ZAC Conference Series: Social Sciences and Humanities
(ZACCS: SSH)
https://conf.zenithacademic.co.uk/index.php/zacsssh
ISSN (Print): 3049-7760 ISSN (Online): 3049-7779
3rd International Humanitarian Conference, Baghdad 2024
Volume 001, Issue 01, 2024, pp. 001-418
DOI: https://doi.org/10.70516/zaccsssh.v1i1.30

Sustainable Human Development In The light of Training and Total Quality (TQ)/ Study area (General Company for Hydraulic Industries) One of the Technological Incubators

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Abstract. This research aims to achieve sustainable human development through training and Total Quality (TQ) in Technological Business Incubators (General Company for Hydraulic Industries), to provide small and medium enterprises with effective human resources. The research targeted the intermediate levels represented by workers responsible for translating strategic decisions and strategic management of human resources by making decisions related to developing and empowering workers and building the necessary and effective capabilities. The study relied on the descriptive analytical approach due to its suitability to the objectives of the study and using the SPSS program to extract the results for the purpose of analyzing them. Thus, the study reached many results, the most important of which is the presence of a significant positive effect between the research variables. The results of the correlation relationships between the training variable and TQ reached 97%, and that the technological incubator provides a set of services in human resource development through training and TQ in its human dimension and leads to improving overall performance, developing workers and continuous work with a future vision and comprehensive sustainable development. It recommended laying the necessary foundations for applying the basic principles of justice and social responsibility necessary for development and investment of effective human capital to achieve sustainable human development.

Keywords: Training, Total Quality (TQ), Technology Business Incubators, Sustainable Human Development.

INTRODUCTION

Business incubators of all kinds are an integrated work system that helps support and qualify institutions capable of providing job opportunities for active youth, and effective investment in human capital to enhance sustainable development and comprehensive quality, and leads to stimulating the economy, growth and innovation to support entrepreneurs and innovators to embody their ideas and help them establish development projects by providing an integrated environment of services and consultations that lead to the establishment and development of these projects, and work to transform ideas from the research and development stage to the implementation stage. Incubators are scientific and technological support units and are established in several sectors that work to facilitate the transfer and localization of modern and advanced technology and focus on developing the technologies of these sectors. An example of this is the incubators established within universities, which aim to benefit from scientific research and transform it into successful projects, by relying on the infrastructure of these

universities from faculty, researchers and experts in their fields, as well as highlighting the role that research institutes and universities can play in the development and progress process.

Research problem:

The research problem is determined by the lack of awareness of the importance and role of training in the best investment of effective human resources and the basis for its application in technology business incubators within the framework of comprehensive quality as a strategic means to achieve effective and necessary sustainable human development in the development process.

The importance of the research: The importance of the research comes through presenting and analyzing the importance of training and comprehensive quality in the process of effective recruitment of human resources in business incubators, in order to provide job opportunities to achieve sustainable human development, as follows:

1. The importance of training and total quality as basic interactive variables that have a great impact on human development as a basic axis in sustainable human development
2. The possibility of providing solutions and recommendations regarding the development and strengthening of the link between the training and total quality axes with their human dimension.
3. The possibility of setting future visions for developing business incubators of all kinds to achieve sustainable human development.

Research objectives:

The research aims to determine the impact of training and total quality in attracting, qualifying and providing institutions and technology business incubators with effective human resources as follows:

1. The theoretical framework that links training and total quality with its human dimension as one of the basic variables in sustainable human development.
2. The relationship of association and influence between training as a basic variable and total quality to enhance the training process within the organizational structure of technology business incubators.
3. Clarifying the impact of training in achieving the requirements of total quality and investing in effective human resources in business incubators, in order to provide fair job opportunities and achieve sustainable human development.
4. Benefiting from the results extracted from the quantitative analysis of the study as an applied model in various sectors of technology incubators in general and technology incubators in all universities in particular.

Research Hypothesis:

1. There is a positive correlation with moral significance between training variables and comprehensive quality in its human dimension.
2. There is a positive impact with moral significance of training and quality methods in developing and building capacities within technology incubators to achieve comprehensive sustainable development.

Research limits:

Spatial limits: represented by the industrial sector, specifically the General Company for Hydraulic Industries as a case study.

Temporal limits: the year 2015, based on information from the year of establishment 1998.

Research methodology: The research relied on the descriptive analytical approach and relied on collecting information on field questionnaire forms, and using the statistical program (SPSS) to analyze data and extrapolate variables to extract the necessary indicators to reach the desired results and achieve the goal.

Previous Studies:

1. (Al-Khalidah Study, 2023) The study aimed to identify the impact of training in improving the performance of employees in the Directorate of Education, Qasaba, Ma'an. The results of the simple regression analysis showed that there are effects of training as a whole in improving the performance of employees..
2. Fardous Bin Azza study, 2015) This study aimed to identify the role of training in improving the performance of workers in small and medium enterprises, and concluded that training is an effective

element and represents the basic pillar. It also concluded that training as an independent variable affects the performance of workers as a dependent variable to a strong degree, with a correlation coefficient of .76%.

3. A study (Hammoud et al., 2017) aimed to identify the reality of the training process in organizations and whether these organizations care about developing and improving their human cadres in a way that achieves comprehensive quality. The results of the study revealed that comprehensive quality management is one of the modern and important administrative approaches that can be applied in all sectors and industries of different types because it is used as an approach to improving and developing performance on an ongoing basis. There is a relationship between training and comprehensive quality management, and this shows us the important role that training plays in achieving comprehensive quality

Theoretical aspect: Conceptual framework

First: The contemporary vision of the concept of human resources training and development.

1. Training:
   Training is the development of workers' skills and capabilities, and the improvement of performance efficiency that leads to increased productivity, and helps in improving and achieving satisfaction, and increasing awareness of the importance of Total quality, and contributes to spreading the culture of quality (Rajab, et al., 2023)[17], and is one of the effective means of achieving results that help in developing human resources (Aqili, 2005, p. 435)[14], and we can define training as an ongoing organized effort and process to develop the fields and trends of human resources, in order to improve performance and to gain them skills, capabilities and knowledge and give them appropriate opportunities for change through continuous motivation to learn and use modern methods (Al-Azzawi, Al-Hamidari, 2004, p. 244)[1], according to training strategies that are compatible with the level of need for effective human resources, in order to bridge the gap between the skills and knowledge possessed by human resources and the knowledge and skills needed by the requirements of development and growth as effective development capabilities to achieve the necessary Total quality in order to achieve the strategic economic development goals And social.
   As for the concept of training as an activity, it leads to raising the efficiency of workers, and it can be said that training is “a work or activity of human resources management activities that works to determine the need of active individuals at different levels for development and rehabilitation, in light of the strengths and weaknesses in their performance and behavior during work (Al-Hiti, 2004, p. 89)[2].
2. Training Strategy: A set of methods, rules and principles related to employee training based on precise plans linked to the organization’s strategic plan, and measured by the degree of response of the sample members surveyed to the paragraphs of implementing the training strategy (Al-Qarala, 2018).
3. Training objectives from the perspective of human resources development: The goal of training is to refine skills, experiences, information and knowledge (Moayyad, Adel, 2002, pp. 13-14)[15]. The orientation towards developing human resources through training and material and human interaction ultimately leads to the emergence of an additional collective value, and this is one of the most important benefits resulting from the basic objectives of a good training function, and Figure (1) illustrates this.

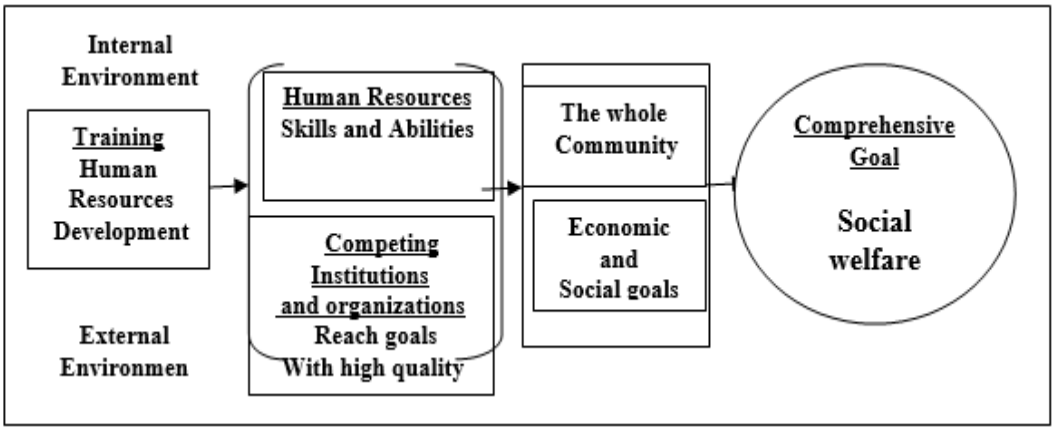


Figure 1. Contribution of training and Human Resources Development to achieving Community goals. Source: Researcher through concepts and objectives

Second: Total Quality (TQ) in the Planning Process

1- Definitions of Quality

The concept of quality is continuous development and improvement, and the meaning and concept of quality as stated in some Arabic dictionaries, indicates that quality means that something is good and its triple action (serious), i.e. perfect work (Al-Zaidan, 2009, p. 24)[3]. Quality management is the process of controlling, documenting, monitoring and improving various processes, in order to ensure their compliance with standard quality standards. In short, quality is the pursuit of ensuring quality in all types of work, regardless of the varying operating conditions or elements. Quality management also includes a basic principle, which is the principle of continuous improvement. It is worth noting that it is very difficult to provide an accurate definition of quality, as each person has his own concept of quality. Accordingly, quality is (leadership and excellence in planning and implementation), and it is necessary to view it as a shared philosophy that constitutes an essential part of the values and culture of the comprehensive development process and shares with quality in general the following:

1. Continuous improvement and development to achieve goals (short, medium, long-term).
2. Participation and collaboration in sound management and planning.
3. Review and response to people's requirements and needs.

2-Total Quality Management (TQM) Concepts:

It is a method of administrative practice within the organization with the aim of achieving success, improvement and continuous development in organizational processes and improving product quality. It is an administrative strategy process based on a set of values, and derives its movement energy from information that enables Within its framework, it can employ the talents of employees and invest their intellectual capabilities at various levels of the organization In a creative manner to achieve continuous improvement of the organization (Al-Jabri, 2021)[20].Total Quality Management is an integrated, comprehensive and interconnected process to achieve long-term success in the development process. It is a systematic approach to improving quality by involving all stakeholders in the improvement process (Faraj, 2023)[18]. Total Quality Management relies on community participation in improving processes, products, services and the cultural environment of work. Total Quality Management benefits members of the organization and society alike (Ahmed, 2010, p. 238). Figure (2) illustrates this.



Figure (2) Concept of Total Quality management

Source: (Al-Ani, et al., 2002), (modified).

The TQM approach is based on three dimensions:

1. The human dimension (quality of human technology), skills, capabilities, knowledge. It is the most important in TQM.
2. The logical dimension (quality of environmental technology): the internal work environment, systems and laws in the external work environment, policies, procedures and activities.
3. The technical dimension (quality of technology) and modern information technology, and Figure (3) illustrate this.

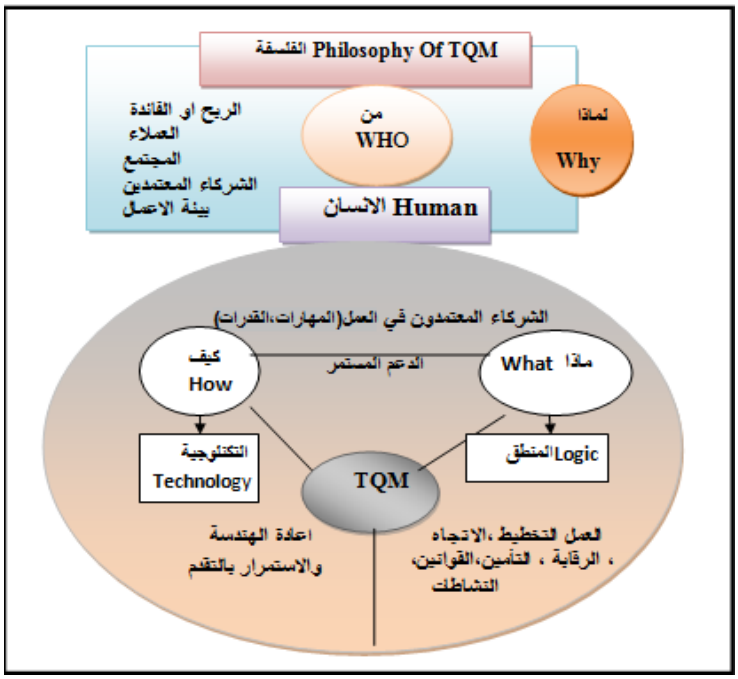


Figure (3) The three dimensions of Total Quality

Source: N, Kelada, 'Comprendre realiser quality total'2ned Dollard Ormeaus, Qubee, Canada, Editions,1992, p55

3-The concept and philosophy of human resources management and its relationship to total quality applications.

It is the contemporary approach to the concept of human resources management through the concept and contexts of strategic planning specifically and its long-term goals and interaction with sustainability and dialectical communication with comprehensive development, and does not intersect with it. It is also a vital perspective that

integrates with other social and economic factors, so it is a focal system within a comprehensive system of dynamic movement and development in a productive, generative manner (Al-Azzawi, 2009, p211)[6] (modified).

Perhaps the most prominent assumptions and principles on which the philosophy of human resources is based in total quality applications are:

1. Interacting as comprehensive framework with sustainable development as a comprehensive incubator for human resources and other elements that are organically interconnected with it.
2. Consistent with the strategic dimension and long-term goals.
3. Relies on knowledge management, modern information technology and advanced communication.
4. The productive human being is a means of development and a central goal for it at the same time
5. Attracts more job opportunities and absorbs unemployment on a regular basis.
6. Takes into account the sustainability of the environment in which the human being lives.
7. Adopting the empowerment policy with total quality standards for the human dimension in involving workers in decision-making, development, planning and adaptation to the environment.
8. Human Resources is an effective strategy for investing in human resources

4-Planning levels for training human resources on Total Quality.

Training includes all levels in the organizational structure of active workers, according to their training needs, as shown in Figure (4) and as follows:

1. Senior management level
2. Middle management level
3. Executive management level

The work of each of these three levels differs from one level to another, as senior management is responsible for making strategic decisions; middle management is responsible for making tactical decisions, while executive levels make decisions related to short-term decisions and in conditions of complete certainty (Cappelli, 2004) .

In this research, we will emphasize the middle levels, represented by the workers responsible for translating strategic decisions through making tactical decisions related to developing workers and building the necessary and effective capabilities in the work, because they are the middle link in the feedback between all levels.

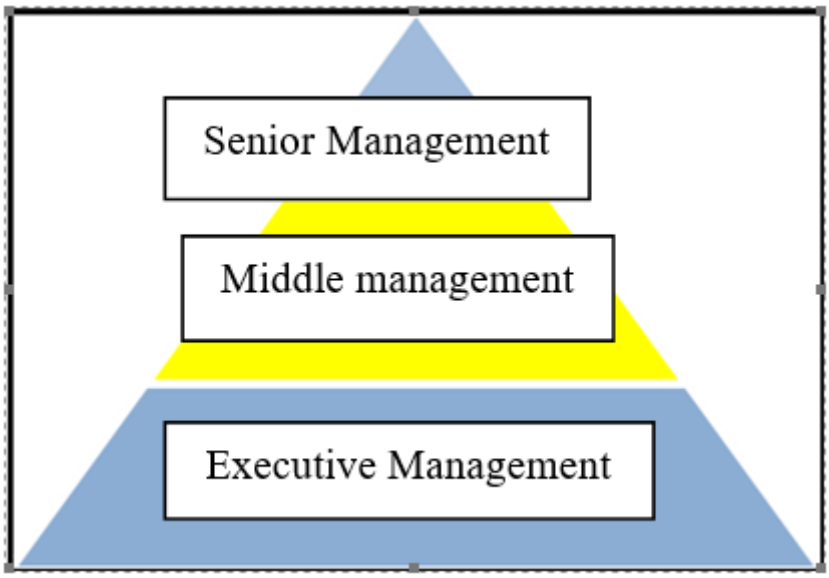


Figure (4) Human Resources Levels

Source: Researcher

Third: Incubators and their objectives

1- What are Incubators

The incubator is an institution designed specifically to develop projects and the success of entrepreneurial companies through a series of support sources that provide services related to adopting the ideas of innovators or developing existing industries by forming small or medium projects, where it provides them with information and

helps them in the necessary feasibility studies, business plans, and project feasibility, in order to continue their growth. It also provides comprehensive services represented in the place, communication networks, in addition to providing some equipment and supplies (http://dspace.univ-ouargla.dz/jspui/), (modified), meaning that it is:

1. Linking with entities that help in the success of the project, such as funding sources, laboratories, and other necessary services.
2. Business incubators are development and economic institutions whose goal is to support and sponsor entrepreneurs, creators, and innovators with ambitious project ideas and a future vision.

The idea of incubators dates back to the early fifties in the United States of America. By the beginning of the eighties, the idea of incubators had spread to Western Europe and East Asian countries, and the names had varied according to each country (Turkmani, 2006), (paraphrased). The idea of incubators appeared in Arab countries in the mid-nineties with the help of the European Union and the World Bank.

2- Objectives of incubators

Business and technical innovation incubators aim to support creative entrepreneurs, inventors and idea owners to establish small and medium enterprises, absorb and create jobs and work sites, and increase national income through developing knowledge capital, using an effective skilled workforce, and achieving sustainable development (Samai, 2010), (adapted) through: -

1. Developing a specific region.
2. Developing markets with a modern vision.
3. Linking education and training to the labor market.
4. Developing the knowledge economy alongside developing the natural resources economy.
5. Increasing knowledge competitiveness.

There are many types of incubators according to the need for them, (Qasha, 2010), (adapted) and they are summarized as follows:

1. Incubators designed for dual use (business and innovation - technology)
2. Incubators designed for specific technical purposes
3. Incubators designed for community development
4. Incubators designed for manufacturing companies

3-The role of incubators in achieving sustainable human development

Incubators contribute to the development of human resources through training, development, capacity building and qualification to establish small and medium enterprises and to manage and develop them during the period of presence in the incubator or by stimulating these resources to work productively and economically and with high quality. Scheme (5) illustrates this:

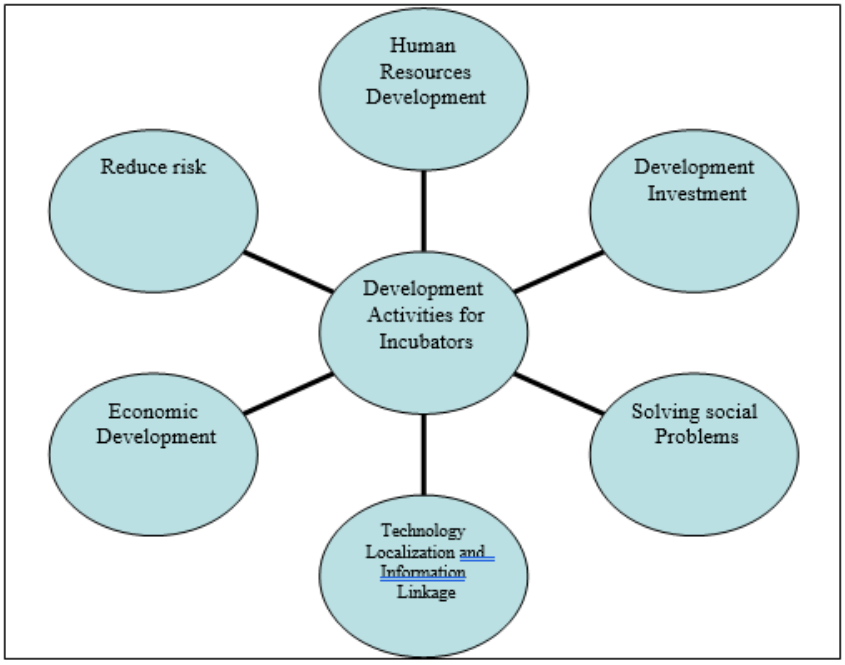


Figure (5) The role of incubators in achieving sustainable human development

Source: Researcher through concepts

Practical aspect: Information analysis and hypothesis testing

First: An overview of the study area

The "General Company for Hydraulic Industries" was established by merging "Al-Fida General Company" and "Ibn Al-Waleed General Company" in Baghdad Governorate. It is one of the formations of the Ministry of Industry and Minerals, aiming to build a solid integrated national industrial base in its field of specialization through its main factories (hydraulics factory and mechanical and electrical factory) and through investing and developing the available human and material resources to provide a national product that covers the needs of the local market and achieves the ability to compete with similar foreign products in global markets. The company's products vary, expressing its identity in the field of mechanical, electrical and hydraulic equipment according to market requirements. There is also the possibility of manufacturing all the devices and equipment that are needed and that fall within the company's jurisdiction as the main entity specialized in this field. Its geographical location is in Baghdad - Al-Saydiyah, on an area of more than (8500) m2. It was established in 1998. The number of its members is (1100) members, including 112)) engineers specialized in the fields of mechanical production and electrical control And systems, and specialized in the fields of mechanical production, electrical control and systems (Al-Fida, 2012).

The company owns four main factories:

1. Specialized and service equipment factory
2. Hydraulic and pneumatic systems factory
3. Hydraulic and pneumatic elements production factory
4. Dampers and tasks factory

In addition to the existence of agreements with international companies to enhance the company's capabilities and develop them (financially and humanly).

Second: Analysis of the responses of the sample members and their perceptions of the research variables

It involves using the SPSS statistical program to analyze the data obtained from the questionnaire form, which numbered (25) forms distributed to all employees at the middle administrative level, i.e. at a rate of 100%, and designed in light of the five-level Liker scale, from the highest weight in it (5) to represent (completely agree), to the lowest weight in it (1) to represent the lowest weight in it (completely disagree). Cranach's Alpha (α) [$1 \leq \alpha \leq 0$] was extracted to measure the degree of reliability of the research sample's answers to the questionnaire questions. The value of Alpha for the research sample after entering the questionnaire paragraphs into the SPSS statistical program and the results appeared reached (94%), i.e. high reliability and stability. Then, the values of the weighted arithmetic averages and standard deviations were found in order to identify the extent of harmony and agreement in the sample's opinions and perceptions of the research variables. The test criterion represented by the hypothetical arithmetic mean* of (3) was adopted as the average of the measurement tool in order to measure and evaluate the obtained degree. Table (1) shows this through the dimensions of the research variables [First: the training variable, Second: the total quality variable.

Table (1) First: General and detailed description of sample individuals' responses regarding the training variable

Standard deviation	Mean	Dimensions	
1.105	4.20	Training is an essential tool in achieving total quality(TQ)	1
1.182	4.15	The importance of balancing training in specialized centers and training within technology business incubators	2
1.050	4.05	The timing and sequence of training is adapted to the trainee's situation.	3
1.050	4.05	Determine the target job category for each Training program included in the plan.	4
1.105	4.20	Interest in involving everyone in training courses for the purpose of developing, enhancing and building their capabilities, Skills and knowledge.	5
1.050	4.05	Involving employees in training courses to apply automation and modern systems at Work.	6
1.105	4.20	Training is the best way to gain environmental awareness for the trainee to interact with his work environment.	7
1.105	4.20	Use of information technology and modern digital systems	8
1.094	4.14	Total	

* Hypothetical arithmetic mean: It is the average of the highest score on the scale (5) and the lowest score (1), i.e.: 3 =(1 + 5/2)

The results extracted in the table above show that the weighted arithmetic mean for the training dimension was (4.14) with a standard deviation of (1.094). This shows that the weighted arithmetic mean is greater than the hypothetical arithmetic mean (test standard) of (3). This is due to the high level of awareness of the importance of the training dimension at the level of work required now and in the future.

Table (1) Second: General and detailed description of sample individuals' responses regarding the total quality variable

Standard deviation	Mean	Dimensions	
1.118	4.25	Relying on incentives and rewards policy to support morale	1
1.050	4.05	Improving product quality and marketing-appropriate quality	2
1.105	4.20	Ensuring the organization of training courses for continuous improvement	3
1.105	4.20	Improving the level of performance and developing knowledge accumulation	4
1.050	4.05	Seeking to increase financial allocations for training, Development and quality programs	5
1.164	4.25	Keenness to attract ideas that support development in work	6
1.050	4.05	Raising the quality of work according to international standards and specifications	7
1.020	4.25	Striving to work on providing high-quality products at low prices	8
1.083	4.16	Total	

The weighted arithmetic mean of the total quality variable was (4.16) with a standard deviation of (1.083), which is clear that it is greater than the hypothetical arithmetic mean (test standard) of (3). This is due to the high

level of awareness of the sample community members of the total quality dimension, in addition to training to reach the required level of development to serve the targeted community from the production process, in order to achieve the comprehensive development process through the combination of participatory community efforts in light of investment in human resources within business incubators that operate on the basis of social responsibility standards that achieve social justice.

Third: Measuring the correlation relationships between the research variables

The correlation relationships between the research variables were measured and their significance was tested, which were included in the first and second hypotheses, using the simple correlation coefficient (Spearman). Then, the significance of the extracted correlation coefficients was tested using the (t) test

1-Testing the first hypothesis:

(H1): There is a positive correlation with significant moral significance between the variables of the training strategy and total quality in its human dimension. In order to accept or reject the hypothesis, the correlation coefficients were tested using the test statistic (t) to verify the significance of the relationship between the training strategy (X) and total quality (Y). Table (2) shows the results:

Table (2) Results of the correlation between the training dimension and the Total Quality dimension

Tabular (t) value	Calculated value of (t)	Dependent variable (Y) Total quality(TQ)	Independent variable (X) Training
1.729	1.957	0.968	

Decision: Accept the hypothesis with 95% confidence.

The results of Table (2) above show the following:

There is a strong positive correlation with statistical significance at a significance level of (0.05) between training and total quality with a correlation value of (0.96), and what supports this is the calculated (t) value of (1.957) which is greater than the tabular (t) value of (1.729), which indicates the acceptance of the first hypothesis (H1). This means that there is a strong correlation between training and total quality at a significance level of (0.05) and a degree of confidence of (95%). This means that increasing the interest of the middle administrative levels in the company in training has a major role in achieving and applying the standards of total quality efficiently and effectively, leading to achieving the current goals and the possibility of developing the future vision in comprehensive development within business incubators.

2-Testing the second hypothesis:

(H1) There is a significant positive effect of training and quality methods in developing and building capacities within technology incubators to achieve comprehensive sustainable development.

In order to test the hypothesis, the research relied on the method (simple linear regression analysis) to measure the effect of training on comprehensive quality, and Table (3) shows the results of the regression analysis.

Table (3) Results of simple linear regression analysis to test the effect of training on Total Quality(TQ)

Tabular (F) value	Calculated value of (F)	Independent Standard error	Regression coefficient(β)	Independent variable (X)
8.190	2.966	0.7359	0.970	Training

The results show that the significance of the training regression coefficient (β=0.970) is proven at a significance level of (1%), and what supports this is the calculated (F) value for the model, which is (2.966), which is greater than the tabular (F) value of (8.180), which indicates that the relationship for the model as a whole is significant and leads to accepting the second hypothesis, i.e. there is a statistically significant effect of training on total quality at a significance level of (1%) and with a confidence level of 99%. Based on the results, the validity of the second hypothesis has been proven

CONCLUSIONS AND RECOMMENDATIONS:

First: Conclusions

In light of the presentation in the theoretical aspect of the research, analysis of the results and testing of hypotheses, a number of conclusions can be reached that can be summarized as follows:

1. Total quality with its human dimension to achieve sustainable human development through training and capacity building is a change in the culture of institutions and the behavior of workers and a modern approach in the environment of business incubators, which has led to influence and push towards continuous performance improvement with desire and voluntarily, thus helping to change the direction of the thinking pattern towards the concepts of social justice that can be achieved by applying its basic standards in the approach of business incubators, which is represented in giving the effective workforce a fair opportunity in work, continuous development and capacity building.
2. Training is an essential tool for achieving total quality through developing human resources and building capabilities as a final product of the operations in the organizational structure of business incubators and the possibility of applying it at all levels necessary for the development process, as well as for investing in effective human capital.

The results of the practical aspect also showed:

1. The results of the arithmetic means of the sample's response level indicated that the principles of total quality are well available, and this is consistent with the observations we obtained through field visits from the side of the clear application of many activities and events.
2. The results of the Liker coefficient analysis showed the existence of a strong significant correlation between the training and total quality (TQ) with a correlation value of (0.96), within the organizational structure of business incubators.
3. There is a significant impact of the training process on the principles of total quality for Al-Fida General Company (research sample), as shown by the results of the regression analysis, which is attributed to the continuous training of the targeted cadres and investing this training in the final presentation of the outputs of the operations.
4. The results of the test for the first hypothesis proved the validity of the significant relationship between training and total quality.
5. The results of the test for the second hypothesis confirmed the proof of the significant impact of training methods on total quality

Second: Recommendations

Despite the positive results shown by the practical side of the increase in the levels of application of the principles of total quality and thus the increase in performance levels, some recommendations should be put forward for action, which are:

1. Generalizing the culture of total quality among workers in general, because total quality is a moving wheel of continuous improvement activities that does not stop, as well as continuous follow-up in the application of the principles of total quality in various fields, activities and levels.
2. The research showed a strong relationship between training and total quality, and therefore it becomes necessary to pay attention to investing the results of training to become a basic basis for launching the achievement of total quality.
3. Since training is a process of continuous learning and acquiring skills and knowledge and thus building capabilities that help in building the empowerment strategy, it has become necessary to use and apply modern technologies in learning such as e-learning (E-Learning) as it is a method that helps in continuous learning, which has become one of the requirements of the era (the era of knowledge).
4. Spreading the culture of initiative and the concept of small and medium enterprises and business incubators in order to provide good job opportunities for young people to invest their positive and effective energies.
5. Encouraging commercial banks to contribute to financing small and medium enterprises and business incubators.
6. Establishing a loan and credit risk fund.
7. Establishing a national program that undertakes the work of small and medium enterprises and follows up on them, based primarily on the principles of justice and social responsibility.
8. Issuing legislation regulating the establishment, management and financing of business incubators and technical innovation as a legal basis.
9. Allocating the annual financial resources necessary to establish and manage incubators.
10. Reviewing and unifying legislation related to encouraging investment.
11. Allocating a budget to train entrepreneurs and rehabilitate job seekers.t.

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