An-Najah National University

Faculty of Graduate Studies

THE EFFECTIVENESS OF A MODEL FOR CREATING INNOVATIVE OERS IN DEVELOPING TEACHERS' GLOBAL COMPETENCES

By

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This Dissertation is submitted in Partial Fulfillment of the Requirements for the Degree of PhD in Learning and Education, Faculty of Graduate Studies, An-Najah National University, Nablus, Palestine.

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Dedication

This dissertation is dedicated to my mother who was my first teacher, and helped me to deal with different challenges; to reach my objectives. To the soul of my father who wanted me to do something special for my community.

I dedicate this effort to my lovely husband who used to support me to achieve my ambition. To my beautiful daughter who used to be my critical friend. To my sons who used to see their mother working on the dissertation, and used to keep silent during the last four years.

To my sisters, brothers, my family, and friends who missed me when I used to be busy. To my colleagues who initiated to adopt the model, implement it, and assist me in developing the GHOSHEH model. To all the experts who judged the model and the study instruments. To all people whom I appreciate and love. This dissertation is dedicated to all of you; as it is the most important achievement of my life, and I hope that learners all over the world benefit from this work and continue to build on others' experiences so that people all over the world will cooperate in developing the global knowledge.

Finally, I dedicate this study to all the women who want to continue learning, and I say to them: You can do it any time. It is never too late, with some seriousness, persistence, and desire to take your place in this world; you can leave something to the next generation, to continue even after death and it will never be too late.

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I am extremely thankful to God for all the successes. Allah my source of strength and inspiration throughout everything in this life and one of them is this dissertation. Thanks, God, for continuing this work that I hope to benefit learners in this life.

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Additionally, I would like to acknowledge the faculty of An- Najah National University for their efforts that helped in developing my experiences. And for my colleagues in the National Institute for Educational Training who assisted me in implementing the GHOSHEH model which is the core of the current study.

Declaration

I, the undersigned, declare that I submitted the thesis entitled:

THE EFFECTIVENESS OF A MODEL FOR CREATING INNOVATIVE OERS IN DEVELOPING TEACHERS' GLOBAL COMPETENCES

I declare that the work provided in this Dissertation, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name	دعاء محمد اسماعيل فؤاد غومة
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THE EFFECTIVENESS OF A MODEL FOR CREATING INNOVATIVE OERS IN DEVELOPING TEACHERS' GLOBAL COMPETENCES

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Abstract

The current study aims to adopt a new instructional design model for creating innovative OER called the "GHOSHEH" model, and to explore Its effectiveness in developing teachers' global competences. The GHOSHEH model incorporates OER with some learner-centered strategies that enable learners to practice, reflect on their practices, solve problems, and create innovative OER. The study answers the following questions: What are the processes involved in the implementation of the GHOSHEH model for creating innovative OER? What are the attributes of the GHOSHEH model regarding Rogers' process for the diffusion of innovations? To what extent do teachers and experts agree on the consistency of the attributes of the GHOSHEH Model with Roger's attributes for successful innovations? How do teachers who applied the GHOSHEH model evaluate its effectiveness on their global competences?

The study includes an intentional and purposive sample of 347 Palestinian teachers who enrolled in a training program at the National Institute for Educational Training (NIET) in Palestine and agreed to participate in the study. In addition, the sample composes of 37 experts from Palestine, Jordan, Saudi Arabia, Egypt, Oman, Kuwait, UAE, Iraq, and Yemen, who agreed to participate in workshops or a conference where the GHOSHEH model was presented.

The study utilizes a specific design of mixed method which is a convergent parallel design. Data was collected using different instruments including a questionnaire for adopting the GHOSHEH model. A self-evaluation questionnaire for teachers' global competences. Four focus groups and a case study on implementing the model.

Results show that teachers and experts highly agreed on the GHOSHEH model's five attributes that enable them to consider the model as innovative regarding Roger's

process. These attributes include relative advantage, compatibility, complexity, trialability, and observability.

Regarding the effectiveness of the GHOSHEH model on teachers' global competences the study provides qualitative and quantitative evidence of the significant effect of the GHOSHEH model on teachers' global competences. In light of these results, the study recommends the Ministry of Education adopt the GHOSHEH model. Moreover, it encourages conducting research on the effectiveness of the GHOSHEH model on students' competences and different skills.

Keywords: Instructional design model, Open educational resources (OER), The GHOSHEH model, Rogers Diffusion of innovation, Teachers' Global Competences.

Chapter One

Introduction, Background, and Literature Review

This chapter aims at introducing the main foundations of the study which investigate the core objective that rolls around a model for creating innovative OER called the "GHOSHEH model" and its effectiveness on teachers' global competences. Therefore, the chapter includes an introduction about the need to develop teachers' global competences, the expected role of open educational resources in teachers' educational development, and the gap that imposes the need to base the teachers' educational programs on instructional design models for creating the open educational resources, and the lack of such models. Furthermore, this chapter reviews the literature that provides the theoretical framework of the study, and the last related studies. Besides, the chapter presents the definitions of the main terms in the study, the study's questions, hypotheses, objectives and significance.

1.1 Introduction

The accelerating changes in our interconnected world invaded the educational field, as same as the other fields of the world. This acceleration leads to an increase in the high-quality educational demand of the learners. Actually, this increase branched from the need of the learners to cope with those changes caused by globalization; due to maintain the equilibrium and take a part in the development of the whole fields of the world.

Recently, the required demands for educational development became different from those of the last era (Shetty, 2016). Thus, preparing learners to cope with globalization becomes one of the most important purposes of the educational fields; to come across people’s diversity, and help learners to create their own innovations that benefit their societies and the global ones (Seechaliao & Yurayat, 2021; Iris, Robert , Ellen, & W.H.A., 2021). Moreover, this coincides with globalization taking a place in achieving the essence of sustainable development which focuses on preparing learners that are able to improve life's quality and preserve the world for all generations (Matekina, Soroka, & Stolyarova, 2021). Therefore, it is fundamental to develop learners’ global competences by focusing on creativity and innovation that are considered demands of these competences. These demands actually benefit learners’ contributions to developing their knowledge. Besides, creativity and innovation enable learners to think

convergent, find multiple potential solutions to a problem, reorganize the problem, and implement creative original ideas in real contexts that leads to innovation (Sinay, Nahornick, & Graikinis, 2018).,

Consequently, teachers who are considered keys of educational improvement and maintenance of quality, should take responsibility for teaching learners to be efficient innovators (Baily & Holmarsdottir, 2019; Sinay, Nahornick, & Graikinis, 2018; Seechaliao & Yurayat, 2021). They should play a crucial role in the development of creativity, and innovation for learners. However, teachers are challenged by the increasing changes related to complicated global issues (Kopish M., 2016; Sinay, Nahornick, & Graikinis, 2018) which make teaching competences in the globalization era broader and more complex than before (Shetty, 2016). These challenges prompt the question: How should teachers be prepared to address the challenging global issues with learners?

Actually, teachers should be well prepared to provide learning experiences that lead to creation and innovation.This can be supported by effective teachers' professional development programs that lead to develop teachers' ideas, practices, values and attitudes for creativity and innovation. Thus, it is essential for teachers to maintain their professional development in order to design and create innovations that benefit learners locally and globally (Seechaliao & Yurayat, 2021).This enables teachers to reach what is called professionalism that reflects teachers 'professional development (Močinić, Tatković, & Tatković, 2020).

Professionalism can be measured by competences related to the quality of teachers' fulfillment of their roles (Wardoyo, Herdiani, & Sulikah, 2017). These competences that compose of knowledge, skills, attitudes, and values (Tapani & Salonen, 2019; TKCOM, 2018), are classified into domains. On one hand, they were classified into two domains by the authors who published the competence-based framework for Chinese teachers. These domains included specific competences that characterize the teaching profession, and cross-curricular competences that are necessary for any professional field (TKCOM, 2018). On the other hand, the authors Wardoyo, Herdiani, and Sulikah (2017) classified these competences in four domains including pedagogical, personal, social, and professional competences.

Recently, the global climate imposed other domains that formed the teachers' global competences (TGC) which reflect teachers' readiness to understand, respect the values of cultural diversity, and interact effectively in a multicultural environment (Kopish, 2017; Orazbayeva, 2016). These global competences which include cognitive development, socioemotional skills, and civic learning, are expected to describe the capacity for examining intercultural and global issues; in order to understand and appreciate others' views and perspectives. It also encourages the interaction with people from different cultures all over the world; to work for well-being and sustainable development (OECD/Asian Society, 2018). Within this topic, Orazbayevaa (2016) classified TGC under the following domains: Socio-cultural competences, Personal competences, and Individual Competences. While Kopish (2017) proposed other twelve global competences in the domains of dispositions, knowledge, and skills that teachers need to live in a global society.

Developing TGC requires an investment in educators' professional development. Global competence should integrate into the core of the educational practices (OECD/Asian Society, 2018). Therefore, the teachers' training programs are expected to provide opportunities for teachers, as global change agents, to engage in global thinking, and provide them with opportunities to innovate within their context and all over the world. In order to do this, some researchers proposed that teacher education programs have to adopt various strategies, including fieldwork and experiential learning opportunities; to engage teachers to practice and reflect on their teaching practices and develop them. Moreover, it appeared that connecting professional education programs to classroom practices, could promote creativity and innovation (Sinay, Nahornick, & Graikinis, 2018). This will result in developing dispositions that are crucial to the success of diverse learners. Additionally, it is suggested to impose teachers to international experiences through study abroad which offers a wide worldview related to citizenship, impacts the development of teachers' cross-cultural sensitivity, and limits the barriers shaped by cultural or linguistic differences (Byker & Putman, 2019). However, not all teachers can benefit from the experience of studying abroad; due to the high cost of travelling and the difficulties of some teachers transferring (Kerkhoff, Dimitrieska, Woerner, & Alsup, 2019).

One of the logical opportunities that allows benefiting from some chances provided by studying abroad, without suffering from travelling, is adopting Open Educational Resources (OER) in the professional training programs and engaging in experiences that encourage teachers to innovate OER and share them globally.

Open Educational Resources (OER) can limit the last challenges as they are free learning, teaching, or research materials that promote lifelong learning by sharing them via public domains to be used, reused, revised, remixed, or redistributed freely in order to benefit and empower the learner despite of different barriers (Conole & Brown, 2018; Lambert, 2018; Urbancic, Polajnar, & Jermol, 2019).

In fact, there are no direct evidences on the impact of OER on TGC. Meanwhile, there is a debate on the ability of OER to develop some of the competences related to TGC. On one hand, some studies revealed that using OER have the potential to enhance teachers' professional competences, open practices and digital literacy that related to individual and personal competences (Conole & Brown, 2018; Kim D., 2018; Urbancic, Polajnar, & Jermol, 2019; Van & Katz, 2019). On the other hand, the study of Orwenjo and Erastus revealed that some teachers such as those of Kenyan secondary schools were not aware of OER and have negative attitudes towards them. So, they preferred to use traditional resources such as textbooks (Orwenjo & Erastus, 2018). The same problem appeared in some higher schools' teachers where the adoption of OER was limited because teachers who are considered the pivotal actors to adopt OER were not engaged to do (Baas, Admiraal, & Van Den Berg, 2019). These negative attitudes towards OER reinforce the claim that OER could be ineffective in developing TGC. Therefore, some educators focused on the importance of teachers' educational programs that assist teachers to develop instructional materials based on OER, practice learning design, and provide them with clear insights about the sequence of the OER implementation in education within different contexts using appropriate technologies in teaching any content (Baas, Admiraal, & Van Den Berg, 2019; Conole & Brown, 2018; Paskevicius & Irvine, 2019). However, if these training programs lacked either the appropriate instructional design models, or experts' assistance in instructional design, they could miss the alignment between assessments and learning objectives (Quiroz, Ritter, Li, Newto, & Palkar, 2016). Therefore, assisting the learners to develop their global competences, requires training programs that provide opportunities for teachers

to practice, engage, and innovate globally. As well, there is a need for an instructional design model that assists teachers to benefit from OER in order to communicate with the global world by reusing, retaining, revising, remixing, and redistributing the new OER globally.

In general, following instructional design (ID) models provides opportunities for the development of teachers' competences, inspires their creativity, and helps them to create innovatively (OECD/Asian Society, 2018). Particularly, if these ID models included systematic teaching and learning plans that provide guidelines for teachers to organize teaching and learning processes based on principles of creative problem-solving to promote the creation of educational innovation. Such ID models are known as models for creating innovation (Seechaliao & Yurayat, 2021). Thus, effective educational programs are expected to base on such models that assist teachers to practice systematic planning and instructional design, and to facilitate students' learning (Khalil & Elkhider , 2016). These models are expected to develop teachers' analysis skills, innovation of instructions and content that promote adopting OER. Especially, if they were integrated with diverse technologies, expertise and management abilities that assist creation of innovations (Seechaliao & Yurayat, 2021).

In order to Increase the efficiency of the ID models in developing teachers' competences, there are empirical evidences on the impacts of experiential learning that combines theoretical knowledge and practical experience (Kolb D. , 1984). Such combination enables reflection on experience, systemization, and generalization which allow applying the gained knowledge in different contexts. Consequently, the efficiency of instructional design models may increase based on experiential learning; because of the provided opportunities for teachers to practice the same models in their classes. This practice and learning from experience promise to develop teachers' competences (Quiroz, Ritter, Li, Newto, & Palkar, 2016), which enable them to assist learners' innovations.

Moreover, the potential of critical inquiry and cross-cultural experiential learning was demonstrated for developing teachers' global competences (Byker & Putman, 2019; Kopish M., 2016). However, this impact was specified to the experiential learning pedagogy that engages teachers in a study abroad professional program which provides opportunities for them to appreciate and respect cultural diversity (Byker & Putman,

2019). As mentioned before, such professional programs could be placed by ones that adopt OER. Therefore, the educational programs that are based on an ID models for creating innovations which combine critical inquiry with experiential learning and OER, are expected to be efficient in the development of teachers' global competence. However, there are no direct empirical evidence on this impact; due to the gap in the presence of such an ID model. Therefore, this study aims to provide such a model and implement it in the Palestinian context. Thus, it is important to provide an overview of the professional educational programs in the Palestinian context which focuses on developing teachers' professional competences.

In Palestine, educational programs for in- service teachers are mostly offered by the Ministry of Education (MOE). In addition to that, there are educational programs for pre-service and some in-service teachers conducted by the Palestinian universities. Since 2008, the MOE developed a strategy specialized in qualifying in-service teachers (MOE, 2008). Indeed, a large percentage of teachers have been trained within training programs emanating from this strategy. This has raised the expectations of a positive impact on teachers' competences and consequently on students' achievement. This is because student achievement, regarding to the intended learning outcomes, is one of the criteria upon which the evaluation of the impact of teacher training programs on the teaching-learning process is based (Bsharaat & Al-Ramahi, 2017). After a decade of condensed training for teachers, the MOE published an evaluation and assessment report which included indicators showed that the percentage of qualified Palestinian teachers according to the teacher qualification strategy has reached 74.5% (MOE, 2022). These teachers were trained either through in service professional educational programs conducted by (MOE), or through the pre-service educational programs conducted by the universities. People who read this indicator expected positive impacts on teachers' competences and students' achievements. However, there are indicators of the low achievement of students in the local and international exams. Besides, the same report provided evidences which indicated that teachers are still low competent. For example, teachers were trained on learner center approach for a decade. However, the report showed that teachers don't allow students to participate enough in the class; the actual time for student participation in the class did not exceed one-third of the actual time for teacher participation (MOE, 2022). This indicates that education in Palestine is still teacher-centered. Another Palestinian study of (Bsharaat & Al-Ramahi, 2017)

indicated the training programs conducted by universities were unable to develop the teachers' competences related to content, assessment, teaching, learner progress, and learning resources. The study recommended implementing various teaching methods in the training programs in order to increase their effectiveness.

These indicators lead to the investigation of models and resources for developing teacher training programs in Palestine, and allow teachers and learners to be locally and globally competent without the need to leave their home land and study abroad. Besides, the promised combination of OER, ID models for creating innovations, and experiential learning approach encouraged the researcher to develop and adopt a new ID model for creating innovative OER called the 'GHOSHEH' model. The model incorporates OER with some learner-centered strategies that enable learners to practice, reflect on their practices, solve problems and create innovative OER. The current study includes more details about developing and adopting the GHOSHEH model. Moreover, the study aims to explore the effectiveness of the GHOSHEH model in developing teachers' global competences in Palestine.

1.2 Literature Review

Reviewing the literature related to this study, showed that the last studies covered the following topics**:**

Teachers Global Competences (TGC): Efforts to support global education have been initiated several decades ago (Molina & Lattimer, 2013). In 1970s the framework of global education concepts emerged in the USA, and resulted in developing the category of global competence (Orazbayeva, 2016). This occurred as a response for the new demands and the global challenges of the life perspective and interconnected world's requirements; such as flexibility, adaptability and innovation which the traditional teaching lacks (Molina & Lattimer, 2013; Orazbayeva, 2016).

According to several researches, one of the most critical factors that promote global education is the development of teachers' global competences to educate for global citizenship. This actually can be attributed to the role of teachers as they are the major players in the global education's mission. Indeed, their role rolls around their goal in assisting learners to solve global problems, and appreciate multicultural society who can promote students to become global citizens (Byker & Xu, 2019; Guo, 2014; Iris, Robert

, Ellen, & W.H.A., 2021; Orazbayeva, 2016; Shetty, 2016; Tichnor-Wagner, Parkhouse, Glazie, & Cain, 2016). Teachers are responsible to assist learners to develop their needed knowledge, skills, and attitudes for participation in a globalized society (Tichnor-Wagner et al., 2016). Shetty described the teachers with global competencies as the only ones who are able to develop learners' global competences. This is because values and attitudes are caught more willingly than taught(Shetty, 2016). Thus, educators have to equip teachers with theory and practice of global competencies, and focus on their commitment to support learners in becoming responsible global citizens, assisting them to develop personalities with a spirit of respecting the variety of cultures, and languages, and helping them to participate in intercultural communication (Guo, 2014; Orazbayeva, 2016; Shetty, 2016).

Despite of the significance of teacher global competence, there has been a lack of an obvious definition of TGC for decades (Orazbayeva, 2016). Instead, it was defined by the definitions of related categories such as teachers' polyculture competence, intercultural competence, and multicultural competence. In 2016, Orazbayevaa tried to define TGC; he started from the general definition of global competence which expresses the ability of an individual to interact effectively in a global environment. This interaction requires deep knowledge, understanding of cultural diversity and international issues. Besides, it requires acceptance of diversity, appreciation to learn from different people and skills to produce for the independent world community. Accordingly, Orazbayevaa considered the global competence as "A new quality of professional competence" in the age of globalization (Orazbayeva, 2016). Similarly, the teacher's global competence could be described as a developed case of the teacher's professional competence caused by Globality.

According to Orazbayevaa (2016), teachers' global competences (TGC) determine teachers' readiness and abilities to perform their professional activities within a changing environment. This includes showing professional activities, continuous professionalism and self-development through an understanding of the social significance of educational activities. Moreover, these competences reflect the knowledge and ability of teachers to organize pedagogical activities, adapt them for a multicultural environment, communicate effectively and prepare learners to interact in the global society. Thus, TGC compose of the following elements: Deep understanding

of belonging to the global community, awareness of intercultural issues, acceptance of cultural diversity, intercultural communication, ability to use a foreign language for intercultural communication, capability to organize effective pedagogical skills in multicultural environment, knowledge and respect of professional ethics, proficiency in information and communication technologies (ICT) and participation in global projects. Besides, a global competent teacher has individual competences related to responsibility, initiative, creativity, critical, and global thinking, in addition to professional competences. Orazbayevaa (2016) indicated that TGC compose of other three levels: Firstly, the social-cultural competence that Includes knowledge of different cultures' cognitive, and behavioral components and intercultural awareness. Secondly, personal competence that Includes a combination of elements related to teacher's readiness for intercultural dialog, values, motivation, responsibility, reflection and tolerance initiative in addition to emotion components. Thirdly, the individual competence that includes proficiency in ICT, creativity, critical global thinking, and capability to work with resources of information (Orazbayeva, 2016).

After that, Kopish, (2017) proposed that TGC include global knowledge, skills and disposition as professional competences, and agreed that in order to develop TGC, teachers should develop a deep understanding of content, especially critical concepts and principles in the disciplines. He added that teachers should develop pedagogical practices to adapt the learning of all students toward the attainment of career readiness. Besides, teachers have to engage learners in collaborative, creativity, critical thinking and problem-solving related to authentic local and global issues. These efforts are expected to assist teachers in developing their global competences (Kopish, 2017). This is the case for all teachers; despite of their teaching experience resulted from years of teaching which is not correlated with teachers' global readiness as revealed in (Kerkhoff, Dimitrieska, Woerner, & Alsup, 2019).

Hence, teachers with different experiences should be prepared well to infuse global perspectives, and competences that enable them to educate for global citizenship. This requires identifying a systematic approach, focusing on analytical and curriculum framework, relevant resources, and spaces for global dimensions into teaching and learning (Guo, 2014). This requirement became essential especially to that teachers were described as "ill-prepared" for the requirements of global changes due to lack of

understanding of globalization's effect on the educational development (Orazbayeva, 2016). Thus, another main question needs to be discussed, that is: How can teachers be prepared to develop their TGC?

To answer this question, Shetty (2016) tried to describe the skills that teachers need to possess in order to consider the dynamic trends in global competencies that evolve with time. Teachers ought to develop their research skills in order to update their knowledge and approaches as per the needs of the time. Furthermore, teacher education should focus on the development of research skills, in order to develop teachers' practices that help students become globally competent. Moreover, Shetty mentioned that teachers must gain competencies related to international dimensions of the subject matter, global issues, pedagogical skills related to the analysis of primary global resources, appreciation of stereotyping, the commitment to helping students become local and global citizens. Consequently, teachers should be responsible to develop globally competent students who are able to:

- Investigate the world and benefit from global resources that remove boundaries and enable to collect evidences.
- Collaborate, cooperate, consider various perspectives.
- Reflect on the various perspectives to understand global dynamics.
- Communicate with diverse learners after recognizing their contexts and select appropriate devices and media to maintain effective communication.
- Have open attitudes towards various learners' reactions.
- Be active listeners to others.
- Develop resources such as programs that facilitate concrete actions.
- Participate in the development of society with creative and ethical manner.
- Monitor and evaluate their actions (Shetty, 2016).

As a teacher, to be globally competent,and to help learners to do, there is a need to gain knowledge about current events and global issues. This knowledge includes interconnected, interdependent, and deep understanding of diversity of cultures, and intercultural communication (Iris, Robert , Ellen, & W.H.A., 2021; Guo, 2014; Tichnor-Wagner, Parkhouse, Glazie, & Cain, 2016). This requirement of such a knowledge is in order to be responsive culturally, and competent in the intercultural issues. In addition,

teachers have to aware strongly of international issues, enable learners to investigate the world, recognize different perspectives, communicate ideas, and taking action. Therefore, becoming a globally competent teacher requires to develop the competences in the following domains (Byker & Xu, 2019):

- Investigating the world and being curious about it and aware of how the world works.
- Recognizing the world by considering the diversity of people, and respect their different perspectives.
- Developing language and communication skills for cross-cultural communication.
- Taking actions to change the world or in order to make difference and rewrite the world

The framework of TGC: Educators put a strong emphasis on finding an appropriate framework that enables upgrading teachers' knowledge, skills and behaviors in order to develop TGC (Iris, Robert , Ellen, & W.H.A., 2021). Gue (2014) focused on teachers' pedagogical skills which include determining lesson goals and objectives, selecting curriculum content, pedagogical approaches and resources to promote global citizenship education. Shetty (2016) proposed a framework that includes the following interconnected approaches which teachers should be equipped with in order to develop TGC:

- Interdisciplinary and multicultural approach: This approach allows teachers to implement strategies for inquiry and investigation to enable students understanding issues and maintain deep learning, and encourage students to analyze knowledge critically and look at knowledge from multicultural perspectives to understand it from the contexts of the individuals.
- Perspective recognition approach: When teachers use this approach, they will assist students to accept variety of individuals and stimulate their collaboration. Teachers will understand the effect of socio-cultural and socio-political background on individuals, and enable students to recognize the variety of individuals' perspectives and understand the different contexts of individuals to accept them.
- Communicative Approach: This approach encourages teachers to enhance the culture of open sharing of resources, knowledge, perspectives and critiques; in order to develop social interaction, and maintain sustainability of wide learning that

will be transformed the acquired knowledge and build on it to cooperate in shaping the global society and solving its problems. Without this approach, it could not be possible to build a body of knowledge based on various perspectives. This approach points to the process that encourage social interaction, social intelligence, open-mindedness and the acceptance of the other.

- Contemplative Social Action Approach: Teachers who apply this approach are worry about translation knowledge into actions and reflect in these actions and practices. Teachers may practice this approach and help learners to do in order to be self- monitoring of actions and ensure that they can adapt their actions to the requirements of the global society.

These interconnected approaches were classified by Shetty under the inquiry approach. Furthermore, Shetty also mentioned the importance of educators' attitudes towards the development of teachers' global competence and the use of various instructional designs in the teachers training in order to develop TGC (Shetty, 2016).

Furthermore, other educators adopted another framework for the TGC that reflects the professionalism of teachers in understanding, interacting, and respecting diversity. Within this framework, global competences wereclassified into three categories: Foundational, Facilitation, and Curriculum design competences. Foundational competences focus on dispositions, knowledge, awareness, and skills that enable teachers modeling intercultural competence for learners. Facilitation competences allow teachers to interact with learners. Curriculum design competences focus on creating alignment between learning activities and assessments to help learners achieve global learning (Dimitrov & Haque, 2016; Iris, Robert , Ellen, & W.H.A., 2021).

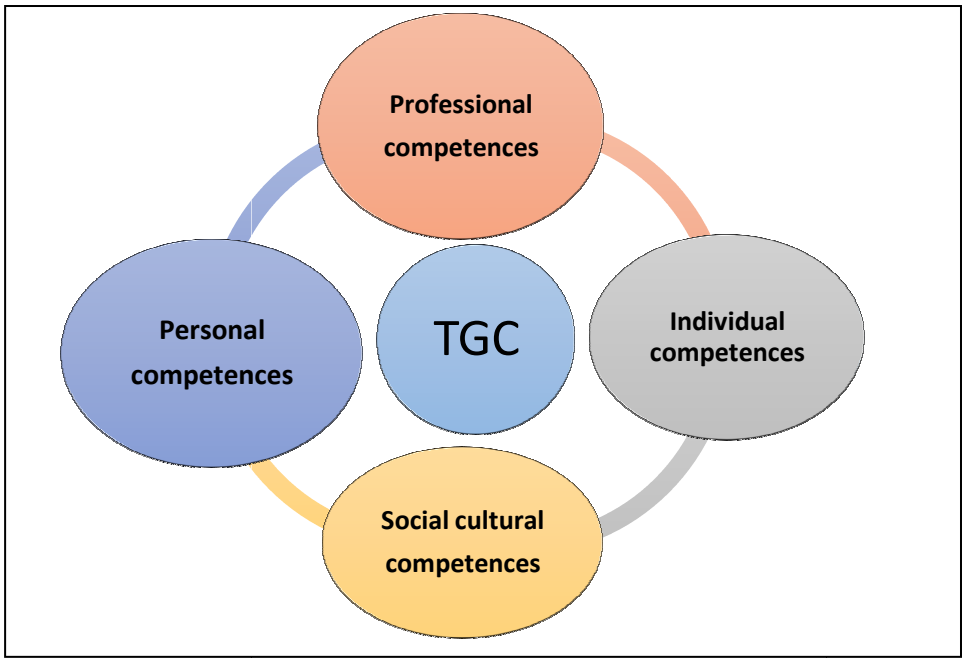
Foundational competences are expected to enable teachers to assist learners' awareness of cultural identities in order to recognize the differences between people. Moreover, a competent teacher values learners' differences, and creates cultural safety and trust. Facilitation competences help teachers to invest in the relationship with learners to build that provides opportunities to work collaboratively and communicate with multiple learners. Teachers should work with the school community and with parents to enhance active communication. Curriculum design competences were added to the foundational and facilitation competences; to maintain the incorporation of content, multiple activities, and learning resources that appreciate diverse perspectives and approaches. A

competent teacher is also expected to incorporate content, learning resources and events related to global issues locally and globally (Iris, Robert , Ellen, & W.H.A., 2021).

Analysis of the last studies allowed the researcher to select the framework of (Orazbayeva, 2016) for TGC; because it covers the frameworks of (Dimitrov & Haque, 2016; Iris, Robert , Ellen, & W.H.A., 2021; Shetty, 2016). Consequently, the researcher represented the selected TGC framework in Figure (1), and provided below description of each competence based on the last research.

Figure (1)

The proposed framework of teachers' global competences



Figure(1) showed that teachers' global competence is not limited to the teachers' professional competence, it includes another three domains of competences. These domains can shape the global competence that was described by Orazabayeva (2016) as a new quality of professional competence. Figure (1) shows that TGC is the center where the following competences rotate around:

- Professional competences: Teachers' professional competences(TPCs) include knowledge of the subject matter, global issues, and pedagogical skills to teach students, assess, and evaluate them with consideration of critical awareness to accept multiple perspectives. Additionally, these competences focus on the commitment to assist students to become responsible citizens locally, and globally (Kopish, 2017). These competences determine teachers' readiness for and abilities

to perform their professional activities in a changing environment, and to show professional activity, continuous professionalism and self-development (Orazbayeva, 2016). TPCs include designing instructions, implementing activities that enable learners to Investigate the world and be curious about it and aware of how the world works, and take actions to change the world (Byker & Xu, 2019). They also include the interdisciplinary and multicultural approach described by Shetty (2016), and foundational and curriculum competences described in (Dimitrov & Haque, 2016; Iris, Robert , Ellen, & W.H.A., 2021).

- Social-cultural competence:Teachers' social-cultural competencies(TSCs) consist of teachers' knowledge of different cultures, and cognitive and behavioral components (Orazbayeva, 2016). Teachers also need to gain knowledge about current global events including interconnected, interdependent, and deep understanding of the diversity of cultures, and intercultural communication (Iris, Robert , Ellen, & W.H.A., 2021; Guo, 2014; Tichnor-Wagner, Parkhouse, Glazie, & Cain, 2016). TSCs enable teachers to assist learners in recognizing the world by considering the diversity of people and respecting their different perspectives (Byker & Xu, 2019). These competences include the perspective recognition approach and communicative approach described by Shetty (2016), and facilitation competences described in (Dimitrov & Haque, 2016; Iris, Robert , Ellen, & W.H.A., 2021).
- Individual competences: Teachers' individual competences (TICs) include proficiency in using modern information and communication sources and technologies and developing a culture of communication in global networks (Orazbayeva, 2016). TICs also involve developing language and communication skills for cross-cultural communication (Byker & Xu, 2019).
- Personal competence: Teachers' personal competencies (TPeCs) involve a mixture of motivation, values, respect, responsibility, initiative, and readiness for intercultural dialog that developed by social exchange (Orazbayeva, 2016). These competences include the contemplative social action approach described by Shetty (2016), which focuses on reflection and self-oriented skills.

Models and scales for TGC: Different models were developed in order to equip teachers with TGCs. One of these models entitled "A global teaching model (GTM)" was developed by Kerkhoffa and Cloud (2020) who tried to investigate the teachers' perceptions and practices related to teaching global competence. This investigation

followed the participation of selected teachers in a course framed with the developed Global Teaching Model. The course provided a space to study global teaching besides culturally relevant pedagogy. This was done by providing readings and discussions about global issues and their connections to local ones. The finding showed that teachers who trained through a course based on GTM were implementing some specific strategies at the end of the course with greater frequency than the control group that was not trained in the same course. These strategies included reflecting on assumptions and biases, discussing current international events, and adapting resources related to global education. Kerkhoffa and Cloud concluded that teachers need support in order to be globally competent. The findings of their study also documented challenges to implementing globally competent education such as the lack of global resources, and that the curriculum is not based on global competence. This is in addition to the assessment that depends on tests that do not assess global competence and the efforts needed to engage learners with global issues. Besides, the need to cover the crowded curriculum was one of the main challenges for implementing globally competent education. The authors confirmed the need for a framework that assists teachers to be globally competent and to reflect that in their teaching practices. Moreover, they recommended providing models that enable teachers to replicate (Kerkhoffa & Cloud, 2020)in order to practice global education, reflect, and develop their own experiences that enable them to be globally competent.

Regarding scales, a scale related to teaching for global readiness was developed by Kerkhoff, Dimitrieska, Jill Woerner and Alsup (2019). The researchers investigated a sample of public schools' Indian teachers' and provided a description of their practices that encourage learners' global readiness by using the scale related to teaching for global readiness. The scale composed of these four dimensions: Practice in a local context, integration of global learning with the studied course, critical frame instruction, and experiences where learners are involved in active learning within the intercultural collaboration. The findings revealed that teachers highly agreed with their situated practice such as valuing diversity. However, teachers scored low on the transactional experiences which applied technology for cross-cultural collaboration (Kerkhoffa & Cloud, 2020).

Teacher educational programs and TGC: The last experiences and research could be used to develop appropriate teacher education programs which have a critical role in developing TGC. These programs are expected to provide opportunities for teachers to develop their knowledge and practice of transactional experiences in contexts. Besides, they have to assist teachers in integrating global topics across the curriculum with authentic engagement, and providing resources that can help them to do (Byker & Xu, 2019; Kerkhoff, Dimitrieska, Woerner, & Alsup, 2019). Moreover, these programs are expected to connect teachers' competences with learners' global experiences, and with the curriculum content (Tichnor-Wagner, Parkhouse, Glazie, & Cain, 2016); to assist learners to understand and appreciate multicultural and multiple perceptions, and adapt to social and cultural norms (Guo, 2014).

Based on that, studies tried to provide pieces of evidence on the efficiency of some educational programs in developing TGC. Some research demonstrated the potential of internationalizing the teacher education programs which can be offered by studying abroad. Studying abroad provides opportunities for critical inquiry and cross-cultural experiential learning. Besides, it offers a larger worldview regarding citizenship especially if it is coupled with teaching opportunities within an international context. This kind of study promises to facilitate experiential learning, promote teachers to appreciate cultural diversity and thus impact the development of teachers' cross-cultural sensitivity regardless of cultural or linguistic differences (Byker & Putman, 2019). Despite these benefits of studying abroad, it is challenged by the high cost of participation of all teachers in such experiences, in addition to difficulties that face teachers when they transferred abroad and not all teachers have been able to travel abroad. Therefore, teachers who are not able to experience global learning abroad should be enrolled in educational programs that provide a range of global learning experiences without leaving one's home. In order to do this, researchers proposed benefiting from modern technology and virtual exchange to promote intercultural understanding, and develop TGC (Kerkhoff, Dimitrieska, Woerner, & Alsup, 2019).

The new technology provided opportunities for teachers to use public platforms in order to communicate with other teachers abroad and assist students' intercultural communication. This facilitates the exchange between teachers and students in local schools and peers from a variety of cultures which can deepen cultural understanding.

Teachers can exchange lesson plans and organize discussions around critical global themes (Kerkhoff, Dimitrieska, Woerner, & Alsup, 2019). Teachers' educational programs can benefit from the opportunities that technology provides; to prepare global-minded teachers and ensure their confidence and ability to engage in transformative practices (Baily & Holmarsdottir, 2019; Byker & Xu, 2019).

Despite these opportunities, the current training programs still focus on local ideas and requirements for certificates. Additionally, these programs are challenged by limited opportunities for teachers to translate such global thinking in their classes; due to the lack of motivation and the crowded school schedules which leave little time for teachers to spend on searching global resources and assisting students to engage in appropriate activities that develop them as global citizens (Baily & Holmarsdottir, 2019). Therefore, it is important to provide teachers with instructional design models that simplify the development of TGCs. Besides, it is essential to provide them with global resources that enable them to exchange experiences without the need to travel to study abroad.

Open Educational Resources (OER)

One of the proposed solutions to limit the challenges of exchanging experiences with global individuals by studying abroad is adopting what is called open educational resources (OER). Actually, these resources are considered recent ways of sharing experiences including knowledge, approaches, and educational materials with others throughout the world (Akter & Mahbub, 2020).

The roots of OER were initiated in 1966 when British educators shared with Americans their educational thoughts through their visits to British schools, and with the world by exporting hundreds of resources freely. These resources included books, journal articles, magazine stories, and television and radio programs to everyone so that people could learn from each other (Rogers V. , 1975). The widespread of technology and networks, assigned such resources as open educational resources (OER). Within this context, open educational resources (OER) were defined in a forum hosted by UNESCO in 2002 as the educational materials that are available free and open for noncommercial purposes use, consultation, adaptation by a community of learners with the support of information, and communication technologies (Yamamoto, J. & Ananou, S. , 2015; Conole & Brown, 2018). After that, OER expanded to include Open Education

research, and Open education practices in addition to massive open online courses or what is called MOOCs that are considered as OER by some researchers (Stracke, et al., 2019; Weller, Jordan, DeVries, & Rolfe, 2018). In 2019 the UNESCO recommendation on OER encouraged monitoring mechanisms, policies, and initiatives on OER across the world. Besides it redefined OER as teaching, learning, and research materials located in the public domain in any format and medium under a copyright released under an open license which permits free access, re-use, re-purpose, adaptation, and redistribution by others (UNESCO, 2019).

Recently, Covid 19 pandemic increased the attention to adopting OER; due to the lockdown regulations and the switch from face-to-face teaching to online one (Bond, Huddleston, & Sapp, 2021; Menzli, Smirani, Boulahia, & Hadjouni, 2022). This in its role stimulates to benefit from the following revealed impact of OER on different domains of teachers' global competences:

- Impact of OER on Professional competences: Teachers' professional competences include knowledge of the subject matter, and global issues. And also, the knowledge of pedagogical skills, which helps them to teach students, assess, and evaluate them; taking into consideration of critical awareness to accept multiple perspectives. This is in addition to the commitment to assist students to become responsible citizens locally and globally (Kopish, 2017). OER could develop teachers' professional competences by providing a space to develop their pedagogical skills such as the support of active learning, motivation of students, and promotion of the international learning communities (Paskevicius & Irvine, 2019). These communities promised to develop teachers' knowledge of the international subject matter in addition to their skills as everyone has something to learn from others ((Paskevicius & Irvine, 2019; Rogers V. , 1975). Teachers may connect with experts, in developing educational materials, who will be mentors, and give useful feedback for them. This feedback could develop teachers' professional practices, knowledge, skills, and attitudes, and encourage them to share their experiences and provide new open resources that may assist others to solve common professional problems. In this way, teachers' professional competences would be developed(Farrow, 2016; Urbancic, Polajnar, & Jermol, 2019). Moreover, OER was believed to assist teachers in the development of instructional materials

quality and learning design by emerging good practices models and forms of teaching and learning (Conole & Brown, 2018; Paskevicius & Irvine, 2019). Teachers can use OER in instructional design for purposes of learning differentiation where some studies found that digital content enhances engagement in learning (Conole & Brown, 2018).

Using OER in teacher educational programs provides opportunities to develop digital literacies and open practices. Where teachers who adopt OER create a space to aware their students to contribute meaningfully by sharing their assignments and engaging in collaboration across time and space (Paskevicius & Irvine, 2019; Van & Katz, 2019). This is a kind of international evaluation for this assignment. In brief, OER could develop teachers' planning skills, implementation, and evaluation within the international learning communities by using, reusing and repurposing the OER.

- Impact of OER on Social-cultural competences:

  Teachers' socio-cultural competences consist of teachers' knowledge of different cultural concepts, cognitive, and behavioral components (Orazbayeva, 2016). OER is expected to develop such competences by removing barriers between teachers from different cultures. This can occur when the OER is shared freely to be accessible for all (Yamamoto, J. & Ananou, S. , 2015). It was also found that adopting OER in educational programs could develop digital literacy and increase socio-cultural understanding opportunities (Gruszczynska, Merchant, & Pountney, 2013).

  OER continues to offer significant opportunities for opening up education to support social inclusion (Conole & Brown, 2018). This could make a shift in the inequality of education; by applying the principle of re-cognitive Justice in education. By this principle, the Socio-cultural, gender, regional, and views diversity are considered in the open curriculum, courses, assignments, and feedback (Lambert, 2018). Therefore, when teachers adopted OER, they would communicate globally despite of diversity, and this could improve their socio-cultural competences.

- Impact of OER on Teachers' Personal Competences: Teachers' Personal Competences involve a mixture of motivation, values, respect, responsibility, initiative, and readiness for intercultural dialog developed by social exchange (

Orazbayeva, 2016). These competences could be developed by OER that enable social exchange due to the accessibility for all, thus the opportunities for exchanging education increase (Farrow, 2016; Urbancic, Polajnar, & Jermol, 2019). For example, excluded learners in developing countries could exchange education with other international learners freely (Lambert, 2018). The same is for teachers anywhere; where using OER increasestheir awareness of openness, and provides opportunities to develop their open practices (Van & Katz, 2019).

These factors provide a richer cultural environment that motivates teachers' intercultural dialog. Thus, it was concluded that OER could support teachers to develop personal competences that benefit teaching and learning. Moreover, teachers have the potential to support OER development by creating and sharing useful OER (Misra, 2012).

- Impact of OER on Individual Competences: Teachers' individual competences includeproficiency in using modern information and communication sources and technologies, and developing culture of communication in global networks (Orazbayeva, 2016). OER provides an environment that encourages the improvement of users' technological skills (Conole & Brown, 2018). This is because OER depends on technology that facilitates the wide scaling of these educational resources and thus promotes globalization and internationalization of education (Conole & Brown, 2018; Stracke M. , 2019). Besides, OER promotes the development of open educational practices (OEP) such as the creation, management and reuse of OER with adaptation for the contextual setting, so that the same resource could produce new innovative ideas with some development. An open share of new knowledge and practicesthat promoted innovation is expected to raise the quality of education professionally. In this way, OEP is considered an approach that helps individuals innovative thinking in knowledge structure and ideas and contributes to the open digital world(Conole & Brown, 2018; Paskevicius & Irvine, 2019). Teachers, as individuals, could benefit from OER to innovate, share their innovation all over the world and achieve professionalism. Teachers also could develop their individual competences by conducting research, where OER increases the opportunities for conducting research (Farrow, 2016) by providing open data for educational research. For example, data collected from MOOCs could be used in the area of learning analytics that facilitates collecting data in addition to facilities

related to open access for journals that enable to review the literature (Conole & Brown, 2018). In this way, OER simplifies the process of research and maintain the benefit of research for teachers as individuals

Challenges of Adopting OER

In spite of the need for OER and the positive impact of OER's adoption on the teachers' competences, the adoption of OER is still not widespread all over the world, and there are contradicting studies that revealed negative attitudes of teachers towards adopting OER in some schools, such as Kenya's primary and secondary schools (Orwenjo & Erastus, 2018), and other universities such as Dutch University of Applied Sciences (Baas, Admiraal, & Van Den Berg, 2019). These attitudes were attributed to the following challenges of adopting OER:

- Poor infrastructures, lack of access to devices for both teachers and students, basic technological skills among teachers, and administrative support that is aware of the existence and benefits of OER (Orwenjo & Erastus, 2018).
- The claim that OER may decrease the innovation opportunities for individuals due to the easy copying of others' works and plagiarism or other dishonest activities (Yamamoto, J. & Ananou, S. , 2015; Farrow, 2016). Meanwhile, if peopleare brought up on digital ethics, they would oblige to preserve people's rights (Farrow, 2016). Therefore, the responsibility of teachers has increased due to the intendance of education to stimulate ethical values for students besides cognitive abilities and creativity (Yamamoto, J. & Ananou, S. , 2015).
- Lack of time, energy, and awards: Other studies focused on barriers for adopting OER related to the assumptions that OER consumes time and energy. This is in addition to hesitation to copyrights issues, lack of funds, or awards that encourage to create and adopt the OER. As a result, these studies recommended to establish an OER training program for the faculty on how to use OER. In addition to provide initiatives to encourage the adoption of OER and institutional support; to change the minds of stakeholders and persuade them to create and adopt OER (Bond, Huddleston, & Sapp, 2021; Menzli, Smirani, Boulahia, & Hadjouni, 2022).
- Lack of appropriate training programs that develop teachers' competences and enable them to use OER in the teaching and learning processes. This caused hesitation among stakeholders on how to use or share OER. Some educators

assumed that additional initiatives of individuals and government, institutional awards, and encouraging climate are needed to overcome these challenges (Bond, Huddleston, & Sapp, 2021; Menzli, Smirani, Boulahia, & Hadjouni, 2022).

Appiah and others provided pieces of evidence on the last challenge when they tried to measure students' and faculty's OER adoption in six colleges of the Technical University of Kumasi. They found that 83.9% of the academic staff and 91.5% of the students have no idea about the OER. Besides, the lack of training for lecturers on how to use the OER and their low awareness level of creative commons licenses were considered barriers to adopting the OER (Appiah, Essel, & Amankwa, 2020). Some common findings were reported by (Bond, Huddleston, & Sapp, 2021) who found that a sample of faculty at Texas Christian University (TCU) were reluctant about OER adoption because they thought that OER consume time and energy. In addition, there was a lack of motivation such as funds or awards for the creation and adoption of OER. The authors suggested that training opportunities and awards/grants from the institutions would be helpful to change the attitudes of faculty.Schuwer and Janssen shared some of the upper barriers through their study based on interviews with 55 educators, board members, and support staff in 10 Dutch higher education institutions. The study focused on practices for sharing and using OER. Findings indicated that the actual rate of adoption of OER is rather low in terms of educators involved in the study. Educators used to share OER with colleagues only and not in modes accessible to everyone. Moreover, the shared materials are often lacking the open license and not always undergo copyright processes. Authors interpreted results by the existence of barriers such as insufficient training on using OER, lack of awareness for open sharing OER, and lack of support for adopting OER, which affected faculty commitment to OER negatively. Moreover, they pointed to the importance of considering cultural issues when sharing learning materials and recommended institutions to formulate policies for raising awareness, encouraging more initiatives to overcome barriers to adopting OER, and providing time for experiments (Schuwer & Janssen, 2018).

A systematic review was conducted to provide insights into OER research in Africa., the study indicated that OER's adoption is still limited to specific African countries and the OER's initiatives mostly focus on creating of the OER, and neglect dissemination of OER. Moreover, the study summarized challenges that limit the OER's adoption. These

challenges include a lack of policies, copyright regulations, OER awareness, infrastructure, and access, educational communities to create and use OER, and awards for the creators of OER. This is in addition to a lack of skills in creating, searching, and implementing OER in education and licensing the resources, and a lack of time and motivation from teachers to create or adopt OER. In this regard and to facilitate the adoption of OER, the study recommended more initiatives in the field of OER, in addition to consideration of individual differences related to culture, language and personality when designing OER for different countries (Tlili, et al., 2022).

Factors that shape OER adoption: Cox and Trotter (2017) tried to better understand of the obstacles associated with OER adoption at three South African universities. They conducted in-depth personal interviews with 18 respondents at three different universities in South Africa's university sector. The authors developed a pyramid to understand the factors that shape OER adoption. The pyramid includes a layered sequence of the following factors (Cox & Trotter, 2017):

- Access: This factor refers to access to the infrastructure and hardware necessary for using or sharing digital OER such as internet connectivity, computers, and electricity. Educators have the least control over this primary factor.
- Permission: Refers to legal permission to use the OER which is included via the OER licensing that determines how to use the OER. In addition, this factor includes the permission for OER creation by the institution's policies that determines the copyright over the created educational resources. It also promotes legal sharing of them openly which leads to the creation of OER.
- Awareness: Refers to the awareness of the concept of OER and how they differ from other resources.
- Capacity: This factor refers to the needed skills to search, use, or create OER. Institutions should support developing the lecturers' capacities in order to engage them with the OER and encourage them to adopt these OER.
- Availability: This refers to the availability of OER related to content, level, language, context…etc. That can be used to achieve objectives of high quality.
- Volition: Refers to the desire and willingness of those who hold copyrights to adopt OER. Therefore, it is complicated since it may be personal, institutional, or social.

When the upper five factors are achieved, the volition becomes a key factor that decides whether or not lecturers will adopt OER.

Falling below of any of these factors will probably influence OER adoption (Cox & Trotter, 2017). Akter and Mahbub(2020) agreed with the factors of access and awareness. The authors tried to examine the feasibility and prospects of OER in some of Bangladesh's educational institutions focusing on the teachers' and learners' attitudes towards OER. Findings revealed that one of the key concerns in creating OER is access to technology that encourages developing a platform for OER in Bangladesh. The other factor is the awareness of teachers by arranging seminars or workshops about the importance of OER. The study recommended the sufficient contribution of government, and authorities to assess the total scenario of OER in Bangladesh (Akter & Mahbub, 2020).

Lantrip and Ray (2021) emphasized the capacity factor that includes supporting faculty with training. The study found that adopting OER impacted the instructional practices of the majority of faculties. Besides, it revealed that there was a need for the support of Oregon community college faculty for OER adoption including training on pedagogical practices and associated technology. There was also a necessity for time for reflection on how to incorporate OER in teaching and customize the OER for that. Faculty believed that adopting OER resulted in positive benefits for students and increased their engagement in learning (Lantrip & Ray, 2021).

All these factors affect the teachers' attitudes toward using OER, thus they affect their competences that involve attitudes in addition to knowledge, values, abilities, and skills (Tapani & Salonen, 2019). Therefore, teachers who have negative attitudes towards technology are less inclined to adopt OER in teaching (Fandiño & Yamith , 2012). Furthermore, some studies agreed with the necessity of supporting overviews of OER, and proposed solutions such as creating national or institutional teachers' communities. This is to enhance understanding of OER and its benefits; so that teachers could engage using OER. In addition, these studies advised conducting future research; to show cases of teachers' engagement with OER; in order to provide insights into the sequence of OER Adoption in education within different contexts (Baas, Admiraal, & Van Den Berg, 2019).

An Initiative in the field of OER

The debate related to the effectiveness of OER on teachers' competences has raised the following question: How could the OER develop teachers' global competences?

The last studies recommended more initiatives in the field of OER and emphasized the importance of instructional design to develop TGC. As a result, the researcher thought logically to provide initiative for adopting and creating OER. This could be done by integrating the OER with instructional design models that guide teachers to adopt and create innovative OER, then sharing the new product locally and globally. Before doing, there was a need to review the literature related to instructional design models for creating innovation.

Instructional design for creating innovation

One of the instructional models that focuses on creating innovation was developed by Seechaliao in 2018 and included a systematic teaching and learning plan that organizes teaching and learning processes to achieve objectives. The model was developed based on the principles of creative problem-solving and social media in real situations. Implementation of the resulted model revealed that it could promote the creation of educational innovation for pre-service teachers effectively. However, the model based on social media which should be updated continuously in order to select the most appropriate one for learning activities, students' learning styles, and their behaviors (Seechaliao & Yurayat, 2021).

Another instructional model for the creation of innovations was published in 2018, this model which entitled "C2I Model", was designed by Jirasatjanukul and Jeerungsuwan (2018) based on both Connectivism and Constructivism theories for creating innovations in real-world experience. On one hand, the Connectivism theory emphasizes on digital eras and the learner's abilities for communication and cooperation, with the background that learning takes place inside and outside the learner. Thus, it is not just an internal activity (Jirasatjanukul & Jeerungsuwan, 2018; Siemens, 2005). Recently, the internet could connect each learner outside by enabling him to use the needed resources in order to construct his own knowledge, and manage relationships with experts all over the world. On the other hand, the Constructivism explains learning by the construction of new knowledge in real-life situations. The

design of the model depends on the Connectivism theory in providing a real-world problem, and on constructivism theory in providing opportunities for learners to construct new knowledge through practice and communication. Moreover, the C2I model includes another component which is an innovation of learning products in the real-world (Kongkakul & Namon , 2014). Teaching and learning activities of the C2I model is based on the AAA Model. The AAA is an abbreviation for an instructional design model which consists of three main processes; Analysis, Activities, and Assessment. The Analysis process centers on the learner's needs, content, and context. As for the Activities process, it consists of what the facilitator will do to reach objectives. This includes teaching and learning strategies. Eventually, the process of Assessments depends on oral, practice, training, tests, and authentic assessment (Kongkakul & Namon , 2014). The processes of the C2I model are described as follows:

- Analysis of content, learners, community, related agencies, and time.
- Activities that include real problem-based learning and assignments for learners to communicate with related agencies. The teacher provides learners with connective content knowledge, and resources, while learners collaborate with each other to provide connective communication skills and arrive at their knowledge by concluding results from different groups. After that, learners develop their knowledge and present it, revise, examine, and conclude according to teachers' suggestions.
- Assessment to determine the extent to which the innovation is applicable, and develop the innovation (Jirasatjanukul & Jeerungsuwan, 2018).

The comparison of Seechaliao model and the C2I reveals that both designs focused on creative problem-solving and social media in solving real situations. However, the C2I model provides opportunities for learners to connect to the digital world and includes more obvious processes that could develop learners' innovation skills. The implementation of the C2I model revealed that it promoted the creation of learner innovation skills (Jirasatjanukul & Jeerungsuwan, 2018). Based on these models, the researcher developed a model for creating innovative OER. The model is called the "GHOSHEH" model.

The developed model for creating innovative OER

Reviewing the literature showed that there has been no systematic process for guiding adopting or creating OER. A comprehensive model for creating innovative OER could provide teachers with a systematic way of creating OER. Such a model could provide teachers also with an approach for finding environments that allow learners to create innovative OER. This gap led the researcher to think about a specific ID model for both creating innovative OER and enhancing teachers' global competences.

To achieve this purpose, there was a need to study the characteristics of instructional design models that promote developing global competences. The literature shows that such models are expected to focus on organizing discussions around current events. This will allow students to explore what is happening around them locally in their communities and globally all over the world, and to understand how those events related to what they are learning. Likewise, these models are expected to promote service learning that involves students participating in, and reflecting upon activities that benefit their communities, and deepen their understanding (OECD/Asian Society, 2018). Moreover, these models have to include strategies that support innovation, creativity, collaboration, effective communication, and critical thinking. Besides, they are expected to involve experiential learning, authentic learning and assessment, real-life problems, and problem-based learning and to support diverse ideas and perspectives of learners (Sinay, Nahornick, & Graikinis, 2018).

Based on the last characteristics, and on the C2I model and AAA model, the researcher tried to develop a model for creating innovative OER and enhancing TGC. The developed model which is called the "GHOSHEH" model includes four processes distributed through a hierarchical shape. The base of the GHOSHEH model includes the first process which is the analysis of content, learners' needs, context, and time. This process is conducted before designing activities; in order to be considered in the design. The second process focuses on activities that are arranged hierarchically, as each activity is a requirement for the next one. The third process includes formative assessment which is continuous in line with activities and followed with feedback. The fourth process is peer sharing which includes sharing the created OER locally and globally; to get feedback and allow others to repurpose the resulted OER, and produce another one based on the first created one.

The model is also based on the integration of problem-based principles and cooperative learning strategies. Besides, the model focuses on reflection, authentic assignments that are actual and related to life, and continuous formative assessment as shown in Figure (2).

Figure (2)

Strategies and approaches of the GHOSHEH model

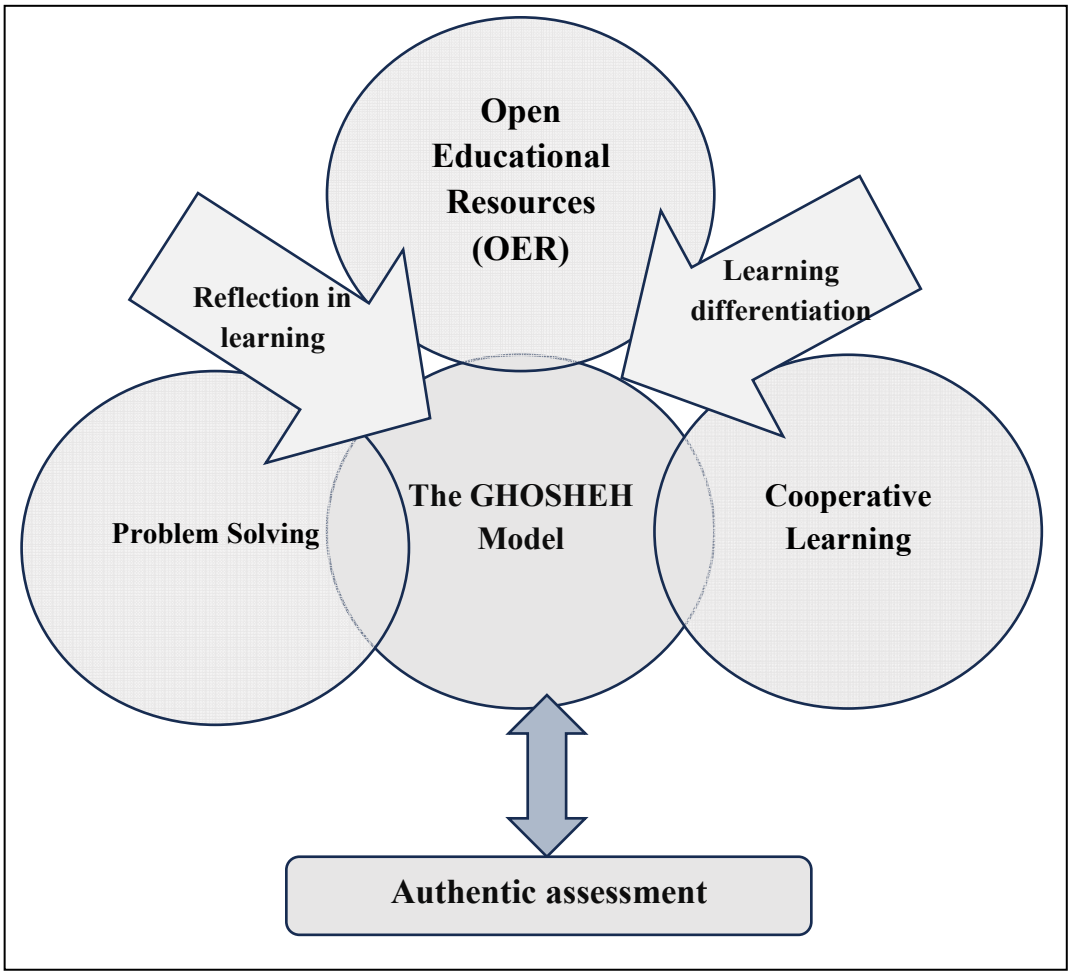


Figure (2) reveals that the GHOSHEH model benefits from the potential of OER which was described before. In addition, the model benefits from both cooperative learning and problem-based learning (PBL) strategies encouraging adopters (users such as teachers or students) to develop their metacognitive abilities and develop their communication skills (Winarti, Ambaryani, & Putranta, 2022). Also, it promotes their entrepreneurial and life skills that include professional, personal, cognitive, self-directed, time management skills, critical thinking, working in a team, communication, and mutual respect (Sungur, Tekkaya , & Geban, 2006).

Many researchers focused on problem-based learning (PBL) such as Thakur and his colleague who reviewed 52 articles related to PBL. They concluded that PBL allows learners to practice cooperative learning by working in small collaborative groups on realistic and open-ended problems. PBL empowers learners and develops their creative thinking, reasoning skills, decision-making skills, scientific skills, communication skills, self-regulated learning skills, team skills, leadership skills and lifelong learning (Thakur, Dutt, & Chauhan, 2018). Studies also revealed positive, and significant relationships among problem-solving, communication skills, and classroom management competence of teachers (Kavrayici, 2020).

Problem-based learning challenges learners to solve problems related to real-world, and engages them actively to search for information in order to solve the problem independently. When learners are given opportunities to get stuck in a problem, they are pushed to try new things that can lead to creative thinking. Therefore, problem solving strategy is considered as a great way to stimulate creativity by creating connections, rearranging ideas and making conjectures (Sinay, Nahornick, & Graikinis, 2018).

The impacts of PBL have interpreted also by considering the principles of PBL. These are collaborative and constructive principles. Thakur and other researchers found that both principles enhance creative thinking and reasoning skills, as the learner has to think creatively to find solutions for the problem and to make decisions regarding the learning resources and the needed information for solving the problem. These decisions have to be taken individually as well as in groups. Therefore, the strategy enhances teamwork, leadership skills, and communication skills; as learners have to communicate within their groups as well as with the class during discussion of their assignments. The strategy also develops scientific skills; so that all learners have to think scientifically to find solutions to the problem. Besides, PBL develops self-regulated learning skills; because learners have to think and learn independently to solve real and messy problems. All these skills promote lifelong learning (Thakur, Dutt, & Chauhan, 2018). All these skills are involved in the global competences. Thus, problem-based learning is expected to develop global competences.

Furthermore, Iris, Robert, Ellen, & W.H.A (2021) found in their study about globally competent teachers that these teachers used to implement the problem-solving strategy to develop global competences through enhancing critical thinking skills. Besides,

teachers used to create learning activities that allow learners to be active in the local or global world, and organize opportunities for the learners to link learning with the immediate environment. Moreover, teachers used to align learning activities with assessment in order to concrete learning outcomes related to global citizenship education.

The GHOSHEH model also focuses on the authentic assessment that involves authentic assignments which focus on real-life or real-world tasks. Such assignments are expected to generate student engagement and develop the 21st-century global competences. Specifically, if the assignments arm learners with flexible problem-solving techniques that can be used in real- life contexts (Sinay, Nahornick, & Graikinis, 2018). The assessment, which is included in the model, is continuous and involves building rubrics in cooperation with students to assess their performance, which contributes to developing students' metacognitive skills, and controlling their self-control of learning (Earl & Katz, 2006).

Besides, the GHOSHEH model focuses on the reflection of the learners in their learning from the beginning. Firstly, the teacher who implements the model starts asking the learners to describe a selected OER, then gradually he asks each student to write his reflection and express his feelings and attitudes towards the OER. This reflection contributes to deepening learners' knowledge, identifying strengths in what they have learned, and pointing out what needs to be developed, thus leading to self-evaluation and personalization of learning (Chang, 2019). The model provides teaching environments that support diverse ideas and perspectives. It allows learners to learn from struggling with tasks, trying to solve them, produce, share products globally and reflect on their learning. Further, such a physical environment provides spaces to create innovations.

As mentioned before, the GHOSHEH model is based on the C2I model for creating innovation. Despite that, there are some differences between both models. A comparison of the characteristics of the C2I model (as described in Jirasatjanukul& Jeerungsuwan (2018)) and the GHOSHEH model is shown in Table (1)

Table (1)

A comparison between the C2I and the GHOSHEH models

Process	GHOSHEH Model	C2I Model
Analysis	The base of the model includes the analysis of content, learners' needs, resources, environments, and time. This process is conducted before designing activities to align the design according to the results of the analysis.	The analysis is one of the learning activities, it follows a set of real-world problems and includes an analysis of subject content, learners' needs, resources, environments, and time.
Activities	Activities are arranged hierarchically, as each activity is a requirement for the next one as follows: 1- Gain attention using OER as connective resources with reflective questions promotes the engagement of learners and enables reflection in the OER. 2- Writing reflections and presenting them incorporates the construction of knowledge with connective collaboration and enables learners to predict the objectives. 3- Objectives are set and discussed by teachers and learners to understand them deeply. 4- A real problem is shared with learners by teachers, the problem should be related to content and requires creating innovative OER. 5- Helping learners to work in teams (F2F or virtual) and providing them with rubrics for self-evaluation. This step includes connective collaboration and communication between learners. 6- Enhancing micro-learning by breaking the problem down into authentic small assignments. This step is similar to the analysis of real problems in the C2I model. 7- Heartening learners to present, and share the resulted innovative OER locally and then globally.	Activities are arranged vertically, from top to bottom as follows: 1- Goal setting: Teachers set a problem related to content and the real world. This stage consists of connective knowledge and connective resources presented by teachers in addition to connective collaboration, and communication between learners. 2- Learner Development: creativities are developed, presented by learners, revised according to teachers' suggestions and examined by evaluating the outcomes of the task to make a conclusion.
Assessment	Formative Assessment is continuous within activities. Learners are provided with rubrics for self-evaluation. The problem is broken down into authentic small assignments. Assessment is followed by feedback similar to teachers' suggestions in the C2I model.	Creativities are revised according to teachers' suggestions and examined by evaluating the outcomes. Assessment is the final stage of learning activities aims at determining the extent to which the innovation is applicable, in order to develop the innovation.
Peer sharing	Created OER are shared locally and globally with peers. Peers can provide the creators with feedback. Moreover, they can repurpose the created OER using the same activities of the GHOSHEH model and create another OER based on the first ones	Nothing is mentioned about Peer sharing.

Table (1) reveals that both models incorporate connectivism with constructivism theories. However, the GHOSHEH model for creating innovative OER includes more specific activities that are rooted in the other five theories. Firstly, Kolb's experiential learning theory. This theory actually emphasizes the central role of experience in the learning process in combination with perception, cognition and behavior. David Kolb, the chairman of experiential learning theory, emphasized on a particular form of learning from life experience where learning is conceived as a process not as outcomes, and ideas are formed and reformed through experience. Therefore, learning is a continuous process of creating knowledge that is grounded in experience, and is formed by the resolution of conflicts between opposed modes of adaptation to the world. Moreover, learning involves transactions between learners that reflect personal knowledge, and the environment which reflects social knowledge (Kolb D. , 1984; Kolb D., 2015). Through experiential learning, learners are allowed to take ownership of tasks, learn through making mistakes, and extend themselves to the real world (Sinay, Nahornick, & Graikinis, 2018).

Experiential learning methodologies were expected to contribute to enhancing education quality by developing competences, and building up added values, creative and critical thinking skills (Habib, Nagata, & Watanabe, 2021; Kolb D., 2015). Kim concluded that organizing experiential learning activities, with consideration of learning outcomes' consistency, teaching-learning activities, and assessment could improve the core competences of learners (Kim D. , 2019). In general, Experiential learning is considered an excellent way to promote creativity, and innovation that are linked to global competences (Sinay, Nahornick, & Graikinis, 2018). Training teachers based on Kolb's experiential learning was found to bring understanding and application of concepts to the same level and make research, teaching and outreach practices in consideration of community's needs. Furthermore, experiential learning enables learners to use new methods in their contexts by practicing what they learnt, which promotes lifelong learning with a strong balance between technical and social skills (Močinić, Tatković, & Tatković, 2020; Nakelet, Prossy, & Bernard, 2017).

Kolb's theory explained that effective learners need four types of abilities. The first is concrete experience abilities (CE) where learners must be open to involving themselves in new concrete experiences. The second is reflective observation abilities (RO) when

learners observe and reflect on their experiences. The third is abstract conceptualizing abilities (AC) where learners create concepts that integrate their observations and reflections into theories. The fourth is active experimentation abilities (AE) when learners use these theories to make new decisions and solve problems (Kolb D. , 1984). Within this context, the GHOSHEH ID model provides opportunities for learners to develop the described four types of abilities by allowing them to observe, reflect, and apply classroom concepts to real-world situations.

Educators found a positive influence of training based on experiential learning on trainees' awareness and use of the approach in delivery of the courses they taught. Also, it was important to improve the use of learner-centered teaching approaches in undergraduate courses. Therefore, many educational institutions offer experiential education programs such as classroom experiential learning exercises to add a direct experience component to traditional academic studies. In fact, the theory has been widely considered a useful framework for learning-centered educational innovation, including instructional design and lifelong learning (Kolb D., 2015; Nakelet, Prossy, & Bernard, 2017). This can be regarded the opportunity that it offers to learners to take ownership of tasks, learn through making mistakes, and extend themselves to the real world (Sinay, Nahornick, & Graikinis, 2018).

Despite the benefits of the experiential learning approach, it is constrained by challenges such as short class periods, large class sizes and financial limitations, poor reading culture, low knowledge of using online resources, and time consumption. These challenges are regarded the dependence of the experiential approach on reflection sessions, research, and application which require a lot of time (Nakelet, Prossy, & Bernard, 2017). In order to overcome such challenges, facilitators are advised to depend on instructional design models that provide opportunities for simulation and then use short practical reflective circles including small discussion groups and presentations. Thus, there is a need to have policies and structural factors besides training to influence the application of experiential learning approaches (Nakelet, Prossy, & Bernard, 2017). Moreover, designing experiential learning activities requires an instructor who assists these activities by instructional models that enable learners to practice what they learn in real- life problems (Anderson, Hsu, & Kinney, 2016).

Secondly, Piaget's cognitive constructive theory. This theory, it illustrates learning by the construction of new knowledge when the previous knowledge of individuals interacts with the new one, which causes internal cognitive conflicts between the new phenomena of individuals and their existing schemas. Hence, disequilibrium processes or what is called assimilation, or accommodation occur when individuals try to make sense of their knowledge to reach a state of equilibrium (Khalil & Elkhider , 2016). The GHOSHEH model is based on cognitive constructive theory when it enables learners to use time on tasks by challenging them with a problem that requires bridging previous experiences with new ones, the problem is expected to cause the disequilibrium state described by Piaget.

Anyhow, because of the obstructions of poor reading culture and time-consuming in researching and reflecting on practices, that teachers face through applying the experiential learning approach and the constructive approaches, facilitators are advised depending on instructional models. These models are expected to provide opportunities to use short practical reflective circles and promote small discussion groups, and presentations to overcome such obstructions (Nakelet, Prossy, & Bernard, 2017). In fact, this aligns with the GHOSHEH model which includes activities that depend on reflection, discussion, problem-solving, and teamwork.

Thirdly, Vygotsky's theory (Sociocultural theory). This theory focuses on the role of social interactions in learning and is reflected by dividing students into groups to cooperate, support each other, discuss reflections, and share experiences so that they can do more tasks with less time. At the same time the teachers scaffold students by continuous assessment and constructive feedback. Vygotsky (1978) explained learning with the concept of Zone of Proximal Development (ZPD) where learners can perform better with some assistance of peers and teachers scaffolding (Vygotsky, 1978). The GHOSHEH model benefits from Sociocultural theory in providing opportunities for students to work in small groups, interact, discuss, and cooperate to solve problems and create new OER. Besides, it provides opportunities to interact with global learners through the peer- sharing process.

Fourthly, Robert Gagne's hierarchical theory. The GHOSHEH model can be considered as a cognitive model as it depends on Gnge's theory which organizes learning tasks for intellectual skills in a hierarchy according to complexity. This is in order to identify

prerequisites that should be fulfilled to facilitate learning at each level. Gagne's proposed a nine instructional events model, initiated by gaining attention and continued by informing learners with objectives of assessing performance and enhancing retention and transfer. The model was considered effective for instructional design (Khadjooi, Rostami, & Ishaq, 2011). The GHOSHEH model composes of small tasks arranged hierarchically according to complexity the same as those of Gagne's events especially in the first levels of the model. However, the GHOSHEH model aligns the tasks according to the context of learners who are expected to create OER; in order to solve a real-life and global problem. In addition to providing opportunities gained from the other previous three theories such as practice, reflection, working in groups, and communicating with peers all over the world.

Fifthly, the Connectivism theory. Connectivism is a new theory introduced by George Siemens and Stephen Downes in 2005. The theory considers learning a process that connects the internal knowledge of an individual with the external one. It suggests that learners could combine their internal information and experiences with those provided by the external factors in the surrounding environment. Particularly, individual's learning is affected by technology as a major player. The theory suggests that learning differs from one to one; due to the differences in the media of technology that surrounds the learners (Siemens, 2005). The GHOSHEH model depends on technology in searching, adapting, creating, and sharing OER. Therefore, it benefits from the Connectivism theory. Figure (3) shows the theories that the GHOSHEH model depends on.

Figure (3)

Integration of the theories that the GHOSHEH model rooted from

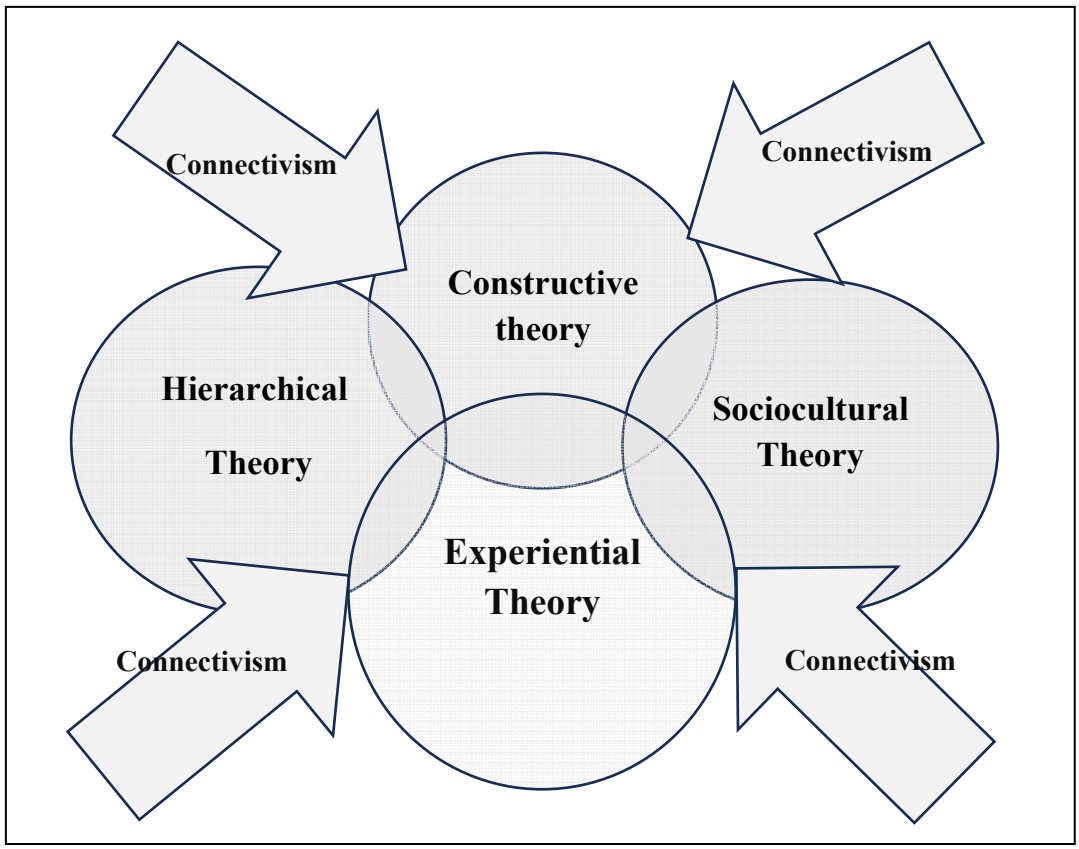


Figure (3) shows how the GHOSHEH model depends on five theories; Four of them incorporate to focus on learning as an internal process. However, the fifth one which is connectivism surrounds all theories. This is because it focuses on both the internal and external aspects of learning that take place inside and outside learners.

Rogers' process for adopting innovative models

Innovation in education refers to any new resource, tool, instructional technique, novel teaching technique, or strategy that can be used by teachers to benefit teaching and learning (Taylor, et al., 2018). In order to increase the benefits of an innovation, it has to be introduced, diffused, and adopted before taking the responsibility to implement them. The process of diffusion of innovations was explained by different theories. However, the most widely accepted one was Roger's Diffusion of Innovations (DOI) theory which was first published in 1962 (Tanye, 2016; Taylor, et al., 2018). Roger's theory for the diffusion of innovations includes a process that fosters introducing and

adopting innovations such as new instructional design models. The process relies on these five stages (Eichler & McDonald, 2021; Rogers E. , 2003):

- Knowledge: This stage includes awareness of the innovative model. This can be done by preparing descriptions and useful materials that are useful for adopters and enable them to answer the question: why should they use the model?
- Persuasion: This stage includes the adopter's decision on the innovative model. Adopters may accept the model, seek more information, or decide how to interpret the information they received about the model. The persuasion stage can be facilitated concretly by the knowledge stage when the instructional designer provides knowledge for adopters (teachers, students, policymakers….) about the model rationale and fulfillment of real needs.
- Decision: This stage leads to the decision of adopters who will either adopt or reject the innovative model. Adoption of the model occurs when the adopters participate in some tests that provide evidence about the ability of the model to solve the problem they defined. Rejection of the model is classified as either active or passive rejection. Active rejection occurs when adopters consider the adoption of the model and then actively decide not to adopt it. Passive rejection occurs when adopters do not make identifiable decisions and the model is rejected due to inaction of the innovation. Instructional designers can facilitate the decision phase by providing opportunities for adopters to try out the model before committing to it.
- Use: This stage includes actual usage of the new model after a period of continuous education and professional development associated with the model's adoption. The instructional designer can support adopters to use the model and consider its ability to solve problems. This can be done by conducting training for the persons leading the instruction, or showing adopters how to use the instructional design model's features.

It should be taken into consideration that implementation of the model may result in the re-invention of this model. This includes changing or modifying by adopters in the process of the model's implementation. Re-invention may improve the model and provide ideas for improving the instructional design in the future. Therefore, the instructional design should be flexible so that it will not break down during re-invention.

- Confirmation: This stage occurs as a result of the adopters' evaluations of their decision to implement the model and their satisfaction with the results of adopting this model. The instructional design may be subsequently discontinued due to the adopters' evaluation. This evaluation depends on measuring some variables such as learners' performances, ease of the model use, satisfaction, and cost to maintain. If adopters find a gap between their expectations of the model and the actual results of implementation, discontinuance will occur. Therefore, instructional designers should assist adopters to understand how to combine the design into their professional practices. Besides they should support them by providing appropriate training that decreases challenges and fix problems of experiencing the instruction in order to achieve the intended outcomes.

In addition to the previous stages, Roger identified the following five attributions that can determine the rate at which an innovation would diffuse and would be considered a good or successful innovation (Eichler & McDonald, 2021; Rogers E. , 2003; Tanye, 2016):

- Relative Advantage: This attribute is one of the strongest predictors of the rate of adopting an innovation according to Rogers. The relative advantage of the innovative model reflects how the model is convenient due to its advantages for the adopters that exceed the current models they use. The innovation should be economical with low initial cost, should save time and effort, and show immediate results. These characteristics could be as incentives for adopters. However, external incentives initiated by the government, community, and higher levels of social organization can be used to increase the relative advantage of innovation and this can influence the potential of adopters' behaviors towards the innovation. Moreover, it should be clear that over-adoption of an innovation may be due to a lack of knowledge about it.
- Compatibility: This attribute refers to the alignment and consistency of the innovative model to the adopters' values, experiences, beliefs, interests, concerns, needs, and other internal conditions related to social, cultural, ideological, and pedagogical aspects. Any conflict may threaten adopting the model which is always compared with current ones. It should be clear that previous ideas of adopters may

affect compatibility; they may cause misusing of innovation and thus mis adoption or over adoption of the innovation.

- Complexity: This attribute reflects the relative difficulty of understanding and using of the innovative model. Difficulties of the model make it complex and this can negatively impact adopters desire to use the model. This either makes adopters less likely to adopt the model or causes discontinuity of use. Characteristics of adopters affect complexity. The innovative model may not be easy for everyone. However, training and providing prototypes may decrease complexity.
- Trialability: this refers to the ability of the innovative model to be tested and practiced on a limited basis. This enables adopters to make decisions related to the model's adoption. The innovative model would be readily accepted if adopters tried it and found it suitable to their needs. The positive impact of trialability on the rate of adoption for early adopters is usually greater than for later ones.
- Observability: This attribute is related to the degree of the visibility of the innovative model's results. Adopters should observe the benefits of the innovative instructional design model in order to adopt it. Therefore, the instructional design model should include observable and measurable learning goals (Rogers, 2003). Observability can be facilitated by providing incentives from the institution or government for diffuserswho encourage others to adopt the innovation (Tanye, 2016).

Furthermore, Tanye specified some of the factors that Roger's DOI depends on. These are (Tanye, 2016)**:**

- Time: Time affects the rate of adoption. The rate becomes higher when adopters accept the model earlier.
- Social system**:** The social system composes of different units; some of them are decision leaders, and the others are change agents and aides. Therefore, some decisions are top-down with the authority coming from the top such as the government. The others are optional and collective. The desired innovation required a mixture of top-down and bottom-up decisions.
- Communication which affects the rate of innovation's adoption; local and global channels of communication are very effective in both the knowledge stage and the persuasion stage. They can play a main role in making the decision about adopting

the model, especially when the adopters are of similar education and socio-economic status.

Rogers' process for innovations diffusion requires the implementation of innovative models before committing to them. Implementation of instructional designs provides opportunities to practice the new model, reflect and develop it according to feedback from real learners and teachers, and with consideration of when, where, and how to apply the model in actual contexts. Without implementing the model, educators' work would be wasted (Eichler & McDonald, 2021).

Furthermore, Taylor tried to analyze the literature related to increasing the diffusion of innovation. As a result, the following critical actions for increasing the diffusion were summarized (Taylor, et al., 2018):

- Plan for the diffusion of innovation, for collecting pieces of evidence of the innovation's effectiveness and value, and for validating the innovation then publish all of that.
- Develop the innovations according to experts and target users' feedback, then involve adopters early in the innovation's development.
- Work with adopters to fit their needs in order to integrate the innovation into their current teaching practices.
- Focus the efforts on the receptive and early adopters in the beginning, then use the innovation's success stories to build the case for it.
- Support adopters during the implementation and use of the innovation. This can be done by conducting training and facilitating discussion. Moreover, the scale of the innovation requires community and institutional support.
- Try to reach out to diverse adopters from different communities as champions of the innovation; in order to spread their experiences with the innovation in their communities.
- Engage administrators and policymakers in adopting the innovation and include them in plans of work, evaluations, and development processs; in order to consider its value and assist the diffusion of innovation.
- Determine the resources needed for continuing large scaling and diffusion of the innovation.

The use of OER in education is considered an innovation. Therefore, the adoption of OER was investigated in higher institutions by Menzli and others (2022) based on Roger's DOI. The study gathered 422 responses from an online survey distributed to faculty members of 25 universities in Saudi Arabia. Results showed positive impacts of relative advantages, observability, and complexity on faculty OER adoption. However, the adoption rate of OER is still not high due to barriers such as lack of training on how to use OER and share them. Thus, the study recommended performing additional initiatives to persuade adopters of OER and overcome challenges related to the trialability, complexity, and compatibility of OER (Menzli, Smirani, Boulahia, & Hadjouni, 2022).

The GHOSHEH model is considered an initiative for adopting OER. It is the first model that focuses on adopting and creating OER within systematic activities. Thus, the GHOSHEH model is considered an innovation. Therefore, the adoption of the GHOSHEH model will be based on Roger's DOI. This requires the implementation of the model by teachers as real clients. This can be done within a training program based on the experiential theory that enables teachers to know the model, use it in training sessions, implement it in their classes, and make decisions.

Analysis of the literature shows the presence of several studies related to OER, teachers' competences, learning theories, and models for innovation. However, there is a gap in the studies that integrate models for creating innovation with OER and different learning theories. Besides, there is a need for models that enable learners to create innovative OER and share them. Such models are essential also to develop the teachers' training programs accordingly. So, this study aims to close the gap by providing a model for creating innovative OER based on the C2I model, the AAA model, and several strategies that enable learners to reflect, practice, and innovate. The study also will investigate the effectiveness of this model on teachers' global competences. Thus, it provides a tool for measuring teachers' global competences based on self-evaluation.

1.3 Definition of terms

1.3.1 Open Educational Resources- (OER)

OER were defined by UNESCO in 2002 as resources adapted by a community of users for different noncommercial purposes, these resources enable users to:

- Retain: Make one's own copy after downloading the original OER.
- Revise: Edit, adapt, and modifies the original OER.
- Remix: Create a new OER by revising or combining the original one with other materials.
- Reuse: Use the original or new remixed OER publicly.
- Redistribute: Share the original OER or new remixed one with others (Yamamoto, J. & Ananou, S. , 2015; Conole & Brown, 2018).

In 2019 UNESCO redefined OER as teaching, learning, and research materials located in the public domain in any format and medium under copyright released under an open license which permits free access, re-use, re-purpose, adaptation, and redistribution by others (UNESCO, 2019).

Recently, OER were defined as resources for teaching and research, that are provided under the Creative Commons (CC) licenses and can be used, shared, and modified freely (Menzli, Smirani, Boulahia, & Hadjouni, 2022).

In this study, OER is defined as online educational materials that are shared via the public domain freely under the creative commons (CC) licenses. These materials enable users to retain, revise, remix, reuse, and redistribute them.

1.3.2 Models for creating innovation

Innovation was defined by OECD (2014) as: “The implementation of a new significantly improved product (good or service) or process, a new marketing method, or a new organizational method in business practices, workplace or external relationships” (p. 22-23).

A model for creating innovation is defined as a specific type of instructional design model that includes systematic teaching and learning plan; to provide guidelines for teachers to organize the teaching and learning processes based on principles of creative

problem-solving that promote the creation of educational innovation (Seechaliao & Yurayat, 2021).

The researcher developed a specific model for creating innovative OER called the GHOSHEH model. This model depends on the principles of creative problem solving and the AAA instructional design model that involves three processes: Analysis, activities, and assessment. The GHOSHEH model for creating innovative OER composes of these processes:

- Analysis: The base of the model includes analysis of the content, learners' needs, resources, contexts, and time.
- Activities: the model's activities are organized hierarchically to assist learners in using OER and creating another innovative OER.
- Assessment: The model focuses on formative assessment followed by feedback.
- Peer sharing: The model encourages learners to share the created OER locally and globally. This process allows peers all over the world to repurpose the created OER and provide the learners with continuous feedback. Besides, it enables peers to follow the same activities of the GHOSHRH model; in order to develop the resulted OER or create other innovative ones. This provides opportunities for learners to communicate and cooperate with peers all over the world; to solve global problems.

1.3.3 Teachers' Global Competences (TGC's)

In general, a competence is defined as the ability to integrate the necessary knowledge, skills, attitudes, and values to manage a problem in a specific context effectively (TKCOM, 2018). And global competence is defined as the capacity to explore local, global, and intercultural concerns, identify views of others, involve in interchange with participants of different cultures, and take actions that have advantages (OECD/Asian Society, 2018). Thus, Global competence (GC) can be considered a combination of knowledge, skills, and attitudes required to understand, align with the globe, and be responsible for sustainable development. This can be translated into insights into the globe's dynamicity (Shetty, 2016).

Regarding teachers, the teachers' global competences TGCs are defined asknowledge, skills, attitudes, and values that reflect teachers' readiness to understand, interact effectively in a multicultural environment, and to take responsibility for cultural

diversity's respect. In order to be aware of the societal issues, and global nature, and to care about people in distant places (Byker & Putman, 2019; Orazbayeva, 2016). These competences are classified into professional competences, socio-cultural competences, personal competences, and Individual competences (Orazbayeva, 2016). In this study, TGC is defined as personal, individual, professional, and social-cultural competences. Teachers should gain such competences to know, think, believe, and practice globally in order to coordinate in solving global problems and building global knowledge with respect to the variety of cultures and perspectives.

1.4 Statement of the problem:

Combining the OER with ID models for creating innovation is expected to be the potential in increasing the efficiency of the educational programs in developing teachers' global competences. Despite that, there is a gap in the studies that provide evidence of the impact of such models on TGC. This is due to the lack of the presence of such ID models for creating innovation that combines OER with promising teaching strategies. This gap encouraged the researcher to develop a model for creating innovative OER. The model, which is called 'GHOSHEH', supports OER through multiple learner-centered strategies with authentic assessment and focuses on practice and reflection. The problem of this study is stated by adopting the GHOSHEH model for creating OER based on Rogers' process for the diffusion of innovations and investigating its effectiveness in developing Palestinian teachers' global competences.

1.5 Research Questions and Hypotheses:

The current study aims to answer the following questions:

1. What are the processes involved in the implementation of the GHOSHEH model for creating innovative OER?
2. What are the attributes of the GHOSHEH model regarding Rogers' process for diffusion of innovations?
3. To what extent do teachers and experts agree on the consistency of the attributes of the GHOSHEH Model with Roger's attributes for successful innovations?
4. How do teachers who applied the GHOSHEH model evaluate its effectiveness on their global competences?

In order to answer the fourth question, these null hypotheses will be tested:

1. There are no significant differences at ($\alpha \leq 0.05$) in the means of teachers' scores to the global competences' domain attributed to the GHOSHEH model.
2. There are no significant differences at ($\alpha \leq 0.05$) in the means of teachers' scores to the professional competences' domain attributed to the GHOSHEH model.
3. There are no significant differences at ($\alpha \leq 0.05$) in the means of teachers' scores to the social- cultural competences' domain attributed to the GHOSHEH model.
4. There are no significant differences at ($\alpha \leq 0.05$) in the means of teachers' scores to the individual competences' domain attributed to the GHOSHEH model.
5. There are no significant differences at ($\alpha \leq 0.05$) in the means of teachers' scores to the personal competences' domain attributed to the GHOSHEH model.
6. There are no significant differences at ($\alpha \leq 0.05$) in the means of teachers' scores to the global competences' domain attributed to gender.

1.6 Objectives of the study

The main objective of this study is to develop a model for creating innovative OER and explore its effectiveness in developing teachers' global competences. This can be done by achieving the following objectives:

- Developing a model for creating innovative OER based on multiple educational theories.
- Adopting the model based on Roger's process for the diffusion of innovation.
- Investigating the effectiveness of the GHOSHEH model on each domain of teachers' global competences (professional, individual, personal, and individual competences).

1.7 Significance of the study

Within globalization, it is useless to prepare learners the same as before. Today's learners need to gain global competences. This can be done by engaging them actively in learning and providing opportunities for them to reflect, think critically, and apply learning to conceptualize solutions for local and global problems, express their ideas, consider the ideas of others, and collaborate with various learners from different backgrounds and cultures (OECD/Asian Society, 2018; Shetty, 2016).

Simply, the new generation should manage and take responsibility to solve the challenges outlined in the sustainable development goals (SDGs) by 2030. This can be done if they developed the global competence that is necessary for employing in the global economy, living cooperatively in multicultural communities, communicating and learning effectively with new media, and achieving sustainable development goals.

Fostering students' global competences requires investing in teachers' professional development programs to make them much more systematic in integrating global competences into the core of teachers' educational practice (OECD/Asian Society, 2018). Teachers' words, attitudes, and practices influence students directly. Hence, it is essential to pay more attention to the professional development of teachers; in order to empower them and groom learners for the future (Shetty, 2016).

The current study focuses on developing teachers' global competences by providing a model for creating innovative OER and investigating its effectiveness on teachers' global competences. The study is the first one that aims at introducing such a model for creating OER innovatively. This will be done by developing a training program based on this model that integrates OER with several strategies, and order them in a way that enables teachers as trainees(learners) to create innovative OER and then share them globally. Teachers also will communicate with other teachers and educators all over the world who will provide feedback and more innovative ideas. This in its role will assist sustainability, and encourage teachers to develop what others produced; so that people all over the world will cooperate in producing knowledge, innovations, and solving global problems. Furthermore, the study includes the development of a training program that will enable teachers to practice the GHOSHEH model in their classes. Teachers will assist students to develop new OER, share them globally, and contribute to producing knowledge and innovations for the digital world.

Such a model deserves to be validated and evaluated; in order to provide shreds of evidence that enable educators to make decisions related to adopting the model for developing teachers' global competences.Therefore, the study is expected to support policies related to the professional development of both educators and teachers.

The study deals with teachers as change agents and focuses on teachers' global competences that are essential to assist students to become global citizens and deal with

different problems. This can be done when students create innovations that reflect and reshape the world. It will also provide an instrument that enables teachers to self-evaluate their global competences. Teachers will practice this instrument by evaluating their global competences before and after the training on how to implement the GHOSHEH model.

The study can constitute a theoretical framework for researchers to investigate the effect of different models for creating innovation on teachers' global competences. In addition, it can stimulate researchers to investigate the role of such training in developing teachers' open practices and compare the effectiveness of the GHOSHEH model on different variables related to the educational system with that of other models or approaches.

The significance of this study will be more observable through reading the next chapters which will provide more details about the GHOSHEH model. Besides, the next chapters will shed light on the development, validation, and implementation of the GHOSHEH model within teachers' educational programs and with students in different levels.

1.8 Summary

This chapter presented some indicators for the need to develop teachers' global competences through effective teachers' educational programs. It also proposed to benefit from the impacts of the OER that promise to provide global experiences for teachers without leaving their homelands. Despite that, the OER faces some challenges related to the need for an instructional design model for adopting and creating OER. Thus, the chapter proposed an initiative created by the researcher which is the GHOSHEH model for creating innovative OER. The chapter introduced the theoretical foundation of the model which is rooted in multiple theories including constructive, hierarchical, sociocultural, experiential, and connectivism theories. Besides, it provided details on how the GHOSHEH model incorporates OER with some learner-centered strategies that enable learners to practice, reflect on their practices, solve problems, create innovative OER, and share them globally.

Furthermore, this chapter describes a process for adopting the GHOSHEH model which is considered an innovation. The process for diffusion of innovation (DOI) was

developed by Rogers who also determined the attributes of the successful innovations. This process will be followed in order to adopt the GHOSHEH model.

Based on the literature review and the gap caused by lacking a model for creating innovative OER, the problem of the study was stated within this chapter. This problem is determined by adopting the GHOSHEH model for creating innovative OER and investigating the effectiveness of this model on the teachers' global competences. The chapter imposed four questions and five hypotheses related to the problem of the study. These questions will be answered within the next chapters.

The second chapter includes more details about the GHOSHEH model and the tools that were used for collecting data; to answer the questions and test the hypotheses.

Chapter Two

Study Methodology

The current study aims at adopting the GHOSHEH model for creating innovative OER and exploring its effectiveness in developing teachers' global competences. This chapter provides more details about the GHOSHEH model as its development and validation. Moreover, the chapter describes the specific design of this study. This design was selected to provide pieces of evidence related to adopting the GHOSHEH model and investigating its effectiveness on teachers' global competences. Furthermore, the chapter provides details on the development of the study's instruments and their reliability, validity, and trustworthiness. In addition, it describes the procedures of the study, the analysis plan, and the ethical issues.

2.1 Design of the study

The current study utilizes a mixed-methods research design that includes the application of quantitative and qualitative approaches by incorporating quantitative statistical results with qualitative ones in order to provide a better understanding of findings (Creswell, 2012) Therefore, data collection depends on several qualitative and quantitative sources

Actually, the study follows a specific design of mixed method which is a convergent parallel design. This design depends on the simultaneous collection of both qualitative and quantitative data. Through this design, the researcher gathers both qualitative and quantitative data, analyzes them separately, compares results from both analysis and interprets results separately benefiting from the support or contradiction of results. By this design, qualitative and quantitative data are considered approximately equal in importance. Thus, they are merged and used to understand the problem of the research. The existence of various sources for data is expected to provide a deep understanding of the results (Demir & Pismek, 2018; Creswell, 2012). As a result, the study followed these approaches:

The quantitative approach: The quantitative approach of this study followed the Quasi-experimental design; because a group of participants was assigned on purpose. Thus, the selection of participants was not random; due to the required characteristics of

the participants that enable them to participate in the experiment (training on how to implement the GHOSHEH model). This is besides their agreement to participate in the study. Particularly, the design is considered as a within-group Quasi-experimental design or crossover design; because only one group is assigned in the experiment of the study, and comparison is made among the same participants before and after treatment (Creswell, 2012; Shadish, Cook, & Campbell, 2002). The study also includes a pre-test and post -test. On one hand, the pre-test depends on a questionnaire to measure the teachers' global competences(TGC) for participants in the experiment before they receive the treatment(A training on how to implement the GHOSHEH model). On the other hand, the post- test depends on the same questionnaire that was given to participants after the treatment; to take another reading of the TGC after training teachers to implement the GHOSHEH model.

Besides, the quantitative approach of this study follows a cross-sectional survey design. This design was selected due to its advantages which include fast realization and low cost (Raimundo, Echeimberg1, & Leone, 2018). There are a lot of uses for a cross-sectional study, one of them is collecting data by questionnaires to examine the current perspectives, beliefs, attitudes, opinions, or practices of participants (Creswell, 2012). At a point in time, this study aims to evaluate the GHOSHEH model, regarding Roger's attributes, from teachers' and experts' perspectives. Thus, it is also depending on. cross-sectional survey design.

The qualitative approach: The qualitative approach of this study depends on the interviews of focus groups to collect shared understanding from individuals and get views from specific participants; in order to generate ideas that promote the development of the studied issues (Creswell, 2012; Rosanna , 2006). The focus groups enabled the researcher to collect qualitative data about the GHOSHEH model from teachers who implemented the model. In addition, the study depended on the focus groups for validation of the model by what is called experts' views.

Furthermore, the qualitative approach of this study was achieved by a descriptive case study for the implementation of the model in teaching math; this is because the case study allows the exploration and understanding of how issues work, which promotes in-depth explanation (Zainal, 2007). And that is sought in the case of implementing the

GHOSHEH model when the case study described in-depth a teacher's implementation of the processes of the GHOSHEH model and the outcomes.

2.2 Study population

The population of this study is composed of 493 Palestinian teachers (217 males, 276 females) who enrolled in an educational program conducted by the National Institute for Educational Training. Besides, the population is composed of 85 experts of education from Palestine, Jordan, Saudi Arabia, Egypt, Oman, Kuwait, UAE, Iraq, Egypt, and Yemen. Those experts participated either in a conference where the GHOSHEH model was presented by the researcher, or in conducting the training for teachers on implementing the GHOSHEH model.

2.3 Study sample

The study was implemented on an intentional and purposive sampleof (347) Palestinian teachers from those who enrolled in a training program at the National Institute for Educational Training (NIET) in Palestine, and agreed to participate in the study. In addition, the sample is composed of 37 experts from Palestine, Jordan, Saudi Arabia, Egypt, Oman, Kuwait, UAE, Iraq, and Yemen, who agreed to participate in the study. The total number of participants in the sample was 384 teachers and experts. Data was collected using different instruments, each instrument was implemented on part of the whole sample. At the same time, there were intersections between the samples because the same teachers who implemented the model responded to more than one instrument as follows:

1. The sample responded to the first questionnaire (Adopting the GHOSHEH model questionnaire): The sample responded to Adopting the GHOSHEH model's questionnaire composed of 345 teachers and 37 experts who accepted to respond to the first instrument (Adopting GHOSHEH model questionnaire). The characteristics of this sample are shown in Appendix (D).
2. The sample of the second questionnaire (Self-evaluation questionnaire of TGC): The sample of theself-evaluation questionnaire of TGC is composed of 285 teachers who accepted to respond to the self-evaluation questionnaire (These teachers were included also in the sample (1) because they respondedto Adopting

the GHOSHEH model's questionnaire). The characteristics of this sample are shown in Appendix (D).

3. The sample of the focus group: The sample of the four focus groups composed of 24 teachers who accepted to participate in any of the 4 focus groups that evaluated the model attributes and its effectiveness on the TGC (These teachers were included also in the sample (1) because they responded to Adopting the GHOSHEH model's questionnaire). Characteristics of this sample are shown in Appendix (D).
4. The sample of the case study:This sample includes 2 participants; a teacher and an expert who facilitated the training of the teacher on implementing the GHOSHEH model. The teacher (Female) was teaching juniors (in the 8th grade) math and has 17 years of professional experience in teaching math. She works in a public school in Salfit town in Palestine. She was enrolled in an educational training program conducted in 2021/2022, where she was trained to implement the GHOSHEH model for creating innovative OER. The expert (Female) has more than 25 years' experience in teaching and leadership and 3 years' experience in training teachers and educators. She read the training material by herself, and discussed some issues with the researcher to ensure her readiness to train teachers on implementing the GHOSHEH model. The expert facilitated training on implementing the GHOSHEH model and followed the implementation up. Therefore, she followed the teacher's implementation of the model and was ready to describe her observation.

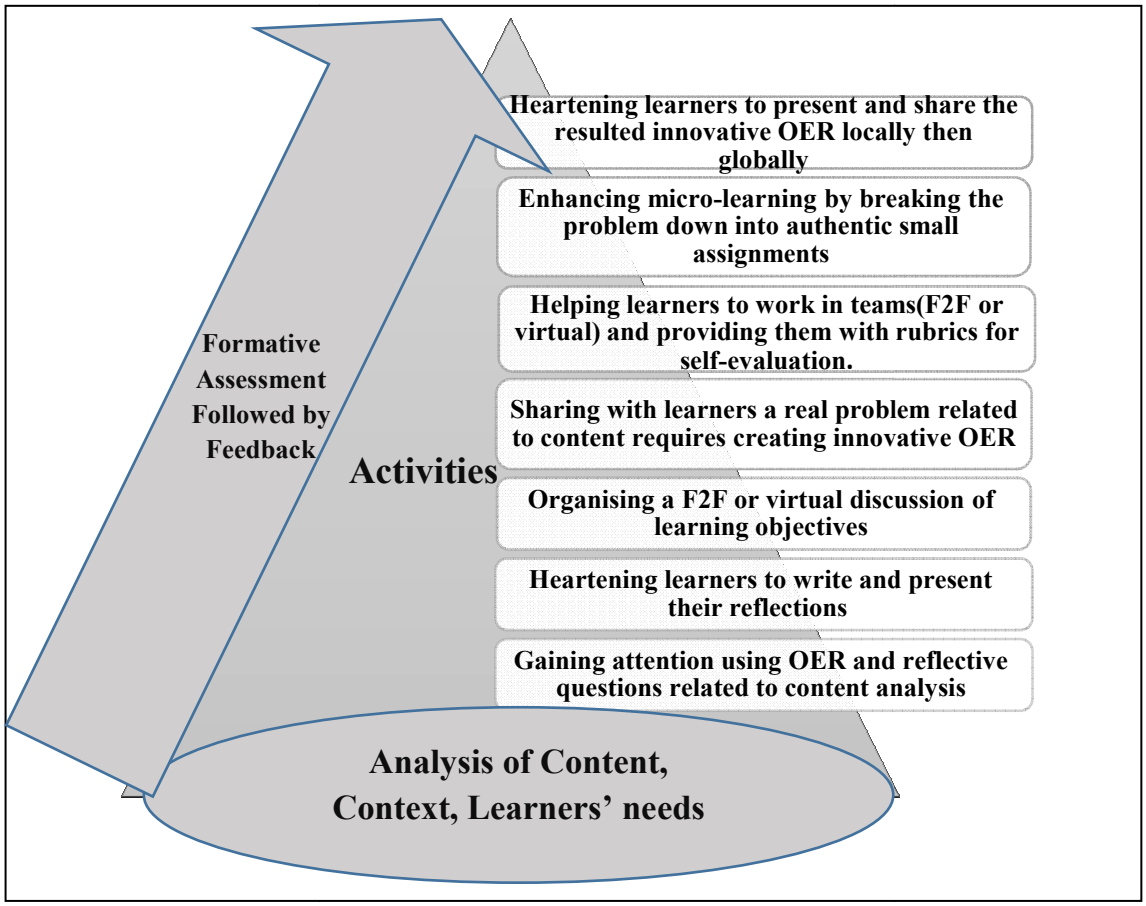
2.4 Study instruments

2.4.1 The GHOSHEH model for creating innovative OER

The main instrument of this study is the GHOSHEH model for creating innovative OER. The idea of this model was initiated by the researcher in 2021 when the first version of the model was developed as shown in Figure (4).

Figure (4)

The first version of the GHOSHEH model



The model in Figure (4) was presented to experts in order to be developed according to their feedback and to conduct internal validating of the model based on the experts' reviews. This is because the impact of the ID models is based on their validity. ID model validation has been viewed as either internal or external. The role of internal validation is to confirm the components and processes of a proposed model. This type of validation could be considered a formative evaluation. Internal validation of ID models could be tested by a process called experts' reviews, where experts critique the proposed model in terms of its structure, components, and use. Moreover, internal validity can be tested using another approach called usability documentation which involves systematic documentation of the model's implementation procedures, time, resources, and challenges. This can be described within a case study. External validation focuses on the impact of the proposed model's products and is mostly tested by field evaluation during the implementation process (Richey, R.C., 2005).

The internal validation was conducted after the initial model's development. This validation focused on verifying the components and processes proposed in the GHOSHEH model. Internal validation was accomplished using national and international experts' reviews. Two panels of experts reviewed the model. The first one is a national panel that consisted of 6 Palestinian experts. While the second one is an international panel that involved 10 international experts (from the United States, China, Spain, India, Sweden, Jordan, Algeria, and Egypt). All the experts (who are named in Appendix B) were selected due to their specific backgrounds and specialty in open education, ID, OER, and teacher training. Eight experts are educators in international universities (Delaware, Suqian, Columbia Quindío, UNIR, Wawasan Open University, Al-Aqsa University, Amman Arab University, and Nour Bachir University Centre). Two experts are independent educational consultants who have experience in the Palestinian context. The other four experts are trainers of teachers who work at the National Institute for Educational Training (NIET) in Palestine. All the participants are researchers; six of them conducted research in the area of ID, five in the area of open education and OER, and the others in general areas of teaching and learning. In addition to the expert reviews, this study includes a case study that provides systematic documentation of the GHOSHEH model implementation which ensures the internal validation done by experts' reviews.

The second version of the GHOSHEH model was developed in 2022 according to the experts' review as shown in Figure (5).

Figure (5)

The developed version of the GHOSHEH model

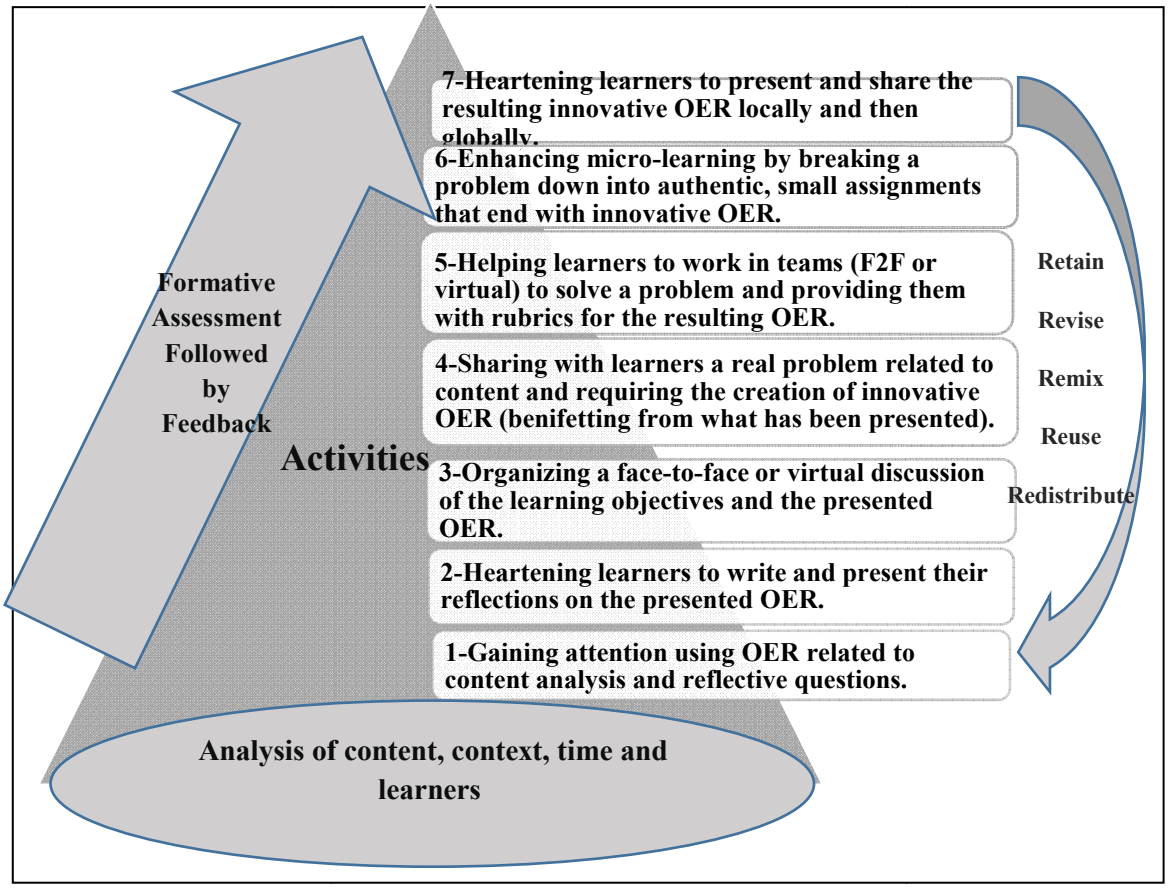


Figure (5) shows that the base of the GHOSHEH model includes the analysis process which is conducted before designing activities; so that the results of the analysis are considered when conducting the activities. The analysis process includes some of the same elements of the first version of the GHOSHEH model shown in Figure (4) which are: analysis of content, learners' needs, context, and time. In addition, the developed version in Figure (5) focuses on determining the educational objectives and selecting appropriate OER that will be done by the teacher before conducting activities. This in turn will assist teachers to select the most appropriate reflective questions to the selected OER which helps to achieve objectives. Besides, these elements help teachers during the development of a related problem to both the selected OER and the determined teaching objectives.

Regarding the differences in the activities of the first version of the model and the second one. The same activities were included in the developed version, and arranged hierarchically likewise version (1); each activity is required for the next one. However,

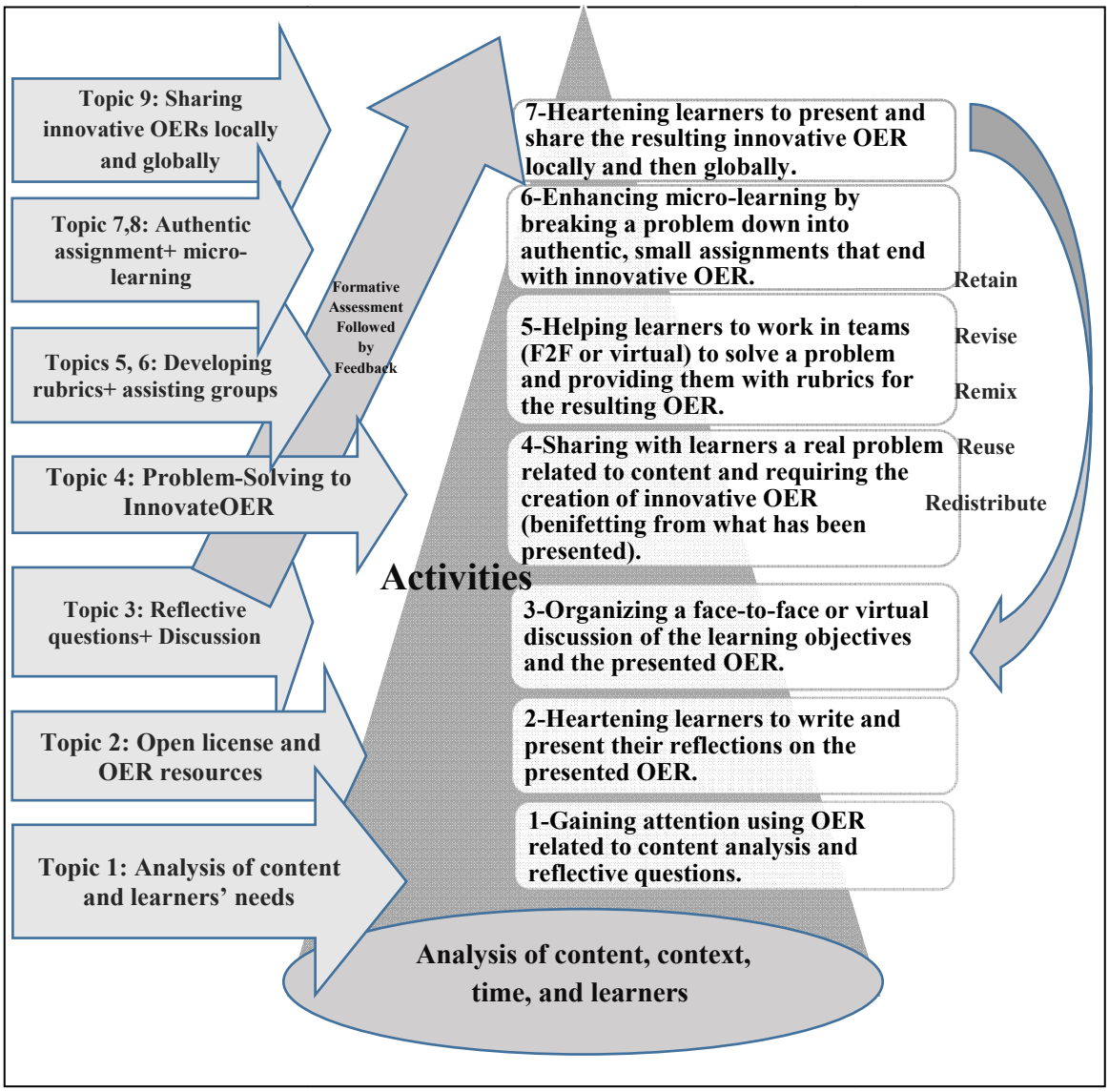
the activities in the developed version (Figure 5) were numbered; to guide users on where to start. Moreover, the activities were specified more in the developed version. Assessment in both versions is formative, continuous in line with activities and followed by feedback. Nevertheless, in the developed version (Figure 5) the assessment arrow starts from the third activity, after organizing a discussion of the learning objectives and the presented OER. The experts recommended starting the assessment arrow from the third activity; because the first and second activities focus on introducing the content, engaging students in learning, and allowing them to reflect. Thus, assessing new learning and providing feedback at these stages is unnecessary. Another arrow was added to the developed model. This arrow follows the final activity, including sharing the new OER locally and globally. The arrow describes the process of peer sharing. Besides it points to the sustainability of the process of creating innovative OER based on the resulted OER from the model. Peer sharing aims to engage peers in retaining, revising, remixing, reusing, or redistributing the created OER. In this way, the OER will be repurposed another time by other learners to build on the knowledge of the learners who created the first OER and accumulate experiences. All these changes became as a result of experts' reviews of the first version of the GHOSHEH model.

2.4.2 The training program for implementing the GHOSHEH model:

After assigning the teachers who were expected to participate in the study, the researcher started to determine their needs in order to develop the training package. She found that teachers who enrolled in a training program conducted by NIET, have finished the training on analysis of content and learners' needs, reflective questions, problem-solving, developing rubrics, and authentic assignments. These concepts and skills are considered prerequisites for implementing the GHOSHEH model. Actually, these topics were parts of the main ones that should be included in any training for implementing the GHOSHEH model as described in Figure (6).

Figure (6)

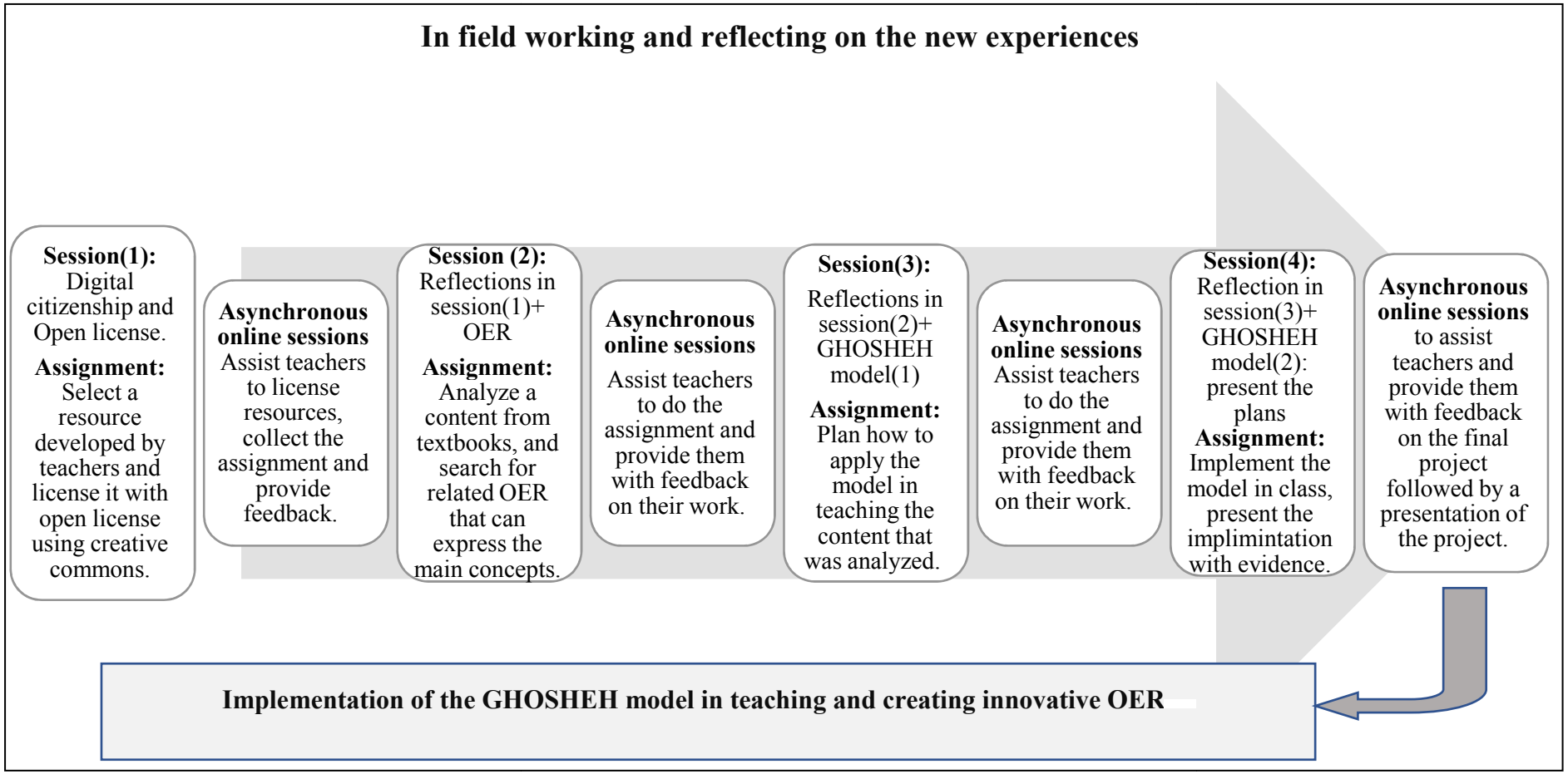
Main topics of the training material on implementing the GHOSHEH model



The developed training program covered the topics in Figure (6) in 40 training hours. The program is composed of weekly synchronic online sessions. Each session ended with a small assignment related to implementing a part of the GHOSHEH model with students. These small assignments were considered parts of the final project which focused on implementing the GHOSHEH model in the class, creating OER with learners, sharing the created OER, and collecting evidence on the effectiveness of that on students' performances and skills. In addition to that, there were asynchronous online sessions to assist teachers' understanding the assignments and projects. The structure of the training program is shown in Figure (7).

Figure (7)

The Structure of the training program for implementing the GHOSHEH model



As shown in Figure (7), the training program depended on practice and reflection on the practice, this is to follow the experiential learning that allows teachers to practice the GHOSHEH model during the training and reflect on their practices. Teachers were provided with continuous assistance and feedback from the facilitators of the training program.

Based on the approach in Figure (7), the training material was developed to cover the topics of the GHOSHEH model that were not covered before. The outline of the training material is shown in Appendix (E). To validate the training material, the researcher discussed the first draft of the training material with 15 experts in the teacher educational programs (As shown in Appendix (F)). The training material was developed according to the experts' feedback. The same experts accepted to be trained by the researcher on how to train teachers to implement. the GHOSHEH model. After that, they conducted the training for teachers according to a schedule developed by the researcher for the training (As shown in Appendix (F)).

Furthermore, triangulation of data was achieved by using the next instruments to facilitate the interpretation of results and enhance the deep understanding.

2.4.3 Adopting the GHOSHEH model's questionnaire

The first questionnaire in this study is called " Adopting the GHOSHEH model's questionnaire" as shown in Appendix (G). The questionnaire was developed by the researcher (in the Arabic language) based on the literature review; for evaluating the model from teachers' and experts' perceptions based on Roger's five attributes for successful models (Relative advantage, compatibility, complexity, trialability, and observability). The questionnaire composes of three sections: The first section includes demographic questions related to state, gender, profession, educational qualification, specialization, and experience. The second part includes (30) items to evaluate the model. These items are classified into five domains that reflect Roger's five attributes for successful innovation. Each item was given a weight to estimate the degree of agreement or disagreement, according to Likert's five-point scale, so that (5) indicates strong agreement, (4) indicates agreement, (3) indicates neutral, (2) indicates disagreement, and (1) indicates strong disagreement. In order to interpret the results of the questionnaire, the following equation was used:

The interval width= (the largest value - the lowest value) ÷ the number of variants of the scale.

By applying the above equation, the interval width was found as follows:

Interval Width= (1-5) ÷ 5 = 0.80

Thus, the interpretation of the weighted arithmetic mean of the participants' agreements is:

- (4.20 - 5.00): Very high
- (3.40 - 4.19): High
- (2.60 - 3.39): Moderate
- (1.80 - 2.59): Low
- (Less than 1.80): Very low

The third section included an open question about the participants' suggestions to develop the model.

2.4.4 A questionnaire for self-evaluation of TGC

The second questionnaire in this study is called "A questionnaire for self-evaluation of TGC". This questionnaire was developed by the researcher based on the analysis of literature and alignment of results to the Palestinian context. The questionnaire was developed (in the Arabic language) to be used by teachers in order to evaluate their global competences before and after implementing the GHOSHEH model. It consists of two sections: The first section includes personal questions related to gender, district, educational qualification, specialization, and experience. The second one includes (71) items to evaluate TGC. These items are classified under four domains that are: Professional competences, Socio-cultural competences, Individual competences, and Personal competences. Each item was given a weight to estimate the degree of agreement or disagreement, according to Likert's five-point scale, so that (1) indicates that one does not achieve the competency, (2) rarely achieves the competency (3) neutral, (4) achieves the competency, (5) achieves the competency consistently. In order to interpret the results of the questionnaire, the same interpretation of the weighted arithmetic means for the questionnaire of adopting the GHOSHEH model was used. The questionnaire for self-evaluation of TGC is shown in (appendix (H)), and used as a pre-

and post-questionnaire to compare the responses of teachers before and after the intervention.

The questionnaire was sent via Microsoft Forms Link for teachers who enrolled in the training program on implementing the GHOSHEH model and agreed to respond to the questionnaire.

2.4.5 The Focus groups

According to Creswell, the focus group enables researchers to get a shared understanding of the studied issue, and views of specific people (Creswell, 2012). Therefore, the researcher selected the focus group to collect adequate data for investigating the attributes of the GHOSHEH model, and its role in developing teachers' global competencies. Four focus groups interviews were conducted with teachers who were teaching different levels, subjects. They were with different specializations, experiences, qualifications, and gender, and they were working in different districts. These teachers were trained on how to implement the GHOSHEH model, then applied the model within the training program, and agreed to participate in the focus group.

In order to conduct the focus group well, it should follow a protocol designed by the researcher. This protocol includes instructions for the process of the focus group interview (Creswell, 2012) the focus group's protocol which was designed and followed by the researcher is shown in Appendix (I).

The researcher conducted the focus groups by herself with a non-participant observer who assisted in the moderation of each focus group. She sent requests for teachers who implemented the GHOSHEH model in different districts; to participate in an online focus group for 90-120 min. Then she informed teachers who accepted to participate about the objective of the focus group, the study, and the required data for investigating the attributes of the GHOSHEH model, and its role in developing global competencies for teachers. After that, she conducted the 4 focus groups with teachers at different times and asked them to answer the questions freely according to their vision of the topic.

The researcher followed the approach of the semi-structured interview. Thus, she asked the scheduled open questions and added other questions when needed. Besides, she

asked the participants for permission to record the focus group's discussion. This is in addition to taking notes on the key themes during the discussion. The researcher encouraged teachers not to hesitate to ask for clarification of any question; in order to remove confusion and enable them to answer questions clearly. Furthermore, the researcher confirmed that the collected data would be used only for the research issues, and would be analyzed and written up without the identification of any individual; so that the quotation will be anonymous.

A double-blind privacy protocol was followed to confirm that data will be treated with complete confidence. This was done by saving data in a file on the researcher's personal computer, and on her cloud, which was secured so that no one can access it. This was to maintain privacy and guarantee the anonymity of the participants. Thus, there were two data files; the first one is considered as a key file which included names and the ID number assigned to every name. The second file included the transcripts of the focus groups where the names were not visible, but just the ID numbers. These two files were stored in different places.

The researcher provided the participants with her contact details; to get in touch. After that, she sent the written data (Transcripts) to the participants in order to confirm or delete or modify their responses if needed. This also allowed her to communicate with the participants, when needed, to clarify some information. Moreover, she confirmed the participants' rights to withdraw from the research at any time and not to answer any questions.

The focus group's questions were divided into two sections; the first section included questions related to the background of the participants such as name, specialist, professional experience, and school. While the second section included 9 open questions related to the teachers' evaluation of the GHOSHEH ID model and its effectiveness on their competences. The questions are shown in Appendix (I).

2.4.6 A descriptive case study

A descriptive case study provides opportunities for the researcher to study the phenomena and describe them within their contexts using a variety of data sources. The case study is considered a valuable method to evaluate an approach when it is applied correctly in the context (Baxter & Jack, 2010). The current study includes a descriptive

case study that describes the implementation of the GHOSHEH model by a math teacher. Data from the case study were collected from multiple sources including a deep interview with the math teacher who implement the model, in addition to a deep interview with the trainer of the teacher and the observation of the teacher's work by the researcher.

2.5 Validity and Reliability of the Questionnaires

2.5.1 Validity of the questionnaires

To maintain validity for the quantitative instruments, the following types of validity were demonstrated for both questionnaires:

- Face validity: The apparent validity of both questionnaires (the validity of the arbitrators) was examined by presenting the questionnaires to five educational experts (as shown in Appendix G) Each of them has a PhD in a field of education and 8-12 years' experience in teachers training. This is in addition to their experiences in instructional design). Arbitrators' recommendations were taken into consideration, and the researcher modified the questionnaires accordingly.
- Construct validity:Construct validity was established by applying factor analysis for each of the two questionnaires.

For the "adopting GHOSHEH model's questionnaire", the factor analysis was done after verifying the appropriateness of the data for the factorial validity by implementing the KMO & Bartlett's test, where the chi-square value was (6343.3) and this value was statistically significant at the level of significance (0.000) and at a degree of freedom (435). This means that the data is capable of factor analysis. Accordingly, the factor analysis was performed using the principal components method and rotating the factors orthogonally in a way that maximizes the variance attributed to Kaiser in order to assume the independence of factors. After the factorial analysis, the Kaiser criterion was adopted, depending if Eigenvalue equates to or is more than one, bearing in mind that the loadings of items are not less than (0.03), taking into account that the saturation of expressions is not less than (0.03). The factor is not approved with less than 3 loaded items, as well as the Cattell criterion which is based on the graphical method; Figure (8) shows the graph for determining the factors

Figure (8)

The number of factors of the "adopting the GHOSHEH model's questionnaire"

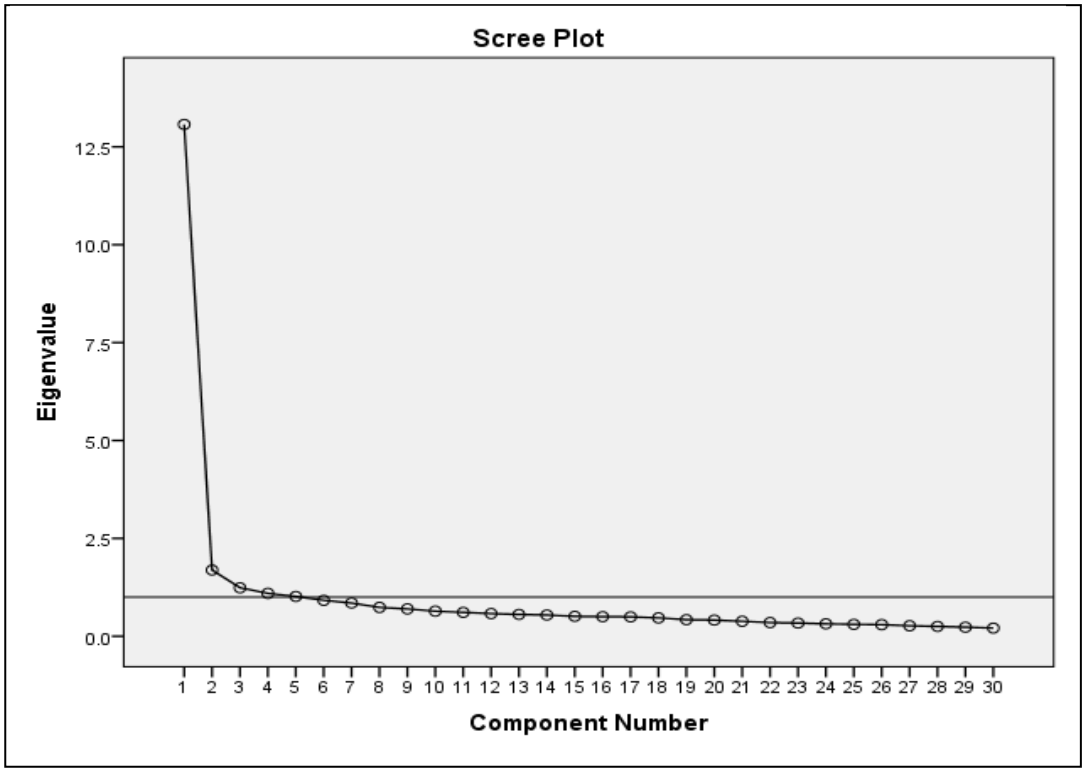


Figure (8) shows that the factorial analysis resulted in five Eigenvalues of more than 1, and these factors explained %60.38 of the total variance. No item was deleted as a result of the factorial analysis as the number of items was 30 distributed into 5 domains according to the factor analysis.

The same was done for the questionnaire on self-evaluation of teachers' global competences. The factor analysis was done after verifying the appropriateness of the data for the factorial validity by implementing the KMO & Bartlett's test, where the chi-square value was (11888.2) and this value was statistically significant at the level of significance (0.000) and at a degree of freedom (2485) which means that the data is capable of factor analysis, and accordingly the factor analysis was performed using the principal components method and rotating the factors orthogonally in a way that maximizes the variance attributed to Kaiser to assume the independence of factors. After the factorial analysis, the Kaiser criterion was adopted, depending if Eigenvalue equates to or is more than 1.7, bearing in mind that the loadings of items are not less than (0. 3), taking into account that the saturation of expressions is not less than (0. 3). The factor is not approved with less than 3 loaded items, as well as the Cattell criterion

which is based on the graphical method; Figure (9) shows the graph for determining the factors.

Figure (9)

The number of factors of the self evaluation of TGC questionnaire

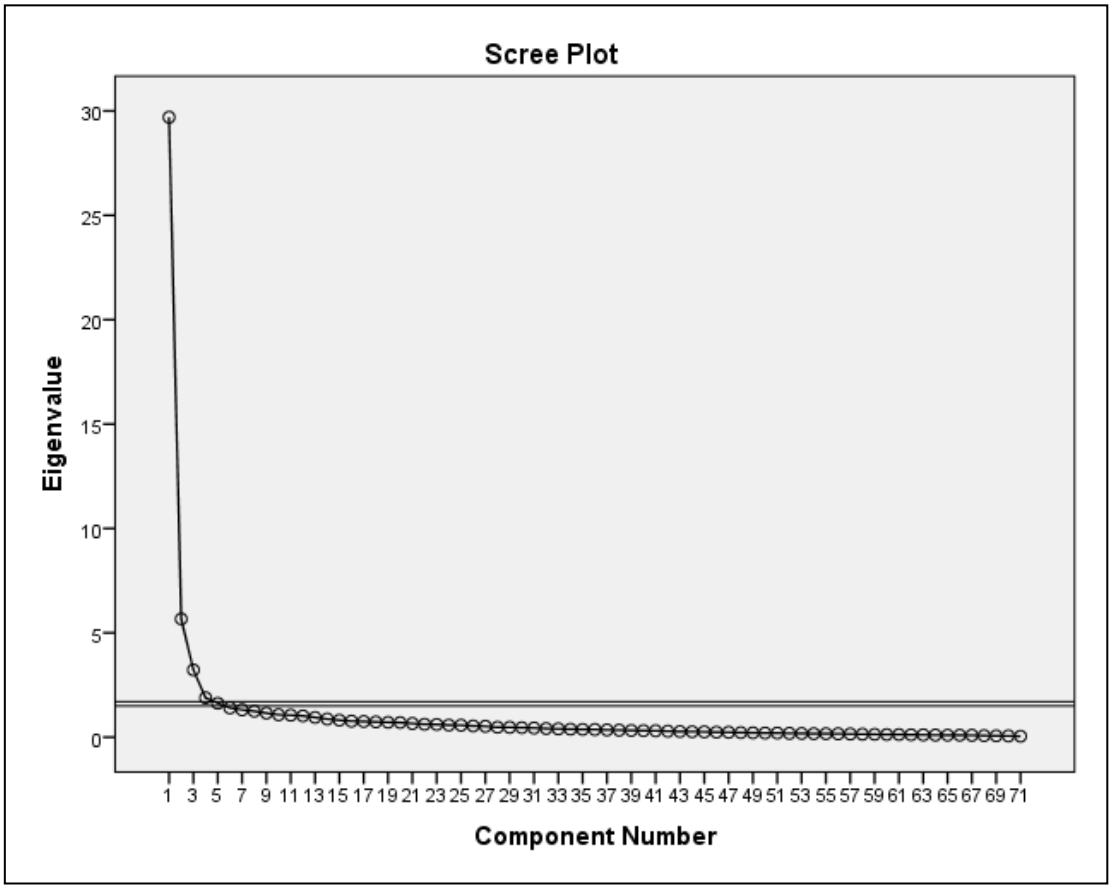


Figure (9) reveals that the factor analysis resulted in four Eigenvalues of more than 1.7, and these factors explained %57.00 of the total variance. No item was deleted as a result of the factorial analysis as the number of items was 71 distributed into 4 domains according to the factor analysis.

2.5.2 Reliability of questionnaires

The reliability of each questionnaire was checked by testing the following:

The internal consistency of the questionnaires

Both questionnaires were piloted on a sample of teachers. After that, the reliability of each of the two questionnaires was examined by calculating the Pearson correlation coefficient between the degrees of each of the different domains and the total degree ((Verma & Abdel-Salam, 2019). Table (2) shows the values of the correlation

coefficients within each domain score and the whole scale of the questionnaire for adopting the GHOSHEH model.

Table (2)

Values of the correlation coefficient with each domain score and the whole scale of the "adopting the GHOSHEH models' questionnaire"

Domain	observability	Trialability	Complexity	Compatibility	Relative advantage
The correlation coefficient with the overall score	0.851**	0.909**	0.874**	0.870**	0.849**

Note: ** means statistically significant at 0.01

Table (2) reveals that values of the correlation coefficients within the five domains of the questionnaire in the overall degree were high and statistically significant at a significance level of 0.01. This indicates a high degree of internal consistency within these five domains and the overall score of the scale.

The same was done to examine the internal validity of self-evaluation of teachers' global competences. Values of the correlation coefficients within each domain score and the whole scale of this questionnaire are shown in Table (3):

Table (3)

Values of the correlation coefficient within each domain score and the whole scale of the self-evaluation questionnaire for TGC

Domain	Professional competences	Sociocultural competences	Individual competences	Personal competences
The correlation coefficient with the overall score	0.851**	0.928**	0.930**	0.879**

Note: ** means statistically significant at 0.01

Table (3) shows that values of the correlation coefficients within the four domains of the questionnaire in the overall degree were high and statistically significant at a significance level of 0.01. This indicates a high degree of internal consistency within these four domains and the overall score of the scale.

Alpha-Cronbach scale**:** To verify the reliability of the questionnaires, the Alpha-Cronbach scale was calculated for each questionnaire. It was found that Alpha-Cronbach for the "adopting the GHOSHEH model's questionnaire" equals 0.949. While

the Alpha-Cronbach for the questionnaire of self-evaluation of teachers' global competences equals 0.979. Each value indicates very high reliability.

2.6 Trustworthiness of the qualitative instruments

Trustworthiness of the qualitative approach is achieved by providing details that make data generation and management transparent and explicit. This can be done when the researcher maintains credibility (truth value or internal validity), applicability (the criterion for evaluating external validity by maintaining transferability of the research findings), and consistency (dependability of the results and the criterion for assessing reliability) (Hammarberg, Kirkman, & de Lacey, 2016).

Trustworthiness of the focus group

1. Credibility: To promote credibility, the following procedures were followed:

- Focus groups' questions were judged by three experts in education and modified according to their recommendations.
- A pilot focus group was conducted online using Microsoft Teams on May 2022 with 10 teachers who teach math, and the questions were modified according to the responses of teachers involved in the focus group. Accordingly, one question was deleted and other branches of a question were combined. In addition, it was found that the number of participants should not exceed seven teachers; to maintain the interaction of all participants and to prevent waiting for a long time to answer the question since the focus group was conducted online.
- Four focus groups were conducted at different times with different participants to achieve triangulation by collecting data at different times and from different participants.
- Written transcripts were sent to the participants to read them and agree or disagree that the written data expressed their words. Participants sent their written agreement online.

2. Dependability: To promote dependability these procedures were followed:

- Data was recorded using the record of Microsoft Teams, in addition to the record of the mobile after taking the permission of participants. The same data was written at the same time.

- Data was collected from 4 focus groups and coding was done for each focus group alone ata specific time, then a comparison was done for themes and subthemes resulting from the analysis of each focus group.

3. Applicability: To promote applicability, saturation of data was established through collecting data in different times and contexts. In addition, saturation was achieved in the analysis of data, where the number of responses to each theme and sub-theme was determined and shown in the analysis. Besides, Direct written quotes were incorporated from participants in this manuscript to establish transferability.

Trustworthiness of the case study

To enhance the case study's trustworthiness, the researcher provided enough details to assess the validity or credibility of the work. The research depended on the triangulation of data sources (Data was collected from interviews with the teacher, and the trainer, and observation of the teacher's work); to explore the results of implementation of the GHOSHEH model from multiple perspectives. A comparison of the data was done by the researcher to confirm findings as described in (Baxter & Jack, 2010).

To promote the consistency of the findings and the dependability of the data, the researcher implemented a process of double coding. Data were coded by the researcher for the first time in May 2022 and after months the researcher returned to the data, and coded them again and compared the results.

2.7 Study variables

Independent variables

The main independent variable is the GHOSHEH model for creating Innovative OER. This variable has two levels the first is before implementing the model and the second is after implementing the model.

Dependent variables

- Teachers' global competences
- Teachers' professional competences
- Teachers' socio-cultural competences
- Teachers' individual competences
- Teachers' personal competences

2.8 Procedures of the Study

The study followed these procedures:

- Developing the GHOSHEH model and validating it from experts' views.
- Developing the training material for teachers to implement the GHOSHEH model, discussing it with experts in teachers' training, and validating the material from trainers' views then modifying it according to recommendations of training experts.
- Developing the research instruments and examining their validity.
- Applying for permission to conduct the study through the approval process adopted by the Ministry of Education (MOE) and the permission is shown in (Appendix A).
- Conducting a training by 15 trainers on implementing the GHOSHEH model for teachers enrolled in an educational program in NIET according to the schedule in Appendix (E).
- Conducting workshops on how to implement the GHOSHEH model for some teachers of private schools.
- Presenting the model at a conference for experts from Palestine, Jordan, Palestine, Jordan, Saudi Arabia, Egypt, Oman, Kuwait, UAE, Iraq, Egypt, and Yemen states and asking them to evaluate the model.
- Piloting the questionnaire on a small group of teachers (25-26) and establishing the internal validity and reliability of questionnaires.
- Assigning a sample from teachers and experts who agreed to participate in the study.
- Providing the sample of teachers and experts with the questionnaire for adopting the GHOSHEH model and asking them to respond online.
- Providing the sample of teachers (who enrolled in the training program for implementing the GHOSHEH model, implemented the model in their classes, and agreed to participate in the study) with the questionnaire for self-evaluation of TGC, and asking them to respond online.
- Conducting 4 focus groups with 24 Palestinian teachers who implemented the model and asking them to evaluate the model and its effectiveness on their competences.
- Establishing the case study and interviewing the teacher and her trainer in addition to observing the teacher's work.
- Analyzing data and documenting results.

2.9 Analysis plan

The instruments of the current study provided quantitative and qualitative data that enabled to answer the questions of the study. The analysis plan of the collected data focuses on these steps:

- Data collected from the descriptive case study was used to answer the first question "What are the processes involved in the implementation of the GHOSHEH model for creating innovative OER?". Thematic analysis with deductive reasoning was considered the most appropriate to analyze the results of this tool; as it seeks to discover knowledge using interpretation. Data from this tool were transcribed and categorized into different themes that answered the research questions.
- Data collected from both the case study and the focus groups was used to answer the second question: "What are the attributes of the GHOSHEH model regarding Rogers' process for diffusion of innovations?". Thematic analysis with deductive reasoning was considered the most appropriate to analyze results from these tools for the reasons mentioned previously.
- Data collected from the first questionnaire (Adopting the GHOSHEH model's questionnaire) was used to answer the third question "To what extent do teachers and experts agree on the consistency of the attributes of the GHOSHEH model with Roger's attributes for successful innovations?" The analysis of the data resulted in means and standard deviations for the responses of teachers and experts who responded to the questionnaire.
- Data collected from both the focus groups and the second questionnaire (Self-evaluation of TGC questionnaire) was used to answer the fourth question" How do teachers who applied the GHOSHEH model evaluate its effectiveness on their global competences? Thematic analysis was followed to analyze the data collected from the focus groups. Besides, six hypotheses were tested to answer the same question. Paired Samples t-test for global competencies before and after adopting the GHOSHEH model was used to test the first five hypotheses, after testing its assumptions, and independent samples T-test was used to test the sixth one, after testing its assumptions.

2.10 Ethical Issues

Ethical approval was sought from both MOE, NIET (as shown in Appendix (A) and participants. The researcher explained the nature of the study to the participants and informed them that participation in the study is on a voluntary basis and that they can withdraw without providing any reason. Data that participant provided were kept in the strictest confidence. Participants were assured that their confidentiality would be maintained and that all data would be used only for the study. All attempts have been made to protect the identity of each participant. No demographic, or institutional data that could lead to the identification of participants were given to anybody.

2.11 Budget

he research did not expense because it was implemented by the researcher who works at NIET as a trainer for teachers, the research only needed permission from MOE and NIET general manager to apply a new approach of training.

2.12 Summary

The current study aims at adopting the GHOSHEH model for creating innovative OER and investigating its effectiveness on teachers' global competences. This chapter provided a description of the GHOSHEH model and how it was developed. Development of the GHOSHEH model included conducting internal validation by experts' reviews. Two national and international panels of experts reviewed the GHOSHEH model and provided their feedback; this enabled the researcher to develop the model accordingly. After that, a training material was developed and a training program was conducted for teachers to implement the GHOSHEH model. This was done by 15 facilitators who were trained by the researcher. In addition to the model and the training material, four tools were used for data, which are: A questionnaire for adopting the GHOSHEH model. A questionnaire for self-evaluation of TGC. Four focus groups and a descriptive case study.

These tools provided quantitative and qualitative data that enabled to answer the questions of the study as follows:

- The descriptive case that was used to answer the first question of the study "What are the processes involved in the implementation of the GHOSHEH model for creating innovative OER?".

- Both the descriptive case study and the focus groups were used to answer the second question: "What are the attributes of the GHOSHEH model regarding Roger's process for the diffusion of innovations?".
- The adoption of the GHOSHEH model's questionnaire that was used to answer the third question "To what extent do teachers and experts agree on the consistency of the attributes of the GHOSHEH Model with Roger's attributes for successful innovations?"
- Both the focus groups and the self-evaluation questionnaire of TGC were used to answer the fourth question" How do teachers who applied GHOSHEH model evaluate its effectiveness on their global competences?

- Besides, the self-evaluation questionnaire of TGC was used to test the hypotheses of the study.

The chapter included the procedure of the study and the analysis plan that focused on the thematic analysis for the qualitative data. Regarding the quantitative data, the plan focused on the descriptive analysis of means, and standard deviations. This is in addition to the use of the paired samples t-test and independent sample t-test for testing the hypotheses. The chapter described the collection of the qualitative and quantitative data within a specific design of the mixed method which is a convergent parallel design. Through this design, qualitative and quantitative data were gathered separately, and will be analyzed in the next chapter; to compare results from both analysis and interpret these results deeply.

Chapter Three

Data Analysis and Results

This study aims to adopt the GHOSHEH model for creating innovative OER and explore its effectiveness on teachers' global competences. Therefore, four questions were presented throughout the first chapter. Besides, six hypotheses were developed to answer the fourth question. To answer the study's questions, qualitative and quantitative data were collected from different tools that were described in chapter two within a mixed-method methodology. This chapter describes the analysis of the collected data. Actually, the chapter displays each question and provides details on how data was analyzed to answer the question. Moreover, it presents the assumptions of the tests that were used for testing the hypothesis. Besides, the chapter displays the results that are considered as answers xtothe questions. Furthermore, the chapter shows how the qualitative and quantitative data are analyzed separately, and then integrated to answer the same question. This will clarify the role of the mixed-method that was mentioned in chapter two.

3.1 Answering the questions of the study

Answering the first question

To answer the first question of the study "What are the processes involved in the implementation of the GHOSHEH model for creating innovative OER?" A descriptive case study on implementing the model was conducted. The descriptive case study is described below.

- **Background**

This case study focused on a female teacher (F) who teaches math to juniors (in the 8th grade). Teacher (F) has 17 years of professional experience in teaching math. She works in a public school in Salfit town in Palestine. She was enrolled in an educational training program conducted in 2021/2022 at the National Institute for Educational Training. Within this program, she was trained to employ the GHOSHEH model for creating innovative OER. During the training period, teacher(F) implemented the model on 30 junior female students in order to teach them dimensions and Pythagoras' theorem. The trainer (S), is the expert who trained teacher(F) on how to implement the

GHOSHEH model. The trainer(S) holds a master's degree in curricula and teaching methods and has more than 26 years of experience in education and teacher training. Trainer(S) read about the GHOSHEH model, understood it well, and used the training material prepared by the researcher to train teachers about the model. The trainer(S) delivered online training sessions on how to implement the GHOSHEH model for teachers. After that, Trainer(S) followed teachers up during the process of the model's implementation in classes. Trainer(S) was able to describe how the model was implemented by the teacher(F). This is because she observed teacher(F) implementing the GHOSHEH model to teach juniors how to use dimensions and Pythagoras' theorem in designing ramps; to prepare the school environment for a special need student called (H). The teacher knew that the student (H) would enroll in the school the following year. Student(H) was unable to walk and used to use a wheelchair. But the school environment was not appropriate for wheelchairs. This raised a problem summarized by this question: how can students help the student(H) to move easily to the primary facilities in the school? Teacher(F) selected an OER about ramps and followed the GHOSHEH model processes to stimulate students to solve their friend's problem. The teacher tried to scaffold students to design ramps for the student(H), and to create OER about the process of design and the solution of the problem, then share the OER in order to help thousands of students similar to the student(H) all over the world.

A thematic analysis of the observation and interviews of the teacher and trainer revealed that the teacher followed these processes to implement the GHOSHEH model:

- **Analysis of content and context**

Teacher (F) analyzed the content and selected Pythagoras' theorem. Then she analyzed the context and the learners' needs to determine the most appropriate problem. As mentioned before, the teacher(F) knew that the student (H) who was using a wheelchair, would enroll in the school the following year. At the same time, the school was not prepared to facilitate the student's movement. Teacher(F) knew that her students were willing to assist their friend. Therefore, she searched for an OER related to the problem and to the math. Particularly, the Pythagoras' theorem. The teacher used her higher-order thinking to connect math to this problem. She said, 'I teach abstract mathematics for the 8th grade, thus when I decided to apply the model, I searched for a resource linking the Pythagorean theorem with the real-life. I found a video about a young man

who designed a ramp for his mother because she has a disability in her feet, so his mother moved by this mobile ramp. At the same time, I knew that a student using a wheelchair would arrive at our school next year and that the school should be appropriate for her. I asked myself: How could we facilitate her movement and help her to transfer to the basic facilities without climbing stairs?'

- **Implementing activities of the GHOSHEH model**

Teacher (F) implemented the GHOSHEH model according to its sequenced activities. She presented a relevant OER, asked some reflective questions, discussed the questions with students, discussed objectives, shared a problem related to the content and the OER, and followed other steps to create and share OER. The teacher (F) described her implementation by saying: 'Actually, the video encouraged the students to think about the problem, while the reflective questions that I asked helped to connect the solutions of the problem with the math content. I told them that next year a student named "H" will come to our school and she is unable to walk and uses a wheelchair. How can we help her to move around the school? How can we use math to do that? We went down to the school garden and determined the location of the classroom of "H" next year, and the basic facilities. Students suggested the locations of the ramps. They began measuring the dimensions, using mathematics, calculating the slope and its relationship to the horizontal and vertical dimensions, and employing the Pythagorean theorem. After that, I classified them in groups and presented some small tasks including [sic] creating brochures about the project and marketing them to obtain community support, measuring the dimensions of the slopes, arranging with the carpenter and the blacksmith, and checking that the slopes match the calculations students did.'

- **Formative assessment**

The teacher developed rubrics for the problem, and provided students with these rubrics. She tried to assist students to evaluate their performances according to the rubrics. The teacher confirmed that the model provided her with opportunities to know her students and assess their performances; in order to align her teaching to their learning styles, varying intelligence, and needs. She said, 'I assisted the students by giving samples of brochures (as OER), distributing the brochures to students in the school and the faculty, communicating with the carpenter and blacksmith, following up

on the calculations, and providing them with evaluation criteria and indicators. The students were waiting to solve the problem moment by moment, and from the first moment, they were asking me: “When will we implement the idea? When are we going to do this step?” As a teacher, I started to know my students well and to focus on their learning styles, intelligences, and needs. Actually, I began to look at the details. This model transformed math from an abstract subject to a real-life, and involved all students in the tasks that increased the students, and teacher’s affiliation with the school.’

- **Peer sharing**

Teacher (F) encouraged the students to share the created OER, and they did. She said, “After that, students produced another video about the process of using math in solving the problem of disabled students. They shared the new OER to benefit others”. However, she did not mention anything about following the OER to know if people benefited from it, repurposed it, or if there was any feedback on the shared OER so that the OER could be developed accordingly.

Answering the second question

To answer the second question "What are the attributes of the GHOSHEH model regarding Rogers’ process for diffusion of innovations?" The same case study was used in addition to the analysis of data collected by the focus groups.

A thematic analysis of the included interviews in the descriptive case study pointed to the following attributes of the GHOSHEH model:

- **Relative advantage of the GHOSHEH model**

Both of trainer (S) and teacher (F) focused on the significance of the model in serving the community, homeland, and even the world. Trainer(S) explained the opportunities that the model provided for learners to apply knowledge in solving actual local and global problems. She considered the model as important for maintaining sustainability, enhancing learners’ life skills and teachers’ planning skills. The trainer(S) said, ‘I was looking for a model that would not make the student's learning end as soon as he left the school. GHOSHEH model which includes OER will impact students learning and sustain this learning outside the school. Moreover, it benefits the community and homeland. Besides, the sequenced steps of the model facilitated application, speeded up

the achievement of educational goals, activated the role of learners, and encouraged the teacher to develop herself technologically. Moreover, the model focuses on life skills, and can be applied face-to-face or online.' The teacher (F) also asserted the importance of the model's emergence from one OER to innovate another OER so as to help sustain learning and enable the growth of knowledge. She described this by saying, 'We benefited from the idea of the video as an OER. It enabled us to use math for serving student (H). After that, students produced another video about the process of using math in solving the problem of the disabled [sic] students. They share the new OER in order to benefit others. I was asking myself: why should one keep his work for himself? Let us share resources to benefit others and accumulate knowledge. Let us share the ideas as far as possible".

The model contributed to achieving a deep understanding of abstract concepts and connecting them to reality. In addition, the model enhanced students' life skills and citizenship and encouraged communication with peers, parents, and the local community. Teacher (F) said, 'The students applied the Pythagorean theorem, measurement, slope, and infinite fractions in different calculations included in the process of designing the ramps. Some of the calculations did not match reality as a result of the presence of infinite fractions, which affected the length of the main ramps. The calculations were not as simple as those in the book, and we dealt with large numbers and infinite fractions, and this is what highlighted the importance of approximation, and how to link mathematics to reality. Moreover, the model increased communication with parents and some professionals such as the carpenter and blacksmith who were contacted to help produce the ramps. As a result, we were able to make 4 ramps in the school that would enable the student (H) to move around in the basic facilities.'

- **Complexity and flexibility of the model**

Trainer (S) considered the model as clear and flexible since she was able to understand it alone without any training, and because she implemented the model and conducted online training for teachers easily. The trainer (S) said, 'Actually, I did not expect that I would be able to train teachers on the model online. However, I was able to do so easily because of the flexibility of the model. In addition, the flexibility lies in the presence of many options for open educational resources.'

The teacher (F) also considered the model to be flexible due to its appropriateness for teaching any subject and any student. The model's consideration of the students' intelligence and their learning styles increased its flexibility. The teacher expressed this by saying, 'Different small tasks assigned to the students made the model flexible. These tasks were appropriate for all students from the lowest to the highest level of achievement. Tasks can be applied from the first grade to the Tawjihi (Grade 12). For example, I applied it with students in the sixth grade and the eighth grade. Moreover, we were flexible in selecting the open resource, as well as in solving the problems. The model did not dedicate any of its steps to a specific thing or a specific content or student.'

- **Compatibility**

The implementation of the model required the teacher to analyze context, and learners' needs so that she could adapt a problem and tasks to the learners' needs, contexts and cultures. Besides, the model increased communication between the teacher and learners. Therefore, Teacher (F) was able to align tasks to the specific internal conditions of learners. The teacher said, 'Communication with students increased through assisting students to solve the problem and do the tasks. For example, we faced a challenge when the problem required a group of students to distribute brochures outside the school; to gain support 2for the idea. As some parents objected and refused to let their daughters do that outside the school. Accordingly, I modified the task to be done inside the school.'

It seems that the model is also aligned with teachers' professional needs and attitudes. The model provided opportunities for teacher (F) to engage in planning and applying learner-centered approach strategies. The teacher benefited from this experience and started to focus on students and take into account the internal conditions of the learners. Teacher (F) described this by saying, 'I used to teach the Pythagorean theorem for 17 years as an abstract theory. However, this model changed my view of teaching and learning. As a result, I enhanced my profession, and this was reflected in the level of the students.' This is in addition to the change in the teacher's role. Instead of explaining the math abstracts, the teacher was searching to select the appropriate open resource, asking reflective questions, and presenting the problem. The teacher also started to provide continuous assessment and feedback, support her students and assist them to

work in groups and serve the community and create innovative OER and share them. The teacher's implementation of these processes increased the model's impact on her competencies.

- **Observability**

The outputs of implementing the model were observable to the teacher (F). Therefore, she was able to consider the impact of the model on her students' knowledge and skills. This was expressed by both the trainer and the teacher. On one hand, the teacher (F) said, 'I felt how mathematics was transformed from a theoretical subject into a practical one, and I regret the 17 years in which I did not know how to teach. It was the first time we produce [sic] an educational video about Pythagoras theorem and linked them to mathematics then shared them with others…Actually, students were working for the happiness of others – specifically, for student (H). Also, their affiliation to their school increased.' The teacher (F) also indicated that one measurable and clear result of implementing the model was an enhancement of the school's environment. She expressed this enhancement by saying, 'We did something to prepare the school's environment for people with special needs, and the students' parents and inclusive education specialists participated in preparing the school for the student(H) before she moved to it.'

- **Trialability**

This case study provides evidence that the GHOSHEH model can be implemented. The study has also afforded an observation of the results of implementation. However, there were some challenges in using the model. Teacher (F) mentioned some challenges such as the need for extra time and the difficulty in matching the students' schedules to the schedules of professionals who assist students in designing the ramps. In addition, students were challenged by the need for support and funds to solve the problem. This challenge decreased when they sought support from parents and the local community. This was expressed by the teacher when she said, 'Implementing the model is not difficult because I have experience in the content, and with some research and participation of students, it was not difficult to implement. The difficulty lies in matching our time at school to the times of the carpenter and the blacksmith and providing materials to solve the problem such as wood and iron. But when students told

their parents, the participation of parents and their support reduced all challenges.' Moreover, both the trainer and teacher agreed on the demand of developing oneself technologically and learning about how to license resources produced by students using open licenses.

The same question was answered by analyzing data collected from the four focus groups. Thematic analysis with deductive reasoning was considered as the most appropriate for this study, as it seeks to discover knowledge using interpretation. Data from four focus groups were transcribed and categorized into different themes based on the conceptual framework that underscored the themes, namely Roger's attributes of innovative models. In the beginning, the researcher repeated reading data and generating some initial ideas, then, initial codes were generated from the written data of each focus group. After that, the researcher sorted the codes of each focus group response into themes. Resulted themes were reviewed, and examples and quotes were provided, then the manuscript was prepared. These processes were followed by Kopish (2016). Finally, the researcher compared themes produced from the four focus groups and selected the common ones. The results of the analysis and comparison produced the following themes:

Teachers' descriptions of the GHOSHEH model'sattributes were categorized within the following themes:

1. Relative Advantage of the GHOSHEH model from teachers' perspectives

All Participants considered the GHOSHEH model as important. There were several reasons for the participants' considerations. Mainly, they expected that the GHOSHEH model contributes in the following:

- Considering the learner as a center of the learning process: 71% of the teachers stated that the model reinforced the role of the student as a center of the learning process, as well as activating his role as an active learner. Teacher (23) said: "The student has become a partner in the educational process and a contributor in the educational process. He gave ideas to the teacher and discovered things he did not know before, and perhaps neither he knew nor the teacher knew them."

This was achieved as a result of the teachers' focus on making the learners responsible for their learning while retaining their roles as mentors, guides, and supporters, which

was confirmed by 50% of the teachers (12), and it emerged in the words of the teacher (9): “A long time ago I thought that I wanted to continue to explain, attend, plan, and speak throughout the sessions. However, this model engages students instead of being free and makes them talk more than the teacher.... For students, it is active learning that gives the student a role in the class, especially when it focuses on the real things they suffer from. Learners can suggest problems and solve them and the teacher monitors their work, guides and supports them”.

- Developing skills of creativity for both learners and teachers: 66% of the teachers agreed that the model develops creative thinking skills; as the model provides an environment that supports originality, novelty, modernity, and flexibility. This was expressed by the teacher (1) who said, “The model provides a space for the student to create, write reflections and produce. Besides, there is authenticity delivered for the students because the students produced new things. I applied the model twice. This model gives scope for creativity and originality in producing open educational resources”. (42%) of the teachers also emphasized that the model helped them to break out of the ordinary and routine and to achieve novelty and modernity of the teacher. Some teachers linked the development of creativity skills to an increase in students’ motivation to learn as a result of linking learning to reality, and to actual problems of interest to the learner while providing a space of freedom for learners to provide solutions to these problems, and the teacher. Moreover, the steps of the model provided the learners with opportunities to reflect on practices, and discuss solutions to problems. It also provided a space to produce, publish and generalize the products, which increased their motivation to produce what is original and competitive, as revealed by the saying of the teacher (3): “There are specific steps that start with the students’ reflections and discussions Thus, there was a method of dialogue between the teacher and the student, and there were tasks through which the students innovate and produce the new, in addition to the fact that the students learned to produce and circulate open educational resources. The students have great creativity, but they need someone to encourage them in such a way. The students have skills and creativity that we cannot imagine.....The model took the student out of being a recipient to become the center of the educational process. We give the student an open source and leave the rest to him to use. The student presents his

skills, creativity, and new models, and the teacher is a facilitator of the educational process, observing the students, guiding them, and tracking their work".

- Developing learners' life skills: It emerged from the statements of 50% of the teachers that the model enhanced learners' life skills, especially the skills of problem-solving, group working, cooperation, research, and communication. Teachers expected that some of the solutions and ideas presented by learners, during their work in solving problems, desired to be supported. These ideas can be developed to be applied effectively, and provide a financial return for the learners. Teacher (14) said: "With the simplicity of the solutions that the student put in place, there may provide a solution to a general, national, economic or social problem….and it can be returned to him with a financial fund if implemented in the future". Teachers also found that the model developed reading and writing skills due to the steps of writing reflections and presenting them in addition to research and problem-solving., which are essential life skills for learners. Teachers expected the model to enhance lifelong learning due to deep understanding, as mentioned by the teacher (16), "The expected output from the model is a big idea that will go deeper and last for more years and more for students" and teacher (18): "our student will tell his grandchildren about this experience".

- Promoting good citizenship: 42% of the teachers indicated that the model provided opportunities to promote good citizenship, starting with attention to societal and national problems, and continuing to try to provide solutions for these problems. The teachers anticipated that continuing education through this model would lead to the graduation of a good citizen, as expressed by the teacher (9): "One of the expected outcomes from the application of the model is an interactive student, a good and cooperative citizen who provides solutions, cooperates, helps others, and has the ability to use technology and solve problems, and everything, we aspire to, is possible to achieve", and teacher (14) by saying, "I believe that the GHOSHEH model develops values and attitudes for the teacher and the learner".

Providing social-emotional support for learners: 29% of teachers emphasized that the model contributed to providing learners with social-emotional support; by engaging them in activities that reinforce the following principles of social-emotional learning:

- Social awareness: The model requires the teacher to develop a problem related to real life and to the learners' context, and many of the developed problems were social. Therefore, the model enhances learners' social awareness by working to solve these problems. Teacher (22) provided a case by saying:" As for my topic, which is snail cultivation for children in Palestine, many students sympathized with the topic. The teacher of the Arabic language was surprised by a young student that never written anything before. The student wrote a wonderful story as much as I sent the students a case about a child with a cochlear implant and how he was before and how people received him, it was an opportunity for them to show their skills in an applied manner". The social awareness of the learners, was constantly reinforced by the cooperative work, as expressed by the teacher (8), "As for the student, it increases the social aspect, the social work and ability to search for information, it strengthens the personality and the student's charisma. Also, it motivates the student to search, even if he has had no role in the groups or the class before; the model affects his achievement, behavior, socialization, and personality."
- Self-management: The model contributed in strengthening the skills of self-management, and the formation of inter-relationships inside and outside the classroom; The problems raised by teachers provided opportunities for students to identify what they need to solve the problems, develop themselves, and make decisions as part of self-management. Problem- solving also requires communication with the local community and forming inter-relationships with its members. Teacher (4) described this by saying: "I applied the model with the eighth grade on seed plants and there was a person who donated olive trees for planting, so the students chose an area of the school and planted it in order to deepen their relationship with the olive trees confiscated by the occupation. It is very interesting for the students to discover what they should do, divide themselves into groups, and develop themselves every day more and more, they had a great relationship with the subject, they would write reports, develop plays, songs, and plant school trees, so it was fun".
- Self-awareness: Self-awareness was enhanced by promoting the learner's self-confidence, and getting to know himself through taking responsibility for his actions which was expressed by the teacher (5) by saying: "He will enhance the student's confidence in himself because he will produce and answer his question alone. Students ask: Why do I learn? The answer is there: To be a producer for your society

and wherever you are located". Also teacher (4) said, "Students discovered themselves on their own, and develop themselves piece by piece." It was found that the emotional support, guidance, and direction provided by the teachers to the students contributed to the formation of relationships with their students, which reinforced the principles of social-emotional support. This was expressed by teacher 12: "When I deal with the student in the GHOSHEH model, I give constant advice and guidance that make the student closer to the teacher. Teaching is an art and a talent." This model helps the teacher to organize his work and brings the student closer to him. When I was a student, I hated mathematics because the teacher used to hit us in order to teach us multiplication. Now there are many ways of motivating learners with all open hearts, and the GHOSHEH model is very important for that". The models' included strategies provided the teacher with an opportunity to focus on the psychological and social aspects of the students. Besides, the students increased their communication with their teachers, and their trust in them, including what the teacher said (21): "Hidden abilities were developed for the students; Through their reflections, students expressed issues related to their psychological aspect and social life, I did not know these aspects before, but I know that now ".

- Developing students' talents and abilities: 33% of the teachers indicated that the model contributed to revealing students' talents through their work in groups to solve problems and the various tasks that required different abilities. The teacher (20) stated within this context: "The students have Buried talents that were discovered; We discovered brilliant students on the computer, and there is a student who is ready to be a leader".
- Focusing on cooperative learning: 29% of teachers agreed that the model enhanced cooperative learning, through students working in groups that contribute to solving the presented problems, which promoted the development of life skills and contributed to learners' support for each other, adapting learning with their abilities and their learning needs.
- Developing higher-order thinking skills: 29% of the participants indicated that the model contributed to the development of higher-order thinking skills as a result of placing the student in educational contexts that promote this, including reflection and problem-solving, and the teacher (6) expressed this by saying: "It will stimulate the student's thinking. Students will produce information and solve problems. The model

shows students creativity and skills, relaxes teachers, enhances students' confidence, and promotes them to think".

- Achieving differentiated teaching: 21% of the teachers stated that the diversity of the model's included strategies, contributed to consedering students' multiple intelligences, levels, and abilities, which was mentioned by the teacher (21) by saying: "The tasks made it easy for us to deliver to each student according to his cognitive abilities, everyone worked according to his cognitive level, and the student with low performance learned from the hardworking and intelligent student[sic] in the group in which he is present, and he learned according to his cognitive abilities and become able to create".
- Supporting students' communication with the world: The model included developing open educational resources and publishing them globally, which encouraged learners to communicate with the world to solve some social problems. This is what was expressed by the teacher (5) by saying: "Development and transfer of societal issues to the world, especially as a Palestinian society. The model can transfer our suffering to the world. For example, I have a lesson in seventh grade, about the continued suffering of the barriers when transferring from one place to another in Palestine, and the apartheid wall. The students loved the topic and liked to pass their voices to the world by making open educational resources that transmit our voices to the world. The interaction increased, which made the class session a space for exploration, interaction, and breaking boredom and routine".

Compatibility and alignment of the model for different contexts

Half of the participant teachers stated that this model can be applied in different contexts, and with different cultures. Teacher (14) said: "In my opinion, the model can be applied in different places; in the city, village, and in the camp, and for males and females, with the availability of strong internet connection, and the permission to visit sites that allow us to use some images and videos to make open educational resources from them. Perhaps, the same environment in which we live will be a resource for students, it can be applied in different schools, but it is up to the administration and the teacher to adopt this idea and make it easy to implement."

Moreover, it emerged from the teachers' statements that the model could be used for education in an emergency; as most of the teachers who had been trained employed the

model during a period of closures; due to a local problem that prevents face-to-face teaching. So, the possibility of employing the model online emerged and was expressed by the teacher (2) by saying: “I had no opportunity to apply the model except with e-learning due to the closure, it was a very wonderful opportunity. My application was simple and with children in kindergarten with online teaching. The result was very wonderful and revealed that children could produce and be creative”.

Furthermore, a debate arose about the following

- The possibility of applying the model in marginalized areas (challenging areas), which suffer from a lack of materials and technological resources, and from poor environments. On one hand, 21% of the teachers found that it is not easy to apply this model in such areas. Teacher (1) said: “I expect that marginalized areas suffer from a lack of services such as electricity, and the internet, and I think that it is difficult to use this model in these areas because this model requires research, communication, online meetings, and discussion after school. And if these things are certainly absent from these areas, there will be problems”. On the other hand, 21% of the teachers found that there is a possibility to apply the model in the challenge areas due to the presence of computers or at least a mobile device in most of them after Corona. In addition to that, the GHOSHEH model provides an opportunity to highlight marginalized areas to support them, which was expressed by the teacher (18) by saying: “We must shed light on learners in Khan al-Ahmar and Masafer Yatta in Hebron, and we must focus on these areas that do not have the internet and electricity, and if we are able to apply the model with students who live in these areas they can produce resources about them, we must convey our voice to the world to show how much these people suffer”. Some teachers suggested adapting the model to the conditions of marginalized areas by applying steps that do not require technology from it.
- The possibility of applying the model to people with special needs: 25% of the teachers agreed that applying the model to people with special needs is not easy, and it depends on the type and degree of disability. Teacher (1) expressed that by saying: “As for people with special needs, gifted people will be exploited well and will have aspects of distinction and these things will be normal for them. As for people of disabilities, the answer depends on the degree of disability they have, because this

model requires research, use of information and the production of an educational source".

On the other hand, 17% of the teachers agreed that the model supports special needs students' learning by integrating them into groups and assigning tasks that are compatible with their abilities and related to solving problems. The teacher (14) said: "From my experience in the tenth grade when I asked the students to create open sources for a lesson in the Arabic language. I was surprised that a student with a special need (who has difficulty with pronunciation and a clear disability) understood the idea and presented it to her family and produced an OER. The students said so and sent me its resource. I was surprised that she understood the idea and perhaps the students explained It, even if there is a difference in abilities, students can teach each other." The teacher (18) added: "I was shocked when I found a student who is visually impaired could draw. We can invest these talents, encourage them, highlight them, and enhance their confidence in themselves so that they feel like their colleagues".

- Applying the model to crowded classes: Opinions varied about the most appropriate number of students to apply the model. On one hand, some teachers found that applying the model with a large number of students is more successful, as the teacher (23) expressed: "I noticed that the model with larger numbers is better; because it requires dividing students into groups, the large number is better. This model solves the problem of the large number of students in the class so that it benefits from the large number of students in dividing them according to their interests, the class would be as groups working on an assignment according to their interests and differences with a leader for each group". On the other hand, the teacher (20) found that the application of the model with a smaller number is better. He said: "As a teacher, a small number is better for a teacher. A large number is applicable but with difficulties".
- Applying the model with students of different ages: The teachers applied the model with students in different age levels, and 38% of the teachers found that the model is applicable to all age levels, as the teacher (9) expressed: "I applied it from the sixth grade to the tenth grade and all of them responded to the model, we can apply it at any stage in the school, even at the university where the students have more experiences and technological resources". On the other hand, 25% of teachers found

that it is not easy to apply the model with juniors in basic levels and this was expressed by the teacher (13) by saying: “I believe that the model can be applied from the fifth grade and above. However, it is not easy, as I imagine, to apply it with grades 1-4. I did not teach this level, but I expect it is difficult for them to apply the model". The teacher (16) added that it is difficult to implement it at the secondary stage because of the Tawjihi exam, which focuses on memorizing: “There is a special challenge for high school. The specificity of Tawjihi makes it difficult to apply such models, which would be very nice”.

Simplicity and complexity: 88% of the participants found that the model is easy and its steps are clear. However, there is a need for training on applying the model. The teachers attributed the reason for the ease of the model to the sequence of steps of the model, which helps to apply it smoothly, in addition to linking the model to life learning as a result of the included real problems related to the content. Teacher (3) expressed that by saying: “It is easy because there are clear steps that the teacher and the student can follow, and It is appropriate for Palestinians because it focuses on problems related to the Palestinian context including political, economic or social problems.”

Flexibility: 79% of the teachers found that the model possesses flexibility, and some attributed the flexibility of the model to the following:

- Focusing on outcomes and outputs with flexibility in teaching according to students’ abilities, and the teacher (4) expressed this by saying: “The model is very flexible. Teaching was not limited to a specific strategy. Moreover, students learned when they worked on reports, videos, the brochures, where each one chose what he wanted. It was not limited to writing a report, for example”.
- The suitability of the model to different specializations as a result of the diversity in the open sources of education. The teacher (23) expressed this by saying: “The model is flexible… and can be used to teach different subjects because there are different open resources that make it flexible for all categories and all subjects”. Despite of that, the teacher (18) found that it is more difficult to apply it in teaching mathematics in the higher grades, due to the abstraction of mathematics increases.
- Providing a space for adapting learning; learning is adapted because each student learns in his own way, and the teacher (9) expressed that by saying: “The model is

flexible because it gives the student the freedom to present the problem in his own way to give solutions ".

Trialability: 71% of teachers considered the model as applicable to all students. Besides, it may contribute to achieving education for all by involving all learners, attracting them, and giving them the opportunity to reflect on and think about the problems. In addition to that, they can solve these problems according to their abilities and levels. The focus of the model is on the employment of OER, the creation of other new OER, sharing them, and providing opportunities to transfer knowledge to learners all over the world. The teacher (1) summarized the role of each step of the model in supporting its trialability as follows: "Step (1) includes attracting the attention of learners through an OER presentation, and this means involving all learners and not marginalizing anyone; because in traditional methods there is a marginalization of students with low achievement. But when I present an OER and ask everyone to reflect on it, present, and discuss it, I will involve all the students. And when I pose a problem and ask the student to produce an OER to solve it, here I gave the student enough time to think, which limits the quick answer that the student is worried about. In steps 5-7, which summarize the production and share of OER, the student is encouraged to link learning with life and interests, and this is reflected through the resulting OER. According to this model, I involved the student in an educational situation that promotes learner-centered approaches. For example, I presented the topic of hyperthyroidism caused by iodine deficiency, and linked it to the practices of the occupation and their confiscation of water resources and consequently the lack of seafood".

Observability: 33% of teachers focused on the resulting learning outputs and outcomes from applying this model. These outcomes were divided into two parts:

- Outcomes related to students: The model aligns with adaptive learning; it allowed students to participate in the learning process actively according to their abilities in order to achieve their goals. Moreover, students were able to observe the achievement of these goals represented by their products (The created OER). The teacher (13) indicated that by saying: "I am happy with this model because it makes the student participate in every stage of its application; From the first stage to the seventh, where the student considers at each stage his role, and this enhances the learning outcomes….. Students have individual differences, and the best method for

giving the lesson is the one that allows the student to participate in the lesson, and sometimes to provide feedback".

- Outcomes related to teachers: The model enabled teachers to develop their global competencies as will be described when answering the third question of the study.

In summary, the teachers' views provided qualitative pieces of evidence on the attributes of the GHOSHEH model and their consistency to the Rogers attributes for successful models.

Answering the third question: To answer the third question "To what extent do teachers and experts agree on the consistency of the attributes of the GHOSHEH Model with Roger's attributes for successful innovations?"

Data was retrieved from the questionnaire about adopting the GHOSHEH model and was analyzed using SPSS statistical program by calculating means and standard deviations within and between questionnaire domains. Data showed that the total mean of the questionnaire items was (*M=3.92*) and the standard deviation was (*SD=0.42*), which indicates a high agreement of the participants with the consistency of the GHOSHEH model's attributes with Roger's attributes for successful innovations. Results are shown in detail in Table (4).

Table (4)

Means and standard deviations of teachers' and experts' responses to the domains of the GHOSHEH model adoption questionnaire(n=345 teachers, 37 experts)

Job		**Relative Advantage**	**Compatibility**	**Complexity**	**Trialability**	**Observability**	**Total**
Teachers	Mean	*4.09*	*3.86*	*3.89*	*3.90*	*3.82*	*3.91*
	SD	*0.46*	*0.46*	*0.54*	*0.49*	*0.43*	*0.41*
Experts	Mean	*4.20*	*4.02*	*4.09*	*4.13*	*4.00*	*4.08*
	SD	*0.57*	*0.52*	*0.58*	*0.57*	*0.54*	*0.50*
Total	Mean	*4.10*	*3.87*	*3.91*	*3.92*	*3.84*	*3.93*
	SD	*0.48*	*0.47*	*0.54*	*0.50*	*0.44*	*0.42*

Table (4) reveals that both experts and teachers highly agreed with the attributes of the GHOSHEH model which enables its adoption according to Rogers' process. The relative advantage of the model gets the first rank in the table.On one hand, the experts'

agreement to this attribute was very high as shown in the table (4). On the other hand, the teachers' agreement with the same attribute was high. All other responses to the attributes reflected high agreement from both teachers and experts. However, the means of responses of experts were slightly greater than those of teachers. More details about the means of teachers' and experts' responses are shown in Appendix (G).

Answering the fourth question: To answer the fourth question of the study "How do teachers who applied the GHOSHEH model evaluate its effect on their global competences?" The focus groups were used again with a focus on the analysis of the questions related to teachers' competences. Thematic analysis of the teachers' responses to these questions revealed that teachers found that the GHOSHEH model contributed to developing these competences:

1. Personal competencies: 75% of the teachers stated that they would apply the model in the coming years due to the observable encouraged results of the model. Teachers attributed their positive attitudes to their observing of learners' interaction and increase in their motivation to learn. Teacher 16 expressed this by saying: "I've compared two groups; the first one applied the model and the second did not, students in the first group were happy and interacted, and I had a good impression about the model. This is because the learner's action is a reaction to the integrated and interactive educational process. When the students in the first group reached this high level of interaction, I took the responsibility to continue applying this interactive integrative model because it should be continued. Moreover, I insisted on development, and not just applying it during the training. This integrative model must be applied in the next years because it gives support, development and insistence on development".

It seems that practicing the model motivated teachers to leave their comfort zone and observe the results which increase their trust in their abilities. The teacher (2) said, "At the first time, I said: Maybe I can't, but we discovered that we can". Teacher (18) added that: "The GHOSHEH model created an innovative and creative teacher, who went outside the scope of tradition and familiar because he wanted to search for an appropriate OER for the required content".

-The model developed the teacher's creativity skills: Teacher (18) said:" The model produces the creative and innovative teacher because the teacher himself will research. I was thinking for a week about how to link content to a productive project. Developing this problem challenged me. It will be made of a creative and innovative teacher".

2. Socio-cultural competencies: 51% of teachers agreed that the model encouraged communication with the local community in order to develop students' skills and solve the included problems. The teacher (24) stated, "We usually teach them many computer programs such as "Desmos", but we face a problem that these programs are in the English language, so students ask a lot to understand. Our idea was to create a program that draws Functions (in math) and uses symbols in the Arabic and from right to left so that all students can deal with the subject and make sure of the solution. The students started working on the program, but we did not reach the stage we want because of the limited use of programming skills by students. We advised the students to go to the technology official in education, the technology park, and an engineer who gives courses and answers Inquiries, and we guided them to two courses during the summer in which they will work, and we gave them to learn programming, as well as courses from Polytechnic University".
3. Individual Competencies: 51% of the teachers agreed that the model encouraged teachers' continuous professional development. This is done throughthe following:

    - Exchange of experiences with colleagues: Teacher (21) expressed the impact of experiences exchange by saying, "When I needed something, especially technological issues that were new to me, I was asking my colleague who teaches technology, and when she was busy, I used to go home and look for how the needed technological program works, and if I did not know, I would ask her and inquire for help".
    - Accumulation of the created OER: Teacher (1) described that by saying:" The teacher can create a platform to employ the GHOSHEH model, and it will be an educational platform that contains a collection of students' products year after year, and here the teacher will develop himself and this works on the professional development of the teacher ".
    - Learning from learners: The relationship between students and the teacher made the learning process a reciprocal process between them. Teacher (5) stated: "We

learn with our students, for example, I did not know before how to produce an open educational resource. Now I know. It is true that we faced some problems, but we developed ourselves and the students during the e-learning period. We are always in the process of learning, like the student, and we learn new things from the student".

- Development of the research skills: This was facilitated when teachers were searching for the appropriate OER and ideas for the problem: The teacher (3) said: "My professional development was through the use of the open resources; how we select the appropriate resource for the educational process, how we promote open resources produced by students at the school and global level, and how we publish our products globally, and we did not know these issues previously".
- Practice and reflection: The model enabled teachers to practice new strategies and reflect their practices. This allowed teachers to develop their professional practices accordingly. The teacher (4) said: "Every time the teacher uses the model, he develops himself one by one. At first, he may use a teaching resource that is not suitable for the content, but when students work, he will discover that if he does this students will learn better, and thus he will work creatively with students and know what the students want. …. The teacher will develop and the student will do too".
- The necessity to develop technological competencies: some teachers agreed with the Arabic metaphor "The need leads to learning"; when teachers needed to employ technology more widely, they sought to develop their technological competencies. Teacher (24) said: "The application of the GHOSHEH model makes one search rather than depending on his own information and saying this is only my information and I will follow it forever".
- Developing teachers' open educational practices: Half of the participants found that the model helps the teacher to develop their open educational practices. Moreover, it helps in discovering students' talents and supports them to produce original ideas that are out of the box. The teacher (2) said: "The model gave us an opportunity to discover the student from other aspects such as his ability to think, and his ability to be creative. We used to think of the student from an academic aspect of application and solution, but we found that there are other aspects of students that can be developed". Teacher(21) added: "I did not know before about

my students' social life, but during the application I had chances to know and to consider the psychological aspect and part of their social life".

Professional Competencies: 50% of the teachers agreed that the GHOSHEH model develops the teachers' professional competencies. Teachers found that the model required a deep understanding of the content; so that the teacher can select the best OER and connect them to a problem from life. Therefore, teachers who applied the model developed their knowledge of content in addition to pedagogy and technology. In other words, teachers developed their technological, pedagogical, and content knowledge (TPACK) regarding the following themes:

- Alignment of OER to the content and analysis results: This was done by selecting the appropriate open resources for the content and creating OER and sharing them. Teacher (3) said, "My professional development was through the use of OER, how to select the appropriate resource for the educational process, how to promote OER produced by students at the school level and at the global level, and how we share our products globally. All these issues were not known to us previously".
- Proficiency in subject and analysis: Deep understanding of the content is required to select the best OER and develop the appropriate actual problem. Teacher (2) said, "I saw that the model requires the teacher to be professional in the subject and the content analysis, and able to prepare himself well for teaching the content. The teacher needs extensive prior preparation. The student becomes a partner in the educational process, he contributes to the educational process and gives ideas to the teacher. perhaps neither he knew these ideas before nor the teacher did".
- The development of planning and evaluation competencies: The sequence steps of the GHOSHEH model provides opportunities for the teacher to organize his teaching plan and process of evaluation accordingly. Gradually, the teacher was developing his planning and evaluation competences. Teacher (21) pointed out, "The model organized my work; so that I was able to complete the content in a specific time and clearly, organize the goals and make sure that they were achieved".
- Developing pedagogical competencies by employing active learning strategies Teacher (16) said: "The GHOSHEH model helped us to break the barriers of e-learning, and when we gave such classes where each group was responsible for solving a problem, here we opened other areas such as cooperative work,

brainstorming, and flipped classroom and thus we opened the way for more than one strategy".

Challenges of applying the GHOSHEH model

Furthermore, teachers provided challenges in applying the GHOSHEH model. Besides, they proposed some points to develop it. Challenges are summarized by the following

- The need for training on the GHOSHEH model: 54% of participants mentioned that implementing the GHOSHEH model requires training for teachers and learners. Teacher (18) said: "The model is considered very flexible if the student and the teacher are trained on it, and its steps are very clear, but it needs training". 25% of participants attributed the need fortraining to the difficulties that the teacher faces in managing the groups in cooperative work and the necessity to practice that within training. Teacher (4) said: "We only encountered difficulty in dividing students into groups, and this is in order to consolidate the idea of groups; because in our school they do not work in groups, even if they sit together, but they are not accustomed to working in the group".
- Time consumption: 70% of the participants agreed that the model requires more time to be applied. Teacher (7) said: "Perhaps the most obvious problem in implementing the model was the lack of time".
- Workload: 13% of the participants said that teachers are overloaded and do not have a lot of time for searching or developing problems as the model requires. Teacher (8) said: "One of the obstacles to applying the model is that we are overloaded, the duties of the teacher are great, and the workload of the teacher affects his productivity".
- Resistance to Change: 38% of the participants mentioned that they found the model new and they did not want to try it at the beginning. However, training, practicing the model, and observing outcomes and outputs made them change their minds. Teacher (14) said: "We had other requirements in the educational process other than teaching the content, so we thought at the beginning that there was something new and a burden on us. But, for me, and after experience, I will take it as an approach in the future".
- Special challenge related to teachers protesting: During the implementation of the model, teachers stopped working, and students were absent due to protesting teachers

for issues related to their professional and financial rights. This interruption of the teaching process or what was called "teachers' strike" maintained for 40 days, and affected both learners and teachers. During the teachers' strike, some teachers continued the implementation of the model despite the strike. However, other teachers stopped and continues after the end of the strike. 21% of the participants mentioned that they were worried after the strike about the time and the remaining content. Teacher (15) said: "During the strike, I was on a break from work, and my students had no experience because they were in the sixth grade, and I faced two dilemmas, either to add the subject or start with the model. Therefore, I started with the model little by little".

- Parents' Beliefs: Palestinian parents still believe that the exam is the most important and serious tool for evaluation. Therefore, parents preferred to see students studying rather than working on a project or to solving a problem, and this challenged students as described by the teacher (15) who said: "Some students told me that they were prevented from using the mobile phones by their parents, and one student promised to edit a video then he told me that he couldn't do because his family took the mobile phone that he worked on; to study for the exam".

Besides, teachers proposed the following in order to develop the model and the implementation process:

- Two teachers suggested developing a web page that includes templates specialized for online implementation.
- Two teachers suggested using a platform that includes a bank to save the resulted OER and enables teachers to exchange experiences.
- Five teachers proposed to depend on e-enabled learning in the implementation of the GHOSHEH model; this can be done by implementing some steps online and others in face-to-face sessions and this integration between online and face-to-face learning can solve the problem of consuming time.
- Three teachers recommended to adopt this model within the official curricula and consider it in the evaluation and assessment process. Teacher (4) said: "From my point of view, the model is very wonderful. It serves the students in a very civilized, wonderful, and scientific way, and increases their effectiveness. I propose that the model should be a truly approved model of education and a part of the quarterly and

annual plan. We should apply this model and occupy approximately a share of one or two lessons that we implement in an actual obligatory and not optional way; because it integrates many things such as e-learning. It also makes the student the center of the learning process. In addition, it serves in the development of competencies and skills for students, and at the end, there is an output that is reflected on the ground, and through the implementation of this model we get a direct and actual application that increases their love for their country and society".

- Provide more information about the model through Internet: Six teachers proposed to publishing more information about the model through Internet. Teacher (12) said: "We as teachers were looking for the model to get more information from YouTube and Google, but when we searched, we found nothing on it".

3.2 Testing Study's Hypotheses

Testing the first hypothesis

To test the first hypothesis of the study: "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the global competences' domain attributed to the GHOSHEH model", analysis was done for the teachers' responses on the self-evaluation questionnaire for the TGC (The total of all domains). This includes testing the means of teachers' responses to the self-evaluation questionnaire of TGC before and after implementing the GHOSHEH model. Paired-Samples T-test was applied to test the first hypothesis. Before that, the assumptions of Paired samples T-test were tested for the responses of the total domains of the questionnaire that represent the teachers' global competences, as shown in Appendix (K). The results of testing assumptions showed the existence of 4 extreme outliers. These outliers were deleted as shown in Appendix (K). Therefore, analysis was done on 285 responses rather than 289. Besides, the normality test showed that the original data was not distributed normally. Thus, data was transformed, and the results of testing the transformed data revealed no violation of any of the Paired -Samples T-test's assumptions. As a result, a Paired samples t-test was conducted to determine the effect of the GHOSHEH model on teachers' global competences by testing the first hypothesis. The results of the test are shown in Table (5)

Table (5)

Results of Paired samples T-test for the differences between means of teachers' scores to TGC before and after implementing the GHOSHEH model

Pair	N	Paired Differences					t	df	Sig. (2-tailed)
		Mean difference	SD.	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
GC (pre) GC (post)	285	0.747	1.397	0.083	0.584	0.910	9.03	284	.000

* Note: GC means global competences

The results in Table (5) indicate a significant difference between the means of teachers' scores to the global competences before and after implementing the GHOSHEH model. The difference of means is in favor of post-training; because the mean of teachers' scores to the global competences before implementing the GHOSHEH model (M=3.49; SD=1.09) is less than the mean of scores after implementing the model (M=4.24; SD=1.12); [t (284) = 9.03, p = 0.00], and the difference between means is significant because the P value is less than 0.05. Therefore, the first hypothesis is rejected.

In order to communicate this statistical significance with the practical significance of these results, the effect size should be calculated. The effect size enables us to know how big is the effect of the intervention on the dependent variables (Creswell, 2012; Lakens , 2013). When using the paired samples t-test, the effect size could be calculated by dividing the mean by the standard deviation. This will result in what is called Cohen's D, as shown in the following equation:

Cohen's D = Mean/std. Deviation

Cohen, the founder of effect size, considered the effect size as small when Cohen's D = 0.2, medium when Cohen's D = 0.5, and large when Cohen's D = 0.8 (Lakens , 2013). The results of this study will be interpreted based on Cohen's benchmarks.

In the case of the effect of implementing the GHOSHEH model on teachers' global competences, the effect size is calculated by dividing(M=.74685) by (SD=.08274) and

the result is 0.53 which is near 0.50 and this means that the effect size of the GHOSHEH model on TGC is medium.

Testing the second hypothesis: To test the second hypothesis of the study: "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the professional competences' domain attributed to GHOSHEH model", analysis was done for the teachers' responses on the domain of professional competences which is included in the questionnaire for self-evaluation of TGC. This was done before and after implementing the GHOSHEH model for creating innovative OER. Paired-Samples T-test was conducted to test this hypothesis. Before that, the assumptions of Paired sample T-test were tested for the teachers' responses on the professional competences' domain as shown in Appendix (L). Results showed the existence of two extreme outliers. These outliers were deleted and the sample became 283. After that, results showed no violation in the Paired Sample T-test assumptions for the data of the responses on the professional competences. Therefore, the Paired samples t-test was conducted to determine the effect of the GHOSHEH model on teachers' professional competences by testing the second hypothesis. Results are shown in Table (6).

Table (6)

Results of Paired Samples T-test for the differences between means of teachers' scores to the professional competences before and after implementing the GHOSHEH model

Pair	N	Paired Differences					t	df	Sig. (2-tailed)
		Mean difference	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
PC (pre) PC (post)	283	.9815	1.4761	.0878	.8088	1.1543	11.186	282	.000

* Note: PC means professional competences

The results in Table (6) indicate a significant difference between the means of teachers' scores to the professional competences before implementing the GHOSHEH model (M=3.43; SD=1.11) and their means of scores after implementing the model (M=4.41; SD=1.12); [t (282) = 11.186, p = 0.00]. Since the P value is less than 0.05. Therefore,

the second hypothesis is rejected. The effect size is calculated by dividing(M=0.98154) by (SD=1.47611) and the result is 0.66 which is greater than 0.50 which means that the effect size is between medium and large.

Testing the third hypothesis: To test the third hypothesis of the study "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers' scores to the social-cultural competences' domain attributed to the GHOSHEH model", analysis was done for the teachers' responses on the domain of socio-cultural competences which is included in the questionnaire for self-evaluation of TGC. This was done before and after implementing the GHOSHEH model for creating innovative OER. Paired-Samples T-test was conducted to test this hypothesis. Before that, the assumptions of Paired sample T-test were tested for the responses on sociocultural competences as shown in Appendix (M). Results showed no violation in the Paired Samples T-test assumptions for the data of the responses on the sociocultural competences. Therefore, a Paired samples t-test was conducted to determine the effect of the GHOSHEH model on teachers' sociocultural competences by testing the third hypothesis. Results are shown in Table (7)

Table (7)

Results of Paired Samples T-test for the differences between means of teachers' scores to the sociocultural competences before and after implementing the GHOSHEH model

Pair	N	Paired Differences					t	df	Sig. (2-tailed)
		Mean difference	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
SC (pre) SC (post)	285	.70202	1.60044	.09480	.51542	.88863	7.405	284	.000

* Note: SC means Sociocultural Competences

The results in Table (7) indicate a significant difference between the means of teachers' scores to the sociocultural competences before implementing the GHOSHEH model (M=3.54; SD=1.19), and their means of scores after implementing the model (M=4.24; SD=1.21); [t (284) = 7.405, p = 0.00]. Since the P value is less than 0.05 then the third hypothesis is rejected. The effect size is calculated by dividing (M=.70202) by (SD=

1.60044). The result is 0.44 which is less than 0.50 and this means that the effect size is between small and medium.

Testing the fourth hypothesis: To test the fourth hypothesis of the study "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the individual competences' domain attributed to GHOSHEH model", analysis was done for the teachers' responses on the domain of individual competences which is included in the questionnaire for self-evaluation of TGC before and after implementing GHOSHEH model. Paired-Samples T-test was conducted to test this hypothesis. Before that, the assumptions of Paired sample T-test were tested for the responses on individual competences as shown in Appendix (N). Results showed the existence of four extreme outliers. These outliers were deleted and the sample became 281 rather than 285. After that, results showed no violation in the Paired Samples T-test assumptions for the data of the responses on the individual competences. Therefore, a Paired samples t-test was conducted to determine the effect of the GHOSHEH model on teachers' individual competences. Results are shown in Table (8).

Table (8)

Results of Paired Samples T-test for the differences between means of teachers' scores to individual competences before and after implementing the GHOSHEH model

Pair	N	Paired Differences					t	df	Sig. (2-tailed)
		Mean difference	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
IC (pre) IC (post)	281	.78556	1.36442	.08139	.62534	.94578	9.651	280	.000

* Note: IC means Individual Competences

The results in Table (8) indicate a significant difference between the means of teachers' scores to the individual competences before implementing the GHOSHEH model (M=3.36; SD=1.12) and their means of scores after implementing the model (M=4.15; SD=1.15); [t (280) = 9.651, p = 0.00]. Since the P value is less than 0.05. Therefore, the fourth hypothesis is rejected. The effect size is calculated by dividing (M=.78556) by

(SD=1.36442). The result is 0.58 which is greater than 0.50 and this means that the effect size is more than medium.

Testing the fifth hypothesis: To test the fifth hypothesis of the study "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers' scores to the personal competences' domain attributed to the GHOSHEH model", analysis was done for the teachers' responses on the domain of personal competences included in the questionnaire for self-evaluation of TGC before and after implementing the GHOSHEH model for creating innovative OER. Paired-Samples T-test was conducted to test this hypothesis. Before that, the assumptions of Paired samples T-test were tested for the responses on personal competences as shown in Appendix (O). The results showed the existence of three extreme outliers. These outliers were deleted and the sample became 282 rather than 285. After that, the results showed no violation in the Paired Sample T-test assumptions for the data of the responses on the personal competences. Therefore, a Paired samples t-test was conducted to determine the effect of the GHOSHEH model on teachers' personal competences by testing the fifth hypothesis. Results are shown in Table (9)

Table (9)

Results of Paired Samples T-test for the differences between means of teachers' scores to the personal competences before and after implementing the GHOSHEH model

Pair	N	Paired Differences					t	df	Sig. (2-tailed)
		Mean difference	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
PerC (pre) PerC(post)	282	.81523	1.50790	.08979	.63847	.99198	9.079	281	.000

* Note: PerC means Personal Competences

The results in Table (9) indicate a significant difference between the means of teachers' scores to the personal competences before implementing the GHOSHEH model (M=3.50; SD=1.18) and their means of scores after implementing the model (M=4.32; SD=1.09); [t (281) = 9.079, p = 0.00]. Since the P value is less than 0.05. Therefore, the fifth hypothesis is rejected. The effect size is calculated by dividing (M=.81523) by

(SD=1.50790) and the result is 0.54 which is near 0.50. This indicates that the effect size is above medium.

Testing the sixth hypothesis: To test the sixth hypothesis of the study "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers' scores to the global competences domain attributed to gender", an Independent-Samples T-test was done after testing its assumptions as shown in Appendix (P). None of the assumptions was violated. Therefore, the Independent Sample T-test was conducted to test the effect of gender on global competences. Results are shown in Table (10).

Table (10)

Results of Independent Samples T-test for the differences in global competences regarding gender

		N	M	SD	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
										Lower	Upper
Difference in global competences	Male	109	0.541	1.27	1.971-	283	.050	-.33392-	.16939	.66735-	.00050-
	Female	176	0.875	1.45							

The results in Table (10) indicate that there is no significant difference between the means of differences in teachers' scores to the global competences before and after implementing the GHOSHEH model, regarding gender. Therefore, the sixth hypothesis is accepted due to non-significant differences (t (283) =1.971, p =.050) in global competences differences for males (M = 0.54, SD = 1.27) and females (M = 0.87, SD = 1.45). The magnitude of the differences in the means (Mean difference=.16939, 95% CI:.66735-to.00050) was significant.

3.3 Summary

This study aims at adopting the GHOSHEH model for creating innovative OER, and investigating its effectiveness on teachers' global competences. To achieve this aim, four questions were developed, and six hypotheses were tested. This chapter provided the results that gave qualitative and quantitative pieces of evidence, and enabled to answer the study's questions as follows:

- To answer the first question of the study "What are the processes involved in the implementation of the GHOSHEH model for creating innovative OER?" qualitative data collected from the descriptive case study was used. Results reflected the four processes involved in the GHOSHEH model for creating innovative OER. The first process is the analysis of the content, context, and internal conditions of learners. The case showed how the teacher benefited from this analysis in determining the most appropriate OER and developing the problem related to the content and learners' interests. The second process is conducting the activities that are sequenced by the GHOSHEH model. The case provided descriptions for each activity. The third process is the assessment and evaluation. The case described how the teacher assessed learners continuously and provided them with rubrics to maintain students' self-evaluation. The fourth process is the peer-sharing process. The case showed that the teacher encouraged the students to share the created OER locally. However, there was no evidence of sharing them globally or following the created OER up after sharing them.

To answer the second question: "What are the attributes of the GHOSHEH model regarding Rogers' process for diffusion of innovations?", the resulted themes from the thematic analysis of the descriptive case study and the focus groups were used. Results showed that the GHOSHEH model has five attributes consistent with Rogers' attributes for successful innovations. The first attribute is the relative advantages. The teachers summarized the advantages of the GHOSHEH model by its positive role in developing the creativity skills for teachers and learners, promoting good citizenship, providing social and emotional support, supporting cooperative learning, encouraging learners' communication, and achieving differentiated teaching. The second attribute is the compatibility and alignment of the model for different contexts. Teachers stated that this model can be applied in different contexts, and with different cultures. Besides, it can be used for education in emergencies. Moreover, there was a debate caused by different perspectives of teachers on the ability to use the model with special needs learners, learners in low basic levels, in crowded classes, and in marginalized regions. The third attribute is the complexity of the model. Teachers found the model simple due to the sequenced steps of the model, which helped to apply it smoothly, in addition to linking the model to life learning. Besides, teachers found the model suitable for different specializations as a result of the diversity of the OER. However, they found it difficult

to be implemented in class 12; due to the Tawjihi national exam that focuses on memorizing specific content. The fourth attribute is trialability. Teachers considered the model applicable to all students. This is due to the flexibility of the model that allows students to solve the included problems according to their abilities and levels. In addition to that, the model focused on the repurposing of some OER related to content, creating other new OER, and sharing them, provided opportunities to transfer knowledge to learners all over the world. These were pieces of evidence on the applicability of the model. The fifth attribute is the observability of the model. Teachers focused on the observable learning outputs and outcomes from applying this model which were related to students and teachers. Besides, the created OER increased the observability of the model.

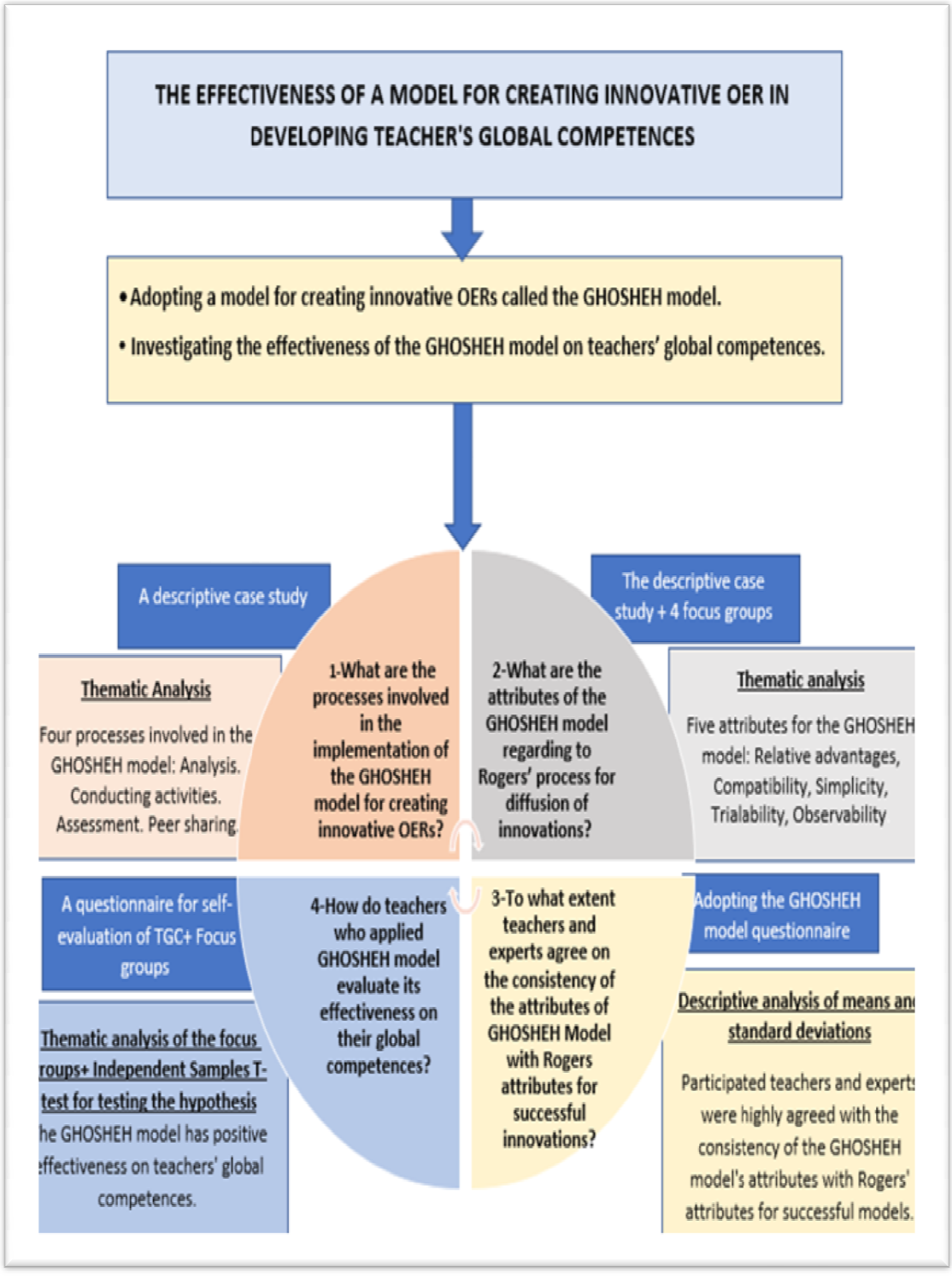
- To answer the third question "To what extent do teachers and experts agree on the consistency of the attributes of the GHOSHEH Model with Roger's attributes for successful innovations?"data collected from the adoption of the GHOSHEH model's questionnaire was used. Results showed that both experts and teachers highly agreed with the attributes of the GHOSHEH model which enables its adoption according to Rogers' process.

- To answer the fourth question" How do teachers who applied the GHOSHEH model evaluate its effectiveness on their global competences? Data collected from both the focus groups and the self-evaluation questionnaire of TGC were used. Results provided qualitative evidence on the impact of the GHOSHEH model on teachers' professional, sociocultural, individual, and personal competences. Besides, the quantitative data collected from the self-evaluation questionnaire of TGC was used to test the six hypotheses of the study. Independent Samples T-test was conducted to test the first five hypotheses. The test was used after testing its assumptions. Results showed that there were significant differences at $\alpha \leq 0.05$ in the means of teachers scores to each domain of the teachers' global competences domains, and to the total domain (TGC). These differences were attributed to the implementation of the GHOSHEH model. The effect size of implementing the GHOSHEH model was calculated for each domain. It was a round medium for all domains. Moreover, results showed that there were no significant differences at $\alpha \leq 0.05$ in the means of teachers' scores to the global competences attributed to gender.

Furthermore, the first three chapters are summarized using Figure (10). The next chapter will show how these results are interpreted and connected to the last studies and the theoretical framework.

Figure (10)

The summary of the first three chapters



Chapter Four

Discussion, Conclusion, and Recommendation

The current study reveals the development of a model for creating innovative OER called the GHOSHEH model. It aims at adopting the GHOSHEH model and exploring its effectiveness on teachers' global competences. The results of the study emanated from analyzing the data collected from four tools. The questionnaire for adopting the GHOSHEH model. A pre- and post-questionnaire for self-evaluation of TGC. A focus group and a descriptive case study. Qualitative and quantitative data collected from these tools were analyzed and results were used to answer the study's questions and to test its hypotheses. This chapter includes a discussion and explanation of the results of each question. Besides it provides the conclusion of the study, and the recommendation suggested in light of the study's findings.

4.1 Discussion of the results related to the first Question

The first question of this study is: "What are the processes involved in the implementation of the GHOSHEH model for creating innovative OER?"

Findings of the descriptive case study of teacher "F" show that the teacher employed four main processes through implementing the GHOSHEH model; which are: Analysis, Implementation of activities, assessment, and peer sharing. Analysis of content and context enabled the teacher to answer two main questions: whom to teach? And what to teach? When the teacher analyzed the internal conditions of her students and knew their needs and interests, she was able to answer the first question: whom do I teach? And when she analyzed the specific content of math, she became able to answer the second question: What to teach? After that, the teacher selected the most appropriate OER that suited the content and the students. This was the video that connected ramps (as an application of the Pythagorean theorem and triangles) to disable students who use wheelchairs. These inputs enabled the teacher to develop an idea for the problem that would interest the students and help them to apply math.

After that, the teacher moved to a third question which is: How to teach? The answer to this question was provided by implementing the activities according to the sequence of the GHOSHEH model. This enabled the teacher to focus on engaging the learners to

reflect on an OER related to the content and to the context (the video of ramps and the wheelchair). After that, she applied the problem-based strategy that focused on applying the content by the students to help one of their colleague "H" by solving the problem. Thus, the problem branched from the learners' context. In addition, activities required cooperative learning and communication with parents and the local community; in order to solve the problem. The teacher finalized the implementation by encouraging students to document their experience, license, and share it; so that others can benefit from the idea. Thus, students documented the steps of solving the problem of their colleague "H" in a video, licensing and sharing the results via OER.

when the teacher implemented the activities, she maintained the continuous formative assessment. This was reflected by the teacher's continuous assistance of learners, and the use of rubrics for solving the problem. These rubrics provided the answer to a fourth question which is: How to evaluate? The teacher depended on continuous evaluation. Thus, she was able to provide assistance to learners on time. She also found communication channels with professionals to assist students in designing the ramp. In addition, the teacher was able to discover the problems that students faced in the content when they applied math to solving a real-life problem. Based on that, she was able to apply authentic assessment and provide instructive feedback. This type of assessment helps users to determine the extent to which the innovation is applicable as revealed in ((Jirasatjanukul & Jeerungsuwan, 2018).

It seems that the implementation of the GHOSHEH model includes the general processes of the AAA instructional design model described in (Kongkakul & Namon , 2014). In addition, it includes a fourth process which is peer sharing. The implementation of the four processes involved in the GHOSHEH model was enough to answer the four questions that are considered key elements of the instructional design models, which are:Whom to teach? What to teach? How to teach? How to evaluate? (Isman A. , 2011). Therefore, one can say that the GHOSHEH model includes the key elements of instructional design models.Moreover, the GHOSHEH model specified these processes to focus on problem-based strategy, cooperative work, and reflection, in order to create innovative OER. Therefore, this specific problem looks similar to the models of creation of innovation which promote the creation of learner innovation skills as described in (Seechaliao & Yurayat, 2021; Jirasatjanukul & Jeerungsuwan, 2018).

Regarding the fourth process which is peer-sharing, it was posed through the implementation of the GHOSHEH model that the teacher(F) encouraged the students to share the created OER. The peer-sharing process was mentioned by the teacher(F) as a final process that includes: sharing the resulted OER in order to be retained, revised, remixed, reused, and redistributed by others. This process enables peer learners to provide feedback on the created OER and repurpose them within the activities of the model itself or in different contexts. Within this process, teachers may connect with experts, who would be mentors, and give useful feedback for them. This feedback could develop the crated OER. Besides it could impact teachers' professional practices, knowledge, skills, and attitudes and encourage them to share their experiences and provide new open resources that may assist others to solve common professional problems(Farrow, 2016; Urbancic, Polajnar, & Jermol, 2019).

Furthermore, the peer-sharing process maintains the circle of the implementation which promotes sustainability. Peers can repeat all the activities of the GHOSHEH model in other contexts to create another OER from the first created one. The case of teacher(F) asserted the importance of the emergence from one OER to innovate another OER so as to help sustain learning and enable the growth of knowledge. The teacher(F) described that by saying, " Let us share resources to benefit others and accumulate knowledge. Let us share the ideas as far as possible". This aligns with the studies of (Conole & Brown, 2018; Stracke M. , 2019) which confirmed on the positive role of OER in scaling experiences and promoting sustainability.

Actually, the peer-sharing process distinguished the GHOSHEH model from other models for creating innovation. This is due to the focus on repurposing of the OER which has a digital nature that enables the easy distribution of the created resources. However, the GHOSHEH model balanced this nature with the quality of the created OER. This quality is controlled within the four processes of the GHOSHEH model. The integration of the four processes of the GHOSHEH model could ensure the preparation of high-quality OER which is considered as more difficult than publishing the OER (Rennie & Reynolds, 2014).

Despite that, the case did not provide any evidence of following the resulted OER up; to know if others repurpose it, or get any feedback from global learners or teachers. It

seems that the purpose of developing the work by getting global feedback on the created OER, was not clear for the teacher, or it needs more time to be achieved.

4.2 Discussion of the results related to the second question

The second question "What are the attributes of the GHOSHEH model regarding Rogers' process for diffusion of innovations?" was answered by analyzing data collected from both the case study and the focus groups of teachers who are expected to be the main adopters of the model.

The key findings highlight that the attributes of the GHOSHEH model align with those of the successful innovation described by Rogers (2003).

The first attribute of the GHOSHEH model is the relative advantage. All participated teachers considered the GHOSHEH model as a significant model because it focuses on serving the community, homeland, and even the world. Besides, teachers found the model essential because it provides opportunities for both teachers and learners to develop their competences. The model enabled teachers to adapt teaching for multiple learning styles of students and for their multiple intelligences and assist all students to cooperate for creating OER and sharing them locally and globally. These results agree with the conclusion in (Conole & Brown, 2018) that focused on the use of OER in the instructional design for purposes of learning differentiation, and with the studies of (Paskevicius & Irvine, 2019; Van & Katz, 2019) which revealed that teachers who adopt OER create a space to aware their students to contribute meaningfully, by sharing their assignments, and engage in collaboration across time and space. This also points to the development of teachers' professional competences that include teachers' open practices. Thus, the GHOSHEH model is considered significant for its contribution to developing teachers' competences and open practices; since it enables teachers to apply multiple strategies and adopt OER. This result also aligns with the results in (Wahbeh Ghosheh, Shweiki, & Sartawi, 2022) which revealed that the instructional design models that combine different teaching strategies with OER contribute to the development of teachers' professional competencies. The same result also agrees with the results in (Paskevicius & Irvine, 2019; Van & Katz, 2019) that pointed to the contribution of OER in developing teachers' open practices.

Regarding learners, most teachers related the relative advantage of the GHOSHEH model to the included teaching strategies especially the problem-based strategy. The model engages students to solve or participate in providing solutions for actual, local, and global problems. This promotes the development of creativity skills for both students and teachers in agreement with the study of (Sinay, Nahornick, & Graikinis, 2018)which revealed that the problem-based strategy stimulates creativity by creating connections, rearranging ideas, and making conjectures. Besides, it seems that the focus of the GHOSHEH model on sequenced steps that combined the OER with multiple strategies engaged the learners in learning and increased their awareness of the presented problems. Besides it increased the awareness of teachers in multiple learner's centered-strategies that enhance the application of the problem solving-strategy. This aligns with the results in the study (Emre-Akdoğan & Ziya , 2016) which pointed to the positive impact of the instructional design based on problem-solving strategy on the enhancement of learners' performance in solving non–routine problems, that result in empowering learners and developing their creativity and other life skills.

The model also enables teachers to provide social-emotional support for students by engaging them in activities that reinforce some principles of social-emotional learning such as social awareness, self-management, and self-awareness. These principles were developed due to the provided opportunities for reflection in learning; as reflection allows students to identify their strengths, determine their needs, and evaluate themselves as revealed by (Chang, 2019). All these skills promote self-management as a main principle of social-emotional learning. In addition, the problem-based strategy, included in the GHOSHEH model, enhanced students' engagement, cooperative learning and discussion.enabled students to identify what they need, develop positive relationships, and make decisions. These results align with the results of (Kavrayici, 2020; Thakur, Dutt, & Chauhan, 2018; Sungur, Tekkaya , & Geban, 2006; Winarti, Ambaryani, & Putranta, 2022)which revealed that problem-based learning develops metacognitive abilities of learners, communication skills, entrepreneurial and life skills, professional, personal, cognitive, self-directed, time management skills, critical thinking, working in a team, and mutual respect. All these skills are considered basic principles of social-emotional learning.

Another promising finding is that the GHOSHEH model promotes sustainability; because it enables adopters to use one OER in order to innovate another OER related to the original one, then share it locally and globally to benefit from it. Learners who received the new OER can retain, revise, remix, reuse, or redistribute them. This continual process helps to sustain learning and enables the growth of knowledge. This result agrees with (Conole & Brown, 2018; Stracke M. , 2019) studies that showed that OER facilitates the scaling up of educational resources and thus promotes globalization, internationalization, and sustainability of learning.

It seems that the model reinforced the role of the student as a center of the learning process, as well as an active learner. Moreover, the teachers anticipated that continuing education through this model would lead to the graduation of good citizens; this is due to the contribution of the model in developing values and attitudes for the teacher and the learner to solve the problems of the community and take the responsibility in serving the community and sharing the experiences as OER. This can serve the global communities, and promote good citizenship by encouraging the teachers and students to become more civic-minded. These findings illustrate the relative advantages of the GHOSHEH model.

The second attribute of the GHOSHEH model is simplicity (Complexity). Most teachers considered the model not complex. Teachers interpreted that by the organized steps of the model, and its flexibility. The flexibility of the model is achieved due to the diversity and adjustability of OER, so that teachers can select any OER related to any content and to the students' contexts. Therefore, the model can be implemented in teaching any content.In addition to that, the model focuses on outcomes and outputs with flexibility in developing any actual problem related to the content, context, and the presented OER. The selection of OER and the development of the problem depend on students' characteristics, learning styles, cultures, levels, and needs. Thus, flexibility is connected to both the simplicity of the model and its adaption to learners' differentiation.Simplicity means that the model is not complex and that increases the rate of adopting the model as mentioned in (Rogers E. , 2003; Tanye, 2016). Despite the GHOSHEH model's simplicity, teachers confirmed the importance of the training for implementing the GHOSHEH model; in order to practice it and learn from experience, as described by Kolb who considered learning a continuous process of creating

knowledge that is grounded in experience (Kolb D. , 1984; Kolb D., 2015). It seems that the teachers consider the impact of practicing the model within a training program that enables teachers to use new methods in their contexts and to learn from their experiences as described in ((Močinić, Tatković, & Tatković, 2020; Nakelet, Prossy, & Bernard, 2017).

The implementation of the model assisted teachers to discover the third attribute of the GHOSHEH model which is trialability. Most teachers considered the model as applicable to students, and that it contributes to achieving education for all. This can be achieved by involving all learners, attracting them, and giving them the opportunity to reflect, think about problems, and solve these problems according to their abilities and levels. As mentioned before, the flexibility of the OER and the model strategies increases the ability of the model to be implemented with different learners and to teach different contents.The focus of the model on the adoption of OER, and the creation of other new OER and sharing them, provides opportunities to transfer knowledge to learners all over the world. Besides, when the created OER are shared freely to be accessible for all, barriers between different cultures are expected to be removed as described in the study of (Yamamoto, J. & Ananou, S. , 2015). In brief, the trialability of the model is attributed to the adoption of OER which offers significant opportunities for opening up education to support social inclusion and make a shift in the inequality of education in agreement with (Conole & Brown, 2018; Lambert, 2018).

The fourth attribute of the GHOSHEH model that was mentioned by half of the participants is compatibility. This can be interpreted by considering the model's processes which include analysis of context and learners' needs so that teachers can adapt the selected OER according to learners' needs. The same is for the problem and the tasks that can be fragmented and adapted to the learners' needs, contexts, and cultures. This is in addition to the contribution of the model in increasing communication between the teacher and learners. Hence, the model promotes the teacher to be closer to the students and this increases the ability of teachers to select the most appropriate OER, problem, and reflective questions. The model also promotes the teacher to provide continuous assessment and feedback; to support the students and assist them; which makes the model adequate to students' needs, beliefs, interests, concerns, and other internal conditions related to social, cultural, ideological, and

pedagogical aspects. These factors increased the model's compatibility as mentioned in the study (Tanye, 2016) which concluded that the innovation which meets the clients' needs, ensures high compatibility, and consequently high rate of adoption. Actually, the percentage of teachers who confirmed the compatibility of the model was less than the percentage of teachers who confirmed the last three attributes.This is due to the dispute that arose about the ability to implement the model in marginalized areas (challenging areas), in crowded classes, with special needs, and with students of different ages. On one hand, some teachers agreed on the ability of the model to be implemented in any case due to its flexibility. On the other hand, other teachers found that in order to implement the model, there are some requirements such as appropriate infrastructure and technological resources, less crowded classes, and learners of specific ages and without disabilities. This debate is expected; because the model is based on OER, and the lack of infrastructure and access is one of the main challenges of adopting OER as mentioned in the study of (Akter & Mahbub, 2020; Tlili, et al., 2022). This challenge causes the fall of having access to the infrastructure and hardware necessary for using or sharing digital OER such as internet connectivity, computers, and electricity, as mentioned in (Cox & Trotter, 2017) who confirmed that educators have the least control over infrastructure as a primary factor that challenges the implementation of innovations. However, some teachers provided solutions for this challenge and became confident that the model can be applied despite of weak infrastructure. This means that the model increased the awareness of these teachers on the impacts of using OER, creating others, and sharing them. This is in addition to the increase of the capacity, awareness, and the willing of these teachers to adopt OER as described in (Cox & Trotter, 2017). Nevertheless, it seems that the implementation of the GHOSHEH model is still unable to increase the awareness, capacity, and willingness of all teachers. Therefore, a debate arose on the ability to implement the model within weak infrastructure such as the case in marginalized areas. According to the researcher, the model can be implemented with most learners and anywhere due to its flexibility. However, more time is needed to develop the capacities, awareness, and willingness of all teachers, and to enable them to reflect on the incorporation of the model; to adopt the model, and try it in different cases. In addition, there should be sufficient contribution of the government and authorities to assess the model, scale it and provide more training programs that enable teachers to work hard in order to enhance learning and teaching.

The fifth attribute is the observability of the GHOSHEH model. Teachers who practiced the model observed its outputs, and outcomes. As a result, teachers detected the recognizable benefits of implementing this model that encouraged them to adopt it. These findings match with the studies of (Rogers E. , 2003; Tanye, 2016) which assigned that the obvious impacts of innovations ensure their diffusion.

In summary, finding show that teachers agreed on the attributes of the GHOSHEH model that allow it to be a successful model as described by Rogers. Moreover, the answer of the next question provides more evidence of the degree of agreement between teachers and other adopters of the GHOSHEH model.

4.3 Discussion of the results related to the third Question

Findings of the third question: "To what extent do teachers and experts agree on the consistency of the attributes of the GHOSHEH model with Roger's attributes for successful innovations?" reveal high agreement among adopters (Teachers and educational experts) on the five attributes of the GHOSHEH model. This indicates that teachers and experts highly agree that the model is successful according to Rogers' definition. This result is interpreted by the qualitative data which showed that adopters considered the model as significant in serving the community, homeland, and even the world; because it is based on adopting OER within multiple strategies including actual problem-solving strategy.

It seems that the attributes of the GHOSHEH model formed positive attitudes of adopters which stimulated them to highly agree with its attributes as a successful instructional design model.This high agreement is considered evidence of the ability of the GHOSHEH model to be adopted by teachers and experts. Consequently, this will encourage to adopt the OER that the model is based on. These results contrast with the findings of (Menzli, Smirani, Boulahia, & Hadjouni, 2022) in which the participants were reluctant to fully create or adopt OER for research and teaching, because of the complexity and the lack of trialability of OER. Additionally, compatibility and observability were barriers to more adoption of OER. This was explained by the lack of OER initiatives to overcome challenges (Menzli, Smirani, Boulahia, & Hadjouni, 2022). Therefore, the GHOSHEH model could be considered an initiative to adopt and create OER. The results of this part of the study also disagree with the study of (Appiah, Essel,

& Amankwa, 2020; Bond, Huddleston, & Sapp, 2021) which revealed that faculty were reluctant to use OER because it is time-consuming, and due to lack of training and encouraging funds, or awards that can be helpful to change the minds. It seems that the GHOSHEH model promoted the intrinsic motivation for the adopters rather than depending on external awards; due to its obvious benefits. Despite of that, the same challenges faced the teacher through implementing the model; the need for extra time, support, and funds to solve the problem and create OER. These challenges could also decrease the adoption of the model in the future if no actions were taken. Thus, it is vital to provide support from the community and government; in order to maintain the adoption of the GHOSHEH model as an initiative to adopt and create OER.

Finally, it is worth to refer the promising attributes of the GHOSHEH model to the integration of several strategies and theories. Therefore, the strengths of these theories and strategies were combined, while their weak points were minimized. This may explain the high adoption of the model that was reflected in the qualitative and quantitative results.

4.4 Discussion of the results of the fourth question and the hypotheses:

The results of the fourth question: How do teachers who applied the GHOSHEH model evaluate its effect on their global competences? showed that teachers found that the GHOSHEH model contributes to developing the domains(sub-competences) of teachers' global competences.

The first sub- competences are the teachers' professional competences (TPC). Findings show that TPCs were developed by implementing the GHOSHEH model. Firstly, knowledge in content was developed; due to the requirements of the GHOSHEH model to analyze the content, and to understand it deeply in order to select the best OER and connect content to the actual life problems. Also, the model requires asking reflective questions related to the content, then developing the appropriate actual problem. Through searching for the best OER, teachers learned a lot about the content by observing different resources related to this content. They also learned when they developed the problem and proposed some solutions that lead to creating the innovative OER, and sharing them. Teachers asked other colleagues about specific knowledge that they need; in order to assist students to create OER. Actually, this was an important step

for building learning communities that promise to develop teachers' knowledge and skills as everyone has something to learn from others; this is marched with the study (Paskevicius & Irvine, 2019) that described the impact of OER in developing learning communities who share experiences with each other.

It seems that the requirements of the GHOSHEH model to understand content deeply and use higher-order thinking caused some disequilibrium that encouraged teachers to assimilate or accommodate their knowledge to reach a state of equilibrium. In this way, they constructed a deep knowledge of the content. This is in harmony with the studies (Khalil & Elkhider , 2016) which depends on Piaget's cognitive constructive theory; to explain the internal cognitive conflicts caused by the interaction of what people know, what they need to know, and how this conflict leads to constructing knowledge as in the case of teachers. In addition to that, the model enabled teachers to develop their pedagogical competences. In fact, this development occurred because of the requirement of the model to analyze content and context, plan, select appropriate resources, apply multiple active learning strategies, use authentic assessment, manage group work, adapt differentiation, and encourage students' life skills. Besides, the model enabled teachers to develop their technological competences due to the requirement of searching, selecting OER, and assisting students to create OER and share them. Thus, teachers practiced new methods, strategies, and processes that are considered as new experiences.The model also helped them to develop their competences depending on the experiential learning that allowed them to organize the learning processes according to the reflection of their experiences as described in the study (Kim D. , 2018). This promotes building-up knowledge, skills, and values that enhance creativity, critical thinking, and lifelong learning; as mentioned in the studies of (Habib, Nagata, & Watanabe, 2021; Kolb D., 2015; Močinić, Tatković, & Tatković, 2020; Nakelet, Prossy, & Bernard, 2017).

These results were confirmed by the quantitative results of testing the second hypothesis "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the professional competences' domain attributed to GHOSHEH model"which was refused due to the existence of significant differences in the means of teachers scores to the professional competences' domain attributed to GHOSHEH model. Thus, there is a positive effect of the GHOSHEH model on the teachers' professional competences.

Vice versa, the quantitative results were interpreted by the qualitative results of both the case study and the focus groups of teachers that revealed the teachers' agreement with the positive effect of the GHOSHEH model on the development of their professional competences. This is due to the requirements of the GHOSHEH model to construct knowledge and practices. Actually, the results reflect the impact of combining constructive theory with experiential learning theory, which can explain how teachers developed their core competences by organizing their constructed experiences within the teaching processes they practiced, in order to achieve the learning outcomes.

Despite the impact of the GHOSHEH model on developing the TPC, the researcher supposes that there are no evidence that teachers benefited from all the processes of the GHOSHEH model. Particularly the peer-sharing process that promotes the circulation and repurposing of the created OER. In order to benefit from this process, teachers should follow the OER after sharing it; to get feedback from experts all over the world. The teachers didn't mention anything about that. Therefore, they missed the connection with global experts as mentors, who can give them useful feedback that develops their professional practices, knowledge, skills, and attitudes. Especially, if teachers shared common professional problems and get some proposals for solutions as mentioned in the studies (Farrow, 2016; Urbancic, Polajnar, & Jermol, 2019). This result poses the need for additional training for teachers to practice this process, and reflect on its impacts on their competences and learners' competences. This may explain the quantitative result related to the effect size of the GHOSHEH model on the development of TPC which was near to medium and not large.

The second sub- competences are the teachers' socio-cultural competencies (TSC). Findings reveal that teachers agreed on the impact of the GHOSHEH model on their communication skills. This impact resulted due to the requirements of the problem-solving strategy, that is included within the model. This strategy enables teachers to communicate with the local community in order to assist students in solving the assigned actual problem. Moreover, the model enhanced the communication between the teacher and the students who cooperated to solve the developed problems. Students became closer to the teachers who knew more about the cultures of these students in order to select the appropriate OER and develop the most suitable problem for the learners' cultures. Besides, teachers communicated with their colleagues and with

experts to develop their technological skills and digital literacy; in order to assist learners in creating OER. This result coincides with the study of (Gruszczynska, Merchant, & Pountney, 2013) which found that adopting OER could develop digital literacy, and thus socio-cultural understandings opportunities increased. The need to develop different competences encouraged teachers to ask other expert teachers inside the school; to overcome challenges that teachers faced when they practiced the model. Thus, teachers interacted with each other and tried to provide solutions for these challenges. This social interaction helped the teachers to develop their sociocultural competences in addition to the professional ones.This agrees with the study of (Nakelet, Prossy, & Bernard, 2017) and aligns with the principles of sociocultural theory explained by (Vygotsky, 1978).

Moreover, searching for OER enabled teachers to view different cultures, construct knowledge about these cultures, and adapt the selected OER according to the students' cultures. As well as, creating new OER and sharing them required teachers and students to be open to other cultures; in order to remove barriers between different cultures. As these OER are shared freely to be accessible for all. This is actually in agreement with the results of (Conole & Brown, 2018; Yamamoto, J. & Ananou, S. , 2015).

It is supposed that the implementation of the GHOSHEH model provides opportunities to combine the constructive theory (When teachers constructed knowledge about content, pedagogy, technology, and cultures) with the experiential one (when teachers practiced the model and determined their needs), and with the sociocultural theory (when teachers interact with others to find solutions to some challenges). This is in order to develop TSC, achieve social inclusion, and remove the inequality of education gradually through providing OER for all. These results were reflected in the case study and the focus groups that show the readiness of teachers to share the created OER and encourage students to do; to achieve the principle of education for all.

These findings interpret the quantitative results of testing the third hypothesis" There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the sociocultural competences' domain attributed to GHOSHEH model", which was refused due to the presence of significant positive effect of the GHOSHEH model on TSC.

In spite of these results, there are no evidence of communication between teachers and global experts or global teachers. As mentioned before, it seems that the teachers missed the opportunities to follow the shared OER in order to communicate with teachers or experts who are willing to repurpose the shared OER. This means that they missed the chance to know about different cultures deeply or participate in any cultural dialogue that develops their sociocultural competences. This may explain the quantitative result related to the effect size of the GHOSHEH model on the development of TSC which was between small and medium.

The third sub- competences are the teachers' individual competencies (TIC). Findings reveal that teachers agreed on the impact of the GHOSHEH model on their individual competences. This impact is expected; due to the opportunities that the model provides for exchanging experiences with others through the adoption and sharing of OER, and in order to deal with technological challenges and improve technological skills. This result coincides with the results of (Conole & Brown, 2018) which showed that OER contributes to developing technological competences.

Besides, findings show that teachers found that their students have more developed technological competences than them. This persuaded them to exchange experiences with their students. Thus, teachers accepted the idea of learning from their students when they tried to assist them in creating the OER.This encouraged teachers to accept that technology became a major part of the learning process, as described by the connective theory (Siemens, 2005). Furthermore, it increased teachers' confidence in their students, and respect for their viewpoints and perspectives. Consequently, this enhanced teachers' attitudes toward the ability of learners to create and innovate. Thus, the model contributed to developing teachers' open educational practices that promote innovation, creation, and reuse of OER with adaptation for the context, and open sharing of the created OER. This result agrees with the studies (Conole & Brown, 2018; Paskevicius & Irvine, 2019) which revealed that OER contributes to the development of teachers' open educational practices that assist individuals' innovative thinking and contribute to the open digital world. Moreover, the included strategies such as problem-based learning and cooperative learning enabled teachers to discover the students' talents and support them to produce original and creative ideas that are out of the box. These ideas were documented as OER that were scaled globally and this promotes the

globalization of education as mentioned in the study (Stracke M. , 2019) and contributes to developing teachers' open practices and teachers' individual competences.

Briefly, the requirements of the GHOSHEH model to search for OER, develop the actual problems, assist students to create innovative OER and share them, and apply authentic evaluation enabled teachers to construct their technological knowledge, develop their open educational practice and their perspectives about technology and respect students' experiences. All these issues are translated from the combination of constructivism, experiential learning, social-cultural and connectivism which promote the development of individual competences.

These results explained the quantitative results of testing the fourth hypothesis "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the individual competences' domain attributed to the GHOSHEH model" which was refused due to the significant positive effect of the GHOSHEH model on teachers' individual competences.

Despite of these results, teachers focused on some challenges related to their overload and lack of time which limit their abilities and attitudes to develop their individual competences. This is in addition to a lack of motivation. It seems that these challenges affected the effect size of the GHOSHEH model on the development of TIC which was near to medium. Thus, more training for teachers and more efforts from the Ministry of Education are required to deal with such challenges.

The fourth sub- competences are the teachers' personal competencies (TPeC). Findings point that the teachers agreed on the impact of the GHOSHEH model on their personal competences, especially their attitudes to adopt OER, create innovative ones, and share them globally despite of cultural differences. Most teachers were encouraged to implement the model in the coming years; due to the observable outcomes of the model that increased its relative advantages. The model helped teachers to observe the values of reflecting, cooperation, sharing ideas, serving communities, and communicating locally and globally, which affected their personal competences. Besides, it encouraged them to retry the model and adopt it in the classes. Teachers found that they have the potential with their students to support OER development by creating innovative OER, which is in harmony with the results revealed by (Misra, 2012).

Furthermore, the positive attitudes of some teachers encouraged them to agree on the ability of the GHOSHEH model to solve the problems of learners in the challenged areas. This was specified by creating OER that focuses on the problems of these areas and shares them with others. These teachers thought creatively with consideration of the accessibility of OER for all which increases the opportunities for exchanging experiences and sharing problems as described in the studies of (Farrow, 2016; Urbancic, Polajnar, & Jermol, 2019). And also enables excluded learners (in developing countries) to exchange education with other international learners freely as supposed by (Lambert, 2018). It seems that the model increased the awareness of openness of these teachers as mentioned by (Van & Katz, 2019).

Once again, findings reveal the contribution of the combination of theories (in this case they are experiential learning, social cultural, and connective theories) in the development of TPC.

These qualitative results agree with the quantitative ones of testing the fifth hypothesis" There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the personal competences' domain attributed to GHOSHEH model" which was refused due to the significant positive effect of the GHOSHEH model on teachers' personal competences. Despite of that, the researcher supposes that teachers missed the opportunities for a greater development of their awareness of openness and their personalities. This is due to the lack of communication between teachers from different cultures in order to discuss their recommendations and develop the created OER. The process of peer sharing was not completely applied; due to different challenges including the difficulties that each teacher faces to leave his or her comfort zone. This is because exchanging experiences with people from other cultures is something new, and requires more effort to study the cultures and the best communicative tools with others. This is in addition to the need for knowing about others' languages. These efforts make the teachers resist the change. Thus, it limits the exchange of experiences to the local side. This may explain the medium effect size of the GHOSHEH model on TPeC.

All these results explain the significant positive effect of the GHOSHEH model on teachers' global competences which was confirmed by testing the first hypothesis" There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the global competences' domain attributed to GHOSHEH model" that was refused; due to

the significant positive effect of the model on teachers' personal competences. This result was not affected by gender as revealed from testing the sixth hypothesis "There are no significant differences at $\alpha \leq 0.05$ in the means of teachers scores to the global competences' domain attributed to the gender" which was accepted due to the agreement of both males and females on the positive effect of the GHOSHEH model on teachers' global competences.

To sum up, the GHOSHEH model has a significant positive effect on teachers' global competences; due to the combination of multiple theories, multiple strategies, OER, and the main process of instructional design. All these were integrated within the GHOSHEH model. The results confirm the effectiveness of the model to develop teachers' global competences through developing their understanding of content (critical concepts and principles in the disciplines) and pedagogical practices to adapt learning for all students. This is in addition to the competences that teachers developed to engage learners in collaboration, creativity, critical thinking, and problem-solving related to authentic local and global issues. These efforts are expected to be the main factors of the positive effect of the GHOSHEH model on TGC in harmony with the study (Kopish M., 2016). Even though, the study shows that the effect size of the GHOSHEH model on TGC is still near the medium. This can be explained by the need for more time to practice the GHOSHEH model and reflect its outcomes, with a focus on all the processes included in the GHOSHEH model. Furthermore, the researcher supposes that despite the positive effect of the GHOSHEH model on TGC, and the high agreement of teachers and experts on its attributes as a successful model regarding Roger's DOI, there is still some resistance from teachers to change. This resistance can be attributed to the modernity of the model, and also to its requirements; as it requires more effort from teachers especially at the beginning, which may decrease the teacher's comfort. This encourages some teachers to resist the new model as explained by(Damawan & Siti , 2020). Besides, it is important to consider some of the challenges that teachers face, in relation to time management; in order to implement the model within school time and in parallel with teaching all content in the textbook to prepare students for the exams. In addition to the need to practice the model within the high load of teacher's work. As they mentioned, teachers hoped to adopt this model and include it within the curricula; in order to benefit from its outcomes. However, this needs some support from the Ministry of Education; taking into consideration that it is important historically to

consider teachers' resistance to change; to facilitate teachers' adoption and integration of new innovations in teaching (An, 2021). Therefore, it is important that the Ministry of Education adopts the model, studies its effectiveness in teaching and learning, and scales it to support teachers and enable them to see the value of the model while they are feeling comfortable and confident. Moreover, long term training is important to consider teachers' resistance to change, since the practice of the model and the observation of its outcomes limit the resistance to change as a result of changing teachers' minds.

4.5 Conclusion

The current study aims at adopting the GHOSHEH model for creating OER and exploring its effectiveness on teachers' global competences. The GHOSHEH model is rooted in the combination of multiple theories. Moreover, it integrates OER with learner-centered strategies including discussion, problem-solving, and cooperative learning; this is in addition to the focus on reflection and continuous assessment. The model involves four processes which are: Analysis, implementing activities, assessment, and peer sharing. The GHOSHEH model was introduced following Rogers' process for diffusion of innovation. This process required the creation of awareness of the GHOSHEH model through a training program for implementing the model, workshops, and conferences. These were followed by the provision of opportunities to practice the model and make decisions about adopting it. Trained teachers on implementing the model, and practiced it with their students. During this process, qualitative data were collected using a descriptive case study and focus groups. Furthermore, quantitative data were collected using two questionnaires. The first one is for adopting the GHOSHEH model regarding Roger's process. The second questionnaire is for teacher's self-evaluation of global competences.

Results reveal that the GHOSHEH model has five attributes that enable it to be a successful innovation regarding Rogers' definition. These attributes include relative advantage, compatibility, complexity, trialability, and observability.

Results provide quantitative pieces of evidence on the high agreement of the teachers and experts (as adopters of the model) on the GHOSHEH model's five attributes that enable us to consider the model as a successful and innovative one regarding Rogers

DOI. This was interpreted by the qualitative evidence that explain each attribute of the GHOSHEH model. The first one is the relative advantages of the model which include its ability to develop higher- order skills for both teachers and learners. This is in addition to the promotion of good citizenship, social-emotional support for learners, and focusing on cooperative learning, differentiation, students' talents and abilities, and their communication with the world. The compatibility of the GHOSHEH model was interpreted by the ability of the model to be applied in different contexts, and with different cultures. Half of the teachers found that the model could be used for education in emergency, with people with special needs, in crowded classes, and with students of different ages. Regarding the complexity attribute, the GHOSHEH model is considered not complex. Teachers attributed this result to the ease of the model; due to the sequence of the involved steps of the model, which helps to apply it smoothly. In addition to that, the model links to life learning as a result of the included real-problems related to the contents. The trialability attribute of the model is connected to its applicability to all students; this enables the model to contribute to achieving education for all by involving all learners, attracting them and giving them the opportunity to reflect, and think about the problems. Actually, the focus of the model on the employment of OER, and the creation of other new OER and sharing them, provide opportunities to transfer knowledge to learners all over the world. The observability of the GHOSHEH model is reflected by the learning outputs and outcomes from applying this model. These outcomes are divided into two parts. The first one related to students; as the model aligns with adaptive learning; it allows students to participate in the learning process actively according to their abilities in order to achieve their goals. Moreover, students become able to observe their achievements that are represented by their products which are the created OER.

Regarding the effectiveness of the GHOSHEH model on teachers' global competences, the study provides quantitative pieces of evidence on the significant effect of the GHOSHEH model on each domain of the teachers' global competences. Moreover, it provides qualitative pieces of evidence that interpret the effect of the GHOSHEH model on each domain of teachers' global competences. Firstly, it was found that the GHOSHEH model positively affects the teachers' professional competencies. Teachers who applied the model developed their knowledge in content in addition to pedagogy and technology. In other words, teachers developed their technological pedagogical and

content knowledge (TPACK). This is due to the requirements of the model to align the OER and the developed problem to the content and analysis results. Then follow the activities of the model and apply all its processes.

Secondly, the personal competencies of the teachers were developed due to their positive attitudes resulting from their observation of learners' interaction and increase in their motivation to learn. It seems that practicing the model motivates teachers to leave their comfort zone and observe the results which increases their trust in their abilities.

Thirdly, the individual competencies of the teachers were developed due to the opportunities that the model provides for teachers' continuous professional development. This is done through exchanging experiences with colleagues, accumulation of the created OER, learning from learners, researching for appropriate OER and ideas for the problem, practicing and reflecting on the practices.

Fourthly, the model positively affects the teachers' socio-cultural competencies. This is because it encourages communication with others in order to develop students' skills and solve the included problems. The necessity to develop technological competencies stimulates teachers to communicate with expert teachers to develop their technological competencies.

The positive effect of the GHOSHEH model on teachers' global competences can be attributed due to the requirements of the model that enable teachers to adopt OER within the four main processes which are analysis (of content, learners, and context), implementation (of activities based on reflection, actual problem solving and cooperative learning), continuous assessment of learning and peer- sharing. These processes, which are rooted in the combination of multiple theories, provided opportunities to benefit from the strengths of each theory and avoid the weakness of any of them.

It seems that the GHOSHEH model promises to graduate good global citizens who are able to participate in solving some global problems in creative ways. However, adopting the model faces some challenges related to time management, teachers' overload, and the need for some efforts from teachers. Within the current context and the lack of motivation or support from the organization, these challenges may increase teachers'

resistance to adopting such promising model. Thus, the sustainability of adopting this model requires support from both the government and the community.

In brief, the current study sheds light on the importance of teacher global competences. Teachers should be well prepared in order to develop their TGC and infuse global perspectives to educate for global citizenship. In order to do, the study provides the GHOSHEH model as a systematic approach that focuses on connecting the content with the context, learners, free resources, actual problems, global communication, and opportunities for creativity and innovation. Hence, there is a need to provide organizational support from the Ministry of Education by focusing on the curriculum framework and providing a space for global dimensions into teaching and authentic evaluation. This is in addition to adopting OER with instructional design models that promote creativity and globality such as the GHOSHEH model.

Finally, it is valuable to consider teachers' recommendations that may contribute to the development of the GHOSHEH model and limit the implementation's challenges. These recommendations focus on designing a web page that includes templates specialized for the online implementation of the GHOSHEH model. Using a platform that includes a bank to save the resulted OER and enable teachers to exchange experiences. Depending on e-enabled learning in the implementation of the GHOSHEH model. This can be done by implementing some steps online and others within face-to-face sessions. This integration between online and face-to-face learning can solve the problem of time, and provide opportunities to use the model in emergencies when there is a lockdown. This is besides teachers' recommendations of adopting the GHOSHEH model within the official curricula, considering it in the evaluation and assessment processes and providing more information about the model through the internet.

4.6 Recommendation

In light of these results, the study provides these recommendations:

Recommendations for teachers:

- Teachers are recommended to adopt the GHOSHEH model and implement all its processes to create innovative OER and share them globally.
- Teachers should encourage students to produce and create OER and then share them globally.

- Teachers should communicate with parents and the local community in order to aware them of the importance of creating OER, and encourage them to support students to solve actual problems and share their experiences.

Recommendation for Ministry of Education:

- Decision makers in the Ministry of Education are advised to encourage teachers to adopt the GHOSHEH model to create innovative OER and share them globally.
- Decision makers are advised to scale the GHOSHEH model by including it within the curricula after conducting the needed research that provides evidence on its effectiveness.
- Decision makers should benefit from the study instrument that is used to measure teachers' global competences in developing an index that documents the teachers' global competences; this index is to be used as a baseline for teachers.
- Decision makers should benefit from the training material on implementing the GHOSHEH model; to conduct long-term training that enables teachers to practice the model and reflect on their practices.
- Decision makers are advised to involve the GHOSHEH model in the induction training program for the new teachers, principals, and supervisors.
- Decision makers are advised to involve the model within the ministry platform in a way that enables teachers to implement the model online or within blended learning.
- Decision makers should design a bank for the created OER from teachers and students, and this requires developing standards for the acceptable OER.

Recommendation for future work

- Researchers are advised to conduct researche on the effectiveness of the GHOSHEH model on students' competences, life skills, and performance.
- Future studies should compare the effectiveness of the GHOSHEH model on teachers' competences with those of other instructional design models.
- Future research should compare the effectiveness of the GHOSHEH model on learners' competences with those of other instructional design models.
- Researchers should study the effectiveness of the GHOSHEH model on facilitating teaching in emergencies such as the lockdown of schools and on teaching and learning in the challenged areas.

- Future studies should compare the effectiveness of the GHOSHEH model when it is implemented online and face-to-face.
- Researchers should explore the role of the GHOSHEH model in teaching students with disability.

4.7 Limitations

In this mixed-methods study, there were two main limitations. Both of them were outside of the researcher's control. The first one was the Palestinian teachers' protest during the implementation of the model, when some teachers stopped working for 40 days; due to issues related to their professional rights. Students were absent and this interrupted the teaching process and part of the implementation of the model and limited the sample to those who accepted to implement the model within these conditions despite their stress. The second limitation is related to the Palestinian parents who believe in the exam as the most important and the main tool of evaluation. Thus, most parents didn't care about implementing the model that depends on authentic assessment. They prevented students from working on OER especially when there were assigned exams. This was considered a challenge that requires the MOE to conduct awareness on the role of such models and the included authentic assessment in teaching and learning.

List of Abbreviations

Abbreviation	Meaning
DOI	Diffusion of Innovation
GC	Global Competences
IC	Individual Competences
ID	Instructional Design
MOE	Ministry of Education
NIET	National Institute for Educational Training
OER	Open Educational Resource
PC	Professional Competences
PerC	Personal Competences
SC	Sociocultural Competences
TGC	Teachers' Global Competences

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Appendixes

Appendix (A)

permissions for the study

An- Najah
National University
PhD Program in Teaching & Learning

جامعة النجاح الوطنية

برنامج دكتوراه في التعلم والتعليم

التاريخ : 2022/5/26

إلى من يهمه الأمر

الموضوع : تسهيل مهمة

تقوم الباحثة دعاء محمد اسماعيل فؤاد غوشة، رقم التسجيل (11970088)، بإعداد دراسة بعنوان:

"The Effectiveness of model for creating innovative OERs in developing teachers global competencies"

وذلك استكمالا لمتطلبات التخرج من برنامج دكتوراة في التعلم والتعليم، يرجى من حضرتكم تسهيل مهمتها في جمع البيانات الخاصة بالدراسة من خلال تطبيق بعض الأدوات البحثية في وزارة التربية والتعليم وكافة مديرياتها، كالاستبانات والمقابلات النوعية، للفئات المعنية (مشرفو التدريب، المعلمون وذوي الخبرة والاختصاص في وزارة التربية والتعليم).

شاكرين لكم حسن تعاونكم .

مع وافر الاحترام ،،،

منسقة برنامج دكتوراه التعلم والتعليم

د. ساندة عفونه

نابلس – ص.ب7، 707 – هاتف 2345113/5/6/7، 2344114، 2341003(09)(972)، فاكس2345982(09)(972)
Nablus – P.O.Box 7, 707 – Tel. (972)(09)2341003 – 2344114 – 2345113/5/6/7 – Fax (972)(09)2345982
Home Page: www.najah.edu E-mail:info@najah.edu

بسم الله الرحمن الرحيم

State of Palestine
Ministry of Education
Center for Educational Research and Development

دولة فلسطين
وزارة التربية والتعليم
مركز البحث والتطوير التربوي

الرقم: و ت /٤١٩/١/١٣
التاريخ: ٢٠٢٢/٠٦/٢٩م

لمن يهمه الأمر

الموضوع: "تسهيل مهمّة بحثية"

يهديكم مركز البحث والتطوير التربوي أطيب تحية، ويرجو منكم التكرم بتسهيل مهمة الباحثة:

"دعاء محمّد اسماعيل فؤاد غوشة/وهبه"

من **جامعة النجاح الوطنية** للحصول على المعلومات اللازمة لإعداد مشروع تخرج بعنوان:

"The Effectiveness of a Model for Creating Innovative OERs in developing Teachers' Global Competencies"

ملاحظات:

- تتضمن الدراسة توزيع استبيانات وعمل مجموعات مع عينه من معلمين ومدراء في المدارس من الملتحقين ببرامج التدريب التي ينفذها المعهد الوطني خلال الأعوم ٢٠٢٢/٢٠٢٣ و ومشرفين تربويين وموظفين تربويين ذوو خبرة بنماذج تصميم التعليم في وزارة التربية والتعليم.
- الاستجابة على الأدوات البحثية من قبل عينة المبحوثين طوعية.
- نظراً لظروف الجائحة يتم تطبيق أدوات البحث عبر النماذج المحوسبة دون تواصل وجاهي مع المبحوثين.
- نرفق لكم اطار مدارس مديريات العينة للتواصل عبر الايميل مع مدراء المدارس برابط الأداة البحثية المحوسب.

مع الاحترام،،

د. محمد مطر

/مدير عام مركز البحث والتطوير التربوي

بسم الله الرحمن الرحيم

State of Palestine
Ministry of Education
National Institute for Educational Training

دولة فلسطين
وزارة التربية والتعليم
المعهد الوطني للتدريب التربوي

From: Dua, Mohammad Esmael Ghosheh

To: Dr. Sofia Rimawi. The General Director of the national Institute for educational training (NIET).

Subject: Permission for Applying GHOSHEH Model in Training Teachers Enrolled in NIET training programs and collecting data for research

Date: 17Th April 2022

Permission for Applying GHOSHEH Model in Training Teachers Enrolled in NIET training programs and collecting data for research

Dear Dr. Sofia Rimawi,

Thank you for the continuous support of the quality of education. I'm writing this letter to submit my request for a permission to apply a model entitled "GHOSHEH model" in training teachers enrolled in NIET training programs in 2022/2023, and collecting data related to the effectiveness of the model on teachers' global competencies. GHOSHEH model which was developed by Dua' Mohammad Esmael Ghosheh, focuses on creating innovative open educational resources (OERs). The model promises to facilitate innovation for both teachers and students. I will conduct a research on the effectiveness of GHOSHEH model in developing teachers' global competencies. This research is a part of my dissertation in An Najah National University (ANNU); as I am a PHD candidate from learning and teaching program. My request includes permission for training teachers to implement the model with their students, and participating in questionnaires and interviews in order to evaluate the model itself and the effect of the model on their global competencies.

I hope that this request will meet your approval. If you gave me your approval, please write your decision bellow.

Best regards

Dua' Mohammad Esmael Ghosheh

Decision: Approved

Dr. Sofia Rimawi

Sofia Rimawi

The General Director of NIET

Appendix (B)

Experts who participated in the experts' panels to validate the GHOSHEH model

No.	Name	Contact details
1	Prof. Xiangyang Zhang	Joint Director of Research Institute for Open Education Suqian University, China Emeritus Professor of Open University of Jiangsu, China Director of EFL Unit of Open Learning School Open Educational Resources Advocacy Committee Member, ICDE Ambassador for OER, International Council for Open and Distance Education https://www.icde.org/knowledge-hub/icde-oer-advocacy-committee
2	Prof. Ebba Ossiannilsson	Professor in innovation and open online learning. The V President of the Swedish Association for Distance Education, and a board member in Job and Skills Coalition Sweden. ICDE, and EDEN Executive Committee. A quality reviewer at ICDE and EADTU. The chair of the ICDE OER Advocacy Committee, and ICDE OER Ambassador. Amember of ICoBC and Chair the Committee for Taxonomy and Quality Grid. European Commission, UNESCO; COL, and ITCILO.
3	Dr. Louis Christilo	Senior Education Specialist at the World Learning. A program evaluator for projects funded by aid agencies such as USAID, FCDO, World Bank, and the Ford Foundation. Experience in teaching courses for the online MS in Global and International Education offered by Drexel University's College of Education.
4	Prof. Ramesh Sharma	Former Associate Professor of Educational Technology and Learning Resources at WOU - Wawasan Open University. Worked at ISTE.
5	Prof.Alberto Corbino	Spain, a PhD in Physics, experience in teaching methods regarding to physics and science and distance learning.
6	Dr. Lina Maria	PhD Candidate Education. An educator at the University of Quindio. Colombia.
7	Prof. Kathleen Copeland	An educator, at the University of Delaware. A project manager and instructional designer for a training material for training teachers of childhood. World bank.
8	Dr. Khaleel Bader Al Bataineh	A professor (Associate) at Amman Arab University Jordan. Applied linguistics, e-learning, blended learning, language in use, language analysis, speech acts and their role in communication and sociolinguistic behavior.
9	Dr. Ahmad Mursy	Assistant Professor at IAU University/Egypt E-content development manager at Ministry of Communications and Information Technology Former Project Research Consultant at United Nations University.

No.	Name	Contact details
10	Dr. Abed -El Noor	Professor of Higher Education at the University Center Nour El-Bashir in El-Beidh, Algeria. Member of the Scientific Council, assistant director in charge of scientific research, and a head of the Ethics and Ethics Committee of the University Profession at the Nour Al-Bashir University Center.
11	Dr. Esma'el Hassouneh	Former Teaching assistant at al-Aqsa University, Gaza, Palestine. Former Assistant Professor of Instructional Technology & E-Training at al-Aqsa University/Gaza.
12	Dr. Waheed Jubran	An educational expert in training teachers, school administrators and educational supervisors. An international expert in training, a certified trainer and consultant from the Arab Trainers Association and the International Federation of Trainers and Speakers. Director of the Educational Development Center at the International Relief Agency.
13	Dr. Hanan Al-Jamal	A doctor in designing Arabic Curriculum. An expert in teachers training for 10 years, National Institute for educational training(NIET), Palestine.
14	Suzan Adnan	A specialist in English. An expert in teachers training for 11 years, National Institute for educational training(NIET), Palestine.
15	Hilmi Hamdan	A specialist in Math. An expert in teachers training for 11 years, National Institute for educational training (NIET), Palestine.
16	Khulood Amer	A specialist in science. An expert in teachers training for 3 years, National Institute for educational training (NIET), Palestine.

Appendix (C)

The arbitrators who judged the study tools

Name	Contact details
Dr. Hanan Al-Jamal	A PhD in education/ Curricula. An expert in teachers training for 10 years, National Institute for educational training (NIET), Palestine**.**
Dr. Ibraheem Al-Nouri	A PhD in education. An expert in training principals and teachers for 10 years, National Institute for educational training (NIET), Palestine.
Dr. Najla' Fathi	A PhD in education/ Evaluation. A specialist in science. An expert in teachers training for 3 years, National Institute for educational training (NIET), Palestine.
Dr. Sofia Al- Rimawi	A PhD in education/Assessment and evaluation. An expert for 16 years in training teachers, supervisors and principals. Birzeit university. Palestine.
Dr. Khaled Dawas	A PhD in education/Social science. An expert in teachers and principals' training. Birzeit university, NIET, Palestine.

Appendix (D)

Characteristics of the sample responded to each instrument of the study

1- **Characteristics of the sample responded to Adopting GHOSHEH model questionnaire**

Gender			Job		Qualification				Experience (Years)			Organization	
Type	**Male**	**Female**	**Teacher**	**Educational Experts**	**Ba.**	**Ba & Diploma**	**Ma.**	**PhD**	**Less than 5**	**5-10**	**More than 10**	**Private**	**Public**
No.	144	238	345	37	230	63	59	30	62	84	236	68	314
Percent%	37.6	62.3	90.3	9.7	60.2	16.5	15.4	7.9	16.2	22	61.8	17.8	82.2
Total	382		382		382				382			382	

2- **Characteristics of the sample that responded to the questionnaire for self-evaluation of teachers' global competencies before and after applying GHOSHEH model**

Gender			*Specialist*						*Qualification*				*Experience (Years)*		
Type	**Male**	**Female**	**Arabic**	**Math**	**Science**	**Technology**	**English**	**Social Studies**	**Ba.**	**Ba & Diploma**	**Ma.**	**PhD**	**Less than 5**	**5-10**	**More than 10**
No.	109	176	67	51	42	50	26	49	223	17	42	3	50	57	178
Percent%	38.2	61.8	23.5	18.0	14.7	17.5	9.1	17.2	78.2	6.0	14.7	1.1	17.5	20.0	62.5
Total	285		285						285				285		

3- **Characteristics of this sample participated in the focus group**

Group	**Time** (SEC)	**No.**	**Female**	**Male**	**Specialist**	**Secondary**	**Basic**	**Kindergarten**	**private**	**Public**	**Ba**	**Post graduate**	**District**
1	105	5	3	2	Science Math Arabic	3	1	1	2	3	5	0	Nablus Ramallah
2	120	7	6	1	Social studies	4	3	0	0	7	6	1	Nablus
3	150	6	4	2	Arabic Math	3	3	0	0	6	5	1	Nablus Hebron
4	110	6	4	2	Math Science	4	2	0	1	5	5	1	Hebron S.Hebron Bethlehem
Total		24	17	7		14	9	1	3	21	21	3	

Appendix (E)

The outline of the training material on implementing the GHOSHEH model

The outline of the training material is documented in two parts; the first one presents the general framework for training teachers on how to plan content according to GHOSHEH model, and the second includes the training matrix.

Part 1: A framework focuses on competencies, learning objectives, learning outcomes and KPI for training on GHOSHEH model

Core Competencies for learners(teachers)	Specific competences for the learners	Learning objectives for the training	learning outcomes for the learners	Key Performance Indicators (KPI)
- The learner determines the relation between digital citizenship and OER. -The learner follows GHOSHEH model steps to create innovative OER. -The learner follows GHOSHEH model steps to assist students to create innovative OER.	-The learner identifies each of the following: Digital citizenship, open license, and open educational resources (OER). -The learner cooperates with virtual group to apply GHOSHEH model for creating OER. -The learner develops teaching plans according to GHOSHEH model for teaching students the content and assist them to create related OER. - The learner implements GHOSHEH model with students.	-The learner expresses in different ways the concepts of: Digital citizenship, open license, open educational resources (OER). - The learner explores the steps of GHOSHEH model. -The learner follows GHOSHEH model to create innovative OER. -The learner follows GHOSHEH model to plan for assisting students to create innovative OER. - The facilitates teaching students based on GHOSHEH model.	-Learner will provides simple definitions for digital citizenship, open license, and open educational resources (OER). - The learner will connect OER with content and digital citizenship. -The learner will create innovative OER according to GHOSHEH model. - The learner will provide teaching plans for assisting students to create innovative OER according to GHOSHEH model -The learner will apply GHOSHEH model with students -The learner will share all resulted OER globally.	-80% of Learners provide simple definition for digital citizenship, open license, and open educational. -70% of the learners create innovative OER according to GHOSHEH model. -70% of Learners provide teaching plans for assisting students to create innovative OER according to GHOSHEH model. -60% of Learners share resulted OER globally. -70% of learners implemented GHOSHEH model with students.

Part (2): The training metrics

Learning Context						
A.Learners The learners are 300 teachers specialized in Arabic, English, Math, Science, Technology and social studies. These teachers have finished yet a training on analysis of content and learners' needs, learner centered strategies such as problem solving, cooperative learning, and designing rubrics for evaluation.						
B.Background Learners have prior experience in teaching, different learning styles, they are overloaded, suffer from staffed classes and insist to teach all content in the textbooks. In addition, they protested due to law salaries. Therefore, they need a lot of socio-emotional support during training.						
C.Resources/Materials/Online Apps Resources: - A video about OER designed by the researcher as an OER: -https://www.youtube.com/watch?v=4DtWWEtY9Bw - A video about open license designed by a trainer as an OER. https://youtu.be/O0EPs7jnJBY - A Guide for teachers to get open license. - A document includes description of GHOSHEH model with examples.						
Session	**Objectives**	**Outcomes**	**Activities**	**Resources**	**Assignments**	**Time**
One+ Two	-The learner expresses in different ways the	-Learner will provides simple definitions of digital citizenship, open license, and open	- Use Microsoft Teams for online training. -Present OER related to	Microsoft Teams A video about OER https://www.youtube	Assignment 1: −Give your own definition	

	concepts of: Digital citizenship, open license, open educational resources(OER).	educational resources(OER).- Connect OER with content and digital citizenship.	citizenship. - Reflect them and write reflections - Discussion to conclude the definition of citizenship and digital citizenship. - Provide definitions of citizenship and digital citizenship. - Ask learners to work in groups and express the concepts of citizenship and digital citizenship with a caricature. - Share the caricatures with the other trainees. - Discuss the relation between digital citizenship and open license. - Conclude the definition of OER. -Discuss the importance and challenges of using OER. - Present a video about OER.	.com/watch?v=4DtWWEtY9Bw A video about open license https://youtu.be/O0EPs7jnJBY	of digital citizenship, open license, and open educational resources(OER). -Determine a content that will be taught later and search for connecting it with digital citizenship. - Analyze content and classify according to priority. -Searching for OER related to content. - Provide previous resources designed by teachers with open license. - Present the	4 hours Synchronies 3 hours Asynchronies

			- Discuss the content of the video. -Provide opportunities for learners to license any resource they have developed such as lesson plans, with open license. - Present a video of how to license resources with open license. -Provide learners with a guide for developing OER. - Give assignment (1). - Provide opportunities for each learner to present his work in (5min).		OER they have found to other teachers in the training session.	
Three	- The learner explores the steps of GHOSHEH model. -The learner follows GHOSHEH model to create innovative OER.	-The learner will create innovative OER according to GHOSHEH model.	- Learning by doing: - Apply the steps of GHOSHEH model with learners (to learn about vision) as follow: - Present an OER related to blindness. - Ask learners to reflect write and present their	OER related to blindness	**Assignment (2):** Teachers will be asked to: - Follow GHOSHEH model to create innovative OER and share them. - Use the OER they found in	

			reflections. - discuss objectives of the activity with learners. - Share with learners a problem related to a blind who had the opportunity to see for 6 hours, and need a program to see the best sights in Palestine in addition to a socio emotional support. - Divide learners into groups and provide them with rubrics to solve the problem and produce OER then share them. - Ask learners to summarize the steps they have followed. - Present GHOSHEH model to compare what they have done with the model steps. - Discuss the importance of such a model.		assignment 1, and the analyzed content to plan for teaching students according to GHOSHEH model. - Present their plans for other teachers in the group.	4 hours Synchr onies 3 hours Asynch ronies
Four	-The learner follows GHOSHEH model	- The learner will provide teaching plans for assisting students to	Group working: -Divide learners into groups			

	to plan for assisting students to create innovative OER. - The learner implements GHOSHEH model with students.	create innovative OER according to GHOSHEH model. -The learner will share all resulted OER globally - The learner will facilitate teaching students based on GHOSHEH model.	according to the class they teach. -Ask learners to select a content that will be taught during the next week, and plan to teach the content by following the steps of GHOSHEH model. - Ask each group to present the plan in 5 min. - Provide feedback on the plan. - Ask each learner to develop the same plan, or develop a new plan for teaching the students next week based on the model, then present the process of teaching with evidences (pictures, videos…).		Assignment (3): Teachers will be asked to implement their teaching plans according to GHOSHEH model. - Present their implementation with evidences.	

Appendix (F)

The schedule of the training program on implementing the GHOSHEH model by the trainers who discussed the training materials and trained on implementing it

District	Subject	Trainer	Session (1)	Session (2)	Session (3)	Session (4)
South Hebron	Math	Dr.Ghanem Ikhlaiel	4th May 2022	8th May 2022	12 May 2022	22ed May 2022
	Arabic		2nd May 2022	9th May 2022	16th May 2022	23th May 2022
	English	Murad Sendi	3ed May 2022	10th May 2022	17th May 2022	25th May 2022
	Science	Dr.Najla' Fathi	18th May 2022	25th May 2022	1st June 2022	8th June 2022
	Technology	Akram Asalweh	12 May 2022	19th May 2022	26th May 2022	2nd June 2022
Hebron	Math	Dr.Najla' Fathi	8th May 2022	15th May 2022	22ed May 2022	24ed May 2022
	Arabic		9th May 2022	16th May 2022	23ed May 2022	30 May 2022
	Science	Safwat Rasras	11 May 2022	18th May 2022	25th May 2022	1st June 2022
	Technology	Dr.Ghanem Ikhlaiel	11 May 2022	18th May 2022	25th May 2022	1st June 2022
	Social studies	Dr.Khaled Dawas	22ed May 2022	29th May 2022	2nd June 2022	9th June 2022
Jinin	Math	Hilmi Hamdan	8th May 2022	15th May 2022	22ed May 2022	29th May 2022
	Arabic	Dr. Ibrahim Al- Nori	25thApril 2022	9th May 2022	16th May 2022	23ed May 2022
	English	Suzan Qindah	10th May 2022	17th May 2022	24th May 2022	31stMay 2022
	Science	Kholood Amer	11 May 2022	18th May 2022	25th May 2022	1st June 2022
	Technology	Hilmi Hamdan	11 May 2022	18th May 2022	25th May 2022	1st June 2022

Nablus	Math	Laila Abu Yaseen	15th May 2022	22ed May 2022	29th May 2022	9th June 2022
	Arabic	Dr. Hanan Al-Jamal	25th April 2022	9th May 2022	16th May 2022	23ed May 2022
	English	Wafa' Mdoukh	10th May 2022	17th May 2022	24th May 2022	31stMay 2022
	Science	Hana' Barghothi	11 May 2022	18th May 2022	25th May 2022	1st June 2022
	Technology	Akram Asalweh	11 May 2022	18th May 2022	25th May 2022	1st June 2022
	Social studies	Najla' Khaseeb	12 May 2022	19th May 2022	26th May 2022	2nd June 2022

Appendix (G)

The questionnaire on adopting the GHOSHEH model regarding Roger's Attributes of innovation

Dear Participants,

Thank you for participating in this questionnaire. This questionnaire aims to evaluate GHOSHEH model for creating innovative OER in order to make a decision about the possibility of adopting the model. The questionnaire consists of three sections; The first section includes questions about personal information. The second section consists of (30) items classified under 5 domains related to adopting the model. While the third section includes an open question about suggestions for developing the model. Please read all the questions carefully, and provide the answer that mostly expresses your opinion. The information you provide throughout the questionnaire will be kept confidential. and will be used for research purposes only. All data will be reported in aggregate and will remain anonymous. Participation in the questionnaire is voluntary and you can exit at any time. There is no anticipated risk to participating in the questionnaire.

If there is any question, please contact the researcher: Dua Ghosheh Wahbeh, mobile: 00972599760095

Section One:

This section relates to personal information; Please write the answer of the following questions or select the appropriate answer for you by ticking (√) at the specified place.

1. **Country:** ----------

2. **Gender:**

( ) Male ( ) Female

3. **Job:**

( ) Teacher ( ) Trainer

( ) Researcher ( ) Other, please specify

4. **Professional Experience:**

( ) Less than 5 years ( ) 5-10 years

( ) More than 10 years

5. **The institution I work for:**

( ) Private institution ( ) Public institution

( ) Other

6. **Qualification:**

( ) Bachelor ( ) Bachelor+ Educational Qualification

( ) Master ( ) Doctorate ( ) Other

7. **I knew about the model through:**

( ) Workshop ( ) Presentation at a conference

( ) Specialized Professional Diploma Program ( ) Other

Section Two: This section includes (30) items related to the model and its applicability. Please read these items carefully, then tick (√) in the appropriate place that reflect the degree of your agreement to the item.

Category	No.	Item	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
1-Relative Advantage	1.	GHOSHEH model contributes to improving the quality of learning.					
	2.	Applying the model contributes to teachers' professional development.					
	3.	Using the model assists teachers to innovate.					
	4.	Using the model assists learners to innovate.					
	5.	The model is considered important to keep updated with recent changes.					
	6.	Implementation of this model will bring many benefits to learners.					
2- Compatibility	7.	The model could be applied in compatible with different cultures.					
	8.	The model enables learners to focus on social issues.					
	9.	The model contributes to constructing new knowledge based on the previous one.					
	10.	Training on this model is compatible with teachers' professional needs.					

	11.	The cost of using the model is low.					
	12.	This model can be applied for teaching in an emergency.					
3-Ease of use (Simplicity)	13.	The steps of the model are obvious.					
	14.	Learning to apply this model is easy.					
	15.	The sequenced steps of the model enable users to use it easily.					
	16.	The model is free of complications that make its application difficult.					
	17.	The flexibility of the model assists its application in different contexts.					
	18.	The model makes the creation of innovative OER easier.					
4-Trialability	19.	The model is able to be tried with students.					
	20.	I will assist with the application of this model with students.					
	21.	It would be easy for teachers to become skillful in applying this model.					
	22.	The flexibility of the model makes application easier.					
	23.	I expect that the results of the trial of this model will encourage its adoption.					
	24.	This model can be applied to students online orface-to-face.					

5- Observability	25.	The model allows users to observe the outputs of applying it.					
	26.	The model enables teachers to measure the achievement of learning goals.					
	27.	The model enables learners to observe the development of their performances.					
	28.	I will use the model as soon as possible.					
	29.	I will wait before using the model to see the results of applying it by other teachers.					
	30.	This model deserves to be used by all teachers.					

Section Three: Please provide some suggestions to develop GHOSHEH model for creating innovative OER.

استبانة حول أنموذج غوشة لإنشاء مصادر تعليم مفتوحة مبتكرة

السّادة الكرام،

بعد أن تمّ تعريفكم بأنموذج غوشة لإنشاء مصادر تعليم مفتوحة مبتكرة، أضع بين أيديكم هذه الاستبانة التي تهدف لتقييم الأنموذج من أجل اتّخاذ قرار حول إمكانيّة تبنّيه. تتكون الاستبانة من ثلاثة أقسام؛ يتضمّن القسم الأول أسئلة حول معلومات شخصية، ويتكوّن القسم الثاني من (30) فقرة موزّعة على مجالات خمس تتعلق بالأنموذج وإمكانيّة تطبيقه، بينما يتضمّن القسم الثّالث سؤالاً مفتوحاً عن مقترحات لتطوير الأنموذج. الرجاء قراءة أسئلة الاستبانة بتمعّن، وإجابتها بدقّة وبما يعبر عن رأيكم، علماً بأن إجاباتكم ستبقى سرية، وستستخدم لأغراض البحث العلمي فقط.

للاستفسار يرجى التّواصل مع الباحثة: دعاء غوشة وهبة، جوال: 00972599760095

شاكرين لكم حسن تعاونكم

القسم الأول:

يتعلق هذا القسم بمعلومات شخصية؛ أرجو منكم اختيار الإجابة المناسبة لك بوضع إشـــارة (√) عنـــد المكـــان المحدد لذلك.

الجنس:

( ) ذكر ( ) أنثى

الدولة: ----------

الوظيفة:

( ) معلّم/ة ( ) مدرّب/ة

( ) باحث/ة ( ) أخرى، يرجى التّحديد

الخبرة المهنيّة:

( ) أقل من 5 سنوات ( ) 5–10 سنوات ( ) أكثر من 10 سنوات

المؤسّسة التي أعمل بها:

( ) مؤسّسة خاصّة ( ) مؤسّسة حكوميّة ( ) غير ذلك

المؤهّل العلمي:

( ) بكالوريوس ( ) بكالوريوس+ مؤهّل تربوي ( ) ماجستير

( ) دكتوراه ( ) غير ذلك

تعرّفت على الأنموذج من خلال:

( ) ورشة عمل ( ) عرض في مؤتمر

( ) برنامج الدّبلوم المهني المتخصّص في التّعليم ( ) غير ذلك

القسم الثّاني: يتضمن هذا القسم (30) فقرة تتعلّق بالأنموذج وإمكانيّة تطبيقه، الرجاء قراءة هذه الفقرات بعناية، ثم وضع إشارة (√) في المكان المناسب.

المجال	الرقم	الفقرة	أوافق بشدة	أوافق	محايد	معارض	معارض بشدة
الأهميّة النّسبيّة	.1	يسهم تطبيق الأنموذج في تحسين نوعيّة تعلّم الطّلبة.					
	.2	يسهم تطبيق الأنموذج في التّطوّر المهني للمعلّمين.					
	.3	يساعد توظيف الأنموذج المعلّمين على الابتكار.					
	.4	يساعد تطبيق الأنموذج المتعلّمين على الابتكار.					
	.5	يعتبر هذا الأنموذج هامّاً لمساهمته في مواكبة العمليّة التّعليميّة للمستجدّات.					
	.6	سيحقق تطبيق المعلّمين للأنموذج فوائد كثيرة للمتعلّمين.					
التّوافق	.7	يمكن تطبيق هذا الأنموذج بالتّوافق مع الثّقافات المختلفة.					
	.8	يساعد الأنموذج المتعلّمين على التّركيز على النّواحي الاجتماعيّة.					
	.9	يسهم هذا الأنموذج في البناء على المعارف السابقة للمتعلّمين.					
	.10	يتوافق التدريب على هذا الانموذج مع احتياجات المعلّمين المهنيّة.					
	.11	تعتبر تكلفة تطبيق الأنموذج قليلة.					
	.12	يمكن تطبيق الأنموذج للتّعليم في الطّوارئ.					
التّعقيد	.13	تتّسم خطوات الأنموذجبالوضوح.					
	.14	يمكن تعلّم تطبيق الأنموذج بسهولة.					
	.15	تساعد خطوات الأنموذج المتسلسلة على تطبيقه بسلاسة.					
	.16	يخلو الأنموذج من التّعقيدات التي تجعل تطبيقه صعباً.					
	.17	تساعد مرونة الأنموذج على تطبيقه في سياقات مختلفة.					

المجال	الرقم	الفقرة	أوافق بشدة	أوافق	محايد	معارض	معارض بشدة
	.18	يسهّل الأنموذج عمليّة إنشاء مصادر تعليم مفتوحة مبتكرة.					
القابليّة للتّجريب	.19	يعتبر هذا الأنموذج قابلاً للتّطبيق مع الطّلبة.					
	.20	سأدعم تطبيق الأنموذج مع الطّلبة.					
	.21	يمكن للمعلّمين التّمكّن من المهارات اللّازمة لتطبيق الأنموذج بسهولة.					
	.22	تسهّل مرونة هذا الأنموذج من قابليّته للتّطبيق.					
	.23	أتوقّع أن تشجّع نتائج تجربة تطبيق هذا الأنموذج على تبنّيه.					
	.24	يمكن تطبيق هذا الأنموذج مع الطّلبة إلكترونيّاً أو وجاهيّاً.					
القابليّة للملاحظة	.25	يمكّن الأنموذج التّربويين من ملاحظة نتائج تطبيقه.					
	.26	يمكّن الأنموذج المعلّمين من قياس تحقّق أهداف التعلّم.					
	.27	يساعد الأنموذج المتعلّمين من ملاحظة تطوّر أدائهم.					
	.28	سأستخدم هذا الأنموذج في أقرب فرصة ممكنة.					
	.29	سأنتظر قبل توظيف هذا الأنموذج لحين ملاحظة نتائج توظيفه من قبل الآخرين.					
	.30	يستحقّ هذا الأنموذج أن يتم تطبيقه من قبل جميع المعلّمين.					

القسم الثّالث: يرجى تقديم مقترحات لتطوير أنموذج غوشة لإنشاء مصادر تعليم مبتكرة؟

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_____

_____

Appendix (H)

A questionnaire for teacher's self-evaluation regarding TGC

Dear Participants:

Thank you for participating in this questionnaire which aims at investigating the effect of a professional training program based on a model for creating innovative Open Educational Resources, on teachers' global competencies. This will be done by self-evaluating of teachers' global competencies before and after enrolling in the professional training program.

The questionnaire consists of two sections; The first section includes questions about personal information. The second section consists of (71) items classified under 4 Areas related to teachers' global competencies. Please read all the questions carefully, and provide the answers that mostly express your opinion or reflection. The information you provide throughout the questionnaire will be kept confidential and will be used for research purposes only. Participation in the questionnaire is voluntary and you can exit at any time.

If there is any question, please contact the researcher: Dua' Ghosheh Wahbeh, mobile: 00972599760095

Teachers' global competencies (TGC) are defined as knowledge, skills, attitudes, and values that enable teachers to professionalize teaching globally by understanding, interacting, and respecting diversity (Kopish, 2017; Orazbayevaa, 2016).

Section One:

This section relates to personal information. Please write the answer to the following questions or select the appropriate answer for you by ticking (√) at the specified place.

1. Directorate:

( ) Nablus ( ) Jineen ( ) Hebron

( ) South Hebron ( ) Other

2. Gender:

( ) Male ( ) Female

3. Specialization:

( ) Arabic ( ) Math ( ) Science

( ) Technology ( ) English ( ) Social studies

( ) Other

4. Qualification:

( ) Bachelor ( ) Bachelor+ Diploma in Education

( ) Master ( ) Doctorate ( ) Other

5. Professional Experience:

( ) Less than 5 years ( ) 5-10 years ( ) More than 10 years

Section (2): This section includes the teacher's global competencies, sub-competencies, and indicators. Please reflect on them and evaluate your professional competencies objectively before enrolling in the training on implementing the GHOSHEH model after that; in order to do, select a number from 1-5; Where number (1) indicates that one does not achieve the competency, (2) rarely achieves the competency (3) neutral, (4) achieves the competency, (5) achieves the competency consistently.

Area	Specific Competencies	Indicators for achieving competencies	Before training	After training
Professional Competencies	1.1 Instructional design for learner- centered approach	1.1.1 I analyze the content into the basic elements before beginning to teach the unit.		
		1.1.2 Classify the content according to its rationale to learners.		
		1.1.3 Follow educational models to design learner-centered instructions.		
		1.1.4 Plan collaboratively with learners to meet their needs.		
		1.1.5 Plan taking into account the differences between learners.		
		1.1.6 Plan to use the most appropriate instructional strategies for both content and learners.		
	1.2 Management of the teaching process	1.2.1 Base the relationship with students on mutual trust.		
		1.2.2 Organize a learning environment that encourages interaction among learners.		
		1.2.3 Encourage learners' participation in developing diverse learning activities.		
		1.2.4 Give the responsibility of some activities (Educational, Social, Entertain mental….) to learners.		
	1.3 Implementation of teaching	1.3.1 Involve the learners from the beginning with the learning objectives of the content		
		1.3.2 Select open educational resources that are appropriate for the content and learners.		
		1.3.3 Ask questions that prompt students to reflect on the content.		
		1.3.4Assist learners to explore the role of what they have learned in solving life problems.		
		1.3.5 Participate with students in developing a variety of open educational resources.		

Area	Specific Competencies	Indicators for achieving competencies	Before training	After training
	1.4 Assessment and Evaluation	1.4.1 Develop evaluation tools that consider learners' differentiation.		
		1.4.2 Use different types of evaluation during the educational process (diagnostic, formative, and summative evaluation).		
		1.4.3 Assist learners to develop self-evaluation skills.		
		1.4.4 Encourage learners to accept others' evaluation of their work.		
		1.4.5 Use the results of the continuous evaluation to improve the performance of learners.		
		1.4.6 Provide constructive feedback for learners continuously.		
2. Socio-Cultural competencies	2.1 Continuous professional communication	2.1.1 Maintain continuous professional relationships with learners.		
		2.1.2 Respect the different cultures of the learners.		
		2.1.3 Consider the cultural differences of the learners when communicating with them.		
		2.1.4 Implement educational activities that integrate all learners from different cultures.		
		2.1.5 Provide continuous support for learners with special needs.		
	2.2 Continuous communication with peer teachers	2.2.1 Develop strong professional relationships with teachers from different cultures.		
		2.2.2Involve teachers with different cultures in solving professional problems.		
		2.2.3 Share with teachers of all cultures experiences that support learning processes.		
	2.3 Continuous communication with parents	2.3.1 Develop relationships with parents with different cultures.		
		2.3.2 share with the parents' things related to improving their children's learning.		
		2.3.3 Cooperate with parents to achieve well-being of learners.		
	2.4 Continuous communication with the community	2.4.1 Develop educational activities that enable learners to serve their communities.		
		2.4.2 Benefit from community resources (gardens, public libraries, health laboratories...) to connect learning with life.		
		2.4.3 Motivate the community to		

Area	Specific Competencies	Indicators for achieving competencies	Before training	After training
		provide available resources that support the teaching and learning process.		
	2.5 Global Communication	2.5.1 Develop open educational resources appropriate for different cultures.		
		2.5.2 Share my developed OER globally		
		2.5.3 Communicate with educators from all over the world to share experiences with them.		
		2.3.4 Develop my English skills to be able to communicate with the world.		
3- Individual competencies	3.1 Using information technology in education	3.1.1 Select the most appropriate technology to teach students specialized content.		
		3.1.2 Use the most appropriate technology to the characteristics of the learners.		
		3.1.3 Select the technological resources that suit the school environment.		
	3.2 Using technology for communication	3.2.1 Use technology for continuous communication with learners.		
		3.2.2 Use technology for continuous communication with parents.		
		3.2.3 Use technology for continuous communication with the local community.		
		3.2.4 Use technology for continuous global communication.		
		3.2.5 Use technology to learn about different cultures in the world.		
	3.3 Developing OER	3.3.1 Support students to reuse OER.		
		3.3.2 Use learning strategies that help learners to produce new OER.		
		3.3.3 Support learners to share the Open Education Resources they have developed globally.		
		3.3.4 Use teaching strategies that contribute to developing students' skills that enable them to solve global problems.		
		3.3.5 Use strategies that develop learners' metacognitive skills (controlling the student for his learning and guidance, identifying strengths and weaknesses, and		

Area	Specific Competencies	Indicators for achieving competencies	Before training	After training
		developing solutions for success...).		
		3.5.6 Provide opportunities for students to reflect on their learning continuously.		
	3.4 Seeking Professional Development	3.4.1 Reflect on my professional practices in order to develop them.		
		3.4.2 Look for updated developments in education in order to develop professionally.		
		3.4.3 Plan for my professional development.		
		3.4.3 Search for researche that benefit my professional development		
		3.4.5 Share with others new experiences resulting from my professional development.		
4- Personal Competencies	4.1 Respect for different cultures	4.1.1 Respect the different cultures in the world.		
		4.1.2 Accept the dialogue with teachers of different cultures.		
		4.1.3 Take the initiative to produce educational resources suitable for different cultures.		
		4.1.4 Feel responsible for solving global problems.		
		4.1.5 Develop educational activities that help learners accept different cultures.		
	4.2 Respect the teaching profession	4.2.1 Respect the ethics of the teaching profession.		
		4.2.2 Care about being a role model for learners.		
		4.2.3 Respect all the learners despite their different cultures.		
		4.2.4 Select the best expressions to describe the teaching profession through different communication medias.		
	4.3 Preparing learners to participate in the digital world	4.3.1 Encourage learners to develop their technological skills.		
		4.3.2 Provide continuous awareness to protect learners from technology's danger.		
		4.3.3 Encourage learners to focus on publishing licenses when sharing their products.		

استبانة التّقييم الذّاتي للكفايات العالميّة للمعلّمين

أعزائي المشاركين/ات،

تهدف هذه الاستبانة لدراسة أثر التّدريب المستند إلى أنموذج لابتكار مصادر تعليم مفتوحة على الكفايات العالميّة للمعلّمين، وذلك من خلال تقييمهم الذاتي لكفاياتهم العالميّة قبل التّدريب وبعده. تتضمّن هذه الاستبانة قسمين؛ القسم الأول يتعلّق بمعلومات شخصيّة، بينما يتضمّن الثاني (71) فقرة مرتبطة بكفايات المعلّم العالمي. نأمل منكم الإجابة عن الأسئلة المتضمّنة في الاستبانة، والتّأمّل في فقراتها لتقييم تطوّر كفاياتكم، علماً أنّ مشاركتكم تطوعيّة، وأنّ إجاباتكم ستستخدم لأغراض الدّراسة فقط، وسيتم التّعامل معها بسريّة تامّة.

للاستفسار يمكنكم التّواصل مع الباحثة دعاء غوشة وهبه، 0599760095.

مع الشّكر لحسن تعاونكم.

الكفايات العالميّة للمعلّمين: هي المعارف والمهارات والاتّجاهات والقيم التي يمتلكها المعلّمون، وتمكّنهم من احتراف التّعليم على المستوى العالمي، وتقسم هذه الكفايات إلى: الكفايات المهنيّة، الكفايات الثّقافيّة الاجتماعيّة، الكفايات الشخصيّة، والكفايات الفرديّة للمعلّمين ((Kopish, 2017; Orazbayevaa, 2016

القسم الأول:

1. المديريّة:

( ) نابلس ( ) جنين ( ) رام الله

( ) الخليل ( ) ج. الخليل ( ) غيره

2. الجنس:

( ) ذكر ( ) انثى

3. التّخصّص:

( ) لغة عربيّة ( ) رياضيّات ( ) علوم

( ) تكنولوجيا ( ) لغة إنجليزيّة ( ) غيره

4. المستوى التّعليمي:

( ) بكالوريوس ( ) بكالوريوس+ دبلوم تربية ( ) ماجستير

( ) دكتوراه

5. الخبرة في التّعليم:

( ) أقل من 5 سنوات ( ) 5–10 سنوات ( ) أكثر من 10 سنوات

القسم الثاني: يتضمن هذا القسم الكفايات، والكفايات الفرعية للمعلّم العالمي، ومؤشراتها، يرجى منكم التّأمّل بها وتقييم ذاتكم بموضوعيّة **قبل** التّدريب وبعده، وذلك باختيار رقم من 1–5 بحيث يعني الرقم (1) لا يحقّق الكفاية، (2) نادراً ما يحقّق الكفاية، **(3) محايد، (4)** يحقّق الكفاية، **(5)** يحقّق الكفاية باستمرار.

المجال	الكفاية الفرعية	مؤشرات تحقيقها	قبل التدريب	بعد التدريب
1. الكفايات المهنيّة	**1.1. تصميم التّعليم المتمركز حول المتعلّم**	1.1.1 أحلّل المحتوى التّعليمي إلى عناصره الأساسيّة قبل البدء بتعليم الوحدة.		
		1.1.2أصنّف المحتوى التّعليمي حسب أهميته للمتعلّمين.		
		1.1.2 اتّبع نماذجاً تربويّة لتصميم التّعليم المتمركز حول المتعلّم.		
		1.1.3 أخطّط بشكل تشاركي مع المتعلّمين لتلبية احتياجاتهم.		
		1.1.4 أبني خططاً تراعي الاختلافات في خصائص المتعلّمين.		
		1.1.5 أخطّط لتوظيف الاستراتيجيّات التّعليميّة الأكثر مواءمة لكل من المحتوى والمتعلّمين.		
	1.2 إدارة العمليّة التّعليميّة	1.2.1 أبني علاقته مع المتعلّمين على أساس الثّقة والمسؤوليّة.		
		1.2.2 أنظّم البيئة التّعليميّة المشجّعة للتّفاعل بين المتعلّمين.		
		1.2.3 أشجّع المتعلّمين على المشاركة في تطوير أنشطة تعلّم متنوّعة.		
		1.2.4 أحمّل المتعلّمين مسؤوليّة بعض الأنشطة (التّعلّميّة، والاجتماعيّة، والتّرفيهيّة، والثّقافيّة.....).		
	1.3 تطبيق التّعليم	1.3.1 أشارك المتعلّمين منذ البداية بأهداف التّعلّم للمحتوى الذي سيتم تعليمه.		
		1.3.2 أوظّف مصادر التّعليم المفتوحة المناسبة للمحتوى والمتعلّمين.		
		1.3.3 أطرح أسئلة تحث الطّلبة على التّأمّل في المحتوى.		
		1.3.4 أساعد المتعلّمين على اكتشاف دور ما يتعلّمونه في حلّ المشكلات الحياتيّة.		

المجال	الكفاية الفرعية	مؤشرات تحقيقها	قبل التدريب	بعد التدريب
		1.3.5 أشارك طلبتي في تطوير مصادر تعليم متنوّعة.		
	1.4 المتابعة والتّقييم لعمليتي التّعليم والتّعلّم	1.4.1 أطوّر أدوات تقويم تناسب اختلافات المتعلّمين.		
		1.4.2 أوظف أنواع التقويم المختلفة خلال العمليّة التّعليميّة(التشخيصي، التكويني، الختامي).		
		1.4.3 أطوّر مهارات التّقييم الذّاتي للمتعلّمين.		
		1.4.4 أشجّع المتعلّمين على تقبّل تقييم الآخرين لأعمالهم.		
		1.4.5 أوظف نتائج التّقييم المستمر في تحسين أداء المتعلّمين.		
		1.4.6 أقدّم التغذية الراجعة البنائيّة للمتعلّمين باستمرار.		
		1.4.7 أوفّر الدّعم المستمر للمتعلّمين ذوي الاحتياجات الخاصّة (الموهوبون، وأصحاب الهمم....)		
2. الكفايات الثّقافيّة الاجتماعيّة	**2.1 الاتّصال والتّواصل المستمر مع جميع المتعلّمين**	2.1.1 أحافظ على استمرار علاقتي مع الطّلبة.		
		2.1.2 احترم ثقافات المتعلّمين المختلفة		
		2.1.3 أراعي الاختلافات في ثقافات المتعلّمين عند التّواصل معهم.		
		2.1.4 أنفّذ أنشطة تربويّة تدمج جميع المتعلّمين على اختلاف ثقافاتهم.		
		2.1.5 أوفّر الدّعم المستمر للمتعلّمين ذوي الاحتياجات الخاصّة.		
	2.2 الاتّصال والتّواصل المستمر مع المعلّمين الأقران	2.2.1 أبني علاقة قوية مع المعلمين على اختلاف ثقافاتهم.		
		2.2.2 أشارك المعلّمين على اختلاف ثقافاتهم في حلّ المشكلات المهنيّة التي تواجهنا.		
		2.2.3 أشارك المعلّمين على اختلاف ثقافاتهم بالخبرات التي تدعم عمليات التعلم.		
	2.3الاتّصال والتّواصل المستمر مع أولياء الأمور	2.3.1 أبني علاقات مع أولياء الأمور على اختلاف ثقافاتهم.		
		2.3.2 أتشارك مع أولياء الأمورفيما ما يتعلّق بتحسين تعلّم أبنائهم.		
		2.3.4 أتشارك مع أولياء الأمور في تحقيق الرّفاهيّة للمتعلّمين.		

المجال	الكفاية الفرعية	مؤشرات تحقيقها	قبل التدريب	بعد التدريب
	2.4 الاتّصال والتّواصل المستمر مع المجتمع	2.4.1 أطوّر أنشطة تعليميّة توظّف التّعليم لخدمة المجتمع.		
		2.4.2 استثمر المصادر المجتمعية (الحدائق، والمكتبات العامّة، وبيوت المسنّين، والمختبرات الصحيّة.....)لربط التعلّم بالحياة.		
		2.4.3 أحفز المجتمع المحلي على تقديم الموارد المتوفرة التي تدعم عملية التعليم والتعلم.		
	2.5 الاتّصال والتّواصل المستمر مع العالم	2.5.1 أطوّر مصادر تعليم مفتوحة تناسب الثّقافات المختلفة		
		2.5.2 أشارك عالميّاً بمصادر التّعليم المفتوحة التي أطوّرها		
		2.5.3 أتواصل مع تربويين من جميع أنحاء العالم لأتبادل معهم الخبرات.		
		2.5.4 أهتم بتطوير لغتي الإنجليزيّة لأتمكن من التّواصل مع العالم.		
.3 الكفايات الفرديّة	**3.1توظيف تكنولوجيا المعلومات في التّعليم**	3.1.1 أنتقي التكنولوجيا الأنسب لتعليم الطّلبة المحتوى التخصّصي.		
		3.1.2 أوظّف التكنولوجيا الأنسب لخصائص المتعلّمين.		
		3.1.3 أوظّف المصادر التّكنولوجيّة التي تناسب البيئة المدرسيّة في التّعليم.		
	3.2 توظيف تكنولوجيا المعلومات في التّواصل	3.2.1 أوظّف وسائل التّواصل التّكنولوجيّة لأتواصل مع المتعلّمين باستمرار		
		3.2.2 أوظّف وسائل التّواصل التّكنولوجيّة لأتواصل مع أولياء الأمور		
		3.2.3 أوظّف وسائل التّواصل التّكنولوجيّة؛ لأتواصل مع المجتمع المحلّي		
		3.2.4 أوظّف وسائل التّواصل التّكنولوجيّة لأتواصل مع العالم.		
		3.2.5أوظّف التّكنولوجيا للتعرّف على الثّقافات المختلفة في العالم.		
	3.3 تطوير	3.3.1 أدعم الطّلبة لإعادة استخدام مصادر التّعليم المفتوحة.		

المجال	الكفاية الفرعية	مؤشرات تحقيقها	قبل التدريب	بعد التدريب
	ممارسات التّعليم المفتوحة	3.3.2 أوظّف استراتيجيّات تعليم تساعد المتعلّمين على إنتاج مصادر تعليم مفتوحة جديدة.		
		3.3.3 أدعم طلبتي لنشر مصادر التّعليم المفتوحة التي طوّروها للعالم.		
		3.3.4 أوظّف استراتيجيّات تعليم تسهم في تطوير مهارات الطّلبة التي تمكّنهم من حل مشكلات عالميّة.		
		3.3.5 أوظّف استراتيجيّات لتطوير مهارات المتعلّمين فوق المعرفيّة(ضبط الطّالب لتعلّمه وتوجيهه وتحديد نقاط القوّة والضّعف، ووضع حلول للنّجاح.....).		
		3.3.6 أوفّر فرصاً تساعد الطّلبة على التّأمّل المستمر في تعلّمهم.		
	3.4 السعي للتطوّر المهني	3.4.1 أتأمّل ممارساتي المهنيّة باستمرار من أجل تطويرها		
		3.4.2 أتطّلع باستمرار على المستجدّات العالميّة في التّعليم لأتطوّر مهنيّاً		
		3.4.3 أضع خطّة خاصّة في تطوّري المهني.		
		3.4.4 اطّلع على الأبحاث التي تقود لتطوّري مهنيّاً		
		3.4.5 أشارك الآخرين بالخبرات الجديدة النّاجمة عن تطوّري المهني.		
4. الكفايات الشخصيّة	**4.1احترام الثّقافات المختلفة**	4.1.1 أحترم الثقافات المختلفة في العالم.		
		4.1.2 أتقبّل الحوار مع المعلّمين من ذوي الثّقافات المختلفة		
		4.1.3 أبادر لإنتاج مصادر تعليم تناسب الثّقافات المختلفة		
		4.1.4 أشعر بأنّي أحد المسؤولين عن حل المشكلات العالميّة		
		4.1.5 أطوّر أنشطة تعليميّة تساعد المتعلّمين على تقبّل الثّقافات المختلفة.		
	4.2احترام مهنة التّعليم	4.2.1 أحترم أخلاقيّات مهنة التّعليم.		
		4.2.2 أهتم بأن أكون نموذجاً يحتذى به من قبل المتعلّمين		
		4.2.3 أتعامل مع جميع المتعلّمين على اختلاف ثقافاتهم باحترام		

المجال	الكفاية الفرعية	مؤشرات تحقيقها	قبل التدريب	بعد التدريب
		4.2.4 أنتقي العبارات التي أصف بها مهنة التّعليم من خلال طرق التّواصل المختلفة		
	4.3مسؤوليّة تجهيز المتعلّمين للمشاركة في العالم الرّقمي	4.3.1 أشجّع المتعلّمين على تطوير مهاراتهم التّكنولوجيّة		
		4.3.2 أقدّم توعية مستمرّة بمخاطر العالم الرّقمي		
		4.3.3 أشجّع المتعلّمين على التّركيز على رخص النّشر عند نشر نتاجاتهم.		

Appendix (I)

Focus group's protocol and questions

Dear Participants,

The researcher Dua' Ghosheh is conducting a study on the effectiveness of a model for creating innovative open educational resources in developing the global competencies of teachers. This study is considered as a part of her dissertation which is a prerequisite for completing the PhD in teaching and learning program in An-Najah National University. Data will be collected for the study using a set of instruments, including an interview with a focus group of teachers who have been trained on implementing the model. This interview aims to investigate the attributes of the GHOSHEH model in addition to the role of GHOSHEH model in developing the global competencies for teachers.

Two focus groups will be conducted online using Microsoft Teams according to the following Protocol:

- Each focus group will consist of (5-6) teachers, and the interview of each group will take from (90-150) min.
- The focus groups will be conducted with teachers who accept to participate, and answer the questions freely according to their perspectives.
- The focus groups will follow the approach of the semi-structured interview, where the researcher will ask the questions attached below, and it is possible to add other questions depending on the responses of the participants.
- The researcher will welcome the participants, introduce herself, continue with an introduction about the purpose of each focus group, and explain why the participants were chosen.
- The researcher will ask the participants for a permission to record each focus group discussion. Besides, notes of the key themes will be taken during the discussion.
- A non-participant observer will assist the moderation of each focus group in addition to the researcher.

- The researcher will ask the participants not to hesitate to ask for clarification if there is any confusion; this is to remove confusion so that participants can answer clearly.
- The researcher confirms that the collected data will be used only for the research issues; data will be analyzed and written up without identification of any individual, and quotation will be by anonymous. In addition, written data will be sent to the participants in order to delete or modify, and it is possible to communicate with the participants to clarify information that is not clear or detailed.
- The researcher confirms that the data will be treated with complete confidentiality, and will be saved in a file on the researcher's personal computer, and on the researcher's cloud, which is secured with a secret number so that no one can access it. To maintain privacy and guarantee anonymity of the participants, the researcher will follow double-blind privacy protocol. There will be two files; One file will be considered as a key file; this will include names and an ID number assigned to every name. The other file will include the transcripts of the focus groups where the names are not visible, but just the ID numbers. These two files are stored in different places.
- Participants will be engaged by starting with a warm-up activity, then presenting a PowerPoint about the model and some plans developed by teachers according to the model.
- Questions will be pre-tested with a pilot group to ensure that they are not too loaded nor leading and that they can assist to answer the research questions.
- The researcher will provide participants with her contact details and welcome to get in touch with them.
- The researcher confirms on the participants' rights to withdraw from the research at any time and not to answer any question.

The focus group's questions:

- Questions about the background of the participants: name, Specialist, professional experience, school.

- Questions about the model:

1- After you learned about GHOSHEH model for creating innovative open educational resources, and practiced it during training meetings, describe your experience with the applying the model?

2- How can you evaluate this model regarding to:

-The importance of the model for you as a teacher.

-The importance of the model for the model for learners.

3- How can you describe GHOSHEH model regarding to:

- The flexibility of the models' steps.

- The complexity of the model

- The ability to apply the model with different learners.

-The compatibility for different educational contexts

4- Learners differ in their culture, needs, learning styles, schools and circumstances. In your opinion, how can this model be used with different learners? How can it be used in different environments and schools that are considered as special cases, such as schools in marginalized areas?

5- Teachers have different professional needs and try to develop professionally in order to fit their needs. How can this model help teachers to fit their professional needs?

6- If you have the opportunities to apply GHOSHEH model several times with learners, what would be the expected outputs?

7- What are the strengths of the model?

8- What are the challenges of its application?

9- What are your suggestions for developing the model?

Thank you for participation

Appendix (G)

Details of experts and teachers responses to the questionnaire of adopting the GHOSHEHmodel

Table 1: Experts and teachers' total means of responses to the questionnaire of adopting GHOSHEH model

Rank	Domain	Total Mean	Standard deviation	Degree of agreement
1	Relative Advantage	4.10	0.48	high
2	Trialability	3.92	0.50	high
4	Simplicity	3.90	0.54	high
3	Compatibility	3.88	0.47	high
5	Observability	3.84	0.44	high
	Total	3.93	0.42	high

Table 2: Teachers' means of responses to the questionnaire of adopting GHOSHEH model

Rank	Domain	Mean	Standard deviation	Degree of agreement
1	Relative Advantage	4.09	0.46	high
2	Trialability	3.90	0.46	high
4	Simplicity	3.88	0.53	high
3	Compatibility	3.86	0.48	high
5	Observability	3.83	0.42	high
	Total	3.91	0.41	high

Table 3: Experts means of responses to the questionnaire of adopting GHOSHEH model

Rank	Domain	Mean	Standard deviation	Degree of agreement
1	Relative Advantage	4.20	0.57	Very high
2	Compatibility	4.13	0.57	high
4	Simplicity	4.09	0.58	high
3	Trialability	4.02	0.51	high
5	Observability	4.00	0.53	high
	Total	4.09	0.49	high

Appendix (K)

Testing assumptions of Paired Samples T-test for the first hypothesis

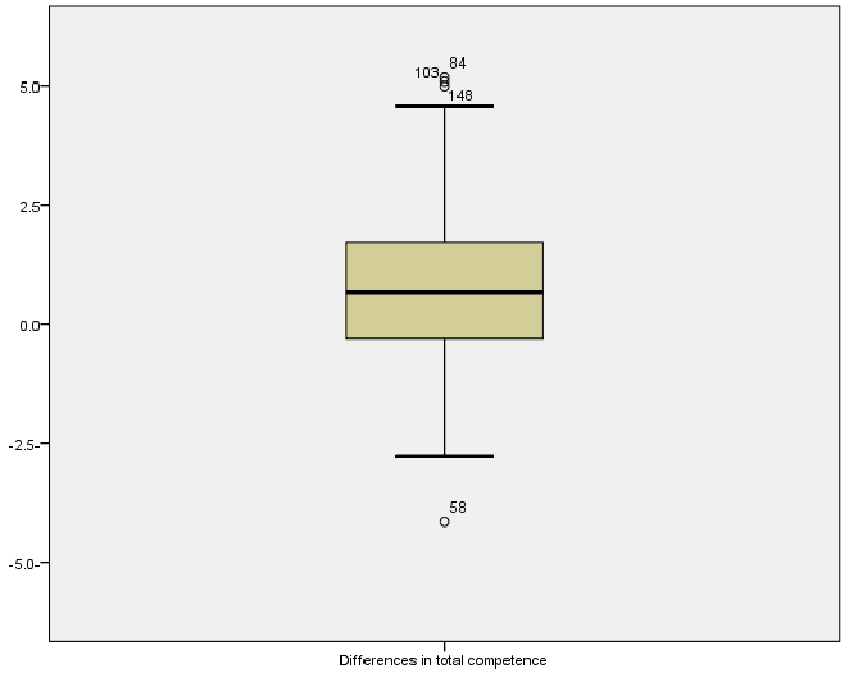
To study the significancy of the differences in means of teachers' responses to the global competences of self-evaluation questionnaire of TGC, before and after implementing GHOSHEH model, Paired-Samples T-test should be applied to test the first hypothesis. In order to do, the following assumptions of Paired-Samples T-Test should be tested:

1. Continuous data: Data of the pre-questionnaire and post-questionnaire are continuous.

2. Independency: Data is independent because for each participant there are two independent responses.

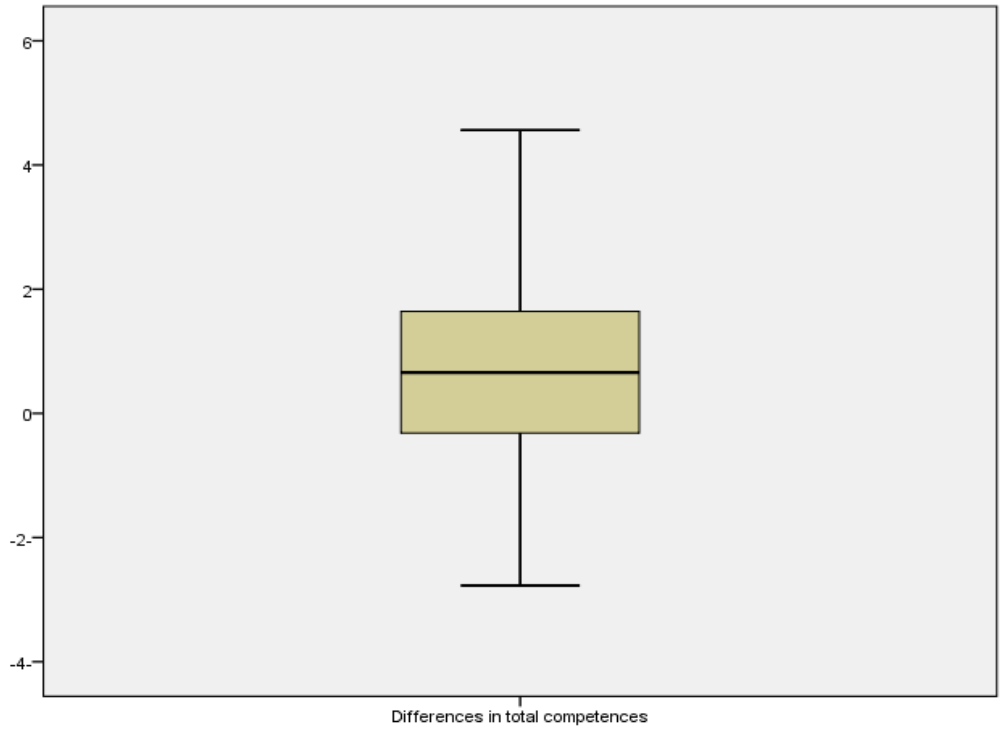
3. Extreme Outliers: One of the important assumptions of Paired-Samples T-test is that data should have no extreme outliers. Testing data showed that there were four extreme outliers as shown in figure (1)

Figure 1: Box plot before deleting extreme outliers of the differences in the means of teachers' responses to global competences



The extreme outliers were deleted as shown in figure (2) and analysis was done on 285 responses.

Figure 2: Box plot after deleting the outliers



4. Normality: Large samples usually follow normal distribution. Despite of that Shapiro–Wilk test and Kolmogorov–Smirnov test results may give significant results for these large samples even for slight deviation from normality, which is considered as one of the weaknesses of these tests (Verma & Abdel-Salam, 2019).The same happened with the sample of this self- evaluation questionnaire for TGC, where the sample(n=285) is considered as large. However, both Shapiro–Wilk test and Kolmogorov–Smirnov test gave significant results for the data of the difference between the post and pre total means, which means that normality is violated. Therefore, the researcher applied relevant transformation for data (RV NORMAL (mean, stddev).

Numeric which returns a random value from a normal distribution with specific mean and standard deviation) as advised by (Verma & Abdel-Salam, 2019).The researcher then tested the normality of the difference between means again using both Shapiro–Wilk test (which is used for samples less than 50 and can be used also for the sample

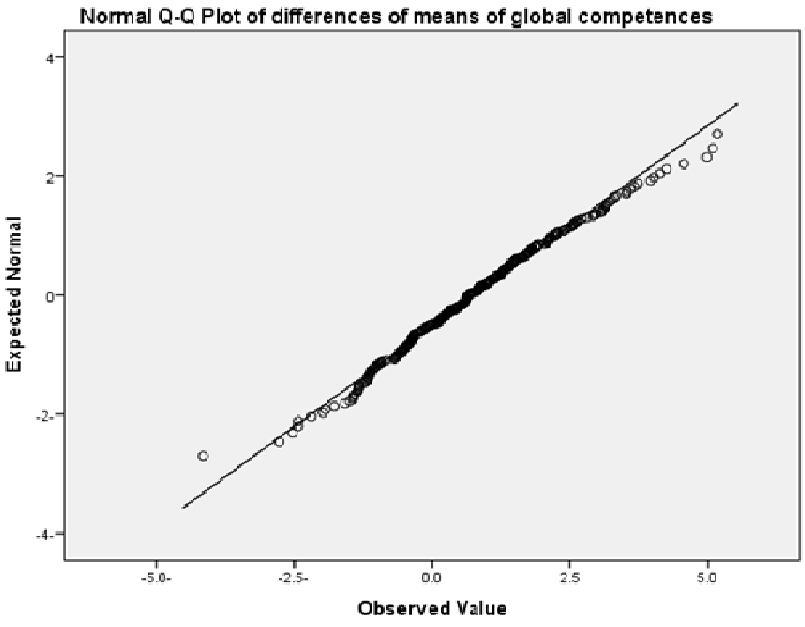
sizes up to 2000 and Kolmogorov–Smirnov test which is usually used for large samples (more than 50)). Results of Kolmogorov–Smirnov and Shapiro–Wilk test are shown in table (1)

Table 1: Results of Kolmogorov–Smirnov and Shapiro–Wilk test for the differences between means of teachers' responses on the self-evaluation questionnaire for TGC

Competences' differences	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Global	.034	285	.200*	.994	285	.342
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Results in table (1) reveals normal distribution of the differences between pre and post means for teachers' self- evaluation questionnaire, due to non-significance differences ($p>0.05$). Moreover, the Q-Q plots were studied for the same data, and results are shown by fig (3).

Figure 3: The Q-Q Plot for the differences inpre and postmeans of the global competences



Figures (3) shows that the points in the Q–Q plot are mostly lie on the line for the data of global competences, thus the distribution of the sample is considered as standard normal distribution.

5. Randomness: One of the important assumptions of Paired Samples T-test is testing for randomness that is mostly related to the assumption that the responses has been collected from a random sample. Randomness was tested using Runs test (Verma & Abdel-Salam, 2019), as shown in table (2)

Table 2: Runs Test for difference in means of the domains of self-evaluationquestionnaire of TGC

	Global
Test Value[a]	.66
Cases < Test Value	142
Cases >= Test Value	143
Total Cases	285
Number of Runs	139
Z	-.534-
Asymp. Sig. (2-tailed)	.593

Results in table (2) show that the absolute value of z statistic is not significant; because it is greater than 0.05, which reveals that the sample is random.

Appendix (L)

Assumptions for paired samples T-test to test the second hypothesis

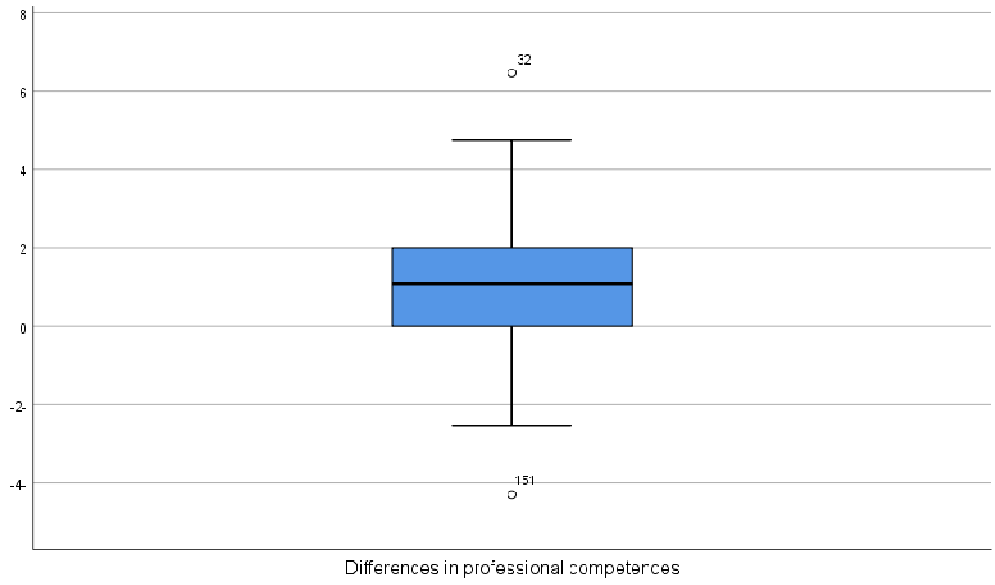
To study the significancy of the differences in the means of teachers' responses to the professional competences of self-evaluation questionnaire of TGC, before and after implementing GHOSHEH model, Paired-Samples T-test should be applied to test the second hypothesis. In order to do, the following assumptions of Paired-Samples T-Test should be tested:

1. Continuous data: Data of the pre-questionnaire and post-questionnaire are continuous.

2. Independency: Data is independent because for each participant there are two independent responses.

3. Extreme Outliers: Testing data showed that there were two extreme outliers as shown in figure (1).

Figure 1: Box plot before deleting extreme outliers of the differences in means of the professional competences



The outliers shown in figure (1) were deleted and the sample became 283. Results after deleting the extreme outliers are shown in figure (2)

Figure 2: Box plot after deleting extreme outliers of the differences in means of the professional competences of

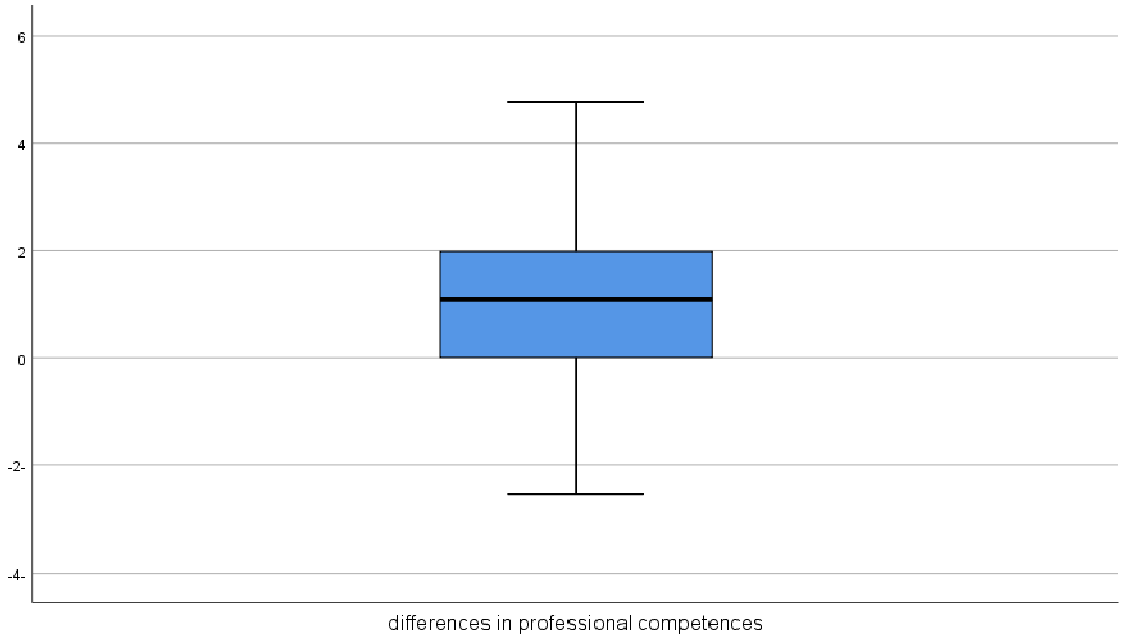


Figure (2) reveals no outliers of the data that represents the differences in means of teachers scores to the domain of professional competences before and after implementing the model.

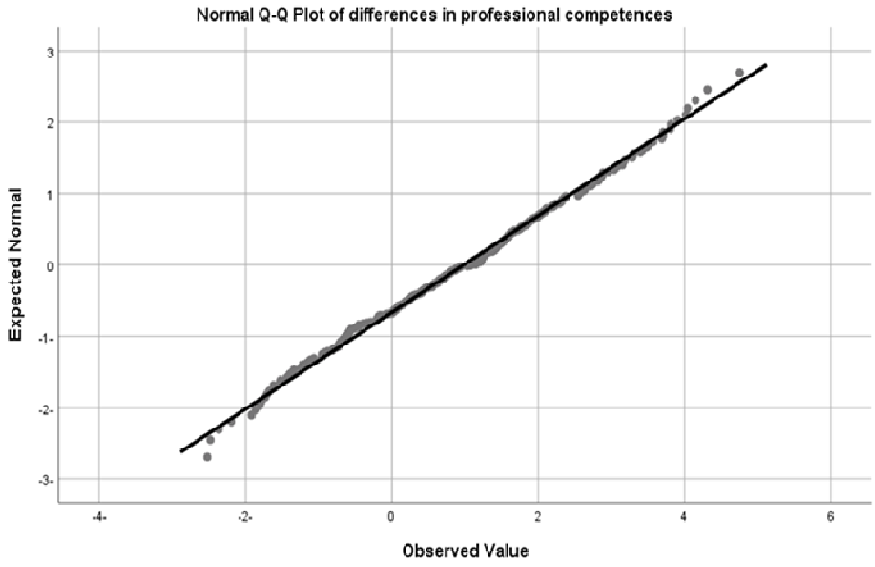
4. Normality: The normality of the difference in means of teachers' responses to the professional competences was tested using both Shapiro–Wilk test and Kolmogorov–Smirnov test. Results are shown in table (1)

Table 1: Results of Kolmogorov–Smirnov and Shapiro–Wilk test for the differences between means of teachers' responses on the professional competences' domain

Competences' differences	*Kolmogorov-Smirnov*[a]			*Shapiro-Wilk*		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Professional	.047	283	.200	.994	283	.352
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Results in table (1) reveals normal distribution of the differences between pre and post means for teachers' responses to the professional competences domain, due to non-significance differences (p>0.05). Moreover, the Q-Q plots were studied for the same data, and results are shown by figure 3.

Figure 3: The Q-Q Plot for the differences inpre and postmeans of the professional competences



Figures (3) show that the points in the Q–Q plot are mostly lie on the line for the data of professional competences. Thus, the distribution of the sample is considered as standard normal distribution.

5. Randomness: Randomness was tested using Runs test (Verma & Abdel-Salam, 2019), as shown in table (2).

Table 2: Runs test for difference in means of the professional domain of self-evaluation questionnaire of TGC

	Professional
Test Value[a]	1.08
Cases < Test Value	141
Cases >= Test Value	142
Total Cases	283
Number of Runs	145
Z	.298
Asymp. Sig. (2-tailed)	.766

Results in table (2) show that the absolute value of z statistic is not significant; because it is greater than 0.05, which reveals that the sample is random.

Results show that there is no violation in any of the assumptions of paired sample t-test. Thus, it can be conducted to test the second hypothesis. However, the sample should compose of 283 rather than 285.

Appendix (M)

Assumptions of Paired Samples T-test to test the third hypothesis

To study the significancy of the differences in the means of teachers' responses to the sociocultural competences of self-evaluation questionnaire of TGC, before and after implementing GHOSHEH model, Paired-Samples T-test should be applied to test the third hypothesis. In order to do, the following assumptions of Paired-Samples T-Test should be tested:

1. Continuous data: Data of the pre-questionnaire and post-questionnaire are continuous.

2. Independency: Data is independent because for each participant there are two independent responses.

3. Extreme Outliers: Testing data showed that there were no extreme outliers as shown in figure (1).

Figure 1: Box plot before extreme outliers of the differences in means of the sociocultural competences of

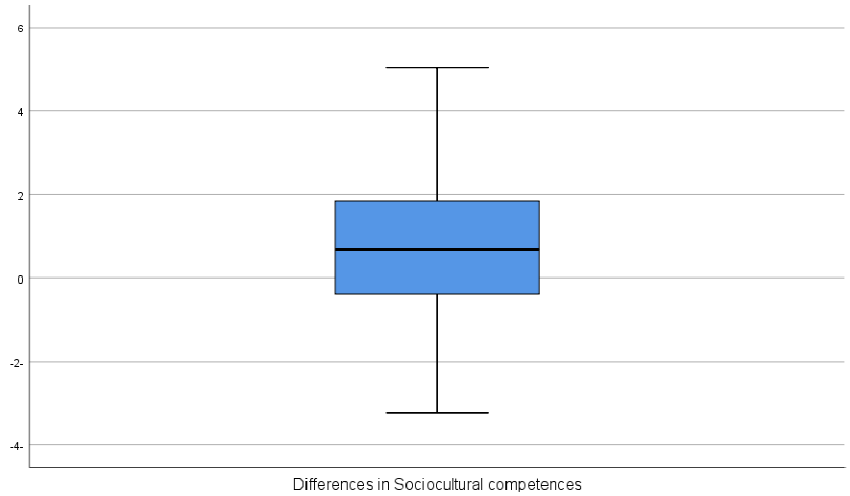


Figure (1) reveals no extreme outliers of the data represents the responses to the sociocultural competence's domain of the self- evaluation questionnaire of TGC.

4. Normality: The normality of the difference in means of teachers' responses to the sociocultural competences was tested using both Shapiro–Wilk test and Kolmogorov–Smirnov test. Results are shown in table (1)

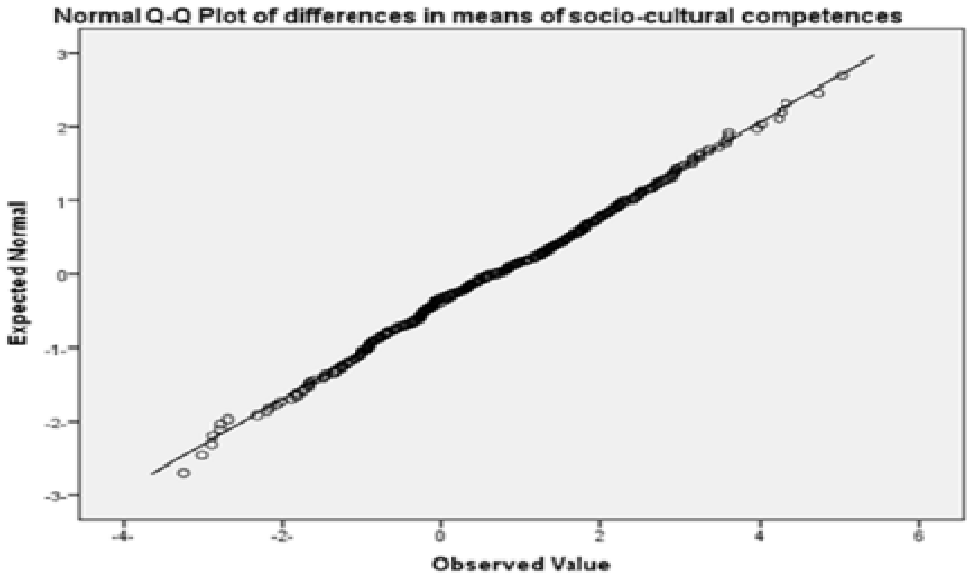
Table 1: Results of Kolmogorov–Smirnov and Shapiro–Wilk test for the differences between means of teachers' responses on the sociocultural competences' domain

Competences' differences	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Sociocultural	.046	285	.200	.995	285	.544
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Results in table (1) reveals normal distribution of the differences between pre and post means for teachers' responses to the sociocultural competences domain, due to non-significance differences ($p>0.05$).

Moreover, the Q-Q plots were studied for the same data, and results are shown by figure 2.

Figure 2: The Q-Q Plot for the differences in pre and postmeans of the sociocultural competences



Figures (2) shows that the points in the Q–Q plot are mostly lie on the line for the data of sociocultural competences. Thus, the distribution of the sample is considered as standard normal distribution.

5. Randomness: Randomness was tested using Runs test (Verma & Abdel-Salam, 2019), as shown in table (2)

Table 2: Runs test for difference in means of the sociocultural domain of self-evaluation questionnaire of TGC

Test Value[a]	***Sociocultural***
Cases < Test Value	.67
Cases >= Test Value	142
Total Cases	143
Number of Runs	285
Z	137
Asymp. Sig. (2-tailed)	-.771-

Results in table (2) show that the absolute value of z statistic is not significant; because it is greater than 0.05, which reveals that the sample is random.

Results show that there is no violation in any of the assumptions of paired sample t-test. Thus, it can be conducted to test the third hypothesis.

Appendix (N)

Assumptions of paired samples T-test to test the fourth hypothesis

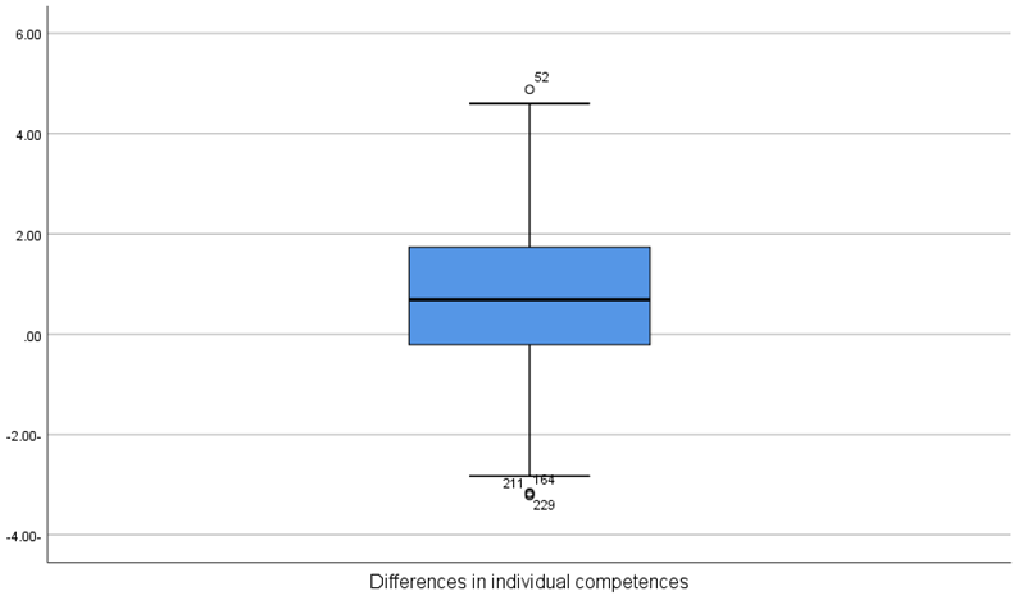
To study the significancy of the differences in the means of teachers' responses to the individual competences of self-evaluation questionnaire of TGC, before and after implementing GHOSHEH model, Paired-Samples T-test should be applied to test the second hypothesis. In order to do, the following assumptions of Paired-Samples T-Test should be tested:

1. Continuous data: Data of the pre-questionnaire and post-questionnaire are continuous.

2. Independency: Data is independent because for each participant there are two independent responses.

3. Extreme Outliers: Testing data showed that there were four extreme outliers as shown in figure (1).

Figure 1: Box plot before deleting extreme outliers of the differences in means of the individual competences



The four extreme outliers shown in figure (19) were deleted and results are shown in figure (2).

Figure 2: Box plot after deleting extreme outliers of the differences in means of the individual competences

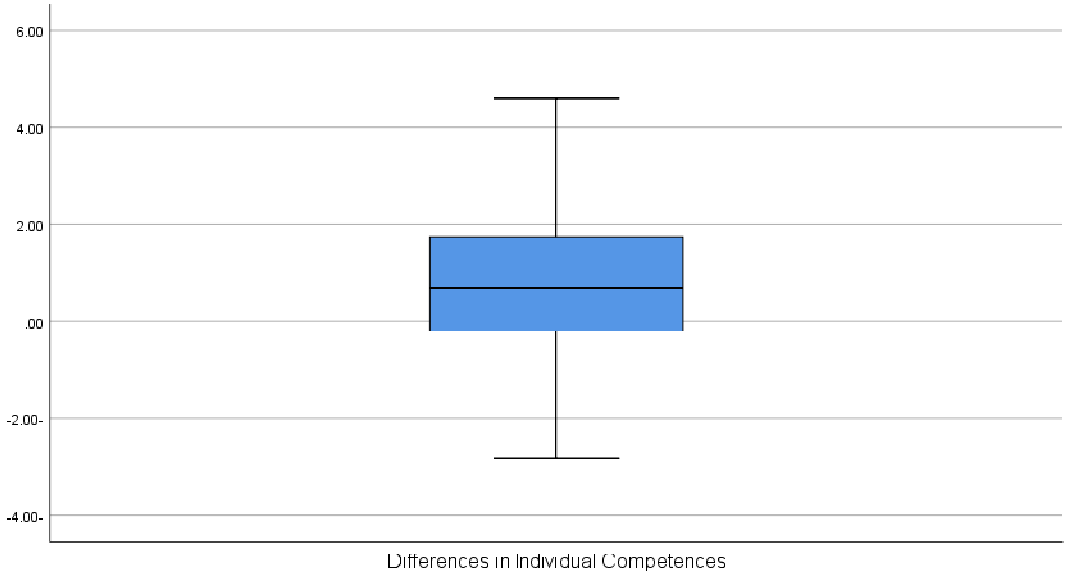


Figure (2) reveals no extreme outliers of the data represents the responses to the individual competences' domain of the self- evaluation questionnaire of TGC.

4. Normality: The normality of the difference in means of teachers' responses to the individual competences was tested using both Shapiro–Wilk test and Kolmogorov–Smirnov test. Results are shown in table (1)

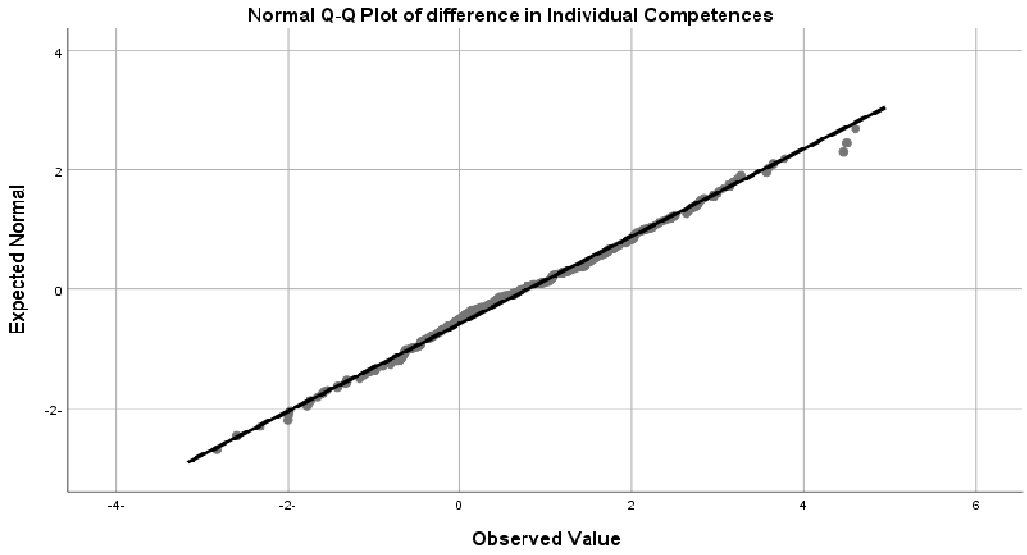
Table 1: Results of Kolmogorov–Smirnov and Shapiro–Wilk test for the differences between means of teachers' responses on the individual competences' domain

Competences' differences	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Individual	.048	281	.200	.995	281	.574
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Results in table (1) reveals normal distribution of the differences between pre and post means for teachers' responses to the individual competences domain, due to non-significance differences (p>0.05).

Moreover, the Q-Q plots were studied for the same data, and results are shown by fig (3).

Figure 3: The Q-Q plots of the differences in teachers' responses to the individual competences



Figures (3) show that the points in the Q–Q plot are mostly lie on the line for the data of individual competences. Thus, the distribution of the sample is considered as standard normal distribution.

5. Randomness: Randomness was tested using Runs test (Verma & Abdel-Salam, 2019), as shown in table (2).

Table 2: Runs test for difference in means of the sociocultural domain of self-evaluation questionnaire of TGC

	Individual Competences
Test Value[a]	.70
Cases < Test Value	140
Cases >= Test Value	141
Total Cases	281
Number of Runs	149
Z	.897
Asymp. Sig. (2-tailed)	.370

Results in table (2) show that the absolute value of z statistic is not significant; because it is greater than 0.05, which reveals that the sample is random.

Results show that there is no violation in any of the assumptions of paired sample t-test. Thus, it can be conducted to test the fourth hypothesis.

Appendix (O)

Assumptions of Paired Samples T-test to test the fifth hypothesis

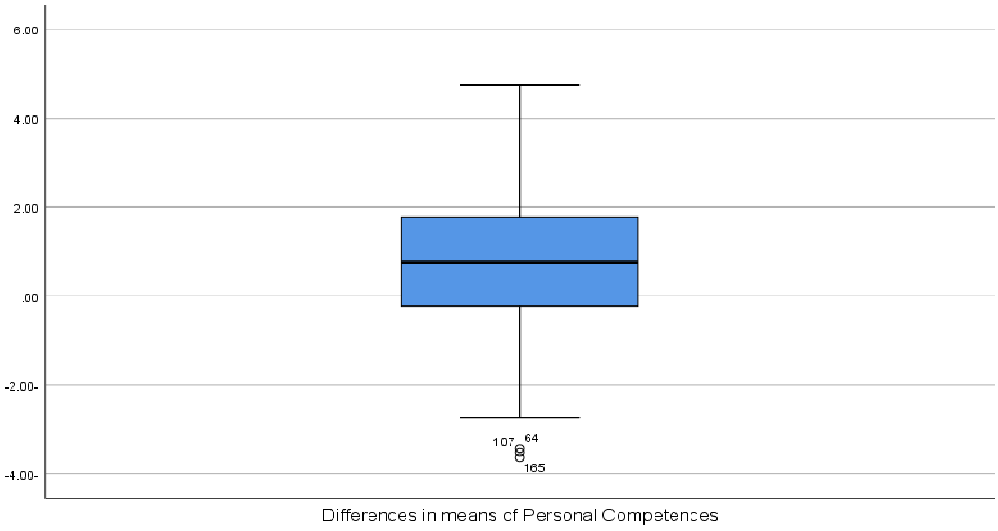
To study the significancy of the differences in the means of teachers' responses to the personal competences of self-evaluation questionnaire of TGC, before and after implementing GHOSHEH model, Paired-Samples T-test should be applied to test the fifth hypothesis. In order to do, the following assumptions of Paired-Samples T-Test should be tested:

1. Continuous data: Data of the pre-questionnaire and post-questionnaire are continuous.

2. Independency: Data is independent because for each participant there are two independent responses.

3. Extreme Outliers: Testing data showed that there were three extreme outliers as shown in figure (1).

Figure 1: Box plot before deleting extreme outliers of the differences in means of the Personal competences



The three extreme outliers shown in figure (1) were deleted and results are shown in figure (2).

Figure 2: Box plot after deleting extreme outliers of the differences in means of the Personal competences

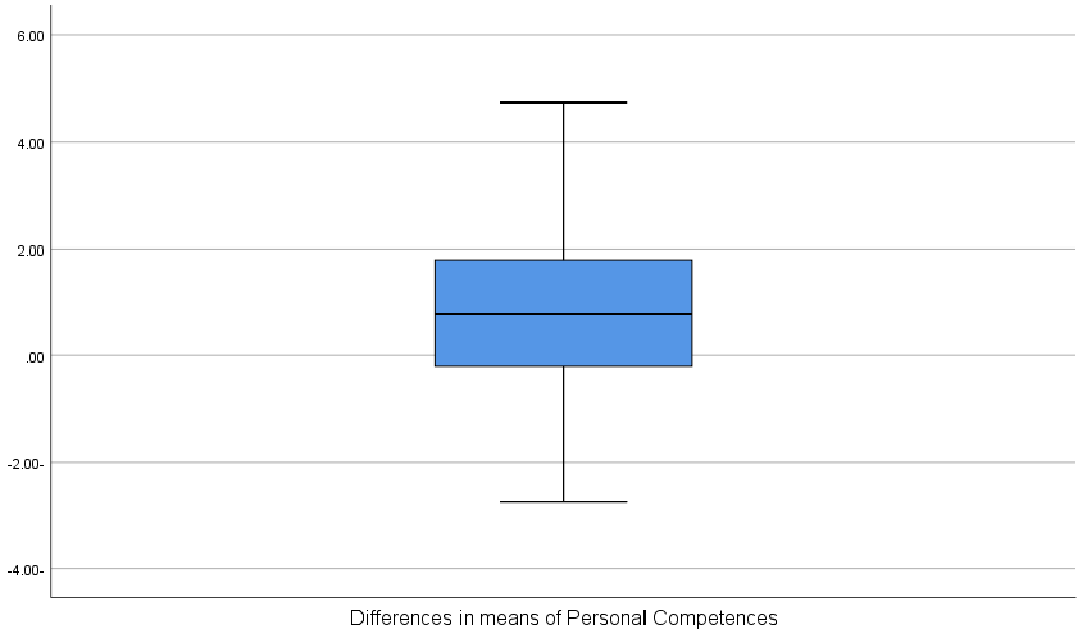


Figure (2) reveals no extreme outliers of the data represents the responses to the personal competences' domain of the self- evaluation questionnaire of TGC.

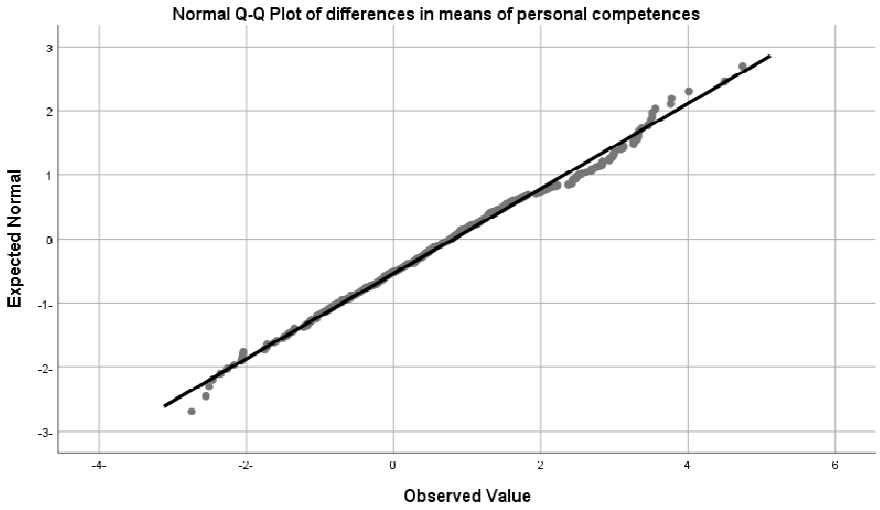
4. Normality: The normality of the difference in means of teachers' responses to the personal competences was tested using both Shapiro–Wilk test and Kolmogorov–Smirnov test. Results are shown in table (1)

Table 1: Results of Kolmogorov–Smirnov and Shapiro–Wilk test for the differences between means of teachers' responses on the personal competences' domain

Competences' differences	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Personal	.051	282	.078	.992	282	.124
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Results in table (1) reveals normal distribution of the differences between pre and post means for teachers responses to the personal competences domain, due to non-significance differences (p>0.05). Moreover, the Q-Q plots were studied for the same data, and results are shown by fig (3).

Figure 3: The Q-Q plots of the differences in teachers' responses to the personal competences



Figures (3) show that the points in the Q–Q plot are mostly lie on the line for the data of personal competences. Thus, the distribution of the sample is considered as standard normal distribution.

5. Randomness: Randomness was tested using Runs test (Verma & Abdel-Salam, 2019), as shown in table (2).

Table 2: Runs test for difference in means of the sociocultural domain of self-evaluation questionnaire of TGC

	Personal Competences
Test Value[a]	.78
Cases < Test Value	141
Cases >= Test Value	141
Total Cases	282
Number of Runs	139
Z	-.358-
Asymp. Sig. (2-tailed)	.720

Results in table (2) show that the absolute value of z statistic is not significant; because it is greater than 0.05, which reveals that the sample is random.

Results show that there is no violation in any of the assumptions of paired sample t-test. Thus, it can be conducted to test the fourth hypothesis.

Appendix (P)

Assumptions of Independent Samples T-test to test the sixth hypothesis

To study the effect of gender on the significancy of the differences in means of teachers' responses to the global competences of self-evaluation questionnaire of TGC, before and after implementing GHOSHEH model, Independent-Samples T-test should be applied to test the first hypothesis. In order to do, the following assumptions of Paired-Samples T-Test should be tested:

1. Continuous data: Data of the pre-questionnaire and post-questionnaire are continuous.

2. Independency: Data is independent because for each participant there are two independent responses.

3. Extreme Outliers: The assumption of Extreme outliers was tested regarding to gender. This was done for the transformed data after deleting outliers from the total sample as done in appendix (G). Results are shown in the Box plot in figure (1)

Figure 1: Box plot for outliers to the global competences regarding to gender

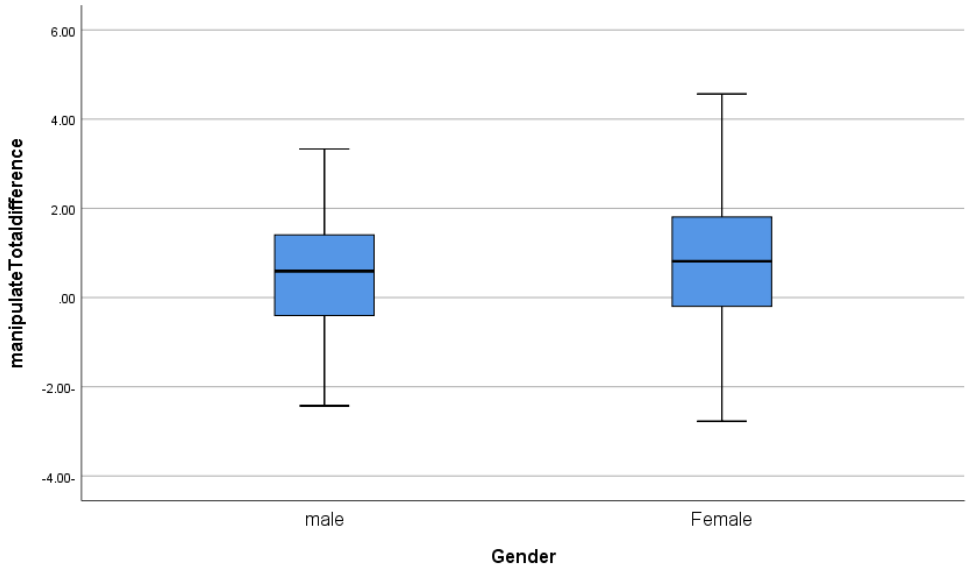


Figure (1) shows that there are no outliers of the data of difference in means of global competences when gender is the independent variable.

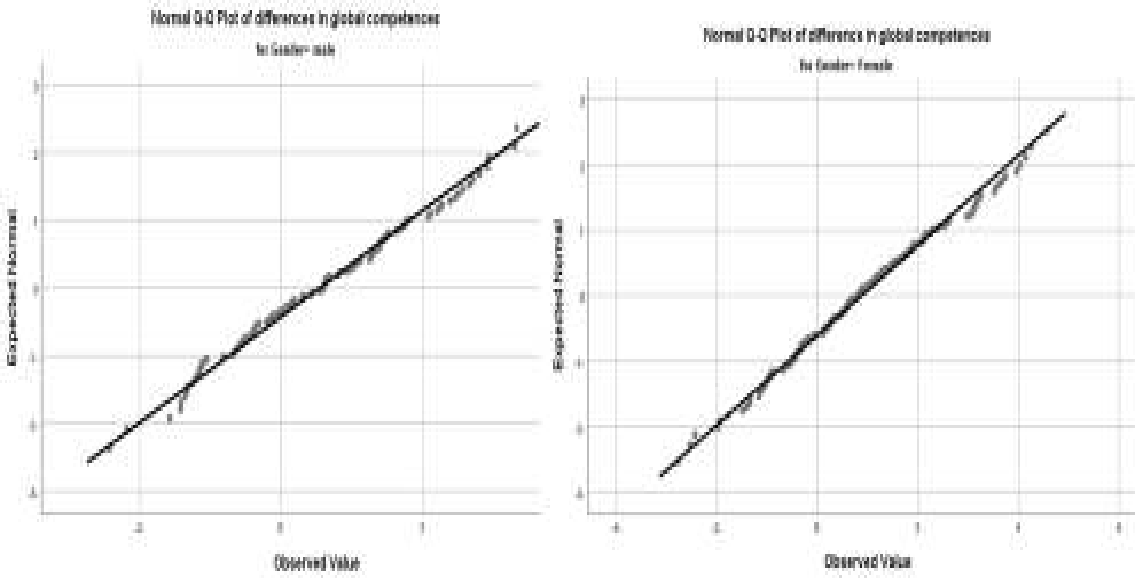
4. Normality was tested also for the transformed data represents the difference in the global competences mean before and after implementing the GHOSHEH model when the independent variable is the gender. Results are shown in table (1).

Table 1: Results of testing normality for global competences regarding to gender

Gender	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
male	.052	109	.200*	.987	109	.385
Female	.044	176	.200*	.992	176	.486

These results are confirmed by the Q-Q plot shown in figure (2)

Figure 2: The Q-Q plots for global competences differences versus gender



5. Randomness: Randomness was tested using Runs test (Verma & Abdel-Salam, 2019), as shown in table (2).

Table 2: Runs test for difference in means of the global competences regarding to gender

	Global	**Gender**
Test Value[a]	.66	2.0
Cases < Test Value	142	109
Cases >= Test Value	143	176
Total Cases	285	285
Number of Runs	139	124
Z	-.534-	-1.461-
Asymp. Sig. (2-tailed)	.593	.144

Results in table (2) show that the absolute value of z statistic is not significant; because it is greater than 0.05, which reveals that the sample is random.

6. Homogeniety: The homogeneity of variances ensures equal variance of the samples with respect to some criterion. Testing Homogeneity is done with Levene's Test, which is used for comparing the variability of two groups or more (Verma & Abdel-Salam, 2019). Levene's Test was used to test the sixth assumption of the independent sample t-test. Results are shown in table (3).

Table 3: Results of Levene's test for homogeneity of the global competences regarding to gender

		Levene's Test for Equality of Variances	
Global Competences		**F**	**Sig.**
	Equal variances assumed	.955	.329
	Equal variances not assumed		

Results of table (2) reveal that the significance value (p-value) of F is more than 0.05. Thus, F-statistic is not significant, which means and there is no evidence that the variability of the two groups differs.

Results show that there is no violation in any of the assumptions of independent sample t-test. Thus, it can be conducted to test the fourth hypothesis.

Appendix (Q)

Means and standard deviations of the teachers' responses to the self-evaluation questionnaire of TGC

Area	Specific Competencies	Indicators for achieving competencies	M (pre)	SD (pre)	M (post)	SD (post)
Professional Competencies	1.1 Instructional design for learner centered approach	1.1.1 The teacher Analyze the content into the basic elements before beginning to teach the unit.	3.19	.972	4.29	.707
		1.1.2 Classify the content according to its rationale to learners.	3.54	.886	4.36	.653
		1.1.3 Follow educational models to design learner-centered instructions.	2.98	.975	4.19	.683
		1.1.4 Plan collaboratively with learners to meet their needs.	3.21	.953	4.20	.729
		1.1.5 Plan taking into account the differences between learners.	3.35	.912	4.27	.686
		1.1.6 Plan to use the most appropriate instructional strategies for both content and learners.	3.25	.925	4.35	.660
		Total	3.25	.692	4.28	.511
	1.2 Management of the teaching process	1.2.1 Base the relationship with students on mutual trust.	3.90	.892	4.50	.646
		1.2.2 Organize a learning environment that encourages interaction among learners.	3.61	.879	4.43	.679
		1.2.3 Encourage learners' participation in developing diverse learning activities.	3.40	.931	4.43	.694
		1.2.4 Give the responsibility of some activities (Educational, Social, Entertain mental….) for learners.	3.27	.933	4.20	.727
		Total	3.55	.707	4.39	.554
	1.3 Implementation of teaching	1.3.1 Involve the learners from the beginning with the learning objectives of the content	3.60	.938	4.43	.684
		1.3.2 Select open educational resources that are appropriate for the content and learners.	3.13	1.082	4.26	.736
		1.3.3 Ask questions that prompt students to reflect in the content.	3.58	.966	4.49	.683
		1.3.4Assist learners to explore the role of what they	3.49	.925	4.40	.721

		have learnt in solving life problems.				
		1.3.5 Participate with students in developing a variety of open educational resources.	3.12	.998	4.25	.794
		Total	3.38	.739	4.37	.587
	1.4 Assessment and evaluation	1.4.1 Develop evaluation tools that consider learners' differentiation.	3.29	.935	4.33	.692
		1.4.2 Use different types of evaluation during the educational process (diagnostic, formative, and summative evaluation).	3.71	.977	4.48	.630
		1.4.3 Assist learners to develop self-evaluation skills.	3.33	.958	4.34	.723
		1.4.4 Encourage learners to accept others' evaluation of their work.	3.59	.905	4.40	.725
		1.4.5 Use the results of continuous evaluation to improve the performance of learners.	3.49	.867	4.36	.727
		1.4.6 Provide constructive feedback for learners continuously.	3.75	.889	4.44	.665
		Total	3.53	.716	4.39	.558
Total for Professional competencies			**3.43**	**.628**	4.36	.506
2. Socio-Cultural competencies	2.1 Continuous professional communication	2.1.1 Maintain continuous professional relationship with learners.	3.73	.907	4.43	.719
		2.1.2 Respect the different cultures of the learners.	4.15	.858	4.56	.654
		2.1.3 Consider the cultural differences of the learners when communicating with them.	4.15	.915	4.58	.663
		2.1.4 Implement educational activities that integrate all learners from different cultures.	3.97	.905	4.49	.717
		2.1.5 Provide continuous support for learners with special needs.	3.48	.924	4.28	.738
		Total	3.89	.737	4.47	.583
	2.2 Continuous communication with peer teachers	2.2.1 Develop strong professional relationships with teachers from different cultures.	3.67	.967	4.29	.753
		2.2.2Involve teachers with different cultures in solving professional problems.	4.02	.944	4.46	.717
		2.2.3 Share with teachers of all cultures experiences that support learning processes.	3.74	.878	4.38	.713
		Total	3.81	.792	4.38	.623
	2.3	2.3.1 Develop relationships	3.78	.898	4.42	.693

	Continuous communication with parents	with parents with different cultures.				
		2.3.2 share with parents' things related to improving their children's learning.	3.57	.994	4.13	.806
		2.3.3 Cooperate with parents to achieve well-being of learners.	3.59	.886	4.17	.815
		Total	3.64	.786	4.24	.654
	2.4 Continuous communication with community	2.4.1 Develop educational activities that enable learners to serve their communities.	3.27	.925	3.86	.851
		2.4.2 Benefit from community's resources (gardens, public libraries, health laboratories...) toconnect learning with life.	3.39	.891	4.19	.759
		2.4.3 Motivate the community to provide available resources that support the teaching and learning process.	3.53	1.17	4.35	.728
		Total	3.36	.818	4.10	.662
	2.5 Global Communication	2.5.1 Develop open educational resources appropriate for different cultures.	3.26	.948	4.06	.786
		2.5.2 Share my developed OER globally	3.09	1.04	4.10	.829
		2.5.3 Communicate with educators from all over the world to share experiences with them.	2.50	1.17	3.62	1.096
		2.3.4 Develop my English skills to be able to communicate with the world.	2.43	1.19	3.30	1.141
		Total	2.82	.886	3.77	.780
Total for Sociocultural competencies			3.51	.660	4.19	.561
3- Individual competencies	3.1 Using information technology in education	3.1.1 Select the most appropriate technology to teach students specialized content.	3.21	1.166	3.87	1.013
		3.1.2 Use the most appropriate technology to the characteristics of the learners.	3.58	.961	4.42	.712
		3.1.3 Select the technological resources that suit the school environment.	3.54	.939	4.36	.751
		Total	3.44	.844	4.21	.669
	3.2 Using technology for communication	3.2.1 Use technology for continuous communication with learners.	3.62	.902	4.32	.752
		3.2.2 Use technology for continuous communication with parents.	3.64	.963	4.37	.753
		3.2.3 Use technology for	3.23	1.049	3.90	.954

		continuous communication with the local community.				
		3.2.4 Use technology for continuous global communication.	3.13	1.070	3.84	.943
		3.2.5 Use technology to learn about different cultures in the world.	3.15	1.075	3.86	.976
		Total	3.35	.817	4.06	.689
	3.3 Developing OER	3.3.1 Support students to reuse OER.	3.37	1.049	4.15	.854
		3.3.2 Use learning strategies that help learners to produce new OER.	3.18	1.019	4.28	.764
		3.3.3 Support learners to share the Open Education Resources they have developed globally.	3.00	1.039	4.13	.844
		3.3.4 Use teaching strategies that contribute to developing students' skills that enable them to solve global problems.	2.85	1.121	4.09	.863
		3.3.5 Use strategies that develop learners' metacognitive skills (controlling the student for his learning and guidance, identifying strengths and weaknesses, and developing solutions for success...).	2.97	1.025	4.03	.877
		3.5.6 Provide opportunities for students to reflect on their learning continuously.	3.25	.931	4.17	.768
		Total	3.10	.843	4.14	.683
	3.4 Seeking Professional development	3.4.1 Reflect on my professional practices in order to develop them.	3.31	.909	4.30	.719
		3.4.2 Look for updated developments in education in order to develop professionally.	3.65	.853	4.46	.749
		3.4.3 Plan for my professional development.	3.38	.913	4.29	.785
		3.4.3 Search for researches that benefit my professional development	3.26	.946	4.18	.840
		3.4.5 Share with others new experiences resulting from my professional development.	3.20	1.044	4.08	.898
		Total	3.36	.754	4.26	.670
Total for Individual competencies			3.32	.721	4.17	.608
4- Personal Competencies	4.1 Respect different cultures	4.1.1 Respect the different cultures in the world.	3.36	.932	4.25	.782
		4.1.2 Accept the dialogue with teachers of different cultures.	3.63	.949	4.25	.808

		4.1.3 Take initiative to produce educational resources suitable for different cultures.	3.65	.957	4.27	.809
		4.1.4 Feel responsible for solving global problems.	2.99	1.070	3.96	.925
		4.1.5 Develop educational activities that help learners accept different cultures.	2.84	1.103	3.66	1.091
		Total	3.29	.765	4.08	.694
	4.2 Respect teaching profession	4.2.1 Respect the ethics of the teaching profession.	3.02	1.052	3.88	.964
		4.2.2 Care about being a role model for learners.	4.33	.877	4.65	.655
		4.2.3 Respect all learners despite of their different cultures.	4.25	.891	4.64	.669
		4.2.4 Select the best expressions to describe the teaching profession through different communication medias.	4.24	.946	4.57	.738
		Total	3.96	.718	4.43	.616
	4.3 Preparing learners to participate in the digital world	4.3.1 Encourage learners to develop their technological skills.	4.08	.943	4.51	.732
		4.3.2 Provide continuous awareness to protect learners from technology's danger.	3.97	.910	4.24	.919
		4.3.3 Encourage learners to focus on publishing licenses when sharing their products.	3.52	1.08	4.27	.828
		Total	3.55	.822	4.08	.764
Total for personal competencies			3.64	.649	4.23	.584
Total for Global Competencies			3.47	.598	4.24	.523

Appendix (R)

Certificate of acceptance of the research extracted from the dissertation

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جامعة النَّجاح الوطنيَّة
كليَّة الدّراسات العليا

فاعليّة أنموذج لإنشاء مصادر تعليم مفتوحة مبتكرة في تطوير الكفايات العالميّة للمعلّمين

إعداد
دعاء "محمد إسماعيل" فؤاد غوشة

إشراف
د سائدة عفونة
أ. د. دانيل برغس

قدمت هذه الأطروحة استكمالاً لمتطلبات الحصول على درجة الدكتوراه في التعلم والتعليم،
بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس – فلسطين.

2023

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الملخص

تهدف هذه الدّراسة إلى تبنّي أنموذج تصميم تعليمي لابتكار مصادر تعليم مفتوحة (أنموذج غوشه)، والكشف عن فاعليّة هذا الأنموذج في تطوير كفايات المعلّمين العالميّة. يتميّز أنموذج غوشه بدمجه لمصادر التّعليم المفتوحة مع مجموعة من استراتيجيّات التّعليم المتمركزة حول المتعلّم، والتي توفّر للمتعلّمين فرصاً للممارسة، والتّأمّل في ممارساتهم، وحلّ المشكلات، وتساعدهم على ابتكار مصادر تعليم مفتوحة.

سعت الدّراسة للإجابة عن الأسئلة الآتية: ما هي العمليّات التي تضمّنها أنموذج غوشة لابتكار مصادر تعليم مفتوحة؟ ما هي سمات أنموذج غوشة لابتكار مصادر تعليم مفتوحة المرتبطة بعمليّات روجرز (Rogers) لصناعة الابتكارات؟ ما مدى موافقة المعلّمين والخبراء على اتّساق سمات أنموذج غوشه مع السّمات التي وضعها روجرز (Rogers) للابتكارات النّاجحة؟ كيف قيّم المعلّمون الذين طبّقوا أنموذج غوشه فاعليّة الأنموذج في تطوير كفاياتهم العالميّة؟

استهدفت الدّراسة عينة قصديّة تكونت من 347 معلّماً فلسطينيّاً ممّن التحقوا ببرنامج تدريبي لتأهيل المعلّمين يعقد في المعهد الوطني للتّدريب التّربوي، ووافقوا على المشاركة في الدّراسة، كما تكوّنت العينة من 37 خبيراً تربويّاً من فلسطين، والأردن، ومصر، والجزائر، والمملكة العربيّة السّعودية، وعُمان، والكويت، والإمارات، والعراق، واليمن ممّن شاركوا في ورشات عمل أو مؤتمرات عرض فيها أنموذج غوشه.

استندت هذه الدّراسة الكميّة الكيفيّة إلى التّصميم المتوازي المتقارب، والذي تضمّن جمع البيانات الكميّة بالتّزامن مع النّوعيّة، وتحليلهما بشكل منفصل، والاعتماد عليهما معاً في تفسير النّتائج. وتمّ جمع البيانات باستخدام أدوات متعدّدة منها استبيان لتبنّي أنموذج غوشة، واستبيان للتّقييم الذّاتي للمعلّمين لكفاياتهم العالميّة قبل التّدريب على الأنموذج وبعده، إضافة إلى أربع مجموعات بؤريّة من المعلّمين، ودراسة حالة وصفيّة حول تطبيق الأنموذج.

أظهرت النّتائج أنّ المعلّمين والخبراء، المشاركين في الدّراسة، وافقوا بدرجة كبيرة على أنّ سمات أنموذج غوشه تتّسق مع سمات النّماذج المبتكرة النّاجحة التي وضعها روجرز والمرتبطة بالأهميّة النّسبيّة للأنموذج، وقابليّته للتّطبيق، ومواءمته للسّياقات المختلفة، وقابليّة مخرجاته للملاحظة، وبعده عن التّعقيد، كما أظهرت النّتائج الكميّة والكيفيّة وجود أثر إيجابي ذي دلالة إحصائيّة لأنموذج غوشه على الكفايات العالميّة للمعلّمين. وفي ضوء هذه النّتائج، أوصت الدّراسة وزارة التّربية والتّعليم والمعلّمين بتبنّي أنموذج غوشه لابتكار مصادر تعليم مفتوحة، كما أوصت بإجراء أبحاث مستقبليّة حول أثر أنموذج غوشه لابتكار مصادر تعليم مفتوحة على كفايات المتعلّمين ومهاراتهم المختلفة.

الكلمات المفتاحيّة: أنموذج تصميم تعليمي، مصادر تعليم مفتوحة، أنموذج غوشه لابتكار مصادر تعليم مفتوحة، روجرز لنشر الابتكارات، كفايات المعلّمين العالميّة.