total score of the questionnaire, and the tables (1) show the result, respectively.

Table (4)

Correlation coefficient between the degree of each phrase and the total score for each of the axes of the study reality questionnaire for the education program

n = 40

The reality of continuous improvement in educational technology	
M	Correlation coefficient
1	*0,562
2	*0,487
3	*0,591
4	*0,623
5	*0,528
6	*0,670

* The tabular value of "t" at the level (0.05) = 0.308

It is evident from Table (4) that:

The correlation coefficients ranged between the degree of each phrase and the total score of the axis to which it belongs (0.400: 0.790), which are statistically significant correlation coefficients at the level of significance (0.05), except for the statement (10) with the axis of continuous improvement of administrative services, and thus the phrase was deleted so that the number of axis phrases was 15 phrase instead of 16 phrases.

Thus, the number of the questionnaire as a whole became (64) statements instead of (65) statements.

Table (5)

Correlation coefficients between the score of each axis and the total score of the educational reality questionnaire for the education program

n = 40

M	The main axes	Correlation coefficient
1	The reality of continuous improvement in educational technology	*0,792

The tabular value of "t" at the level (0.05) = 0.308

It is evident from Table (5) that:

The correlation coefficients between the degree of each axis and the total score of the questionnaire ranged between (0.521: 0.832), which are statistically significant correlation coefficients .

It is clear from the two tables (2, 1) that the questionnaire statements are characterized by an acceptable degree of validity.

Second: Calculation of stability:

To calculate the stability of the questionnaire on the reality of continuous improvement in educational technology, the researcher used the Alpha Cronbach coefficient by applying it to a sample of (40) students from the research community and from outside the basic sample, and the following table shows that:

Table (6)

Evaluate Cronbach's alpha coefficients for a questionnaire on the reality of continuous improvement in educational technology

n = 40			
M	The main axes	alpha coefficient t value	Alpha college
1	The reality of continuous improvement in educational technology	*0.654	*0.654

The tabular value of "t" at the level (0.05) = 0.308

It is evident from Table (6) that:

The alpha coefficients of the reality questionnaire and the reality of continuous improvement in educational technology ranged between (0.521: 0.781) , and the total alpha value (0.654 *), which are statistically significant coefficients, which indicates that the questionnaire has an acceptable stability coefficient.

The final picture of the questionnaire on the reality of continuous improvement in educational technology:

The researcher wrote the questionnaire in its final form after calculating the scientific transactions in preparation for the application of the questionnaire to the basic sample, Annex No. (3)

- Basic study

The researcher applied a questionnaire on the reality of the continuous improvement of the educational technology under research on the basic sample of (120) female students, in the period from 5/23/2021 to 5/26/2021. The application was done electronically in preparation for statistical treatment using the SPSS program.

Estimated scale used:

The researcher adopted a triple scale of assessment according to the experts' opinions, which is (agree), and she gets 3 marks (to some extent), 2 marks, (disagrees) and she gets 1 degree for the phrases and thus the questionnaire becomes valid for application.

- Statistical treatments:

After collecting and tabulating the data, it was processed statistically. To calculate the results of the research, the researcher used the following statistical methods:

- Percentages.
- Correlation coefficient.
- Cronbach's alpha coefficient.
- Estimated score.
- Relative weight.
- Iterations.

Presentation and discussion of results

In order to achieve the goal of the research and to answer its questions and within the limits of the data reached by the researcher through the method used and the research sample and the tools of data collection and statistical analysis used, the researcher presents the research questions and discusses them.

The researcher has adopted the relative weight of the responses of the research sample 80% or more to accept the statements that indicate or give an indication that the academic reality of the education program in the light of the Kaizen methodology at the Faculty of Physical Education for Girls, Helwan University in the different dialogue is achieved with a high degree, and from (60 to less than 80%) an indicator of its achievement moderately, and less than 60% are indicators of achieving it to a small degree.

First: Presenting and discussing the results of the continuous improvement of the education program.

Presenting and discussing the results of the continuous improvement of educational technology in the education program.

Table (7)

Frequencies, estimated degree, relative weight, and arrangement of the responses of the research sample (the reality of continuous improvement of educational technology in the education program).

n = 120

m	ferries	agree		To some extent		disagree		Estimated score	relative weight	ranking
	As one of the students of the education program, I see that...	K	%	K	%	K	%			
1	The teaching halls have data show devices or an interactive whiteboard to display scientific materials	56	46,7	37	30,8	27	22,5	226	73,88	4
2	Modern technological methods are used in teaching.	65	54,2	42	35	13	10,8	292	81,11	1
3	The college has Internet networks to facilitate the learning process.	39	32,5	22	18,3	59	49,2	211	58,61	6
4	There are educational technologies to support e-learning in college	51	42,5	33	27,5	36	30	255	70,83	5
5	The media of educational technology is used to reduce learning time.	63	52,5	35	29,2	22	18,3	281	78,05	3

6	Diversity is made in the use of educational techniques in the educational process.	64	53,3	40	33,3	16	13,3	288	80	2
The total degree of the axis								1593	73,74	7

It is evident from Table (7) that:

The sample responses varied on the axis phrases (**the reality of continuous improvement of educational technology in the education program**), as the relative weight of the responses ranged between (58.61% to 81.61%) for phrase No. (3) And for phrase No. (2)

As for the relative weight of the responses of the research sample on the expressions of the axis as a whole (73.74%), which indicates the achievement of continuous improvement of educational technology in the education program to a medium degree.

The researcher attributes this to the development of the educational process by increasing interaction through the use of technological means that help in achieving learning, and make the student and the teacher in a state of eagerness to carry out their respective duties to the fullest because the educational process has become more fun thanks to technology.

Sentence No. (2), which states (modern technological methods are used in teaching) ranked first, with a relative weight of (81.11%), and the researcher attributed this to the fact that the ease of obtaining lessons by recording them and uploading them on the Internet, and this in turn opens an area for discussion between teacher and student. The current development in most countries and developed societies is a result of the development of technological means of education and everything related to student education through the use of technology.

This result is consistent with the result of (Shadia Daoud, Alaa Hashem) (2019 AD) applying the Kaizen methodology in the light of information technology and its effective role in the continuous improvement of performance by application in Islamic banks in the Kingdom of Saudi Arabia. Sentence No. (3) has stated (there are internet networks in the college to facilitate the learning process) on the last order with a relative weight of (58.61%) and this is due to the absence of an internet network due to the lack of sufficient budget to facilitate the teaching and learning process.

Thus, the question that states what is the reality of continuous improvement of educational technology in the education program has been answered.

Conclusions and Recommendations

First: the conclusions.

It is clear from the previous presentation that:

- 1- The Kaizen methodology is a strategic option to reform the quality systems in education in its various types, levels and institutions.
- 2- The Kaizen methodology makes a fundamental change in the performance of workers, their feelings and their affiliation with educational work within the framework of quality.
- 3- The Kaizen methodology in quality achieves the objectives of qualitative and comprehensive quality, and it guarantees quality in both administrative and technical educational work.
- 4- The use of the Kaizen methodology helps to reduce the waste of resources and capabilities and seeks for a good distribution of these resources and capabilities within the organization so that the work occurs smoothly and smoothly.
- 5- The Kaizen methodology prevents wastage, holds those responsible for the problems, and ensures that errors are not repeated and changes are made to sites to ensure the smooth flow of work in accordance with quality.

Second: recommendations

Based on the foregoing, the following recommendations can be made:

1. Highlight the aspects that require continuous development and improvement.
2. Adopting the Kaizen methodology for continuous improvement in the departments of pre-university education, and this will only be achieved by the presence of a training system that qualifies individuals to understand this methodology, and works on developing institutional capacity (professional development).
3. All leaders and employees adopt the integration between total quality and the Kaizen methodology for continuous improvement.
4. Develop institutional awareness of the importance of performance development and continuous improvement.
5. Building performance development and continuous improvement programs.

Reference List

First: Arabic references:

- 1- Saeed Al-Mulsi: "Evaluating the School's Environment and Administrative Climate", the Arab Center for Educational Research for the Gulf States, Kuwait, (2010).
- 2- Mohsen bin Hafez Baomar: "Japanese Kaizen Methodology", Riyadh, and Dar Al-Ashab for Publishing and Distribution, (2017).
- 3- Medhat Muhammad Abu Al-Nasr: "Total Quality Management, the Japanese Kaizen Strategy for Organizational Development", Cairo, the Arab Group for Training and Publishing, (2015).
- 4- Muhammad bin Al-Shahat Hussein Khatib, Abdul Ghaffar bin Abdul Aziz Quraish: "The Japanese Quality Kaizen Approach and its Applications in Arab Educational Work", volume of the Arab Universities Conference, (2019 AD).

Second: Foreign references:

- 5- Aurel, T., Andreea, R., & Simina, T. S: Continuous Quality Improvement in Modern Organizations Trough Kaizen Management, Neum, 9th Research/Expert Conference with International Participations, QUALITY 2015, B&H, Bosnai Hercegovina, 2015, P.30
- 6- Luis, J., Maldonado, A., Oropesa, M.: Kaizen Planing, Implementing and Controlling, USA, Springer International Publishing, 2017, P16.
- 7- Park, S., et, al.: Continuous Improvement in Education, California, USA, Carnegie Foundation For The Advancement Of Teaching, 2013, PP.5-6.

Third: Internet sites:

8- (<https://titwir.blogspot.com/2020/01/What-is-Kaizen.html>)

9 <https://www.google.com/search?q=%D8%A7%D9%84%D8%AA%D8%AD%D8%B3%D9%8A%D9%86+%D8%A7%D9%84%D9%85%D8%B3%D8%AA%D9%85%D8%B1&oq=%D8%A7%D9%84%D8%AA%D8%AD%D8%B3%D9%8A%D9%86+%D8%A7%D9%84%D9%85%D8%B3%D8%AA%D9%85%D8%B1&aqs=chrome..69i57j35i39l2j0i512l7.14934j0j7&sourceid=chrome&ie=UTF-8>

10 https://mobt3ath.com/dets.php?page=410&title=%D8%AA%D9%83%D9%86%D9%88%D9%84%D9%88%D8%AC%D9%8A%D8%A7_%D8%A7%D9%84%D8%AA%D8%B9%D9%84%D9%8A%D9%85%D8%8C_%D8%AA%D8%B9%D8%B1%D9%8A%D9%81%D9%87%D8%A7%D8%8C_%D9%88%D8%A3%D9%87%D9%85%D9%8A%D8%AA%D9%87%D8%A7