

## **Evaluating students' perspectives about virtual classrooms with regard to Seven Principles of Good Practice**

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This study assesses the quality of distance learning (DL) in higher education assessed by considering the Seven Principles of Good Practice (SPGP). The participants were 77 second-year students from the Computer and Instructional Technologies Program (CEIT) of a Faculty of Education in Turkey. A questionnaire was developed in line with the SPGP and administered to collect data after 14 weeks of teaching. The author's observations were added to a discussion of the connections between student perspectives and the SPGP. The lessons were delivered in a virtual classroom. It is a synchronous online learning environment with online meetings, chat, forums, whiteboards, desktop sharing, document sharing and other online features. The analysis of the results of the questionnaire indicate that this questionnaire as it has been developed in this study can be effective in understanding and evaluating the perspectives of learners on the quality of distance learning in virtual classrooms. This study also presents some new evidence on the potential of virtual classrooms for teaching, learning and learner interaction. Finally, some suggestions regarding the expectations of distance learners were also provided for instructors who wish to utilize virtual classrooms in their teaching.

**Keywords:** distance learning; introductory programming course; learners' perspectives; Seven Principles for Good Practice; synchronous setting; virtual classrooms

### **Introduction**

Over the course of the last decade, many changes have occurred in the emerging economies that support education programmes. One of the key changes is the widespread use of the internet in teaching, which facilitates communication among learners, teachers and sharing resources for learning. The cost of education is another factor driving the change. In emerging economies, with an increase in the population, the cost of conventional education has increased significantly (Moore & Kearsley, 1996); while on the other hand, the cost of storing and transmitting information has been falling due to innovations in DL technologies.

As a reasonable and more affordable alternative to conventional education, DL settings have begun to be used all over the world and research studies have focused on various aspects of distance learning settings in the last decade. For instance, Tricker, Rangelcroft, Long and Gilroy (2001) have focused on the quality of feedback, materials and tasks in DL. Fuks, Aurelio, Gerosa and De Ducena (2002) motivate for the instructor's role in facilitating and managing counselling cooperative learning within the DL environment. Spangle, Hodne and Schierling (2002) have meanwhile evaluated

more than 1200 students in order to determine students' communication skills, the design of activities and the quality of feedback. Time management was also evaluated in DL practices, taking note of variables in technology, context and class size. Richardson and Newby (2006) focused on students' responsibilities for their own learning. Puzziferro (2008) investigated the relationships between student satisfaction, grades and performance in higher education. In another study, students' perspectives reflect that effective teachers should be visibly and actively involved in their learning, and should provide a flexible learning environment (Young, 2006).

Following the improvements in DL systems, new features in synchronous communication augmented DL systems. Considering the idea that effective learning comes by means of real time interactions, a number of higher education institutions have begun to launch courses within synchronous settings. Virtual classrooms are one of the main components of synchronous settings, which share certain similarities with 'real' classrooms. In this context, Lonie and Andrews (2009) have addressed the new technical and pedagogical roles and responsibilities of instructors in managing virtual classrooms. Stewart, Harlow and DeBacco (2011) studied both student-instructor and student-student interactions. The authors found that enhanced video-conferencing, whiteboards, and chatting and discussion boards can support the interactions in synchronous DL. In addition, Lowrie (2007) studied learning engagement in DL settings; Goldwater and Fogarty (2011) focused on classroom management in virtual classrooms; and Chiu, Yang, Liang and Chen (2010) discussed the students' participation style and its effect on success in virtual classrooms.

Despite the increase in the number of organisations offering virtual classrooms, Owens, Hardcastle and Richardson (2009) have pointed out that new evidence is required for exploring teaching-learning processes in virtual classrooms. In this study, pedagogical and technical characteristics of virtual classrooms were evaluated by ascertaining student views, in order to contribute to the standard development efforts in this regard. Thus, the SPGP was used in order to present a comprehensive assessment of virtual classrooms.

Despite the increase in the number of organisations offering virtual classrooms, Owens et al. (2009) have pointed out that new evidence is required to explore teaching-learning processes in virtual classrooms. In this study, both the pedagogical and technical characteristics of virtual classrooms were evaluated through students' views, in order to contribute knowledge in this area. Thus, the SPGP was used in order to put forward a comprehensive assessment on virtual classrooms.

### Evaluating the distance learning quality

Educators and researchers are concerned that quality assurance procedures for the design and delivery of DL courses have been ignored (Motiwalla & Tello, 2000). Thus, with the increasing number of applications using DL, researchers have started to look at evaluations of the quality of DL at different dimensions. For example

Mohono-Mahlatsi and Van Tonder (2006) studied evaluations of the mentoring system, with a focus on effective mentoring. Recommendations are made for different stakeholders on how the mentoring system can be improved for DL. Chaney, Dorman, Glessner, Green & Lara-Alecio (2007) listed common quality indicators, including: clear analysis of audience; institutional support and resources; faculty support services; mission of the institution; reliability of technology; and review of instructional materials. Wang, Solan and Ghods (2010) noticed that course quality and system quality interact with one another, and both lead to changes in the DL environment. They found that course quality significantly affects both system flexibility and the faculty-perceived impact of distance education. Taylor (2002) conducted a survey with instructors regarding seven principles and suggested that learner perspectives ought to be involved.

In this study, I used the SPGP, which includes criteria for assessing quality in higher education courses, according to learner perspectives. Seven principles were specified in line with the discussion of experts in the field (Chickering & Gamson, 1987). The authors Chickering and Gamson (1987) argue that the quality of course depends on a set of seven principles. In their view, effective teaching practices encourage: (1) student-faculty contact; (2) cooperation among students; (3) active learning; (4) prompt feedback; (5) time on task; (6) high expectations; and (7) respect for diverse talents and ways of learning.

Although some studies have taken SPGP into consideration in higher education, only a few studies have used these principles to evaluate online courses. For example, Graham, Cagiltay, Lim, Craner & Duffy (2001) analysed online course materials, student and instructor discussion-forum postings, and faculty interviews, through SPGP. Bangert (2004) used the SPGP to evaluate the effectiveness of an Educational Statistics course by conducting a 35-item questionnaire. Hoskins (2010) found that the SPGP can be administered in an electronic classroom to put criteria for evaluating an e-teacher. She showed that the content remains the same as in the traditional classroom, but the modes of interaction vary between the content, faculty, and students, respectively.

The need for empirical data on DL pedagogy is crucial because there is the danger that DL course design becomes driven by technology without sufficient emphasis on pedagogy. In recognizing this gap, Chickering and Ehrmann (1996) have argued that these principles can be effective guides for the implementation of online courses. In addition to this, a team of evaluators at Indiana University found that the seven principles can be applied to both face-to-face and online courses (Graham, Cagiltay, Craner, Lim & Duffy, 2000). However, they concluded that specific strategies for evaluating the principles differed between the face-to-face and online settings. Also, the Ohio Learning Network (OLN) drew on SPGP in a report that assessed online education and recommendations for higher education institution for quality instruction (OLN, 2002). The report stated that the principles derived from SPGP remained valid

for online education.

All of these studies hint at the possibility of SPGP as an evaluation method for different online learning applications such as forums, web-based applications and on-line applications, amongst others.

### Purpose of the study

Some studies give insight into the potential evaluation methods that might be used to assess student reactions in different DL applications (Newlin & Wang, 2002; Göktaş, 2009; Kiggundu & Nayimuli, 2009). In emerging economies, the tendencies on using synchronous sessions of DL require assessing this kind of environments. So, identifying the advantages and limitations of the synchronous sessions in virtual classrooms when employing DL can provide crucial insights for distance educators.

Thus, this study evaluates distance learner perceptions about the quality of a course delivered in virtual classroom. The quality of the DL setting is investigated in three dimensions (teaching, learning and interaction), by a questionnaire based on SPGP.

### Method

The data in this study are obtained by administering a questionnaire, and observing learner behaviour in an introductory programming language course. The participants were 77 (46 male, 31 female) pre-service teachers (sophomores) from the CEIT Program of the Faculty of Education. The course was taught for five hours a week over 14 weeks, synchronously in a virtual classroom. All of the learners had access to the internet at home, 90.9% of them had previous synchronous course experience.

### Process

The course consisted of synchronous sessions (live sessions in virtual classrooms). In virtual classroom sessions, Adobe® Connect infrastructure was used. Students participated in the synchronous sessions from their houses, which were distanced from the institution, in different cities around Turkey.

The main subjects of the course were: algorithms; programming language constructs; interface design; general programming concepts; and problem-solving activities. Instructors presented the subjects by using the components of virtual classrooms in their presentation, discussion, group work, and so forth. The virtual classroom has three main components managed by instructor:

1. *Meeting* (organisation, recording, teleconferences)
2. *Communication* (webcam, chat, imaging participants, controlling role of participants etc.).
3. *Content sharing* (desktop share, documents share, whiteboard, notes, surveys, tests, etc.).

A wide variety of videos, images, animations, texts, as well as a whiteboard, in different formats, could be shared between the learners and instructors in the virtual

classroom. Participants could raise hands and talk via microphones and webcams and use the chat function for writing. Participants could write, draw pictures, figures and graphics by using a whiteboard. A Facebook group is also used as a supplement, to post announcements or to conduct discussions about assignments. The system supports up to 8-10 students synchronously. Figure 1 illustrates a view from virtual classroom.

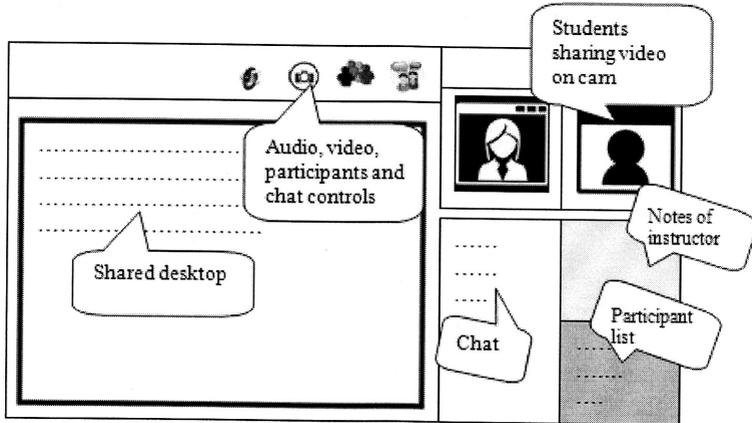


Figure 1 Symbolic view of a virtual classroom

### Instrumentation

The researcher, who was also the instructor, developed a Likert-type questionnaire to determine the quality of the course. Dillman's (2000) principles, namely: 1. purpose of the instrument; 2. specifications; 3. items pool; 4. pretesting and final form; were followed as a guideline for developing this questionnaire.

In the first phase, the purpose of the instrument was defined for the learners and instructors to determine the quality of the synchronous courses. In the second phase, the items' format is adjusted as five-point scale from '1. strongly disagree', to '5. strongly agree'. In the third phase, by reviewing similar instruments in studies of Bangert (2004) and Graham et al. (2001), considering the perspectives of Hoskins (2010) from the "Art of E-Teaching" and adding new items according to the experts' opinions, 69 items were constructed. The last phase is pretesting for validity and reliability. The content validity of the instrument was provided by three experts' reviews. Experts reviewed the items for clarity, accuracy and their appropriateness for sample by using the criteria: (1) unnecessary; (2) somewhat necessary; and (3) necessary. Also experts' opinions were used to check whether the items measured the constructs to be measured. The most essential 40 items remained in the pool and they were allocated in seven subsections according to seven principles. For reliability, first, a pilot survey was carried out on another 71 pre-service teachers ( $\alpha = 0.85$ ). In addi-

tion,  $\alpha$  is calculated for each subsection, in order to determine the internal consistency ( $\alpha_1=0.87$ ,  $\alpha_2=0.83$ ,  $\alpha_3=0.79$ ,  $\alpha_4=0.84$ ,  $\alpha_5=0.76$ ,  $\alpha_6=0.78$ ,  $\alpha_7=0.92$ ).

### Data analysis

Descriptive analysis was carried out based on mean, frequency, percentage and standard deviations of the items. The statistical data for all subsections were interpreted for each item and for the whole subsection. The items that have negative meaning were analysed by reversing the mean values. In addition, the author used his observations to explain and discuss the causes of respective learner responses. During the lessons, the researcher recorded his observations by taking notes about learner behaviours. The lessons in virtual classroom were recorded by the system, so that the researcher also took the records into consideration. For example, the item “multiple ways are allowed to interact with the instructor privately”, was explained by referring to observations of these “ways” as realized in the teaching process. Similarly, in the item “instructor could prepare enriched activities for group work”, the activities were exemplified. Thus, observations contribute to the validity of the study, along with a discussion of learner responses compared with learner behaviour. In order to discuss learners’ responses clearly, the seven principles are grouped into 3 dimensions (shown in Figure 2) by considering their most common features.

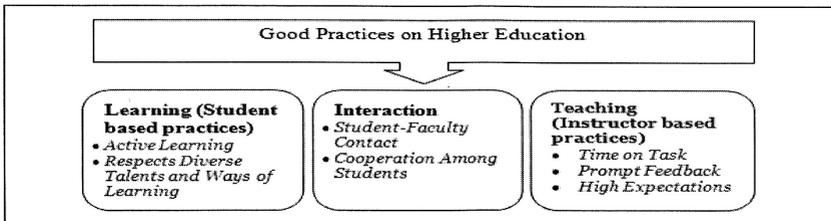


Figure 2 Three main dimensions for SPGP grouped in this study

The following mean value intervals were used to evaluate perceptions regarding subsections (1.00-1.79: not satisfactory, 1.80-2.59: merely satisfactory, 2.60-3.39: satisfactory, 3.40-4.19: highly satisfactory, 4.20-5.00: excellent).

## Results and Discussion

The discussions were constructed on the items of each dimension, in the form of a bottom-to-top hierarchy (items-subsection-dimension).

### Practices related to “interaction”

#### *Contact between Student and Faculty*

Student answers regarding student and faculty contact are shown in Table 1.

**Table 1** Evaluation for Student-Faculty Contact

Practices	<i>M</i>	<i>SD</i>
Instructor made announcements about the course	4.24	1.19
Instructor could encourage communication between students	4.02	1.25
I could reach the instructor easily and asked him questions	3.87	1.25
Instructor responded clearly to my questions	4.23	1.05
Instructor provided opportunities for interaction with experts	3.83	1.16
It was possible to interact with the instructor privately in multiple ways	3.06	1.23

The mean response given to this principle was highly satisfactory ( $M = 3.88$ ). Participants assessed the items regarding instructors' announcements ( $M = 4.24$ ) and the instructors' responses to the questions ( $M = 4.23$ ). In the virtual classroom, instructors often used text-based communication (notes, instant-messaging) to inform the learners about course topics or to make announcements. Instructor also used video and voice features in the context of instructor-student communication. The item "instructor could encourage communication between students and himself" is evaluated as highly satisfactory ( $M = 4.02$ ). Sometimes instructors stopped the presentation to acknowledge student opinion. In this context, Conceição (2006) highlights that due to the fact that the instructor is physically absent, he should learn how to communicate with students to make online courses more student-centred. The process of accessing instructor and asking questions synchronously is assessed as being highly satisfactory ( $M = 3.87$ ) and the instructor's responses towards them are assessed as excellent. Also, outside the virtual classroom, the instructor provided students multiple ways (email or phone) for private interaction where necessary for learning. In this manner, Mayisela (2013) concluded that mobile technology has the potential to increase accessibility and communication in blended learning courses.

The mean values about student-faculty subsection were rated as satisfactory ( $M = 3.88$ ). In this regard, Watson and Rutledge (2005) found in their own study that 30% of students did not agree with the statement: "I felt as much a part of my online class as a regular class." In another study, Keeton (2004) pointed out that students in online courses expected more interaction with the instructor outside the classroom than did regular face-to-face students. Similarly in this study, student-faculty contact is found to be effective especially in the virtual classroom, and some limitations regarding the synchronous system are addressed.

### *Cooperation among Students*

The mean, frequency and percentage values for the student responses regarding cooperation among students are illustrated in Table 2.

Cooperation may be interpreted as activities conducted inside the course or outside the course. In this study, there were some limitations in terms of discussion among learners. Although discussions carried out on in the online chat setting were useful,

occasionally learners found these difficult to follow. Specifically, they expressed that the communication was slow in online chat settings. In a similar study Rhode (2009) found that participants found it difficult for learners to follow the messages in the sending order. In this sense, some students indicated the need for some other online tools for effective cooperation. For example, Palloff and Pratt (2009) stated that effective use of discussion forums can contribute to cooperative learning. This is because the item about the effective discussion among students is rated as merely satisfactory ( $M = 2.0$ ). Working on code pieces together by sharing desktops and time spent working on tasks in groups proved useful. In the virtual classroom, this kind of cooperative work could not be realized in all lessons. Students were required to discuss the incorrect pieces of programming codes, for example, away from the online sessions, but they were not able to conduct effective peer critique. The students assessed the item stating that the instructor encouraged them in peer critiques as merely satisfactory ( $M = 2.26$ ).

**Table 2** Evaluation for Cooperation among Students

Practices	<i>M</i>	<i>SD</i>
Group members could not work on projects collaboratively.	3.01	1.38
Instructor encountered some balancing problems on evaluating students' work.	2.70	1.38
Instructor could prepare enriched activities for group work.	3.38	1.29
Effective discussion environment is provided.	2	1.06
Other online tools are needed for effective cooperation.	2.26	1.36
Students are encouraged about peer critiques.	2.26	1.30

In assignments or projects, a number of students thought that group members could not work collaboratively, so the related item is rated as merely satisfactory ( $M = 3.01$ ). In this sense, I can say that allocating students groups and asking them to work together in the online environment may not meet their expectations. With regards to learner perspectives, Chiu et al. (2010) note that within a group, students must actively share ideas, explain their opinions, articulate their reasoning, and elaborate their knowledge. In addition, most students expressed that the instructor could not precisely assess how much student work was conducted the group work. Learner perspectives showed that interaction among students during the course was less than their interaction outside the course. Buckley (2003) considered teacher perspectives, postulating that it is not only important to create an interactive environment for learning, but it is also important to design discussion activities that can trigger learning cooperatively.

The results of this study reflected that cooperative learning activities can be constructed in DL settings, but the results show that the lowest mean value ( $M = 2.59$ ) to have been given to this subsection by learners. In this regard, Zhang and Walls

(2006) reported that the encouragement of cooperation among students was most rarely practised in online instruction.

### Practices related to teaching

#### *Time on Task*

The mean, frequency, percentage and standard deviations of student responses regarding time spent on tasks are shown in Table 3.

**Table 3** Evaluation for Time on Task

Practices	<i>M</i>	<i>SD</i>
Students spent enough time on tasks to complete them on time.	3.26	1.21
System served effective time management on the part of students.	3.52	1.24
Instructor developed examples that take much time to deliberate.	3.36	1.41
Instructor gave students enough time when they raised their hands.	4.30	0.97
Instructor organized the schedule of the course and deadlines.	3.25	1.31
Technical problems negatively affected student time management.	3.58	1.28

For carrying out the classroom activities smoothly in a virtual classroom, learners ought to be able to use the tools without facing technical impediment. In virtual classroom when the learner attempted to express an idea he/she raises his/her hand (activate the hand raising function). The instructor made sufficient time available to learners to talk on raising their hands. Also, when the learners worked on different tasks in the lessons, they were given sufficient time to complete tasks. The participants rated this issue as excellent in their feedback ( $M = 4.30$ ). Similarly, in Bangert's study (2004), most students (83%) indicated that the course was organised in such a manner as to allow them to effectively complete assignments. Thus, by good organisation, DL courses provide sufficient time for learners engaging in learning activities, as well as for completing course assignments. Technical problems, especially when the line is busy, negatively affected the lesson time. Also, the programming activities took a significant amount of time for students to complete. Therefore, planning the activities proved crucial to time management. Learners assessed the instructor to have planned the course well in this regard, arranging time necessary for tasks, and making the importance of deadlines clear to the students as satisfactory ( $M = 3.25$ ). According to the perspective of e-teachers, in her own study, Hoskins (2010) stated that e-teachers also ought to plan their time such that teaching no longer occurs at a scheduled time. It can become an activity without established ground rules for accessibility.

Instructors explained time management on assignments to students and managed them through the system, by reminding students of their deadlines. However, in some lessons, instructors were required to explain the program code line by line, and spent some time on the code pieces. Accordingly, the item "instructor developed examples which takes much time to solve", was considered a limitation and assessed as satis-

factory ( $M = 3.36$ ). In addition, the time students remained in lessons during the term was recognised, which helped students when it came to time management.

Delivering online teaching requires more time than does face-to-face teaching (Dahl, 2003; Mabrito, 2006). In addition, Taylor (2002) found in a separate study that time on task was the only principle that was rated in the lower scores, with a score of 2.94. In this study, although technical problems and limitations regarding the nature of the course caused occasional limitations when it came to time management, learners' overall assessments of time on task showed it to have been satisfactory ( $M = 3.54$ ).

### *Prompt Feedback*

The descriptive results regarding prompt feedback are illustrated in Table 4.

**Table 4** Evaluation for Prompt Feedback

Practices	<i>M</i>	<i>SD</i>
Instructor provided multiple ways of feedback for projects and quizzes.	3.29	1.09
Students received feedback from videos about the lessons they had missed.	4.49	0.77
Students could revise the assignments by receiving evaluative and corrective feedback.	3.48	1.33
Feedback from peers and instructors was delayed in the system.	2.78	1.47
Instructor increased student motivation by encouraging them to do their best.	3.13	1.39

Feedback provides an opportunity to evaluate student improvements on learning. Tsai (2012) found that online feedback from teachers and course websites may enhance student learning. In this study, students could resubmit their projects after revising them according to instructor reviews. In this regard, students assessed the evaluative and corrective feedback mechanism as having been highly satisfactory ( $M = 3.48$ ). Graham et al. (2001) assert that providing detailed feedback to each student ought to be one of the main targets of online instructors. In order to send feedback for each task or projects, instructors preferred to share examples of general mistakes on projects as a way of using time effectively. Instructors used a variety of ways including synchronous system features, email and social networking, in order to send feedback. Some studies have shown that successful feedback can be given through email or forum postings (Göktaş, 2009; Williams & Jacobs, 2004). Learners assessed the item about multiple ways of giving feedback as satisfactory.

In the virtual classroom, lessons are recorded (videos of activities in virtual classroom), and organised for learners to follow the videos repeatedly. This feature may be considered an important advantage of synchronous sessions, and was assessed by students in this study as excellent ( $M = 4.48$ ). One of the most important issues in

online learning is giving feedback on time, where students need it for their projects, assignments or other tasks. In this regard, participants have some negative opinions about the delays in timely feedback ( $M = 2.78$ ). Also, peer feedback is an important factor for learners while working on projects. However, the instructor did not allow students to share their own projects with each other before the project was completed. As a result, the responses to the item related to the effectiveness of peer feedback on projects rated this aspect as unsatisfactory. In virtual classrooms, or by using other tools, eye contact and body language cannot be realized as it can face-to-face. This can affect feedback regarding motivation. The majority of students thought that motivational feedback had some limitations ( $M = 3.13$ ).

The mean value of learner's rates on the subsection "prompt feedback" is highly satisfactory. Similarly, in another study based on WebCT, learner responses reflect that most of the learners (96%) not only feel that feedback was timely, but also felt that feedback was helpful when it came to course assignments, and general course requirements (Bangert, 2004).

As a result, the synchronous setting allowed learners to receive feedback from the instructor and from peers, which enhanced their understanding through revision. But the instructors' habits about feedback and systems affordances can effect participants' behaviours.

### High Expectations

Table 5 shows the results of student assessment of the high expectations subsection.

**Table 5** Evaluation for High Expectations

Practices	<i>M</i>	<i>SD</i>
Instructor gave students challenging assignments.	3.53	1.25
Students were supported for the creation of new ideas and authentic answers.	3.47	1.27
Instructor expected students to perform well.	3.83	1.67
Instructor articulated criteria clearly for evaluating students' performances.	3.73	1.20
Instructor provided examples of previous student work.	3.31	1.32
Instructor presented requirements regarding absence and taking part in discussions.	3.99	0.88

The assessments about high expectations are generally rated as highly satisfactory, from ( $M = 3.31$ ) to ( $M = 3.99$ ). The various techniques instructors used to keep students highly motivated may contribute significantly to learning. At the beginning of the course, the instructor clearly explained his expectations about assignments and he stated that he would evaluate participation in discussions in the virtual classroom. Also, he defined the criteria about the student performance clearly. He also declared

that he would evaluate how long a student was on the system. This was rated on the “instructor expected students to perform well” as successful ( $M = 3.83$ ). Learner responses showed that the instructor encouraged them in their abilities by affording special attention to challenging assignments. The instructor was reported to have kept learners highly motivated by encouraging them to create new ideas and to state authentic answers to questions. Learners evaluated this item as satisfactory ( $M = 3.47$ ). On writing programming codes in order to reach possible best solutions, learners considered the instructor’s expectations. Another way in which the instructor relayed his high expectations to the students was by providing examples of previous students who were found highly satisfactory.

Practices related to “learning”

#### *Active Learning*

Students’ responses regarding active learning are shown in Table 6.

**Table 6** Evaluation for Active Learning

Practices	<i>M</i>	<i>SD</i>
Instructor used different kinds of instructional materials.	4.16	1.13
Instructor could create learning environments according to the various learning styles.	3.23	1.37
Students are engaged in talking, writing, presentation and studying about subject.	3.62	1.44
Students needed to use other internet tools, blogs, forums, social networking, etc.	2.61	1.30
Instructor could coordinate the learning activities.	4.04	0.95
Students were generally passive listeners.	2.96	1.53

Moore (1989:1-6) described student-content interactions as “changes in the learner’s comprehension, the learner’s perspective, or the cognitive structures of the learner’s mind”. So, one of the most important issues in online environments is managing the student-content in learning activities (Bender, Wood & Vredevoogd, 2004). Most of the students found the instructor successful in coordinating the learning activities on the system ( $M = 4.04$ ). In the virtual classroom, instructors used presentations, documents, code pieces, and video or other formats of contents synchronously. Participants evaluated the item that the instructor used different kinds of instructional materials as highly satisfactory ( $M = 4.16$ ). Instructor could encourage learners by participating in the lessons according to their learning styles by watching, talking, writing and discussing. To increase the active participation of learners, the instructor encouraged them to use the whiteboard and the chat setting, especially when writing sample programme pieces. Learners rated this item as highly satisfactory.

Writing programmes requires thinking time, so during this time, learners may be

seen as passive. To prevent the learners from becoming passive listeners, instructors put a great deal of effort into finding authentic examples and to bringing these to the attention of the students. But learners did not think that the instructor was successful in this regard ( $M = 2.96$ ). Some students carried out different activities via Facebook, but the instructor did not make it obligatory. Furthermore, he required the students not to use these settings during lessons, in order to keep them focused. As a result, learners reported the availability and use of supplementary internet tools as merely satisfactory ( $M = 2.61$ ).

When talking, writing or presenting on the subjects of the course, the instructor could not physically see the learners and a huge effort was made to keep them actively engaged in the lectures. Almost all items are assessed as satisfactory in active learning subsection, except for the subjects being passive listeners. This is generally viewed as a limitation in this manner of synchronous session.

#### *Diverse Talents and Ways of Learning*

The student responses regarding diverse talents and ways of learning are shown in Table 7.

**Table 7** Evaluation for diverse talents and ways of learning

Practices	<i>M</i>	<i>SD</i>
Students had opportunity to show own talents on system tools.	3.88	1.31
The system supported different kinds of materials (video, text, audio, multimedia, etc.).	4.31	1.09
Instructors planned instruction to address the diverse range of learning preferences.	3.49	1.41
Instructor guided students in selecting topics for assignments.	3.56	1.27
Instructor encouraged students to express their own points of view.	3.07	1.58

The synchronous setting used in this study offers various types of materials for learning (video, text, audio, multimedia, etc.). The use of different instructional materials was convenient for learners for presenting their own talents, and was rated as having been excellent ( $M = 4.31$ ). In some lessons, the instructor used examples that can offer more than one solution or view for a particular problem. So, presenting distinct points of view about the problems during the lesson was assessed as having been satisfactory ( $M = 3.56$ ). Learners chose appropriate projects and used their own methods to solve problems. They had the opportunity to show their talents on the system by video, text, graphics and audio formats, and were instructed on how to share applications both inside and outside the class. For example, they designed algorithms; explained their views about codes; tried to find errors in codes; followed the code pieces; and estimated the efficiencies of codes. In this regard, Hannafin, Hill, Oliver, Glazer and Sharma (2003) stated that the implementation of online media for teaching

staff ought to become both familiar with the functionality of new instruments, and to specify new ways of working. In addition, instructor lesson plans were assessed as satisfactory when it came to the way in which it catered for a diverse range of learning preferences. As a result, the learner responses mean value about showing their own talents is evaluated as having been highly satisfactory ( $M = 3.88$ ). In parallel to this study Bangert (2004) found that, the majority of students felt that the instructor created instructional activities that allowed several different ways for students to demonstrate understanding of critical course concepts.

### Overall Evaluation

The mean value and standard deviations in three main dimensions addressed in synchronous DL are listed in Table 8.

**Table 8** Evaluations in three main dimensions

Dimensions of Seven Principles	<i>M</i>	<i>SD</i>
Good Practice Encourages Student-Faculty Contact	3.88	0.71
Good Practice Encourages Cooperation Among Students	2.59	0.52
<b>Overall Interaction</b>	<b>3.24</b>	<b>0.68</b>
Good Practice Encourages Active Learning	3.04	0.64
Good Practice Respects Diverse Talents and Ways of Learning	3.65	0.89
<b>Overall Learning</b>	<b>3.53</b>	<b>0.67</b>
Good Practice Gives Prompt Feedback	3.43	0.98
Good Practice Emphasises Time on Task	3.54	1.19
Good Practice Communicates High Expectations	3.64	1.02
<b>Overall Teaching</b>	<b>3.55</b>	<b>0.85</b>

It is observed that though the system has some benefits, there are still challenges with regards to cooperation among students. Active learning, which is directly associated with learning, was evaluated as having been quite low. Unlike the results of this study, Gomez Alvarez (2005) found that active learning was the best predictor in both criterion variables, and prompt feedback and high expectations comes after active learning. A promising result can be seen in the student-faculty contact, diverse talents and high expectations subsections. The mean values of evaluations showed that the synchronous setting was evaluated by students as having been highly satisfactory with regard to interaction ( $M = 3.53$ ), teaching ( $M = 3.55$ ) and learning ( $M = 3.24$ ). Taylor (2002) also concluded that instructors were self-reporting the use of the principles in their online courses in six of the seven principles (contact between faculty and student, feedback, ways of learning, expectations, learning techniques, and relations among students), which ranged from 3.10 to 3.78.

In this manner, despite the limitations related to system, students or teachers, good practices can be ensured in accordance with the seven principles framework within an

established learning setting. In this regard, Wang et al. (2010) assert that instructors who intend designing effective online course tasks, should implement their seven principles.

Learner perspectives may be shaped by the nature of course, as computer programming as a subject mainly concerns abstractions. Learner perspectives support the constructivist-based teaching practices that are suggested by the SPGP. In addition, the questionnaire developed for this study provided some valuable experience for the creation of an instrument that can be used by students to examine the quality of synchronous courses. While it is recommended to use the SPGP in conventional higher education courses, this study puts forward new evidence about the applicability of the SPGP for DL courses. In this study, SPGP is used as a framework for evaluation in teaching, learning and interaction dimensions. The results indicate that it can also be used as a guide for the design and delivery of DL courses. Minor revisions may be required depending on the nature of the courses or on the technical features of the given online environment. As is known for emerging economies, a major argument for DL as a way for promoting higher education is its lower marginal cost per student when compared with face-to-face applications. But while gaining cost-effectiveness, emerging countries should not be willing to compromise the quality of instruction. For this reason, investigating the quality of DL applications and revealing the limitations and advantages is crucial for stating standards for DL.

### **Conclusion and Implications**

SPGP have been accepted by academicians for evaluating quality of process in undergraduate education (Graham et al., 2001; Bangert, 2004). This study provides further evidence that these principles can be evident in virtual classroom settings. Positive correlations were found between the use of the seven principles and interaction, learning and teaching.

In the constructivist perspective, interaction proves important for both instructors and students and in order to facilitate supportive and corrective feedback, instructors must design highly interactive settings. Student responses regarding the activities in the virtual classroom and the other components reflect on comprehension of introductory programming. In this context the perspectives regarding overall learning were “highly satisfactory” while active learning sub-section was evaluated as “satisfactory” and diverse talents and ways was evaluated as “highly satisfactory”. Learners reported thinking that the instructor used the system to give prompt feedback, highlighted the time to be spent on tasks, and described high expectations as “highly satisfactory”. So, the “teaching” dimension of SPGP was considered “highly satisfactory”. The dimension “interaction” was rated as “satisfactory”. It was interesting to note that cooperation among students was evaluated at the lowest assessment rate as “merely satisfactory”.

The improved features of the synchronous system played an important role in learners’ positive perceptions of the questionnaire based on the SPGP. The synchro-

nous system offered learners online webcam, desktop and document sharing, presentations and whiteboards, and the ability to work on the same task collaboratively. The system's improved communication features contributed to positive learner views on the "interaction" dimension, which were addressed as student-faculty contact and cooperation among students. Meeting in virtual classrooms and getting efficient feedback were adherence to feedback sub-dimension of SPGP. In synchronous lessons, time management differs from traditional lessons when it comes to the use of technical functions. Therefore, planning and managing the reactions of unexpected positions in the lessons can overcome wasted time. In traditional classrooms or in virtual classrooms, instructors generally have high expectations from the students. In DL settings, it is quite difficult to motivate distance learners through high expectations, because learners may have different future goals. Considering the features of the system, the activities of the instructor and the nature of the course, it can be observed that the necessary principles for good practice in higher education can be satisfied.

Certain broader implications were found for DL in higher education. For instance, when instructors become increasingly familiar with synchronous technologies, they will organise the learning environments more effectively. Instructors also need to be pioneers in terms of having the flexibility to make adjustments when the technology does not work as expected. Managers should choose software with the flexibility to support different levels of course design (Wang et al., 2010). Furthermore, learners should be taught how to use DL systems and be able to gain experience in new tasks such as researching, solving problems, and making collaborative studies in new settings.

Ultimately, the results of this study show that learner perspectives about DL can be obtained through a SPGP-based evaluation instrument. This provides insight when using similar instruments, in order to evaluate the quality of DL instructional practices.

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