

Learning Approaches and Lecture Attendance of Medical Students

Madeleine Bates, Harriet Dismore, Sally Curtis
University of Southampton

Corresponding author:

Sally Curtis

Faculty of Medicine

University of Southampton

Southampton

SO17 1BJ

Tel: 023 8059 5609

Fax: 023 8059 4262

email: s.a.curtis@southampton.ac.uk

ABSTRACT

There are arguably many factors that affect the way a student learns. A recent report by the Higher Education Policy Institute (HEPI) and the Higher Education Academy (HEA) on student academic experience in the UK states that class size is an important factor in the quality of the student experience and that smaller class sizes are of greater educational benefit than lectures. This paper assesses research related to lectures, lecture attendance of medical students and their learning approaches in higher education outside the clinical setting. A questionnaire and focus groups were employed to gather quantitative and qualitative data. The results show that students value lectures in the curriculum alongside other teaching and learning methods.

[Keywords : learning, higher education, lecture, attendance](#)

INTRODUCTION

[In the context of a globally-competitive higher education \(Robertson 2010\) there has been an increased emphasis on the learning and experiences of students at universities in the UK. For example, Woodall and colleagues \(2014\) reported that students in the UK are increasingly demonstrating customer-like behaviour and demanding more 'value' from institutions. One aspect of the student experience under investigation is **lecture attendance**.](#)

Lectures are still the most common form of teaching in higher education (McGarr 2009).

With large classes the teacher is able to deliver content to everyone simultaneously. Indeed lectures are cost-effective and involve less preparation in relation to other modes of teaching (McGarr 2009; ~~and~~ Jones 2007). However, the literature is heavily weighted towards the disadvantages of lectures, which are reported to lack engagement, during which students may become easily distracted (Bligh 2000; Jones 2007; McGarr 2009). Bligh (2000) found lectures worked best for teaching facts, not problem solving. He argues students accept conclusions the teacher has given to them without encouraging critical analysis. It has been stated that students must learn to think, and lecturers should use more 'active' teaching to encourage this (Bligh 2000; Jones 2007).

Lecture attendance has been studied globally, with most of the literature comparing attendance to performance. Researchers [tend to](#) agree there is a relationship, but the strength and influence of confounding variables is debatable (Stance, 2006; Massingham ~~et al.~~ [and Harrington](#) 2006). The overriding opinion is that attendance slightly increases assessment performance (Walbeek, 2004). Studies have examined why students choose to attend lectures. Dolnicar (2004) found the most common reasons for attending were to find out what material was relevant and to ensure nothing important was missed. Reasons for non-attendance are frequently related to lack of motivation and one study reported 60% of reasons involved poor motivation (Massingham ~~et al.~~ [and Harrington](#) 2006; Moore et al. 2008).

A common theme discussed in the literature was the teacher's influence. Gupta ~~et al~~ and Saks (2013) found the most common reasons for non-attendance were lecturer-related, with 87% saying the delivery was important or very important. Another reason mentioned was learning. Both Billings-Gagliardi ~~et al~~ and Mazor (2007) and Mattick et al (2007) found some medical students felt lectures did not match their learning style.

In 1960, Rita Dunn created the phrase 'learning-style', defining it as the way to learn material that is unique to the individual (Gurpinar et al. 2011). Since then numerous surveys have been compiled to assess the way individuals learn (Coffield et al. 2004). Although it is claimed the understanding of learning styles has multiple benefits, many authors highlight flaws in the concept and in some of the surveys themselves (Coffield et al. 2004; Romanelli et al. 2009; Cassidy, 2004).

One advantage is if teachers know how their students learn, pedagogy can be tailored to best suit their needs (Coffield et al. 2004; Cassidy, 2004; Pashler et al. 2008). Teaching that matches a learner's preferences is termed the 'meshing hypothesis' (Pashler et al. 2008 108). Yet this may also risk 'pigeonholing', inadvertently limiting the potential number of ways to learn. Interestingly, Romanelli et al (2009) proposed that a learning/teaching style mismatch may be beneficial by challenging students to adapt and experience different ways to learn.

However, researchers are undecided as to whether a learning style is a 'state' or 'trait'; if it is a fixed attribute or changes according to the educational situation. Cassidy (2004) proposes that a person's learning style does have structure, but can be altered by situations and experiences. Arguably the biggest weakness in the hypothesis is the lack of evidence and the unknown implications within education. Indeed most studies on the topic only have a small number of participants (Pashler et al. 2008). Although this does not necessarily mean learning styles do not exist, there are few robust studies supporting the concept and the surveys (Coffield et al. 2004; Pashler et al. 2008; Rohrer et al. 2012).

Another way learning and teaching is described is as 'active' and 'passive'. Passive learners memorise material and prefer lectures. Active learning involves the student using reflective thinking and it is considered the better way to learn (Michel et al. 2009; Wingfield and Black, 2005). However, Michel et al and colleagues (2009) explain that comparing the two is difficult to quantify, with research focusing on student satisfaction, not performance. When they attempted to compare the two, they found active learning is not superior. Other studies also came to the same conclusion (Haidet et al. 2004; Wingfield and Black, 2005). One cross-sectional study found participants rated active learning sessions as having less educational value (Haidet et al. 2004).

Marton and Säljö (1976) introduced the concepts of surface and deep levels of processing (Marton et al. 1976). This was later renamed 'learning approaches' (Webb, 1997). Deep learning involves understanding and analysing ideas, whereas surface involves memorising and rote learning (Beattie et al. 1997). Strategic/achieving learning was added later by different academics; an approach driven by organisation and the desire for high grades (Mattick et al. 2004). Shukr et al (2013) conclude a single method of teaching would only serve 60% of the cohort, so variety should be used.

Research has shown that personal responsibility and interests often motivate medical students, such as the aspiration to be a competent doctor and to learn more about the vocation (Mattick et al. 2004). Socially, students often aim to impress their peers and teachers. Students can enjoy demonstrating knowledge and wish to avoid belittlement by their instructors (Deketekaere et al. 2006)

The literature discusses the implications of certain teaching on medical students' learning. Although lectures are a significant proportion of some medical schools' teaching, some studies believe this is not the best way for active learners to learn (Lujan et al. 2006). Shukr et al (2013) conclude a single method of teaching would only serve 60% of the cohort, so variety should be used. Gurpinar et al (2011) examined whether medical students' learning change, but found 51% are stable over the first 2 years of the course. However, the authors acknowledge learning could have changed further on in their training.

Lecture attendance can be low in groups such as medical students. Studies have found

some feel lectures do not 'suit' their preferred way of learning (Billings-Gagliardi [et al. and Mazor](#) 2007; Mattick et al. 2007). Although there is separate literature on medical students' learning and attendance, there have been no studies that explore both, and if they relate to students' attitudes and preferences for teaching sessions. Research in these areas could provide medical schools with information about how their students learn and want to be taught, contributing to the field of medical education and inform educational policy.

Methods

A questionnaire was distributed to year 1 and 2 undergraduate medical students in one university. The questionnaire contained questions taken from the Grasha-Riechmann Student Learning-Style Survey (Reichmann 1974) that related to learning approaches. Questions about teaching session attendance and preference were also included. A 5-point Likert scale (strongly agree, agree, neither agree or disagree, disagree, strongly disagree) was used to rate student responses to the questions, for example '*Most of what I know I learned on my own*'. This paper presents selected questions from the questionnaire. Students were also able to write free text comments.

A paper copy of the questionnaire was distributed at the end of four lectures – two for year 1 and two for year 2. In order to capture non-attenders, an email was sent to everyone in both years which contained a link to an online version of the questionnaire. Students were asked to confirm on the email that they had not completed a paper copy at a lecture. A follow-up email was sent two weeks after the first was sent out. Students were given the opportunity to volunteer to participate in a focus group after completing the questionnaire. Responses from the questionnaires were used to inform the focus group discussion topics.

Focus groups were audio-recorded and each group lasted approximately one hour. [In addition to obtaining ethical approval from the University Ethics Committee and assuring all participants that their information would remain anonymous to protect their identity.](#)

Formatted: Tab stops: Not at 15.75 cm

[they were provided with an information sheet and asked to provide their consent. This confirmed their understanding of the process and their right to withdraw at any time without needing to justify their decision.](#) Focus group recordings were transcribed and analysed using thematic analysis. The transcripts were analysed line-by-line and statements were labelled with codes. These codes were reviewed and grouped together to form themes and sub-themes. The themes were reviewed and the transcripts re-read to find any new segments that needed to be coded.

Results

In total, 260 questionnaires were collected (154 females, 106 males), including 135 questionnaires from year one and 125 from year two. Years one and two have a combined total of 402 students.

In addition to the questionnaire, two focus groups were held with 5 students from year one (3 females, 2 males) and 8 from year two (5 females, 3 males) attending.

Table 1

* On the questionnaire students were instructed that the term 'class' or 'classroom' should be read as 'lecture' or 'lecture theatre'

The study produced a questionnaire response rate of 64.7% [and of those](#) only 10 low attending students completed the survey. Some of the 10 low attending students left descriptions in the comment box about how they prefer to learn and their opinions on lectures, but none were interested in participating in a focus group. The 2 focus groups contained students who attend at least half of all teaching sessions.

Figure 1

The majority of students from all the attendance categories either agreed or strongly agreed that lectures were worthwhile (Figure 1). The reasons for this were described in the focus groups primarily in terms of lectures as a way to obtain a broad understanding of the topic. As one student explained, lectures were a way of introducing new words and ideas to students:

It's the first time you're exposed to that information, it's easy not to get it. But what it does to is expose you to the language. You're hearing all these words crop up. For me lectures are a way of making things a bit familiar for the first time.

Other comments were similar to this, presenting lectures as helpful for, 'getting the big picture, getting the general understanding' and that a lecture, 'starts the foundation of understanding'.

The practical benefits of lectures were also acknowledged, as was variation in lecture delivery depending on the lecturer:

I think it's the only practical way of teaching a large group of people something for someone who doesn't have much time but has a wealth of knowledge. Obviously it varies in style and there are some lecturers who are much better at it than others.

However there was also acknowledged a difference in the number of lectures in year 1 compared to year 2, which for one student was perceived to be at odds with the university lifestyle:

First year is really heavy on lectures. They have so many lectures, I mean when it's your first year of university, it makes it difficult to get involved with uni. Yeah, we're here to be doctors... But you're here for a uni experience as well.

For another student there was no option but to find them worthwhile as they did not feel they had a choice: 'I'm happy because I have no choice but to be happy with it'.

Figure 2

Figure 2 shows that for all attendance groups the majority of students showed disagreement or a neutral response to the statement that lecture (classroom) activities are generally boring. However, explanations for finding lectures boring focused mainly on the length of time students spent in lectures. For example, as one student commented:

It's so soul-destroying going into a lecture theatre and sitting there for 4 hours and then coming out and it's a different time of day...

As other students alluded to, concentration could not always be maintained for the periods of time that lectures were scheduled. As one student put it, 'I'm there but I'm not mentally there'. Furthermore, 'guest' lecturers unaware that students would be attending numerous lectures in a row could exacerbate this.

Like back-to-back lectures. I'm 'off' by the second or third lecture. These lecturers who come for their one lecture a year, they don't know the system.

A number of responses suggested that experiencing a mixture of lectures and other teaching sessions was welcomed. Some directly compared the boredom of lectures with tutorials:

...in a lecture it's really easy to doze off for a large proportion of the time. Whereas in a tutorial you're more likely to be picked on, or asked a question at any point so you're more likely to pay attention and take more in.

Even moving between different physical spaces appeared to help maintain student concentration and motivation. For example, as one student put it:

Sometimes just a case of a change in environment where, cos if you're in LT1 or 2 (sic) all day, then they all blur into one. And I think things like that, in the same way that anatomy breaks things up, it's just a different environment, and that, to me, is partly why I like it a bit more.

Figure 3

The students with the lowest attendance showed the strongest agreement with the statement that most of what they know they learned on their own (Figure 3). The focus group data highlighted many ways that students learned on their own. In keeping with earlier comments, it was recognised by one student that the lecture introduces concepts, which then have to be researched independently:

Every single lecture there's lots of things I don't understand, but that's because I'm seeing it for the first time, and I think every time I go home and look it up, I think 'oh, that's the answer to my question'. I think it's a waste of time asking a question that I could just look up in a book anyway.

Alternative ways of learning included finding different ways to keep their notes:

Yeah flashcards. If the lecture says 'the enzyme X does, catalyses this reaction' then I write on one side 'what catalyses this reaction?' or 'what does enzyme X do?' ...It forces you to think about things. I find if I write up my notes I can read it and think 'I

know that' but actually, whether or not it's actually processed, that's what makes me think about it, when I write little questions and the answer on the other side...

Others used technology and YouTube was mentioned frequently as a source of useful information.

YouTube is very good for things like that. If I don't understand something, almost before I look it up in a textbook I look it up on YouTube.

One student considered the process of learning a personal one and that the methods of learning need to be adapted according to the learners' needs:

I think you adapt to what you're given. If you're not great at learning from lectures, if you're of the same mind-set as us you'll go to the lecture and adapt it to your style. So you'll go home, make the flashcards, write the mind maps, write it up on the board, you change it for you.

Other students adapted the methods of learning to suit their mental condition. For example, this student, in common with a number of others, used YouTube when they did not feel energetic enough to do other things.

I used YouTube before my exams, especially after I gone over my lecture slides once and drawn out mind maps, if I couldn't face doing any more work I'd just sit through some videos. I found that quite a good way of consolidating it.

Indeed the process of consolidating learning was referred to a number of times. Less frequently mentioned was the need to learn with other students. One such mention was in addition to using technology as well:

For me it's the discussing it, and talking about it I learn from. I learn from talking about it, talking it through and then, but I do love watching YouTube videos with people drawing things out.

For some students, learning was a journey of discovery and learning approaches could change depending on the task:

I feel I'm finding my best ways. I have weeks where I feel it's easiest to just copy it out, others where I think it's really good to do it on a whiteboard. Other times I feel it will help watching YouTube videos or an anatomy App that helps. I'm still finding my best way, in some ways. But I also vary.

An additional comment suggested that some students would rather learn independently than attend lectures at all:

Some people just genuinely don't like lectures. They still get really good in the exams, because their method of learning is to sit with the book and go through it.

Indeed, this was a view expressed by another student who stated that:

At long as you understand the general concepts, you've gone to all the lectures, you're keeping up. That's how I'd rather spend my time at uni, because I do a lot of other stuff.

Figure 4

Figure 4 shows that more students from the lower attendance category felt an obligation to attend lectures. Perhaps unsurprisingly, the main reason for attending lectures was that important information would be presented for exams or assignments:

But I'm scared that if I miss a lecture I might miss something important. I'm a bit geeky.

There was also a suggestion that there is a 'type' of student who is more selective about whether they attend lectures. This student appeared to have tried this approach to learning in the past:

I'm not the type to look at the beginning of the day and think 'should I go in?' The only time I've done it I missed one of the most important lectures, so I'm not doing it again!

Another reason for attending lectures was the financial investment of university education. Although not all students mentioned this, benefitting from what had been paid for was important to some:

Obviously if I was ill I wouldn't, and sometimes I've thought 'I really didn't need to come to this, cos it was really pointless', but I make myself go as I'm paying for it.

An important factor for a few students was the lecture slides made available prior to the lecture. There was a sense that staff and students could use this to determine attendance rates. This student explains that some students would attend lectures depending on how much information was presented on the slides:

But sometimes you look at lecture slides online – I mean I go anyway – but I can see why people wouldn't, cos you see why people feel like they have to. You look at lectures slides online, it's like 2, 3 words in a heading – that's it. There's no other extra info, so you have to go to the lecture.

For other students there was a personal feeling that they should attend lectures, whether it was out of guilt ('*I feel really guilty if I don't go.*') or more a matter of student identity. For example, as one student described, '*It just feels like something a uni student does. You go to lectures*'

Figure 5

It can be seen in Figure 5 that all attendance groups agreed that everyone has a responsibility to get as much out of the course as possible. This was reflected in the comments made about responsibility during the focus groups, which were generally in favour of students accepting their own. With regards lecture attendance, the following conversation demonstrates the need for some students to be in control:

R: Do you think lectures should be compulsory?

1: I think it defeats the object of being in control of your own learning.

Other students had quite strong views about their own responsibility, with one explaining that it was out of a duty and pointed out that it is they who pay for the course:

You go to it out of a sense of duty. Because you think it might help in some way or it might crop up in the exam. And if I don't go it's more fault. I'm taking responsibility for my own learning. I paid for this!

However, it was more likely for year 2 students to point out how responsibility for learning changes as the student progresses through the course.

There's a point in first year where you have to accept that it's self-directed. You can get really annoyed at the medical school for not giving you enough direction, but when it comes down to it, you are going to leave it til a few weeks before, and you are going to sort it out yourself. But it's down to you.

Another reason for taking responsibility for learning was that it signalled a professional attitude. This explanation is presented in the following two quotes, both concerning attendance at lectures. As these illustrate, the job of a doctor will be to work at unsociable hours and therefore getting into a routine of attending classes was perceived by some to be good preparation for this:

It's a bad attitude: not turning up. As doctors, we'll be expected to turn up to things whether we like it or not.

We may as well actually get into the routine of bothering to get up in the mornings. I had a tutor for my pathology who said 'I've had to get up a 7am every day for the past week, that's unreasonable'. That's a 4th year student! It's a bad attitude. It's not professional. You're going into a career that's particularly important that you turn up and do weird hours. You may as well get into the routine of going to things you don't want to go to.

There was also an acknowledgement that despite the efforts of institutions and staff to provide the necessary resources for learning, some students may always find a reason to raise issues.

You give them [students] a lot of resources and they're like 'oh there's too much to do', but when you don't them a lot of resources they're like 'oh my god it's all self-directed learning... You can never please students.

In keeping with earlier quotes, there was also mention of responsibility to learn as part of the adult learner identity. As one student stated this was about choice and accepting that this choice of taking responsibility was also for the individual to make: 'You're meant to be adult learner. You're meant to choose what you want to do'.

DISCUSSION

The recent HEPI HEA report stated students perceive less educational benefit of lectures compared to smaller class sizes. However, the majority of students in this study found lectures to be worthwhile with the highest attendees valuing them the most.

Students were encouraged to discuss their opinions on the purpose of lectures. Many students mentioned how lectures are useful for gaining a broad understanding of a topic. Lectures provided a foundation, and finer details would be learnt away from the lecture theatre using a variety of methods. This has been seen in previous studies. [For example,](#) Hubbard (2007) found that 73% of engineering students attend lectures to gain a general idea on the subject. Dolnicar (2004) also investigated reasons for attending. The most common ~~included was~~ to find out ~~what relevant~~ material ~~was relevant~~, with 45% of students agreeing they attend to learn essential material.

The students' fear of missing 'important' information in a lecture has been noted in other papers; Dolnicar (2004) found that 72% of students attend to avoid missing content, and Billings-Gagliardi ~~et al~~ [and Mazor](#) (2007) discovered this reason amongst high-attending students. Students in our study believed that the availability of lecture notes affected

attendance. Mattick et al. (2007) investigated lecture non-attendance and did not note this. However, the 2014 report from the HEPI and HEA concluded that online lecture notes did in fact decrease attendance (Soilemetzidis et al. 2014).

Many of the students in this study discussed difficulty maintaining their concentration, either throughout one lecture or when there are many lectures back-to-back. It has previously been claimed that a student's attention declines over time (Aaron [et al. and Skakun](#) 1999; Coffield et al. 2004), and that this occurs after the first 10 minutes (McGarr, 2009). However, Wilson et al (2007) found there is little scientific evidence to support this claim.

Although it may seem counterproductive to attend a lecture without paying full attention, participants provided explanations for their high attendance. Some discussed feelings of 'guilt' if they missed teaching, and others mentioned the financial aspect. These reasons have not been reported in the literature.

We established aspects of lectures that can be pivotal to whether students find them useful. The most significant was regarding the lecturer, which included their method of delivery. Some students discussed certain lecturers whose teaching style they particularly appreciated. Previous studies have found that students believe the lecturer is important for the success of a lecture (Billings-Gagliardi [et al. and Mazor](#) 2007; Mattick et al. 2007; Gupta [et al. and Saks](#) 2013).

Although the students in the focus groups had high attendance, they generally believed that not all students benefit from attending lectures. Both Billings-Gagliardi [et al. and Mazor](#) (2007) and Mattick et al (2007) have previously found that some medical students feel lectures do not match their preferred way of learning, although the way students did prefer to learn was unclear.

Aside from lectures, we found how students like to learn away from the lecture theatre. A main finding was that most of the volunteers used online resources to support their learning. However, they would also use visual aids such as mind-maps, or audio recordings. Lujan [et al](#) and Dicarolo (2006) found that only 36.1% of first year students favour one style of information presentation. Similarly to this students in our study would not always use the same learning method, attributing a change in approach to the way they are feeling, or the educational situation. Although there has been plenty of previous research on the use of specific e-Learning packages (Khogali et al. 2011), there is little literature on medical students' learning through external online resources such as YouTube. Despite their learning approaches the majority students from all attendance groups agreed they had a responsibility to get as much out of the course as possible.

This study obtained a high response rate and employed mixed methods. However, a limitation of this research is the small number of low attending students who participated. As a consequence we are still unsure about how low attending students prefer to learn. Future research could try to capture the thoughts and views of these low attending students

The 2014 HEPI-HEA report concluded that students believed the benefits of teaching sessions decline with increasing class size (Soilemetzidis [et al.](#), 2014). In slight contradiction to this, most of our students value lectures in the curriculum. This paper also demonstrates that alongside lectures students employ other learning strategies such as lecture notes, mind-maps, audio recordings and online resources.

REFERENCES

Aaron, S. and Skakun, E. 1999. Correlation of Students' Characteristics with Their Learning Styles as They Begin Medical School. *Academic Medicine* 74(3): 260-262.

Formatted: Font: Italic

Beattie, V., Collins, B. and McInnes, B. (1997). Deep and Surface Learning: A Simple or Simplistic Dichotomy? *Journal of Agricultural Economics and Development* 6(1): 1-12.

Formatted: English (U.K.)

Formatted: Font: Italic

Billings-Gagliardi, S. and Mazor, K. 2007. Student Decisions about Lecture Attendance: Do Electronic Course Materials Matter? *Academic Medicine* 82(10): S73-S76.

Formatted: Font: Italic

Formatted: Font: Italic

Bligh, D. 2000. *What's the Use of Lectures?* San Francisco: Jossey-Bass Publishers.

Formatted: Font: (Default) Arial, 11 pt, Complex Script Font: Arial, 11 pt

Cassidy, S. 2004. Learning Styles: An Overview of Theories, Models, and Measures. *Journal of Educational Psychology* 24(4): 419-444.

Formatted: Font: (Default) Arial, 11 pt, Complex Script Font: Arial, 11 pt

Formatted: Normal (Web)

Coffield, F., Moseley, D., Hall, E. and Ecclestone, K. et al. 2004. *Should We Be Using Learning Styles? What Research Has To Say On The Practice.* Learning & Skills Research Centre. Report number:1,

Formatted: Font: (Default) Arial, 11 pt, Not Italic, Complex Script Font: Arial, 11 pt

Formatted: Font: Not Italic

Formatted: Font: (Default) Arial, 11 pt, Complex Script Font: Arial, 11 pt

Formatted: Font: (Asian) Arial Unicode MS

Deketelaere, A., Kelchtermans, G., Struyf, E. and De Leyn, P. 2006. *Disentangling clinical learning experiences: An exploratory study on the dynamic tensions in internship. Medical Education, 40(9), 908-915.*

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Normal, Indent: Before: -0.02 cm, Don't adjust right indent when grid is defined, No widow/orphan control, Don't adjust space between Latin and Asian text, Don't adjust space between Asian text and numbers

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Dolnicar, S. 2004. Conference Proceedings of the Australian and New Zealand Marketing Academy. *What Makes Students Attend Lectures? The Shift Towards Pragmatism in Undergraduate Lecture Attendance.* Wellington, New Zealand, ANZMAC 2004.

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Gupta, A. and Saks, N. 2013. Exploring Medical Student Decisions Regarding Attending Live Lectures and Using Recorded Lectures. *Medical Teacher* 35(9): 767-771.

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Gurpinar, E., Alimoglu, M., Mamakli, S. and Aktekin, M. 2011. Learning Styles of Medical Students Change in Relation to Time. *Advances in Physiology Education* 35(3): 307-311.

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Haidet, P., Richards, B., Morgan, R.O., Wristers, K. and Moran, B.J. 2004. *A controlled trial*

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

of active versus passive learning strategies in a large group setting. *Advances in Health Sciences Education*, 9 (1): 15-27

Hubbard, R. 2007. What use are lectures now that everything can be found online? *MSOR Connections* 7(1), 23-25.

Jones, S. 2007 Reflections on the Lecture: *Outmoded Medium or Instrument of Inspiration?* *Journal of Further and Higher Education*; 31(4): 397-406.

Khogali, S., Davies, D., -Donnan, P., Gray, A., Harden, R., Mcdonald, J., Pippard, M., Pringle, S. and, Yu, N. 2011. Integration of e-learning resources into a medical school curriculum. *Medical Teacher*, 33(4), 311-318.

Lujan, H. and, DiCarlo, S. 2006. First-Year Medical Students Prefer Multiple Learning Styles. *Advances in Physiology Education* 30(1): 13-16.

Marton, F. and, Säljö, R. 1976. On Qualitative Differences in Learning: I - Outcome and Process. *British Journal of Educational Psychology* 46(1): 4-11.

Massingham, P. and, Herrington, T. 2006. Does Attendance Matter? An Examination of Student Attitudes, Participation, Performance and Attendance. *Journal of University Teaching and Learning Practice* 3(2): 83-103.

Mattick, K., Dennis, L. and, Bligh, J. 2004. Approaches to Learning and Studying in Medical Students: Validation of a Revised Inventory and its Relation to Student Characteristics and Performance. *Medical Education* 38(5): 535-543.

Mattick, K., Crocker, G. and, Bligh, J. 2007. Medical Student Attendance at Non-Compulsory Lectures. *Advances in Health Science Education* 12(2): 201-210.

McGarr, O. 2009. A Review of Podcasting in Higher Education: Its *Influence on the Traditional Lecture. Australasian Journal of Educational Technology* 25(3): 309-321.

Michel, N., Cater, III, J.J. and Varela, O. 2009. Active Versus Passive Teaching Styles: An Empirical Study of Student Learning Outcomes. *Human Resource Development Quarterly* 20(4): 397-418.

Formatted: Font: 11 pt, Italic, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: Italic, (Asian) Chinese (PRC)

Formatted: Font: 11 pt, Italic, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: Italic, (Asian) Chinese (PRC)

Formatted: Font: 11 pt, Italic, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: Italic, (Asian) Chinese (PRC)

Formatted: Font: 11 pt, Italic, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: Italic, (Asian) Chinese (PRC)

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: 11 pt, Complex Script Font: 11 pt, (Asian) Chinese (PRC)

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Formatted: Font: Italic

Moore, S., Armstrong, C. and Pearson, J. 2008. Lecture Absenteeism Among Students in Higher Education: A Variable Route to Understanding Student Motivation. *Journal of Higher Education Policy and Management* 30(1): p. 15-24.

Formatted: Font: Italic

Pashler H., McDaniel, M., Rohrer, D. and Bjork, R. 2008. Learning Styles: Concepts and Evidence. *Psychological Science in the Public Interest* 9(3): 105-119.

Riechmann S. and Grasha, A. 1974. A Rational Approach to Developing and Assessing the Construct Validity of a Student Learning Style Scales Instrument. *Journal of Psychology* 87(2): 213-223.

Formatted: German (Germany)

Formatted: Font: Italic

Robertson, S. 2010. Corporatisation, competitiveness, commercialisation: new logics in the globalising of UK higher education. *Globalisation, Societies and Education* 8(2): 191-203.

Formatted: Font: (Default) Arial, 11 pt, Complex Script Font: Arial, 11 pt, (Asian) Chinese (PRC)

Formatted: Normal, Don't adjust right indent when grid is defined, Don't adjust space between Latin and Asian text, Don't adjust space between Asian text and numbers

Rohrer D. and Pashler, H. 2012. Learning Styles: Where's the Evidence? *Medical Education* 46(7): 634-635.

Formatted: German (Germany)

Romanelli, F., Bird E. and Ryan M. 2009. Learning Styles: A Review of Theory, Application, and Best Practices. *American Journal of Pharmaceutical Education* 73(1): 9.

Formatted: Font: Italic

Shukr, I., Zainab, R. and Rana, M. 2013. Learning Styles of Postgraduate and Undergraduate Medical Students. *Journal of College of Physicians and Surgeons Pakistan* 23(1): 25-30.

Formatted: Font: Italic

Soilemetzidis, I., Bennett, P., Buckley, A., Hillman, N. and Stokes, G. 2014. *The HEPI-HEA Student Experience Survey 2014*. HEA: York.

Stance, L. 2006. The Effects of Attendance on Academic Performance: Panel Data Evidence for Introductory Microeconomics. *Journal of Economic Education* 37(3): 251-266.

Formatted: Font: Italic

Walbeek, C. 2004. Does Lecture Attendance Matter? Some Observations from a First-Year Economics Course at the University of Cape Town. *SAJE Journal of the Education Association of South Africa* 72(4): 861-883.

Webb, G. 1997. Deconstructing Deep and Surface: Towards a Critique of Phenomenography. *Journal of Higher Education* 33(2): 195-212.

Formatted: Font: Italic

Wilson, K. and Korn, J. 2000. Attention During Lectures: Beyond Ten Minutes. *Teaching of Psychology* 34(2): 85-89

Formatted: Font: Italic

Wingfield S. and Black, G. 2005. Active Versus Passive Course Designs: The Impact on Student Outcomes. *Journal of Education for Business* 81(2): 119-123.

Formatted: Line spacing: Double

Woodall, T., Hiller, A. and Resnick, S. 2014. Making sense of higher education: students as consumers and the value of the university experience. *Studies in Higher Education*, 39(1): 48-67.

Formatted: Font: (Default) Arial, 11 pt, Complex Script Font: Arial, 11 pt, (Asian) Chinese (PRC)

Formatted: Normal, Don't adjust right indent when grid is defined, Line spacing: Double, Don't adjust space between Latin and Asian text, Don't adjust space between Asian text and numbers

Formatted: Font: (Default) Arial, 11 pt, Complex Script Font: Arial, 11 pt, (Asian) Chinese (PRC)

Formatted: Font: (Default) Arial, 11 pt, Italic, Complex Script Font: Arial, 11 pt, Italic, (Asian) Chinese (PRC)

Formatted: Font: (Default) Arial, 11 pt, Italic, Complex Script Font: Arial, 11 pt, Italic, (Asian) Chinese (PRC)

Formatted: Font: (Default) Arial, 11 pt, Complex Script Font: Arial, 11 pt, (Asian) Chinese (PRC)

Formatted: English (U.K.)