Effectiveness of a proposed program in developing practices on differentiated instruction for teachers

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Abstract

This article intends to identify the impact of a suggested program for improving practices and fostering positive beliefs about differentiated instruction (DI) for practitioner teachers. To achieve the goal of the study, the author used a true experimental design, namely, the Post-test-only Control Group Design. The researcher selected a random sample of 50 female-students from a public university. To gauge the performance of the study groups, the researcher used a DI Observation Card and a Scale of Beliefs about DI. The results of the study showed the following. Firstly, a statistically significant difference exists between the mean score of the experimental group's female-students and that of their counterparts in the control group, which is in favour of the experimental group in the suggested program for developing practitioner teachers' practices of DI. Secondly, a significant difference exists between the mean score of the experimental group and that of their counterparts in the control group in the suggested program for fostering practitioner teachers' positive beliefs about DI. Thirdly, a significant correlation exists between practitioner teachers' practices of and beliefs about DI.

Keywords: effectiveness, practices, practitioner teacher, differentiated instruction, practitioner teacher

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Introduction:

The twenty-first century has witnessed rapid and successive changes in various aspects of life. These changes pose real challenges to contemporary education as an effective tool in cultivating an individual; developing the individual's cognitive, skill and emotional capabilities and preparing the individual in the scientifical, educational and social aspects of life. Thus, the education system has moved to a learner-centred education system through learners' active participation in the educational process. The application of modern teaching strategies take into account the students' age/development, needs, tendencies, abilities and prior experiences. The presence of differences among students and their diversity in terms of their learning methods and in their brain control abilities requires teachers to use a variety of educational strategies to accommodate the various intelligences of their students. Teachers must also develop these intelligences to ensure the effectiveness in the acquisition of the total knowledge and intellectual skills in the new century. These methods must emphasise the diversity of strategies and the usage of such strategies to enhance learning situations (Nawfal, 2010). Furthermore, they must highlight the diversity in learning assessment methods, the management of students' behaviour and the tasks assigned to students (Heacox, 2017).

Constructivist theory represents the theoretical basis for most modern teaching strategies, including the differentiated instruction (DI) strategy, which is based largely on this theory. At the beginning of the emergence of DI in 1995, Carol Ann Tomlinson was a known expert in this area. Tomlinson posited that in DI, teachers start from the point where students are in and not from the starting point of the curriculum. They have to accept the premise that they must be prepared to teach students via different forms and methods of instruction and respond to their different interests. Moreover, they have to teach at different speeds to match the complexity of the different subjects being taught. Teachers have to ensure that the student has competitiveness with himself/herself, as he/she grows and improves more in this way rather than competing with other students. Skilled teachers build their instructional plans on the premise that learners differ from each other in various aspects. Therefore, the impact of these differences on their teaching methods, curricula and required outputs does not appear (Tomlinson, 2005).

We also find that differentiation is represented in unified content with varied levels of difficulty, diverse teaching strategies, diverse learning activities, varied options for expressing learning, ongoing assessment methods and diverse learning resources. DI is not a new concept. It is based on sound educational practices and places students at the centre of the educational process. As such, students' learning needs guide the direction of the teaching plan. DI also helps improve the quality of education provided to all students by engaging them in activities that meet their learning needs and taking into account their strengths and preferred learning styles.

DI is applied to a typical classroom of high-, medium- and low-ability students. Students in the same class differ in their desire to learn, inclinations, learning styles and experiences. These differences affect their ability to learn, and no single method of learning is suitable for all students. Nevertheless, students can learn unified academic content with different degrees of complexity in different ways, strategies, activities and learning resources. They can express their learning outcomes in different ways, and they can all reach a distinguished level of performance that meets the required standards (Tomlinson, 2005). Thus, we can judge the success of DI by the extent to which it meets the standards, which is the attainment of the highest levels of quality in performance.

Differentiated instruction refers to 'an instruction strategy that considers learners' features, abilities, talents, desire, and how they favour to learn, this is to produce the same learning outcomes using various methods and tools' (Attia, 2009:1). Blaz (2006) defined it as 'a broad set of teaching strategies and directions that focus on two concerns of a good educator: pupils and the learning process'. Langa and Yost (2007:103) also defined it as 'the teaching adapted to a class of diverse

students, and providing activities that vary in content, processes and outcomes'. Meanwhile, Heacox (2017) indicated that teaching differentiation means changing the pace, type or level of teaching that one provides in response to the students' needs, interests or learning preferences.

DI, as it appears from the previous review, is based largely on constructivist theory, from which stems active learning with its various interactive activities that take place in the classroom under the supervision of the teacher. Proponents of DI see that its goal is to increase learners' knowledge. It considers their characteristics and their previous experiences to increase their potential and capabilities. Its main point is teachers' expectations of learners and learners' attitudes towards their potentials in an educational environment that suits them all.

Some of the biggest challenges teachers face in terms of the high diversity of student levels are the differences in their home environment, culture, expectations from school, experiences, response to learning requirements, ways of understanding the world and many other differences.

Recognising and responding to these challenges and requirements, the concept of DI has evolved and received considerable attention within the education systems of developed countries. Kojk et al. (2008) stated that the idea of diversifying instruction started to occur in the educational policies of different countries in 1989, when the Declaration of the Rights of the Child was enacted. This concept then emerged as a result of the World Conference on Education held in 1990 in Jomtien, followed by the Dakar Conference in (2000), which, in its recommendations, emphasised that the differences among learners and that their different ways of learning should be taken into account. Curricula and teaching methods must be diversified so that all learners can be taught in line with their characteristics and that each of them attain maximum success and achievement within the framework of their potential and abilities. These recommendations had direct repercussions on the educational process. The content of education must emphasise the philosophy of active learning. In addition, the learner must be the centre of the educational process. The curricula must be focused on the basic concepts and pivotal ideas associated with the learner's life. In addition, education must be aimed at fostering understanding among learners and enabling them to think creatively and solve problems.

Study problem

Looking at the reality of teaching in public education at the present time, we find that the traditional method occupies a large place among the methods used by teachers. This observation is in line with what the researcher noticed in field training schools. We proceed from the recent trends in education that advocate the ideas that learners should be the centre of the educational process and that the differences between them and the diversity of their preparations, abilities, needs, inclinations and learning styles should be taken into account. As such, we find importance in applying some modern methods and strategies that place the learner at the centre, such as DI. Hence, we must verify the method of employment for the factors of challenge and diversity in learning, identify students who benefit the most from the current teaching plans and modify those plans as needed in such a manner that they benefit a greater number of students.

Studying the relationship between teachers' practices and their beliefs has become necessary. Within the limits of the researcher's knowledge, programs directed at developing DI practices and fostering positive beliefs about this method are not widely available in the Kingdom of Saudi Arabia. As such, this absence is the main motive for conducting this study, which aims to seek answer the research questions:

1. What is the impact of the suggested program in improving a practitioner teacher's DI practices?
2. What is the effectiveness of the proposed program in fostering a practitioner teacher's positive beliefs about DI?

3. What is the relationship between a practitioner teacher's practices of and beliefs towards raising DI?

Terms used in the study

Differentiated Instruction (DI):

Obeidat and Abu Al-Sameed (2007, p. 117) define DI as 'education that aims to advance learners' knowledge, not just those who are facing problem in achievement'. It is a school policy that takes into account an individual's characteristics and previous experiences. Its goal is to increase the student's capabilities and capacities. Its main point is to provide a suitable environment for all students.

DI is defined procedurally in this study as a set of procedures that a teacher uses to teach female-students, whose abilities differ in one class to achieve equal educational opportunities and augment the efficiency and proficiency of the educational process.

Beliefs:

Wenden (1986, p. 27) views beliefs as 'viewpoints that are based on personal experience or the views of others'.

Procedurally, the term 'beliefs' in this study is defined as a teachers' views on the DI, in which it is perceived as a reality and an instruction for their behaviours and thinking'.

Theoretical framework

Differentiated Instruction (DI):

DI is an educational approach to instructing learns of differing motivation levels, interests and ways of learning within the same classroom (Tomlinson et al, 2003). The achievement of learning goals, performance of tasks and activities and support for learners' requirements and types of learning are among the most important principles of the educational process (Tomlinson, 1999). DI is designed to provide diverse learning opportunities for students with diverse proficiency levels in knowledge and understanding, capabilities, interests and personality patterns (which may be affected by their intelligence favours, culture, gender, or learning styles).

Tomlinson further suggested that through DI, teachers can (a) develop challenging activities commensurate with all learners by providing varied levels of complex assignments for an activity, (b) provide varying degrees of scaffolding and (c) change the way students process the task.

The intent of DI is to maximise each student's improvement and individual success to the upper limit of what can be learned.

On the basis of these principles, Rock et al. (2008) provided a theoretical framework for differentiated learning through four guiding principles and seven core principles. The four guiding principles include:

(a) a focus on key ideas and skills in each content area.
(b) response to individual differences among students.
(c) integration of assessment and teaching.
(d) ongoing modification of content, process and outcomes to meet the individual students' prior knowledge needs.

The Core Principles also include seven key beliefs about DI, which include:

(1) Life experiences and readiness to learn differ significantly among students of the same age.
(2) These differences have a significant effect on their learning.

(3)   Students' learning is increased when teachers design activities that are beyond the students' independent level, which can motivate them to learn.
(4)   Learning is most effective when the topics are closely correlated their life situation.
(5)   Learning is boosted by authentic learning opportunities.
(6)   Learning is enhanced when a student feels respected and appreciated by his/her teachers and community.

Differentiated instruction Steps:

Several studies and research, such as Al-Magrabi (2018), Tomlinson, (2005) and Fultz et al. (2012), emphasise the following steps for differentiated instruction:

1. The teacher identifies the special skills and capabilities of each student to attempt to answer the two questions: What does each student know? What does each student need?
2. The teacher selects the appropriate teaching strategies for each student and the adjustments/modifications that will be made to strategies to make them fit this diversity.
3. The teacher defines the tasks the students will perform to achieve the learning objectives.

Respecting the diversity that exists among learners within classrooms has become one of the most significant challenges facing educational systems worldwide in the twenty-first century. The easiest way to communicate with all learners is by providing them with diversity and choice (Jensen, 2006).

Characteristics of DI

Hashem (2009), Heacox (2017) and al-Magrabi (2018) stated that DI has many advantages, including the following:

1. It considers the diverse learning styles and interests of the learners.
2. It is considered a basis for planning and meets the different and diverse needs of the learner, as well as the differences among learners.
3. It is learner-centred instruction with the use of the group system.
4. It adopts essential learning standards, but it takes different styles and types according to the needs of learners.
5. The evaluation is done interactively with the teaching at all times and with all forms.
6. Multiple-choice tasks are assigned to the learner and are used consistently.
7. It is characterised by coherence, flexibility and diversity. However, it is full of complexity and challenges when motivating students to do their best.

Previous studies

Al-Ghamdi's study (2013) aimed to prepare a list of differentiated teaching skills that must be available in the performance of Islamic education teachers in the basic stage and to identify the extent to which these skills are available in their performance. The author adopted the descriptive approach, and an observation card was applied to a sample of 35 teachers in Makkah. The results revealed that the rate of performing differentiated instruction skills as a whole by Islamic education teachers in the primary stage was (15.08%), which is a very low percentage compared with the required performance level, that is, 80% or more.

Another study is that of Al-Shafi'i (2013), which aimed to determine the effectiveness of differentiating teaching strategies in developing some of the life skills and achievement motivation in science for students in the preparatory stage. The researcher used descriptive and experimental approaches and two study tools: a scale of achievement motivation in science and a measure of life skills. The results showed the effectiveness of the differentiating teaching methos in improving life

skills and achievement motivation among students. Moreover, they demonstrated that a significant positive correlation exists between the growth of students' motivation for academic achievement in science and the growth of life skills.

Al-Bultan (2017) aimed to identify the status and needs of science teachers' utilization of DI and the obstacles of its application from their perceptions. The author adopted the descriptive survey method, and a survey was implemented to 224 teachers. The results revealed that science teachers' utilization of DI is at a moderate degree, and a number of obstacles exist in science teachers' utilization of DI, including eight that come with a large degree and 13 that come with a moderate degree.

Al-Bidaiwi (2019) examined the effectiveness of using the DI strategy in improving academic achievement in the special teaching methods course. The researcher used the quasi-experimental approach on a sample of 40 students. The results confirmed the effectiveness of the DI strategy in advancing academic achievement in the special teaching methods course.

Al-Yasi (2019) also aimed to identify the effectiveness of using an electronically differentiated learning strategy in teaching mathematics in raising the level of the academic achievement of third-grade middle school female-students. The experimental method based on quasi-experimental design was implemented to 60 students. The results indicated that the utilization of differentiated learning strategy electronically in the teaching of mathematics has led to an improvement in the academic attainment in math of higher and lower levels among third-grade middle school female-students.

Abdulhameed et al. (2021) revealed the effectiveness of employing DI approach in developing the historical thinking skills of second-year middle school students. The researchers used the experimental method on a sample of 60 students. Findings suggested that the treatment group outperformed the control group in the post application of the historical thinking skills test.

Al-Harithi and Al-Aklubi (2021) aimed to explore the effectiveness of the DI strategy in teaching the Fiqh course to develop some of the habits of mind among third-grade middle school students. The researchers followed the experimental method with a quasi-experimental design on a sample of 50 students. The results showed that the treatment group outscored the control group in the post-application of the Habits of Mind scale.

Among the studies that focused on beliefs is Al-Rua'sa's (2007) study, which explored the effectiveness of a proposed scenario in developing behaviours and changing perceptions about active learning. The sample consisted of 50 female-student teachers, and a Scale of Beliefs about Active Learning was used. Findings indicated that the suggested program had a significant impact on changing the perceptions about active learning.

Al-Qahtani (2014) study aimed to identify the impact of a proposed training program based on active learning and its strategies in changing the beliefs about the approach among teachers of geography in the sixth primary grade in Riyadh, Kingdom of Saudi Arabia. This examination had a sample of 23 female teachers. The results indicated that the suggested training program had a great influence on the experimental group in developing positive beliefs towards active learning.

Having a review of the previous studies on DI and beliefs about the strategy, the following points have been raised:

1. Studies confirmed the importance of DI and its positive impact on students in terms of academic achievement and the development of habits of mind.

2. This study differed from previous studies in terms of the study sample, as it was administered to university level students.
3. This study agreed with Al-Bidaiwi (2019), Al-Yasi (2019), Abdulhameed et al. (2021), Al-Harithi and Al-Aklubi (2021) in one of its objectives, which was to identify the effectiveness of DI.
4. Some of the previous studies recommended the application of DI, while some of them recommended the need to pay attention to beliefs, as well as the need to know the beliefs teachers hold and their relationship with teaching strategies.

Methods

This study relied on the Randomised Post-test Only Control Group Design (Melhem, 2000). Two groups of practitioner teachers were randomly selected to form an experimental group and a control group. The proposed program was administered to the treatment group without the control group. After completing the implementation of the program, the post-test was applied to the members of the experimental and control groups. Table (1) clarifies the study design.

Table (1) Experimental design of the study.

Group	Independent Variable	Post-test
Experimental group	The proposed program	1- DI Observation Card 2- Scale of Beliefs about DI
Control group	-	1- DI Observation Card 2- Scale of Beliefs about DI

This design is characterised by avoiding seven obstacles of internal validity: history, maturation, testing, measurement tool, statistical regression, selection and selection interaction (Al-Sherbiny, 1995).

This pre-test-free type of experimental design was selected because of concerns on the effect of the pre-test on the post-test, which impact the internal validity of the study experiment. In addition, the pre-test application of study tools may negatively affect the instructors' interest to have a look at the program later due to feelings of difficulty regarding the items of these tools (Adas, 1997).

Study population

The study population consisted of all female-students who were in the sixth level under the Islamic Studies Department in the academic year 2021 (N=105).

Study sample

The sample composed of 50 sixth-level female-students. They were chosen randomly and were categorized into two divisions: an experimental group (N=25), which included those who studied the course under differentiated instruction, and a control group (N=25), which included those who studied the course in a traditional way.

Study tools' design and application procedures

To achieve the goal of the study, the following stages were followed:

- The topics of the Special Teaching Strategies course were determined and were taught using the DI.
- Diverse teaching materials for differentiated instruction were prepared.
- The study instruments (DI Observation Card and a Scale of Beliefs about DI) were designed.

Experiment implementation stage

1. The practitioner teachers were guided to implement DI in the classroom.
2. The trainees' performance was evaluated at the conclusion of the program using the instruments (DI Observation Card and Scale of Beliefs about DI).

Study tools

The researcher used the Observation Card and the Scale of Beliefs as tools for data collection for their relevance to the study objectives, methodology and population and to answering questions.

First: ID Observation Card

The observation card was designed and summarized below:

Setting up the purpose of observation card: This tool aimed to gauge the level of the practitioner instructor's ability to practice DI.

Formulating the phrases of the observation card: The first draft of the observation card items was formulated, which contained two parts, as follows:

1- The first part contains an introduction to the objectives of the study, the type of data and information that the researcher wished to collect from the study participants and a guarantee of confidentiality of the information provided. The researcher assured that the data would only be used for the purposes of this research.
2- The second part consisted of (27) phrases that were distributed over four axes. Table (2) shows the number of card phrases and their distribution to the axes.

Table (2) Observation card items and axes

Observation Card	Axis	Phrases' Number	Total
The practitioner teacher's practices of DI	Designing Stage Practices	8	27
	Implementation Stage Practices	12	
	Evaluation Stage Practices	3	
	Practices of Classroom Organisation and Management	4	
The observation card			**27 phrases**

Scoring of the observation card: After writing the observation card items, a five-point scale was selected. It described the level of the practitioner teacher's proficiency in the practice described in the statement. The level of the participant's proficiency was calculated according to a Likert scale. The scale is illustrated in Table (3) below.

Table (3) Limits of the five categories of the Likert scale
(Limits of the average responses)

No.	Category	Equivalent Score	Category Limits	
			From	To
1	Absent	1	1.00	1.80
2	Low	2	1.81	2.60
3	Medium	3	2.61	3.40
4	High	4	3.41	4.20

No.	Category	Equivalent Score	Category Limits	
			From	To
5	Very High	5	4.21	5.00

A) *Validity of the observation card*

1. *Face validity*

The observation card was presented initially to a group of peer-reviewers in curricula and instruction to measure whether it measured what it was designed to measure and to judge its appropriateness for the objectives of the study. The comments were addressed, and the card appeared in its final form, thus consisting of 27 statements divided into four sections.

2. *Internal consistency*

To determine the extent to which each of the card's phrases was related to the total score of its axis, Pearson's Correlation Coefficient (PCC) was calculated. Table (4) below shows PCCs between the card's phrases and the axis overall score.

Table (4) PCCs between the card's phrases and the axis overall score

Axis	Phrase No.	Axis Correlation Coefficient	Phrase No.	Axis Correlation Coefficient
		Observation Card **(Practitioner teacher's practices of DI)**		
Designing Stage Practices	1	0.790**	5	0.649**
	2	0.593**	6	0.643**
	3	0.765**	7	0.619**
	4	0.596**	8	0.707**
Implementation Stage Practices	9	0.591**	15	0.799**
	10	0.808**	16	0.534**
	11	0.733**	17	0.621**
	12	0.734*	18	0.674*
	13	0.534**	19	0.856**
	14	0.698**	20	0.701**
Evaluation Stage Practices	21	0.946**	23	0.795**
	22	0.828**	-	-
Practices of Classroom Organisation and Management	24	0.648**	26	0.816**
	25	0.796**	27	0.710**

** significant at 0.01.

Table 4 demonstrates that the value of the correlation coefficient between each of the phrases with its axis is positive and statistically significance at the 0.01 level or less. This outcome demonstrates the internal consistency of the card's phrases and their suitability to measure that for which they were designed.

B) *Study tool consistency*

The Cronbach's alpha coefficient (α) was used to verify the consistency of the observation card. Table (5) shows the values of Cronbach's alpha consistency coefficients.

Table (5) Cronbach's alpha coefficient for measuring the consistency of the observation card

Observation Card	Section	Phrases' Number	Alpha Value
The practitioner	Designing Stage Practices	8	0.821

Observation Card	Section	Phrases' Number	Alpha Value
teacher's practices of DI	Implementation Stage Practices	12	0.878
	Evaluation Stage Practices	3	0.816
	Practices of Classroom Organisation and Management	4	0.727
The overall consistency		**27**	**0.948**

Table 5 shows that the overall consistency coefficient is (0.948), which is a high consistency value. This outcome indicates that the observation card has a high degree of consistency and can be relied upon in the field application of the study.

Second: Scale of Beliefs about DI

The scale of beliefs about DI was setup as per the following ways:

Determining the goal of the scale: This scale is a self-reported scale that aims to measure some of the practitioner teacher's beliefs about DI.

Scoring system of the scale : After writing the scale items, a five-point scale was selected, which described the practitioner teacher's beliefs about DI. The level of the sample members' proficiency was calculated according to a Likert scale. This scale is illustrated in Table (6).

Table (6) Limits of the five categories of the Likert scale

No.	Category	Equivalent Score	Category Limits	
			From	To
1	Strongly Disagree	1	1.00	1.80
2	Disagree	2	1.81	2.60
3	Neutral	3	2.61	3.40
4	Agree	4	3.41	4.20
5	Strongly Agree	5	4.21	5.00

The length of the range was used to obtain an objective judgment on the means of responses of the study sample after they were statistically treated.

Determining beliefs about DI: In light of the educational literature review on beliefs and differentiated instruction, the researcher determined the beliefs about DI in a scale, which consisted of four main axes.

Preparing the first draft of the scale: The scale consisted of 24 phrases distributed over four axes, as shown below in Table (7).

Table (7) Beliefs scale items and axes

Scale	Axis	Phrases' Number	Total
The practitioner teacher's beliefs about DI	Designing	5	
	Implementation	10	24
	Evaluation	6	

Scale	Axis	Phrases' Number	Total
	Classroom Organisation and Management	3	
	Observation card		**27 phrases**

A) Validity of the scale of beliefs about DI

1. Face validity

The same procedure for the observation was followed to ensure the face validity for the scale. A group of referees was asked to validate the scale in terms of the appropriateness of the statements to the purpose of the study. Amendments were made as per the referees' comments in the final form of the scale.

2. Internal coefficient validity

To determine the degree to which each of the scale's phrases was related to the overall score of its axis, PCC was calculated.

Table (8) PCCs between the scale's phrases and the axis overall score

	Scale (Beliefs about DI)				
	Axis	**Phrase No.**	**Axis Correlation Coefficient**	**Phrase No.**	**Axis Correlation Coefficient**
	Designing	1	0.684**	4	0.723**
		2	0.796**	5	0.717**
		3	0.888**	-	-
	Implementation	6	0.752**	11	0.652**
		7	0.783**	12	0.803**
Beliefs about		8	0.821**	13	0.601**
		9	0.776**	14	0.739**
		10	0.689**	15	0.651**
	Evaluation	16	0.793**	19	0.618**
		17	0.785**	20	0.784**
		18	0.849**	21	0.774**
	Classroom Organisation and Management	22	0.766**	24	0.740**
		23	0.816**	-	-

Table 8 shows that the value of the correlation coefficient between each of the phrases with its axis is positive and statistically significance at the 0.01 level or less. This outcome indicates the validity of the internal consistency of the scale's phrases and their suitability to measure that for which they were designed.

B) Consistency of the scale of beliefs

The Cronbach's alpha coefficient (α) was used to verify the consistency of the scale of beliefs. Table (9) shows the values of Cronbach's alpha consistency coefficients.

Table (9) Cronbach's alpha coefficient for measuring the consistency of the scale of beliefs

Scale	Axis	Phrases' Number	Axis Consistency

Scale	Axis		Phrases' Number	Axis Consistency
Beliefs about DI	Beliefs about	Designing	5	0.814
		Implementation	10	0.900
		Evaluation	6	0.859
		Classroom Organisation and Management	3	0.753
	Overall consistency		**24**	**0.957**

Table 9 shows that the overall consistency coefficient is (0.957), which is a high-consistency value. This outcome indicates that the scale holds high consistency and reliability of the tool can be warranted.

Results and discussion

In this section, the statistical methods that were used to analyse the results of the study according to its hypotheses and the results' interpretation and discussion are presented.

Statistical processing methods

To address the purpose of the present study and to analyse the collected data, the following statistical measures were calculated:

1. The independent sample T-test to investigate the differences between the treatment and control groups.
2. Pearson correlation coefficient to examine the relationship between the study variables.
3. Cronbach's alpha (α) coefficient to determine the stability coefficient of the two study tools.
4. Eta squared (η^2) to determine the efficacy of the experimental treatment.

Verification of hypotheses

The first hypothesis states that no statistically significant differences exist between the mean scores of the treatment group's female-students and that of their peers in the control group's female-students in DI practices.

To verify the validity of this hypothesis, the arithmetic means, standard deviations and t-test values for two independent samples were calculated. The results are identified in Table 10:

Table (10) Significance of the difference between the post-test mean scores of the experimental group and control group students in DI practices.

	Group	Students' Number	Arithmetic Mean	Standard Deviation	T-value	Significance	Eta-squared (η^2)
Designing Stage Practices	Control	25	1.49	0.451	-13.836	0.000**	0.886
	Experimental	25	4.28	0.900			
Implementation Stage Practices	Control	25	1.66	0.470	-13.071	0.000**	0.825
	Experimental	25	4.26	0.877			

	Group	Students' Number	Arithmetic Mean	Standard Deviation	T-value	Significance	Eta-squared (η^2)
Evaluation Stage Practices	Control	25	1.71	0.689	-13.600	0.000**	0.887
	Experimental	25	4.51	0.764			
Practices of Classroom Organisation and Management	Control	25	1.54	0.482	-15.084	0.000**	0.888
	Experimental	25	4.43	0.828			
The practitioner teacher's practices of DI	Control	25	1.60	0.460	-14.215	0.000**	0.884
	Experimental	25	4.32	0.839			

** significant at 0.01.

Table 1 shows that the female-students in the treatment group surpassed those in the control group in the practices of DI. The mean achievement score of female-students in the treatment group was (4.32) out of the maximum score, while that of female-students in the control group was (1.60) out of the maximum score. This outcome reflects the significant differences between the mean score of the experimental group's female-students and that of their peers in the control group.

The effect size from the results obtained from the application of the post-test was (0.884), which indicated that the statistical results were significant. The proposed program in developing practitioner teacher's DI practices is characterised by features that contribute to organising knowledge and transferring it to female-students, thereby strengthening its effectiveness in developing DI practices for the practitioner teacher.

This finding was consistent with those of Al-Shafi'i (2013), Al-Bidaiwi (2019), Al-Yasi (2019), Abdulhameed et al. (2021) and Al-Harithi and Al-Aklubi (2021).

This finding was not consistent with that of Al-Ghamdi (2013), which showed that the rate of performing differentiated instruction skills as a whole by Islamic education teachers in the first stage was (15.08%), which is a very low percentage compared with the required performance level, which is 80% or more.

The second hypothesis states that no significant differences exist at the (≤0.05) level between the post-test mean score of the experimental group's female-students and that of the control group's female-students in the Scale of Beliefs about DI.

To test this hypothesis, means, standard deviations and t-test values for two independent samples were calculated, and the results are shown in the Table 11:

Table (11) Inferential statistics of the Scale of Beliefs about DI.

Beliefs about	Group	Students' Number	Arithmetic Mean	Standard Deviation	T-value	Significance	Eta-squared (η^2)
Designing	Control	25	2.74	0.908	-5.262	0.000**	0.482
	Experimental	25	4.02	0.809			
Implementation	Control	25	2.65	0.895	-6.602	0.000**	0.680
	Experimental	25	4.10	0.638			

Beliefs about	Group	Students' Number	Arithmetic Mean	Standard Deviation	T-value	Significance	Eta-squared (η^2)
Evaluation	Control	25	2.79	0.940	-5.063	0.000**	0.518
	Experimental	25	4.02	0.775			
Classroom Organisation and Management	Control	25	2.61	0.941	-5.780	0.000**	0.579
	Experimental	25	4.07	0.833			
Practitioner Teacher's Beliefs about DI	Control	25	2.70	0.867	-6.096	0.000**	0.753
	Experimental	25	4.06	0.704			

** significant at 0.01.

Table 11 reveals that the participants in the treatment group outperformed their counterparts in the Scale of Beliefs about DI. The mean achievement score of female-students in the experimental group was (4.06) out of the maximum score, while the mean achievement score of female-students in the control group was (2.70) out of the maximum score. This outcome reflects the statistically significant differences between the mean score of the experimental group's female-students and that of their peers in the control group. The effect size from the results obtained from the application of the post-test was (0.753), which indicates that the statistical results are significant. The proposed program in fostering practitioner teachers' positive beliefs about DI is characterised by features that contribute to fostering positive beliefs, thereby strengthening its effectiveness in fostering practitioner teachers' positive beliefs about DI.

This finding is consistent with those of Al-Qahtani (2007) and Al-Rua'sa (2007), which indicated that the proposed program has a significant effect on changing beliefs.

The third hypothesis reveals that no correlation relationship exists at the significance level of (≤0.05) between the practitioner teacher's practices of and beliefs about DI.

To verify the validity of this hypothesis, the PCC was calculated. Table 12 summarizes the results

Table (12) Correlation between the practitioner teacher's practices and beliefs about DI

Pearson Correlation Coefficient (r) and Significance (s)		Beliefs about				Practitioner Teacher's Beliefs about DI
		Designing	Implementation	Evaluation	Classroom Organisation and Management	
Designing Stage Practices	r	0.756	0.862	0.694	0.741	0.687
	s	0.000**	0.000**	0.000**	0.000**	0.000**
Implementation Stage Practices	r	0.588	0.657	0.751	0.695	0.884
	s	0.000**	0.000**	0.000**	0.000**	0.000**
Evaluation Stage Practices	r	0.635	0.629	0.577	0.685	0.653
	s	0.000**	0.000**	0.000**	0.000**	0.000**

Pearson Correlation Coefficient (r) and Significance (s)		Beliefs about			Classroom Organisation and Management	Practitioner Teacher's Beliefs about DI
		Designing	Implementation	Evaluation		
Practices of Classroom Organisation and Management	r	0.856	0.574	0.632	0.814	0.882
	s	0.000**	0.000**	0.000**	0.000**	0.000**
Practitioner Teacher's Practices of DI	r	0.723	0.636	0.711	0.565	0.710
	s	0.000**	0.000**	0.000**	0.000**	0.000**

** significant at 0.01.

Table 12 shows that the value of the correlation coefficient was (0.710), which indicates that a direct correlation exists at a significant level (0.01) between the practitioner teachers' practices of and beliefs about DI. The positive beliefs about DI lead teachers to become convinced of the effectiveness of the strategy, thereby enhancing their practice of DI.

This finding is consistent with that of Al-Shafi'i (2013), which showed the existence of a significant correlation between the growth of students' motivation to achieve and the growth of life skills in the effectiveness of differentiating teaching strategies.

The studies of Al-Rua'sa (2007) and Al-Qahtani (2014) confirmed that a relationship exists between teachers' beliefs and their teaching experiences in the classroom. These attitudes have an impact on teachers' knowledge and how they interpret these experiences in their school practice, as well as on their future teaching behaviours. The researchers also confirmed that these beliefs act as mental models that drive teachers' practice and processing of new information. Hence, teaching practices are best when practitioner teachers' beliefs about differentiated instruction are positive. Moreover, a higher level of the proficiency of practicing differentiated instruction can lead to the changing beliefs about it.

In light of this finding, we approved the alternative hypothesis, which stated that a correlation exists between the practitioner teacher's practices and beliefs about differentiated instruction.

Conclusion

The current study investigates a state-of-the-art issue to determine how a proposed program designed by the author can foster positive beliefs about the ID for teachers. The results of the true experimental design found that the proposed program is beneficial for developing practitioner teachers' practices of DI. The proposed program is also found to be effective in enhancing practitioner teachers' positive beliefs about DI. The results also demonstrate a significant correlation between practitioner teachers' practices of and beliefs about DI. The results of the current study could be significant for teachers to enhance their capabilities and refine their skills to acquire twenty-first century skills.

Recommendations

On the basis of the findings of the current study, many recommendations could be presented for teachers, policy designers and practitioners. Firstly, relevant individuals should include and encourage DI training in teacher preparation programs in education faculties. Secondly, they should

organise training courses and workshops to introduce DI to in-service female-teachers, train them on the approach and teach them how to practice it. Thirdly, they should to provide an appropriate classroom environment for the use of DI in middle schools.

Suggestions for Further Research

Many suggestions could be proposed here for future studies. Firstly, researchers should conduct studies on the obstacles facing the application of differentiated instruction in public schools and the mechanisms for overcoming them. Secondly, they should carry out studies on ways to enhance the influence of the suggested program in augmenting practitioner teachers' differentiated instruction practices. Thirdly, they should conduct studies comparing the beliefs of in-service teachers with those of practitioner teachers about differentiated instruction.

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