

Physiotherapy clinical students' perception of their learning environment: A Nigerian perspective

A C Odole,¹ PhD; N A Odunaiya,² MSc; O O Oyewole,³ PhD; O T Ogunmola,² BPT

¹Physiotherapy Department, College of Medicine, University of Ibadan, Ibadan, Nigeria, and School of Research and Postgraduate Studies, Faculty of Agriculture, Science and Technology, North West University, Mafikeng Campus, South Africa

²Physiotherapy Department, College of Medicine, University of Ibadan, Ibadan, Nigeria

³Physiotherapy Department, Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria

Corresponding author: A C Odole (adesola_odole@yahoo.com)

Background. A favourable environment has a positive and significant impact on students' learning, academic progress and well-being. The present study was undertaken to identify the perceptions of physiotherapy students in their clinical years of their learning environment at the College of Medicine, University of Ibadan, Nigeria.

Methods. A focus group discussion involving 12 undergraduate physiotherapy students was used to obtain information about their perception of their learning environment. Six students from two clinical levels of study were recruited through a simple random sampling technique. The focus interview guide was developed based on information obtained from the DREEM questionnaire and literature review. The interviews were analysed using the identified themes from DREEM and grounded theory for emerging subcategories.

Results. Five descriptive themes and several subcategories were identified: (i) context of learning (course objectives, student focused/teacher centred, active learning); (ii) context of teachers (knowledgeable teachers, provision of formative assessment, approachable lecturers, cordial teacher-student relationship); (iii) context of students' perception of their academic skills (understanding the subject); (iv) context of atmosphere (adequacy of facilities, e.g. chairs, classrooms, library, books); and (v) context of social life (religious activities, social functions, school-related social activities).

Conclusion. Most students perceived their learning environment as good, especially with regard to student-teacher relationships. Some of the teachers were described as knowledgeable, and as providing formative assessment. However, students perceived their learning as being teacher centred. To facilitate an excellent learning environment, particular attention needs to be paid to availability of physiotherapy textbooks in the college library, sufficient appropriate furniture in classrooms, and provision of a functioning departmental library. The findings from this study may provide insights for teachers who wish to enhance the effectiveness of their teaching and of their students' learning.

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A favourable environment has a positive and significant impact on students' learning, academic progress and well-being.^[1] Eliciting students' perception of the learning environment is a useful basis for modifying it and improving its quality, and provides students with a voice through

which they can share their experience in the school.^[2] This information, gained through questionnaires, interviews and focus groups, can be used to enhance the strengths and address the weaknesses of the institution.^[3] An environment conducive to learning, for example with comfortable learning rooms, a receptive clinical environment and motivated, skilled and approachable teachers, is believed to increase learner motivation, which in turn leads to better engagement in learning and improved performance.^[4] Identification of factors that will improve the learning environment, and an understanding of how students learn, will therefore help the teacher to facilitate learning and plan a curriculum to improve learning outcomes.^[5]

Evaluation of the educational environment comprehensively assesses what is happening and how things are in the school.^[1] Interest in the role of the learning environment in undergraduate medical schools has been increasing.^[2] Particular attention has been paid to students' perception of their learning environment in nursing education.^[6] In a study carried out in Malaysia, medical students perceived that their teachers were good at

communicating with them, and that their teaching helped them to develop professional competence. They also considered the overall atmosphere of the school as comfortable, and reported better-than-average social lives.^[1] In a study from Australia, health science students perceived that the environment was positive, and also that the teaching was student centred. They reported that the environment had a positive impact on their achievement and success.^[7] However, there appears to be no published qualitative study on perceptions of the learning environment among physiotherapy students in Nigeria. It is important to provide empirical information on how these students perceive their learning environment in order to improve their engagement in learning and their performance. This study therefore explored the perceptions of physiotherapy students in their clinical years of their learning environment at the College of Medicine, University of Ibadan, Nigeria, with the intention of using the findings from the study to enhance the strengths and address the weaknesses of the institution, and so improve the learning environment.

Methods

A qualitative methodology was used to investigate the students' perceptions of their learning environment. The study sought to explore individual student experiences, which are considered valuable for improving understanding of

aspects of the experience of the education environment. The study could be described as phenomenological in nature.^[8] It has been suggested that a focused discussion is suitable when the informants are involved in more or less the same situation. Using this method, the informants received support to describe their cognitive and evaluative meaning around a theme, i.e. in this context focusing on their views of and thoughts about their learning environment.^[9]

Before commencement of the study, ethical approval was sought and obtained from the University of Ibadan/University College Hospital Research Ethics Committee. Each student involved signed an informed consent form in which ethical issues were addressed, including guaranteed confidentiality and freedom to withdraw from the study at any time. Statements on confidentiality were included in the informed consent form. Students' names were not included in the recordings. The focus group discussion involved 12 of a total of 54 undergraduate physiotherapy students (26 at level 400 of study and 28 at level 500 – these are the full clinical years of study at the university). Six students were selected from each level through a simple random sampling technique (fishbowl technique), in which 6 names were picked randomly from a bowl containing the names of the level 400 students and another 6 from a bowl containing the names of the level 500 students. The students whose names were picked were invited to participate in the study. The focus interview guide was developed based on information obtained from the Dundee Ready Education Environment Measure (DREEM) questionnaire^[10] and literature review. It was assessed for content validity by five physiotherapy educators at a departmental seminar.

The DREEM is a 50-statement, closed-ended questionnaire developed to assess the learning environment of educational establishments.^[10] It has been found to have good internal consistency.^[10-12] Each of the 50 items falls into 1 of 5 categories: students' perceptions of learning; students' perceptions of teachers; students' academic self-perceptions; students' perceptions of atmosphere; and students' social self-perceptions.^[7] The focus guide included the five questions listed below. The discussion was conducted in English, the official language of communication/study in Nigeria.

Question 1: What are some of your challenges in the learning process?

Probe: Is the teaching student centred? Are course objectives provided at the start of the course? Is teaching teacher centred? Is the teaching period put to good use? Does the teaching emphasise the long term more than the short term?

Question 2: What can you say about the whole teaching process in physiotherapy?

Probe: Are the teachers knowledgeable? (method of teaching, student-teacher relationship, and teachers' organisation, preparation and feedback).

Question 3: What are your views on your learning environment?

Probe: How conducive is it to learning? (infrastructure, facilities, library, equipment).

Question 4: Does studying physiotherapy have any influence on your social life? How?

Probe: Does studying physiotherapy restrict you from, or expose you to social life? Do you have time for other things apart from academic activities? How is your relationship with lecturers and students? How often do you make new friends?

Question 5: Is there anything more you would like to share with regard to your learning environment?

Probes were used in each question to clarify participants' responses and elicit more complete responses to the question. The interview focus guide

was used to guide the moderator and maintain uniformity in the topic that was being explored; to obtain more information, further questions were asked and probed by the moderator. We acknowledge that some questions in the focus guide were directional, even though this appears to be a limitation in qualitative studies. Before commencement of this study, many of the students had complained informally about their learning environment to some lecturers. Moreover, a study from Nigeria had reported challenges faced by medical students in the learning process.^[13] Experience in our learning environment reveals that students tend to respond better to questions that are directional. In addition, in the Nigerian cultural context, asking a direct question will elicit comprehensive information rather than evasive responses.

The focus group discussion was guided by a facilitator (a postgraduate student from the Institute of Child Health, College of Medicine, University of Ibadan) who is knowledgeable and trained in focus group discussion. The participants were encouraged to talk freely and spontaneously. Three discussion sessions were held, the first between male students from both levels of study, the second between female students, and the third with males and females combined. This was done in order to encourage the students to provide fuller information, as we thought that gender could influence their responses – we considered that some intimate issues such as cases of sexual assault on both males and females would be better explored in separate groups. Each session lasted for about 60 minutes. The sessions were audio recorded, and an observer also took notes. The recorded information was transcribed verbatim, and content analysis of the transcripts was carried out by two individuals knowledgeable in qualitative analysis. They transcribed independently and later met to arrive at a consensus.^[9] The themes were taken from the DREEM questionnaire, while substantive statements relevant to the question and common descriptive subcategories were identified using the grounded theory approach.^[5,9,14] Even though some of the themes have been identified in the literature, we were of the opinion that they may not strictly apply to our cultural context, where elders dominate and whatever they do is supposed to be right, so we still needed to explore the perceptions of the students. However, we felt that we could be guided by established themes from previous studies^[1,2,7] Content thematic analysis was used to analyse the information that emerged.

Results and discussion

Five themes identified from the DREEM questionnaire were used in the analysis of the information obtained (Table 1). These are the context of students' perception of learning, the context of students' perception of teachers, the context of students' perception of their own academic skills, the context of students' perception of their learning environment, and the context of students' perception of their social life.

Students' perception of learning

Providing quality learning experiences is the goal and responsibility of all educational programmes, and assures student, faculty and programme success.^[15] The aim of this theme was to explore the University of Ibadan undergraduate physiotherapy clinical students' perception of learning. Three subcategories that emerged from this theme were teacher-centred teaching, optimal use of the lecture period by teachers, and provision of course objectives. We wanted to address students' views of the teaching activities, such as whether they received course objectives, whether they found that the teaching period was being put to good use, and whether

Table 1. Themes and description of the responses

Category	Theme	Description
1	Context of learning	Teacher-centred teaching, optimal use of the lecture period by teachers, provision of course objectives
2	Context of teachers	Knowledgeable teachers, provision of formative assessment, approachable lecturers, cordial teacher-student relationship
3	Context of students' perception of their academic skills	Understanding the subject, translation of theoretical knowledge to application
4	Context of atmosphere	Inadequate facilities (chairs, classrooms, library, books)
5	Context of social life	Religious activities, student-related social activities, social functions

learning was student focused and encouraged active learning, as opposed to a teacher-centered approach. The majority (9) of the participants reported that some lecturers did not utilise their lecture periods adequately. A participant stated: 'The teaching time isn't put to good use by some lecturers.' Another student said: 'We do not receive learning objectives for some of our courses, and some lecturers do not tell students they will not be around for classes and they keep us waiting, which I think is not helpful to the student.' Another said: 'Some of them are still using the old style of lecturing where they just dictate their old lecture notes without updating.' The learning problems experienced by these students could be explained in terms of the cultural perspective: 'Elders are always right: they have good reasons for whatever they do, they cannot be wrong and must not be challenged.' Teachers with this attitude do not see it as their responsibility to give learning objectives to students, nor do they feel they owe students an explanation for being absent or late for lectures. They are often not student-centred in their teaching, and students perceive their approach as being teacher-centred.

In order to enhance learning, students should perceive it as an activity that transcends ordinary teaching. It should be characterised by teachers inspiring, supporting, actively involving and communicating with their students.^[16] We propose that the provision of learning objectives to students at the beginning of a course helps them to take responsibility for their learning and provides opportunities for them to develop autonomy by self-directed learning.^[17] Lecturers in the Nigerian context may need to absorb new sets of values that would facilitate students' learning.

Students' perception of teachers

The theme was introduced with the purpose of exploring the students' perception of their teachers. The subcategories that emerged from this theme were the student-teacher relationship, feedback and formative assessment of students, and teachers' knowledge of taught courses. Teachers facilitate transmission of knowledge, and they constitute part of the learning environment. A knowledgeable, motivated, skilled and approachable teacher is likely to increase learners' motivation, which in turn leads to better engagement in learning and improved performance.^[18] Students' positive perception of their teachers has been recognised as an important characteristic of effective learning experiences in a previous study.^[19] The teacher or facilitator is one of the most powerful variables in the educational environment. His or her actions, attitudes (e.g. evidenced by tone of voice or comments made), enthusiasm, and interest in the subject will affect learners indirectly.^[20] A teacher should aim to provide an environment in which learners feel safe to experiment, voice their concerns, identify their lack of

knowledge, and stretch their limits.^[20] Physiotherapy educators should be responsible for teaching physiotherapy students how to provide healthcare safely, efficiently and effectively in potentially multicultural environments. Physical factors can make it difficult for learners and teachers to relax and pay attention. Ensuring adequate breaks and being mindful of the physical environment are part of the teacher's role.^[20] An environment conducive to learning may provide insights for teachers who wish to increase the effectiveness of their teaching and their students' learning. For example, it may be relatively easy to change how feedback is given to students, to make classroom sessions more interactive, or to 'check in' with the class more frequently. It has been suggested that teachers may not be aware of effective and/or innovative strategies used by their colleagues in the same institution. One simple approach to faculty development could be to provide a forum for faculty members to share their 'best practices' for teaching.^[19]

Teachers' knowledge

Half of the participants reported that the lecturers were knowledgeable generally, while others had varied perceptions of their teachers' knowledge. One participant said: 'I will say generally that they are knowledgeable, but I can classify our lecturers into two groups. One group is those ... who lecture for lecturing's sake, but the other group are those who lecture you for future purpose, they lecture you so that you can know, so that you can apply it in your practice, they lecture you like they know this thing.' Another participant said: '... based on the confidence with which lecturers answer questions in class, I feel that not all the lecturers are knowledgeable. Some lecturers prove to be more knowledgeable, based on the way they answer the questions and give us stuff.'

We believe that students can assess their teachers' knowledge of taught courses. They all have the course content and curriculum at the beginning of the session. They are being taught to take responsibility for their learning, and all of them can access information on the internet and from textbooks. The ability of lecturers to give in-depth but comprehensible explanations reassures students that their teachers have good knowledge of the courses that are being taught.

Feedback and formative assessment

Four of the participants reported that the teachers provided feedback, and 2 participants reported that impromptu tests are given for assessment of learning (formative assessment). A participant said: '... 60 - 70% of the lecturers give impromptu tests to assess our knowledge on what they taught us, and if they observe from our scores that we didn't get the questions right they will still want to revise with us.' Impromptu tests can be used

for formative assessment of students' learning, whereby the lecturers use test scores to identify areas that need to be made clearer to the students. Students' scores are not used in the summative assessment; instead, they provide feedback on areas that need more work.

Student-teacher relationship

An excellent learning environment should include student-teacher interaction, not just teachers imparting knowledge to students.^[18] Almost all (10) of the participants reported that most of their lecturers were approachable, and 5 reported that they had a cordial relationship with their teachers. One participant said: 'The relationship between the teachers and lecturers is cordial.' Another said: 'They can talk to you any time, even when you do not understand what they taught you in class, you can walk to their offices and they will re-explain to you without asking any question. Most of them are approachable.' Another said: 'The interaction between the lecturers and the students is just like between children and their parents.' Most of the participants compared their student-teacher relationships with those in other departments in the faculty. A participant said: '... relating to other departments, I think it's good. Most of the lecturers keep open doors; some will even give you their number, so you can give feedback. Some of them extend it to a personal level.' Most participants reported that some of their lecturers were friends with them on Facebook. In addition, a participant said: 'The relationship is so cordial, and it encourages a more conducive environment for learning. We do not have to become hypertensive because our lecturer just walked in!' The students take courses from various departments and faculties in the university in their preclinical levels of study (first to third years), and also share accommodation with students from other departments and faculties. These experiences enabled them to compare student-teacher relationships in the physiotherapy department with those in other departments.

The participants' responses highlight the vital importance of students' perception of their teachers. They reported that some of the lecturers appeared more knowledgeable than others in terms of how well they were able to explain the content of the courses. Few reported on the provision of feedback. Most of them stated that the teachers were approachable, and they all reported that teacher-student relationships were cordial. Most added that their teachers were friends with them on Facebook, possibly suggesting social interaction between the students and the teachers. According to Stronge *et al.*,^[21] social interactions between teachers and students encourage students to learn and achieve. Such interaction, and the provision of an environment in which students feel free to voice their concerns, identify their lack of knowledge and stretch their limits, will therefore facilitate learning.^[4] One study found that teachers do not only teach; they also perform many other non-teaching tasks and functions (e.g. administrator, counsellor and friend).^[22] It has been reported that a teacher who spends time interacting socially with students, works directly with them, and demonstrates a sense of fun and willingness to participate in a friendly and personal manner, is considered to be effective.^[18] Physiotherapy educators act as role models for students, and therefore need to have highly developed cultural awareness, cultural knowledge, cultural sensitivity and cultural competence.^[23] Remembering names and involving learners in setting ground rules are ways in which mutual trust can be built up. Feedback on performance, a vital part of teaching, should be done constructively and with respect for the learner; safety can be compromised through humiliation, harassment, and

threat of forced disclosure of personal details.^[20] Teachers should attempt to get a sense of what students know and can do, as well as their interests and passions, and what each student cares about and wants to do.^[24]

Students' perception of their academic skills

This context addressed students' views of their learning strategies, and problem-solving skills they have developed to prepare themselves for the physiotherapy profession. It has been suggested that there is an intimate relationship between students' perceptions of the quality of their courses in higher education and the approaches to studying that they adopt in those courses.^[25] Most of the participants read to gain more complete understanding rather than just to pass. One student said: 'Initially when I was in preclinical school, my idea ... was just to read and pass, but now I understand better that it is not all about reading and passing but it is about doing and knowing the basis of what you do, which I think is more important.' The students perceived that what they were being taught in the classroom could be applied in the care of their patients once they were in clinical practice. At the clinical level of their studies, it was apparent that they had achieved higher levels of cognition (application, analysis, synthesis and evaluation) in addition to lower levels of cognition (knowledge and comprehension). Students with a deep approach to learning have the intention of understanding, engaging with, operating within and valuing a question.^[26] They are interested in learning for its own sake, wanting to understand ideas for themselves and not because of the marks they will score. The majority of the respondents reported that learning is not all about reading and passing, but about the ability to apply the theory. Cognitive learning, a highly active process largely directed by the individual, involves perceiving the information, interpreting it on the basis of what is already known, and then re-organising the information into new insights or understanding.^[27] Cognitive learning theory includes several well-known perspectives, such as gestalt, information processing, cognitive development, situated cognition and social cognition theory.

Students' perception of their learning atmosphere

Student perceptions of a good learning atmosphere encourage deep approaches to studying and influence learning outcomes both directly (perceptions of outcomes) and indirectly (perceptions of approaches to outcomes).^[28] This theme addressed our students' perception of their learning environment (how relaxed the atmosphere is during lectures, whether infrastructure is adequate, whether there are opportunities to use and develop interpersonal skills, availability of recommended books in the library). The question asked was 'What are your views about your learning environment?' The majority (10) of the participants reported that it presented many challenges, especially with regard to infrastructure. Participants commonly reported that the chairs in the lecture room were uncomfortable and of poor quality, and there were too few chairs. A participant said: 'The chairs are bad and it is very difficult sitting on this chair for 2 - 4 hours.' Another said: 'We do not have good chairs for learning, we have so many bad chairs and we are just managing and patching.' Another added: 'The chairs are not enough, two lectures cannot be held simultaneously, for example the 400 and 500 level students cannot hold classes simultaneously.' Apart from the inadequate chairs, a participant also said: 'The classrooms are so clumsy, there are not enough spaces for lectures, some of the time we use rooms meant for practical classes for lectures.'

In addition to complaints about the chairs and the classrooms, the majority (75%) of the participants reported that the department did not have a functioning library to promote additional reading. A typical response was: 'There are no facilities for further reading like a library.' Elaborating, one participant said: 'We do not have physiotherapy books, even in the medical library in the college, so there is nothing to fall back on after getting stuff in class.' A participant also emphasised the scarcity of physiotherapy textbooks in the bookshop: 'I went around the college bookshop and the only books I could see were more of medical books, dental books and nursing books, you can count the number of physiotherapy books. I was very annoyed.'

The learning environment is not limited to student-teacher interaction, teaching and learning activities, but also includes good physical structures and facilities.^[29] These include good (and sufficient) chairs, sufficient classrooms suitable for their purpose, a well-equipped library and access to relevant books, all of which are important for optimal learning outcome.

Students' social life

We asked the question 'Does physiotherapy restrict or expose you to social life?' This question could be regarded as a leading one; however, in our context students respond better when they are directed. The intention was to capture information on how the course has impacted on participants' social life. While one respondent felt that 'Social life depends on the individual', most (8) of the participants reported that their social lives involved school-related social activities (quiz competitions, sports, students' carnivals), and attending fellowship (i.e. religious activities), and social functions such as weddings and birthday parties. One participant said: 'Social life for me is school.' Almost all the participants ($n=11$) reported that their physiotherapy studies did not hinder their participation in social activities, one stating: 'Physiotherapy does not restrict my social life, you just need to plan your time well.' Another went into more detail: 'Physiotherapy permits us to socialise like during the hall week, physiotherapy allows us to go out for dinners.' A very enthusiastic participant said: 'One thing physiotherapy is known for is social gathering, we do it to the peak. I give it to them thumbs up!'

A social learning environment equips students with the tools necessary to collaborate with teachers and peers and participate in activities both inside the classroom and beyond the walls of the school. A safe social networking/learning environment can extend the relationship between students to allow continued dialogue and collaboration after school hours.^[30] Most of the participants concluded that their social life was good, and that physiotherapy did not restrict their social life.

Conclusion

This qualitative study, which appears to be the first on physiotherapy students' perception of their learning environment in Nigeria, indicated that most students perceived their learning environment as good, especially with regard to student-teacher relationships, although fewer described their teachers as knowledgeable and as providing formative assessment. Most also felt that their social lives were not restricted by studying physiotherapy. However, students perceived their learning environment to be inadequate in terms of facilities such as the library, chairs and classrooms. They also reported that some teachers did not make good use of lecture periods.

The findings highlight some of the strengths and weaknesses of the learning environment at the College of Medicine, University of Ibadan, as

perceived by physiotherapy students. The strengths could be enhanced and the weaknesses addressed in order to improve the situation. The results of the study cannot be generalised to all physiotherapy institutions in Nigeria, as we focused on one institution (the University of Ibadan), but further studies could be carried out elsewhere. Furthermore, our students' perception of their learning environment could be evaluated on an ongoing basis, as part of quality assurance. Finally, the findings may provide insights for teachers who wish to enhance the effectiveness of their teaching and their students' learning. We recommend that workshops on biomedical education be organised. In particular, these workshops should address cultural issues that impact negatively on students' learning.

References

1. Arzuman H, Yusoff MSB, Chit SP. Big Sib students' perceptions of the educational environment at the School of Medical Sciences, Universiti Sains Malaysia, using Dundee Ready Educational Environment Measure (DREEM) inventory. *Malays J Med Sci* 2010;17(3):40-47.
2. Prayoonwong T, Nimnuan C. Dental students' perceptions of learning environment. *South-East Asian Journal of Medical Education* 2010;49(1):49-54.
3. Roff S. The Dundee Ready Educational Measurement (DREEM) – a generic instrument for measuring students' perceptions of undergraduate health professions curricula. *Med Teach* 2005;27(4):322-325. [<http://dx.doi.org/10.1080/01421590500151054>]
4. Hutchinson L. ABC of learning and teaching: educational environment. *BMJ* 2003;326(7393):810-812. [<http://dx.doi.org/10.1136/bmj.326.7393.810>]
5. Pimparyon P, Roff S, McAleer S, Poonchai, B, Pempa S. Educational environment, student approaches to learning and academic achievement in a Thai nursing school. *Med Teach* 2000;22(4):359-364.
6. Said NM, Rogayah J, Hafizah A. A study of learning environments in the Kulliyah (Faculty) of Nursing, International Islamic University, Malaysia. *Malays J Med Sci* 2009;16(4):15-24.
7. Brown T, Williams B, Lynch M. The Australian DREEM: Evaluating student perceptions of academic learning environments within eight health science courses. *International Journal of Medical Education* 2011;2(2):94-101. [<http://dx.doi.org/10.5116/ijme.4e66.1b37>]
8. Clouder L, Toms J. Impact of oral assessment on physiotherapy students' learning in practice. *Physiother Theory Pract* 2008;24(1):29-42 [<http://dx.doi.org/10.1080/09593980701378157>]
9. Borglin G, Fagerström C. Nursing students' understanding of critical thinking and appraisal and academic writing: A descriptive, qualitative study. *Nurse Educ Pract* 2012;12(6):356-360. [<http://dx.doi.org/10.1016/j.nepr.2012.04.009>]
10. de Oliveira Filho GR, Viera JE, Schonhorst L. Psychometric properties of the Dundee Ready Educational Environment Measure (DREEM) applied to medical residents. *Med Teach* 2005;27(4):343-347. [<http://dx.doi.org/10.1080/01421590500046387>]
11. Mayya S, Roff S. Students' perceptions of educational environment: A comparison of academic achievers and under-achievers at Kasturba Medical College, India. *Educ Health* 2004;17(3):280-291. [<http://dx.doi.org/10.1080/13576280400002445>]
12. Roff S, McAleer S, Harden RM, et al. Development and validation of the Dundee Ready Education Environment Measure (DREEM). *Med Teach* 1997;19(4):295-299. [<http://dx.doi.org/10.3109/01421599709034208>]
13. Anyaehie USB, Nwobodo E, Oze G, et al. Medical students' evaluation of physiology learning environments in two Nigerian medical schools. *Adv Physiol Educ* 2011;35(2):146-148. [<http://dx.doi.org/10.1152/advan.00106.2010>]
14. Maeno T, Takayashiki A, Anne T, Tohno E, Maeno T, Hara A. Japanese students' perception of their learning from an inter professional education program: A qualitative study. *Int J Med Educ* 2013;4(1):9-17. [<http://dx.doi.org/10.5116/ijme.50e5.e19a>]
15. Somenarain L, Akkaraju S, Gharbaran R. Student perceptions and learning outcomes in asynchronous and synchronous online learning environments in a biology course. *J Online Learn Teach* 2010;6(2):353-356.
16. Kernan WN, Hershman W, Alper EJ, et al. Disagreement between students and preceptors regarding the value of teaching behaviors for ambulatory care settings. *Teach Learn Med* 2008;20(2):143-150. [<http://dx.doi.org/10.1080/10401330801991667>]
17. Gummeson C, Nordmark E. Self-reflections in an online course – reflecting learning strategies? *Adv Physiother* 2012;14(2):87-93. [<http://dx.doi.org/10.3109/14038196.2012.671848>]
18. Rubio MC. Effective teachers – professional and personal skills. *ENSAYOS. Revista de la Facultad de Educación de Albacete* 2009;24(1):35-46.
19. Victoroff KZ, Hogan S. Students' perceptions of effective learning experiences in dental school: A qualitative study using a critical incident technique. *J Dent Educ* 2006;70(2):124-132.
20. Hutchinson L. ABC of learning and teaching: Educational environment. In: Cantillon P, Hutchinson L, Wood D, eds. *BMJ ABC of Learning and Teaching in Medicine*. London: BMJ Publishing Group, 2003.
21. Stronge JH, Tucker PD, Hindman JL. *Handbook for Qualities of Effective Teachers*. Alexandria, VA: Association for Supervision and Curriculum Development, 2004.
22. Ngho MS, Wong I, Wong A. A qualitative study of perceptions of student teachers towards teaching 2012. <http://www.conference.niesg/paperycover/as00616.pdf> (accessed 5 October 2012).
23. Bialocerkowski A, Wells C, Grimmer-Somers K. Teaching physiotherapy skills in culturally-diverse classes. *BMC Med Educ* 2011;11(1):34. [<http://dx.doi.org/10.1186/1472-6920-11-34>]
24. Bransford JD, Brown AL, Cocking RR. *How People Learn: Brain, Mind, Experience, and School*. Expanded edition. Washington, DC: National Academy Press, 2000.
25. Richardson JTE. Students' perceptions of academic quality and approaches to studying in distance education. *Br Educ Res J* 2005;31(1):7-27. [<http://dx.doi.org/10.1080/0141192052000310001>]
26. McKimm J. *Learning theories*. 2002. <http://www.faculty.londondeanery.ac.uk/e-learning/setting-learning-objectives/Toolbox%20-%20%20Learning%20theories.pdf> (accessed 23 February 2012).
27. Hammond L, Austin K, Suzanne O, Rosso J. *How people learn: Introduction to learning theories*. 2001. www.stanford.edu/class/ed269/hplintrochapter.pdf (accessed 23 February 2012).
28. Lizzio A, Wilson K, Simons R. University students' perceptions of the learning environment and academic outcomes: Implications for theory and practice. *Studies in Higher Education* 2002;27(1):27-52. [<http://dx.doi.org/10.1080/03075070120099359>]
29. Demiroren M, Palaoglu O, Kemahli S, Ozyurda F, Ayhan IH. Perceptions of students in different phases of medical education of educational environment: Ankara University Faculty of Medicine. *Med Educ Online* 2008;13(1):8. [<http://dx.doi.org/10.3885/meo.2008.Res00267>]
30. Braungart M, Braungart R. Applying learning theories to healthcare practice. 2007. <http://www.jblearning.com/samples/0763751375/chapter2.pdf> (accessed 23 February 2012).