Does online CPD work- Saudi Case

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Abstract
The aim of this study is comparative: to evaluate the effectiveness of the current Saudi Arabian Ministry of Education's (MoE) face-to-face CPD programme against the same CPD material provided in an online format. The face to face CPD was introduced to develop teachers' pedagogical practice, in the light of the adoption of a new National Curriculum based on the use of the BSCS 5E instructional model and it is envisaged that the delivery of this CPD material through the use of on-line approach has the potential to bring the training to a large number of teacher in what is a very large and culturally sensitive country in a way in which face to face delivery would simply be unable to achieve
The process of evaluation is guided by Guskey's five levels as a framework, which is helpful in gauging the impact of CPD programmes at a number of different levels.
Mixed methods were used in this study, questionnaire and Flanders Interaction Analysis Categories (FIAC) were used to collect quantitative data and in depth semi-structured interviews were used to collect the qualitative data.
A total of 20 male specialist science primary teachers, teaching upper level (UK Years 4, 5 and 6), with students aged 9, 10 and 11 respectively from different regions in Al-Guwayiyah province, were selected to participate in this study.
This sample was divided into two equal groups, each made up of 10 teachers. Group A were trained face-to-face, and Group B were trained via the online CPD programme.
The initial results indicated that in general, teachers' have a very positive view of the online CPD programme indeed it has been found to be slightly more positive than the attitudes towards the face-to-face CPD programme.

1. Introduction
The Saudi Arabia government has introduced new mathematics and science curricula to be thought in primary and secondary schools. These curricula were designed based on enquiry-based strategy organized around the BSCS 5Es instructional model. Such instructional strategies have presented a challenge for Saudi Arabian science teachers who often use chalk-and-talk methods when explaining Science Phenomena [1]. Moving from one method of teaching to the other requires additional teacher training, and the problem has been compounded by the scarcity of CPD programmes provided by the MoE and the logistical difficulties of implementing these CPD programmes across a large country like Saudi Arabia. Furthermore, the cultural traditions of Saudi Arabia restrict face-to-face (f2f) interaction between males and females, preventing more female teachers from taking part in CPD programmes [2]. As a solution to these problems, it is thought by many researchers [3, 4, 5] that delivering CPD programmes online would be a plausible option that merits further investigation. The potential benefits of online learning in terms of its flexibility and effectiveness might then be realised [6].

2. Study Aim
The aim of this study is comparative: to evaluate the impact of the current MoE f2f CPD programme, which has been utilised in order to develop teachers' pedagogical practice, in the light of the adoption of a new National Curriculum based on the use of the BSCS 5E instructional model [7], and to compare it to the same CPD material provided in an online format.

3. Methods
The process of evaluation in this study was guided by Guskey's evaluation model [8], which is helpful in gauging the impact of CPD programmes at a number of different levels and situations. These level are: 1) Participants' reactions; 2) Participants' learning; 3) Organisational support and change; 4) Participants' use of new knowledge and skills and 5) Students' learning outcomes. Mixed methods include questionnaire, semi-instructional and classroom observation using FIAC were used. However,

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this paper focuses only on gathering evidence regarding the extent to which teachers were satisfied with CPD programmes in Guskey's level 1. Therefore, the data were obtained by questionnaire will be presented. To prompt teachers to provide feedback on content, process and context of the CPD programme, the questionnaire was categorised into three main sections composed of 24 statements which were followed by two open-ended questions to allow for more extended responses

4. Sample
A total of 20 male specialist science primary teachers were selected to participate in this study. This sample was divided into two equal groups, each made up of 10 teachers. Group A were trained f2f, and Group B were trained via the online CPD programme.

5. Results analysis
In general, the overall satisfaction towards online CPD programme is 4.54, which is strongly positive. The overall satisfaction for f2f CPD programmes is 3.52, which is positive.

5.1 Part 1 – CPD programme content

Figure 1: Percentage, mean and standard deviation for responses related to the content of the CPD programme.
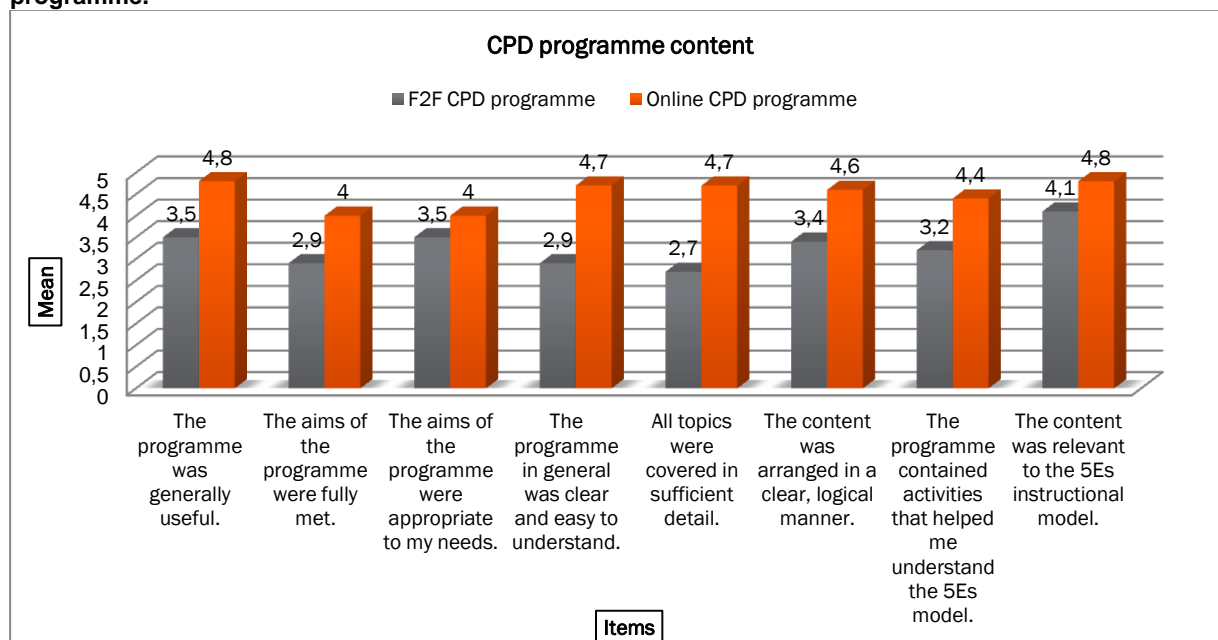

Figure 1: Mean for responses related to the content of the CPD programmes

As can be seen from figure 1 above, the general response towards programme content, for both CPD programmes, was neutral, positive, and strongly positive. However, the mean score for each item was higher for online (Group B) than f2f (Group A). All online CPD programme participants' responses were either positive or strongly positive.

The statements for the online CPD programme content included, "The programme was generally useful', "The programme in general was clear and easy to understand.", "All topics were covered in sufficient detail", "The content was arranged in a clear, logical manner.", and one particular statement, "The content was relevant to the 5Es instructional model" received the highest mean scores (4.80, 4.70, 4.70, 4.60, 4.80) with standard deviations of 0.42, 0.48, 0.48, 0.70, 0.42, respectively.

On the other hand, the statements "The aims of the programme were fully met.", "The programme in general was clear and easy to understand", and "All topics were covered in sufficient detail." for group A – f2f - presented the lowest results with means of 2.90, 2.90 and 2.70 respectively with standard deviations of .99, .88, and 1.08

5.2 Part 2 – CPD programme procedure

Figure 2: Percentage, mean, Std. Deviation for of responses related to procedure of the CPD programme.
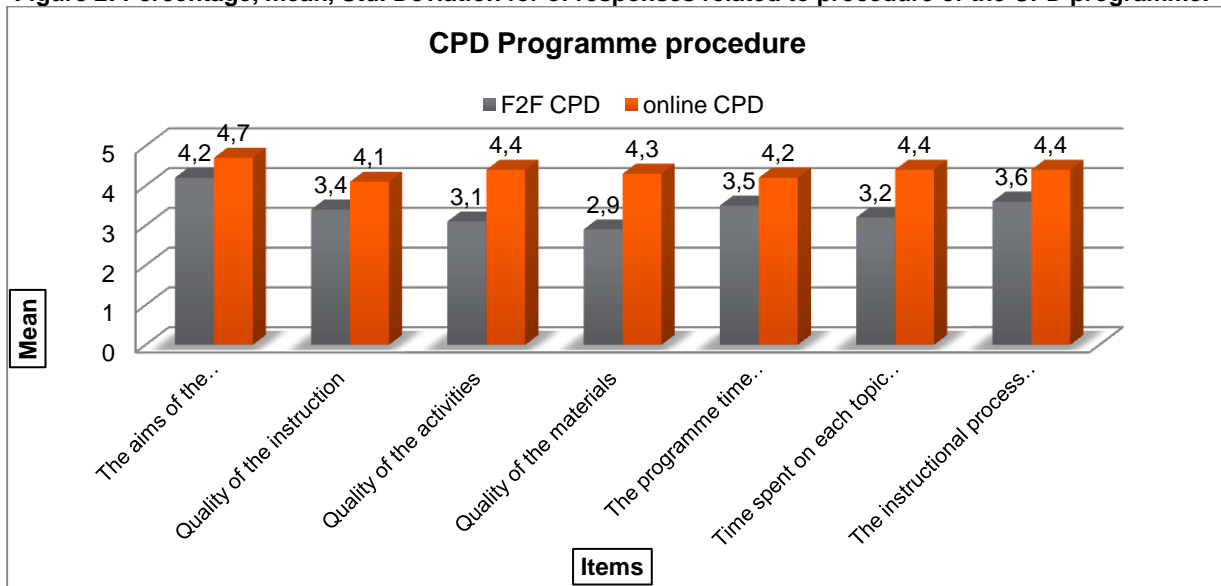

CPD Programme procedure

Figure 2:Mean for responses related to procedure of the CPD programmes

As can be seen from figure 2 above, in general, the overall satisfaction towards programme procedure of online CPD programmes is 4.36, which is strongly positive. The overall satisfaction for f2f CPD programmes is 3.40, which is a neutral reaction.

The highest score for both f2f and online programmes was in statement 1: "the aims of the programme were clear" with results of 4.70 and 4.20 for online and f2f programmes respectively.

The lowest score for the f2f programme was in the quality of materials, with a score of 2.90, a clear neutral. In this regard, the online programme received 4.30, a positive score.

The lowest score for the online programme was in the quality of instruction at 4.10. This, however, is still a positive score and is 0.70 higher than the score of 3.40 received by the f2f programme.

As can be seen from the table, the largest difference between the two different types of CPD programmes is in the quality of materials with a difference of 1.40, with f2f receiving 2.90 and online 4.30.

5.3 Part 3– CPD programme context

Figure 3: Percentage, mean, and Std. Deviation for each items of f2f CPD programme context.
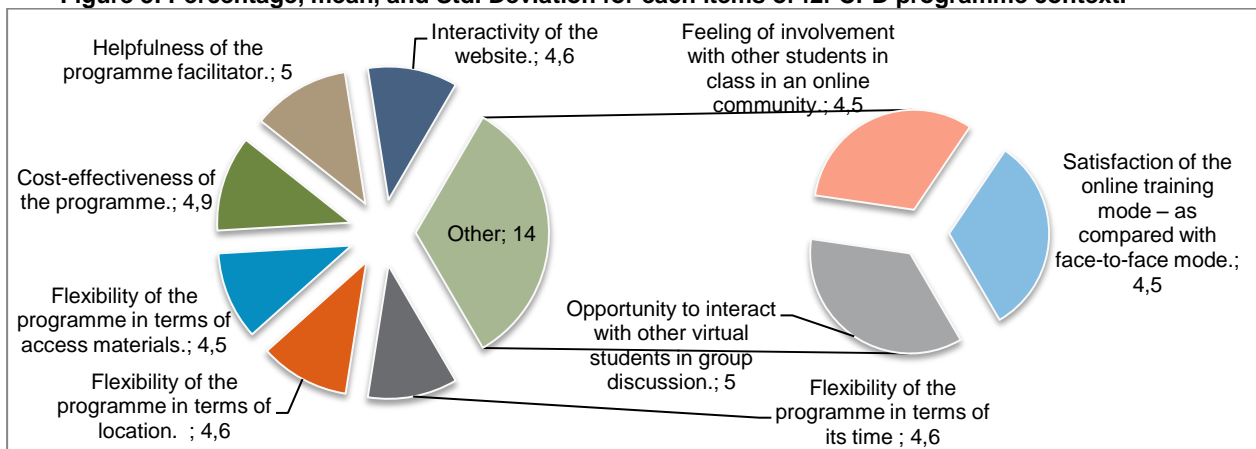

Figure 3: Mean for each items of f2f programme's context

The overall satisfaction towards f2f programme's context is 3.82, which is positive. The statements "Cost-effectiveness of the programme" and "Preparation and management of the facilitator of the programme" received the highest mean scores (4.20, 4.50 with Std. Deviations of .92 and .71,

respectively. The statements "the comfort of the chair", "Flexibility of the programme in terms of access materials", "flexibility of the programme in terms of its time", and "Satisfaction of the f2f mode – if compared with an online mode." received the lowest mean scores (3.20, 3.40, 3.60, 3.60) with Std. Deviations of 1.55, 1.07, 1.26, 1.17 respectively. Consequently, the sample's satisfaction towards f2f CPD programme's context   was positive for all statements, except the lowest two items in which teachers had neutral reactions.

Table 4: Percentage, mean and standard deviation for each items of online CPD programme context
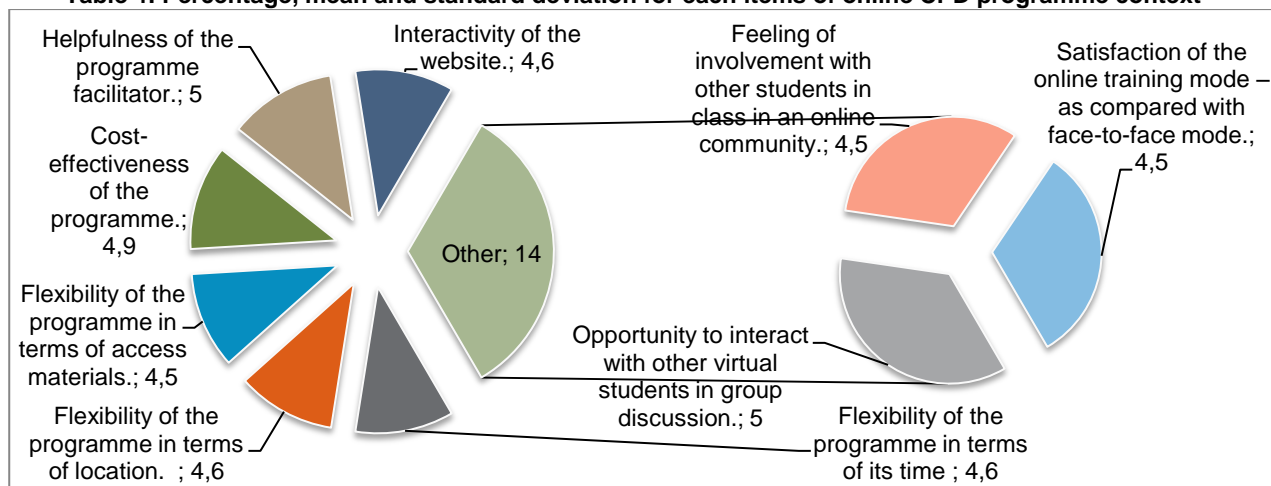

Figure 4: Mean for each items of online programme's context

The overall satisfaction towards the online programme context is 4.69, which is strongly positive. It is notable that the highest mean score for online CPD programme context was in the opportunity to interact with other virtual students in group discussion and in the helpfulness of the programme facilitator, which both received the maximum mean score of 5.00 with a Std. Deviation of .00. These results were followed by the cost-effectiveness of the programme, flexibility of the programme in terms of its time and in flexibility of the programme in terms of location, which received, mean scores of 4.90, 4.60, and 4.60 with Std. Deviations of .32, .52, and .52 respectively.

On the other hand, the lowest mean score for online programme context was in feeling of involvement with other students in class in an online community and the flexibility of the programme in terms of access materials with mean score 4.50, which was also a strongly positive response.

At the end of the questionnaire, two open-ended questions were also given to allow teachers to express additional information - if they had any - regarding their perceptions toward CPD programmes. More specifically, the teachers were asked to add what they found most interesting in the CPD programme and if they had any more information they wanted to add.

To analyse the open-ended questions, responses provided in Arabic have been translated into English. All responses were then categorised into main themes then ranked based on the highest percentage of each statements.

With regards to f2f participants' responses, the teachers believed that the most interesting thing they experienced was the programme content, the 5Es instructional model, which received about 40% of the responses. On the other hand, 20% of the participants believed the time period of the programme was not enough.

With regards to the online CPD programme, the flexibility of the programme had the highest percentage of positive responses, at 30%, which is in line with the response received in statements 16 and 17 of the questionnaire, which refer to the flexibility of the programme and which received highly positive results.

Other responses received mentioned the organisation of the programme, independence of the learning, and one teacher found that the opportunity for discussion provided valuable experience.

6. Conclusion

The overall satisfaction towards online CPD programme is strongly positive whereas towards f2f CPD programme is positive. the general response towards programme content, process and context for both CPD programmes, was neutral, positive, and strongly positive. However, the mean score for

each item was higher for online CPD programme than f2f CPD programme especially in the cost effectiveness of the programmes, in flexibility of the programme in terms of its time and in flexibility of the programme in terms of location.

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