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Teaching large and diverse classes: A practice-based approach

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Abstract

Often we are asked to welcome more and more students into our lectures, seminars and other teaching units. This can be a real challenge, especially with the increasing diversity of our student body. As a group of academics, we decided to proactively approach this topic by conducting research into our students' feelings and anxieties while being taught in large classes. The aim was to introduce best practice and teaching excellence amongst academics, which we approached by producing an easily accessible education toolkit informed by our research findings.

This problem is not exclusive to Reading or indeed to the UK; this is a topic discussed in higher education around the world. Attendance rates in lectures drop as students vote with their feet. Attainment drops as students disengage with the teaching. As we cannot ignore these facts it is important to pro-actively address them, identify the causes, and adjust our teaching to mitigate the risks.

Keywords: Large class teaching; diversity; inclusivity; large class education toolkit; technology-based learning

1 Large class teaching

Often we are "asked" to welcome more and more students into our lectures, seminars and other teaching sessions and therefore need to "cope" with the increasing diversity of our students. This can be a real challenge, especially with this increasing diversity of our student body.

Mulryan-Kyne (2010) reports that the student enrolment numbers at tertiary level institutions have doubled in many of the Organisation for Economic Co-operation and Development (OECD) countries over the last two decades. This places significant pressure on universities, where staff are already exposed to a number of competing demands such as increased research accountability, focus on quality assurance and enhancement, in addition to other accountabilities. Often the biggest pressure is seen at undergraduate level, where large classes are a common phenomenon across many education systems, with class sizes often ranging from 300 to 1000 students. In addition to the increasing number of students per class, the student population is increasingly diversifying, e. g. in age, cultural and socioeconomic background, and experience. This brings a greater variability of student expectations and experiences to the classroom, which can make it quite challenging for the lecturer to satisfy (Biggs 1999).

Hornsby (2014) uses the term 'massification' of higher education when referring to rapidly increasing student numbers and large class teaching. Massification challenges many processes and approaches used in traditional teaching at university level as lecturers are often faced with new challenges when class sizes increase (Biggs 1999). Classroom management, the need for clear communication and new avenues to encourage engagement and attendance are just some examples of these challenges. The range of students and diversity of the class is important to consider when tackling these challenges. This means that lecturers need to take the range of abilities, experiences and qualifications into account, while considering technical and physical limitations of the teaching environment.

Many challenges identified with large class teaching can directly have a negative effect on the student experience and learning. Anonymity and low student engagement often increase as class size increases and as direct student-staff interactions decrease (Carbone and Greenberg 1998). Poor engagement can lead to a low commitment to the course, which can in return result in higher drop-out rates and social isolation (Wan, Chapman and Biggs 1992). Attendance can be a real challenge in large classes and dwindling attendance rates are often seen leading to a number of knock-on problems specifically for first-year students (Kuh, Kinzie, Schuh and Whitt 1991). In addition, students often adopt a passive role in large classes resulting in behaviour and responses triggered by an impersonal teaching environment. This includes behaviour, which would be less likely observed in small class teaching, such as late arrival, leaving early or increased noise (Mulryan-Kyne 2010).

2 The approach we used at the University of Reading

The issues and challenges described can also be seen within the University of Reading, UK, where student numbers significantly increased over the last 10 years. At the beginning of this period, the university established a working group looking into operational challenges and potential solutions together with new pedagogical approaches. However, the work focused more on the operational challenges and less so on the potential pedagogic approaches, which – from a teaching perspective – is clearly an important gap.

Leading on from this work, a team of academics tried to proactively approach the topic of "teaching large classes" from amongst the academic body as we believed this to be the most effective way of improving our student experience. Colleagues are often more open to "learn" from other colleagues, who struggle with similar issues and understand the challenges. Working together as teams, on truly institution-wide issues, is often the key to success, and teaching large classes, is certainly a challenge across many subject areas within the University of Reading. We initiated this university-wide topic using a team-based approach from amongst the academic body and put together a multidisciplinary team with experience in large class teaching.

The overarching aim of this project is best summarised as "to improve the student experience in large and diverse classes". This approach led to the idea and subsequent development of our "Large Class Education Toolkit". This, as a resource, was designed to instigate change amongst teaching staff, and encourage best practice and teaching excellence in teaching large classes, with the specific focus on offering the best teaching environment for cohorts of increasing diversity (Strohfeldt 2017).

3 What we did

The project ran over a period of 2 years and consisted of a research phase (the first 15 months), the development phase of the toolkit (6 months) and the dissemination phase (the remaining 3 months and beyond).

The approach to the research phase was two-fold – a student-centred and a staff-centred approach with the ultimate aim to inform the development of the toolkit. The student-centred part of our research was importantto gain an understanding of the expectations of our students and their challenges. We surveyed more than 700 first-year students in the first two weeks of their arrival at University in order to collect their opinions before they were influenced by their course and university experience. We chose a variety of university programs, all with a minimum class size of 50 + students. Typical questions we asked were "how many students do you think is a large class" and "how many students do you think is a small class" amongst other questions. We looked at their prior education, ethnic background and implications of any disabilities. We also asked the students what they think would help to improve teaching in large classes or which opportunities and challenges they see.

In the staff-centred part of our research, we were interested in understanding the challenges teaching staff experience and methods they apply to overcome these, i. e. identifying best practice to foster T&L excellence. In order to capture these, we decided to use structured professional interviews as our approach. We approached around 40 academics with experience of teaching large classes, who represent a range of subject areas. Again we asked questions like "how many students do you think is a large class" and "what challenges does teaching large classes bring", but also "what tips and tricks the academics use in their teaching". It was also important for us to understand the potential limitations of the methodologies colleagues were interested in using and what the specific issues are that staff experience at Reading University.

4 Findings

Within this paper, we do not aim to provide a full statistical analysis of the survey and professional interviews but want to highlight findings, which informed the design of our Toolkit. The student-focused research highlighted specifically four main aspects:

Students did expect and looked forward to being taught in large lecture theatres. They clearly articulated that being taught in a large lecture theatre is an aspect they associate with university life and they look forward to it. However, the students also told us that this is not the only form of instruction they expect or want; they expect a mixture of class set-ups and instructional designs.

In regards to the question about "how many students make a class large", the majority of students answered between 80–120 students, with the average being just above 100. This is consistent with numbers found in the literature (Biggs 1999). Interestingly, these numbers were cited by students independent of their actual class size they were taught in at the University. Often large student cohorts are broken down into smaller seminar groups. The size of these classes is often determined by operational factors and workload of teaching staff. We were surprised by the answer the students gave us to the question "how many students they expect in a small class to be present". Students often referred to numbers less than 10, which is often lower than class sizes within the University of Reading and might explain some differences in perception between students and university. This number might result from experiences the students have during their studies at their secondary schools before joining the University. Therefore, we would expect that this number may well vary, depending on the cultural/educational background.

Concerns raised by students can mainly be summarised as a feeling of anonymity, struggling to understand the lecturer because of noise and challenging acoustic conditions, and lack of relevance to the student's interests. It is important to recognise that some students actually appreciate the feeling of anonymity, as they feel less pressured about their academic abilities. The acoustic challenges can be quite serious, especially if you aim to facilitate an inclusive teaching environment, as students with certain special requirements or students with a different first language, might find it challenging to follow the lecture.

It was both interesting and encouraging to note that students "like" lectures, however, they expect them to be "good". It was found, that the most important aspect of a good lecture, is that they need to be engaging and the lecturer needs to present control in the classroom. Furthermore, it is important that the lecturer respects and recognises students as individuals and values their cultural backgrounds, in order to support their diverse needs.

During the professional interviews with academic colleagues, we explored the challenges they perceive when teaching large classes (and some of these are more widely about teaching at university level). Most concerns were expressed around keeping the class under control, which is significantly more challenging when you teach a large cohort. Some colleagues described they felt easily overwhelmed by large cohort sizes, potentially lacked confidence, and they felt a lack of tools and method available, which would allow them to present more engaging lectures. Obviously, the increased workload large cohorts bring was also a prevalent issue.

We noticed that everyone developed their own techniques and strategies to deal with the challenges presented to them. This is probably not surprising however, we were impressed by how much good practice is present within the university and we were keen to capture this. It was also important for us to highlight that there are colleagues who face similar challenges. However, we also found that the university T&L infrastructure, does not necessarily support the best practice we identified and often acts as an additional barrier.

Last but not least, it became clear that especially for experienced academics, the actual number of students in their classes is not primarily the challenge. The real challenge comes when these academics are asked to teach a cohort, whose size is larger than what they are used to. Often, this can provide challenges and worries, as their tried and tested teaching style might not work anymore. A colleague who has been asked to suddenly teach a cohort of 50 students, when they previously "only" taught classes of 15 students, might experience similar challenges to a colleague who teaches 200 students. This means that the actual student number becomes less relevant in a discussion around large class sizes and we need to respect the individual's previous experience.

These findings formed the evidence base for the design of the "Large Class Education Toolkit". The toolkit is an easily accessible and clearly structured collection of tips and tricks, teaching approaches and pedagogic strategies, which have been found to be specifically useful when teaching diverse and large classes at university level.

5 The "Large Class Education Toolkit"

5.1 Concept and design brief

The aim of the "Large Class Education Toolkit" was to create a useful resource for academics teaching large classes, which has been informed by our research at Reading. It was important for us to bring good practice examples together and to ensure that is applicable at and relevant to Reading. There were a number of criteria these resources had to fulfil, and many of these impacted on the design brief:

The toolkit had to be easily accessible, recognising that academics are busy professionals, who try to juggle a variety of sometimes conflicting duties. While we are fully aware that the tips and tricks contained in the toolkit are not necessarily new and it would be perfectly possible to gather them from the relevant literature, there is a body of academics, whose priorities focus on other activities. Therefore we focused on making this toolkit easy to access, visible and different to standard publications – an interactive resource rather than a standard book/brochure/publication. The idea was to make it easy to understand by providing links to the relevant literature and further reading for interested colleagues. Colleagues are also encouraged to add to the toolkit, any ideas and information they have and see the toolkit as the start of a collection of ideas.

As a more unique concept and approach, we wanted to be transparent to colleagues, about how much extra time would be required to implement some of the strategies mentioned in the

toolkit. The idea behind this was that we wanted to show colleagues that little changes, which do not demand a lot of time, can have a big impact. The aim was to increase the engagement with the methods offered. Therefore, we decided to structure the toolkit into sections, which indicate the length of additional preparation time required.

Diversity was the main aspect which underlined all of our thinking. Any methods, tips and tricks presented, were designed keeping a diverse cohort of students in mind. Students on our courses come from a wide range of backgrounds and have a variety of needs. However, providing an inclusive learning environment is not only important to support those learners, but will be of benefit to all students. Often simple tricks can make a real difference. It is also important to keep the diversity of the teaching staff in mind and their needs. Colleagues will be more comfortable with certain teaching approaches than others, however, they need to develop an awareness of how this impacts on the students.

Reality is important – will this work within my institution and with my students? We deliberately chose an approach, where real-life examples were used. Emphasis was given within the case studies to potential limitations and how to deal with those. Colleagues from a range of subjects were involved in order to provide a wide variety of approaches.

5.2 Design – The "Large Class Education Toolkit"

The "Large Class Education Toolkit" was designed keeping the above-explained concept in mind using the evidence base we collected. We were in the fortunate position to be able to use the universities' real job scheme, which means that some of our Graphic Design students designed the toolkit – designed by students for the benefit of students.

In order to fulfil the design brief of "visibility, easy to access, being different" we decided on creating a colourful folder, with the idea that it is a good reminder in every academic's office. The folder is a collection of strategies, which can be added to, so it acts as a repository for colleagues to collect ideas, etc. However, we were aware of the limitations of a physical copy and therefore also created an interactive online version. This is available as an open-access resource, which enables wider dissemination (Strohfeldt 2017).

In regards to the content, we decided to structure the toolkit into three sections reflecting the amount of time needed to implement the ideas presented. The sections are labelled '5 + minute activities', '30–60 minute activities' and '60 + minute activities' and these sections are represented by colour-coordinated cards of different sizes. The idea is that the '5 + minutes activities' section compromises small tips and tricks, which help you to improve your general teaching. The '30 + minute activities' section is a collection of exercises and ideas, which will support you in teaching large classes. These will require some additional preparation time, which is recognised in the title of this section. New or different pedagogic approaches are represented in the last section – '60 + minute activities', which means that a more intense preparation is required.

Each topic or case study is represented on one card, which can be taken out of the folder to act as a reminder or info sheet. Each card is structured providing an introduction in form of a brief literature background, real-life application and a top tips section together with literature references. In addition, there is space to add their own notes to emphasize the interactive nature of this toolkit.

5.3 Content

The following section provides an overview of the topics discussed in the toolkit and some ideas on how to approach these. The aim is to provide an idea, why certain topics were chosen and their relevance to teaching large and diverse cohorts at University level. For more detailed information on the content, please refer to the toolkit itself.

5.3.1 '5-minute activities'

The '5-minute activities' section is a structured collection of tips and tricks to manage your class well. These tricks are certainly not exclusive to teaching large classes and can be applied in any teaching scenario. However, the issues, which these tips and tricks try to address, might be more prominent and challenging in large class teaching. Also, this section aims to raise awareness and understanding of diversity in the classroom (Strohfeldt 2017).

Making a good **START** to your teaching session is really important to ensure you get the attention of all students present (ibid.). This will also provide you with the confidence to be able to control the class. **ATTENDANCE** is always a big challenge in large classes as students believe they can easily hide. Try to make the teaching session "worthwhile to attend". Similar approaches also help with the **ENGAGEMENT** issue in large classes. It is often tricky to get students to interact and engage with the teaching. **CLARITY** is a really important aspect when teaching large and potentially diverse cohorts. It is important to have important aspects clearly decided for yourself before you even attend your teaching session. How **ACCESSIBLE** is your teaching? Making your teaching accessible, will actually be of benefit to a wide range of audiences with diverse needs to support their learning. Thinking about **INCLUSIVITY** when teaching large and diverse classes is really important and it encourages you to implement techniques which are beneficial to all students in the classroom. **ANONYMITY is** one of the main characteristics of large class teaching and is actually an interesting aspect. Anonymity can be a real challenge when your teaching benefits from these direct interactions. Anonymity also provides an opportunity for students who want to be or rely on being part of a more anonymous crowd. It is equally important to plan a good **FINISH** to your teaching session as it is to make a good **START.** This will allow the students to understand the learning outcomes, next steps and expectations. Inviting an increasingly diverse cohort of students really requires us to make our teaching **CULTURALLY** responsive. You are encouraged to understand the cultural and social backgrounds, as well as the cultural experiences and differences your students may have. Good **COMMUNICATION** is crucial when teaching large and diverse cohorts. Last but not least – **FEEDBACK**, which – in this context – means feedback to the lecturer. Even the best lecturer can improve their teaching style by adapting to the changing needs of each individual class. This can be especially challenging, but also rewarding when facing a big cohort.

5.3.2 '30–60 minute activities'

The '30–60 minute activities' section is a collection of real-life case studies, where colleagues used a variety of approaches to improve large class teaching. These approaches take some additional preparation time, which is indicated in the title of this section. There is a mixture of technology and non-technology-based approaches. Additionally, it is important to keep the diversity of the student cohort in mind when choosing your approach – do all students have access to mobile devices? Are students 'happy' to engage in peer discussions or are there cultural barriers you need to be mindful of? Each topic is concluded by a number of top tips provided by real academics using these approaches regularly in their teaching. The following provides an overview of topics included within the toolkit and why these are relevant to large class teaching of diverse cohorts (Strohfeldt 2017).

There are a number of free and paid-for educational apps and online pages, which can be used to engage your students anonymously through questions, quizzes and other challenges. These also allow you to receive instant feedback from a large cohort on their understanding and progress with the subject topic. Enabling student anonymity has been shown to reduce fear and increases participation (Kay and Sage 2009; Rocca 2010; Weaver and Qi 2005). Regularly engaging students in activities reduces attention drift and disruptive behaviour (Bligh 1998; Kokkelenberg, Dillon and Christy 2008). There are a number of these online services and apps available; however we have chosen the most popular ones, which are freely available (there might be restrictions on functionality or number of participants).

One group of these apps can be broadly summarised as online quizzes and polling software, such as *KAHOOT®*, *SOCRATIVE®*, *QUIZZIZ®* or *POLLEVERYWHERE®*, where the teacher can setup online quizzes or surveys with relevant questions prior to the teaching session. These mini quizzes can then be used at strategic points throughout the lecture to engage the students and track their progress. Polling allows you to provide your students with a platform to voice their opinion, give and receive feedback without breaking their anonymity, which many students find reassuringly similar to traditional audience response systems. There are also software solutions on the market such as *Mentimeter®*, which allow you to run fully interactive presentations.

Some colleagues have successfully used social media to engage their students within large classes such as *TWITTER* and *FACEBOOK* (Evans 2014; Lackovic, Kerry Lowe R and Lowe T 2017). It is important to respect and safeguard privacy as many will use *FACEBOOK* as a very personal platform. Additionally, it is important to exercise caution when setting up a closed group and monitoring activity within the group.

When teaching a large cohort it is essential to ensure that all students understand the key concepts. However, students learn at different paces or there might be more distractions present when teaching large classes, which can provide a challenge when you try to ensure that key concepts are confidently delivered and understood. It can also be challenging to answer all the questions of your large audience and there are always questions, which are repeatedly asked. Creating *SCREENCAST* prior to or after your teaching session might be a good solution. A screencast is a recording of your computer screen, which basically records (audio and video) what you do on the computer, e. g. recording of a PowerPoint presentation or a word document etc., (Oud 2011). Another solution, which works very well for more visual teaching are *PENCASTS*. Pencasts are virtual notes – a video of someone taking notes on a notebook including the audio. The use of virtual notice boards such as *PADLET®* are excellent to answer frequently asked questions effectively and efficiently.

There are also a number of non-technology techniques and approaches, which can be used to make large class teaching more engaging and inclusive. Not every student has a working smart phone or mobile device and while you can suggest students work together as teams, it is important not to forget some of the "old school" methods. Coloured *VOTING CARDS* are a useful way to run quizzes, for polling or to receive feedback. Having something physical encourages interaction and you can create a "game show feeling" for some interactive fun. You can add things like a countdown clock to encourage a more game-like atmosphere. You should also not forget the simple activity of asking the audience to stand up and then vote by sitting down etc. This physical activity helps the students to refocus by changing their posture and activity level. *PEER DISCUSSIONS* are also a good way to break up a lecture and introduce an element of interactivity, which helps to change the pace. Peer discussions have also been shown to be beneficial to students' learning.

Last but not least, the toolkit contains a brief guide on how to create good multiple choice questions *(MCQ)*. Many of the techniques introduced here use MCQs in order to engage students, provide or receive feedback. MCQs provide a fun way to connect with your students and can be very efficient, if you can reuse your questions. However it is not simple or quick to design good MCQs. Specific attention has also to be given to students with specific needs when creating good and inclusive MCQs, which should be standard when teaching large and diverse cohorts.

5.3.3 '60 + minute activities'

The '60 + minute activities' section is a selection of examples showcasing different pedagogic approaches to large class teaching. This section tries to inspire lecturers to explore teaching styles, which are different to traditional lectures. Often these pedagogic approaches are dismissed as colleagues are concerned if they can be applied in large cohorts. This section in the toolkit provides a collection of ideas, where the teaching staff have used alternative modes of delivery other than the traditional front-focused passive lecture.

The toolkit provides an overview over *ACTIVE LEARNING*, which is an instructional design where the students actively and meaningfully engage with the taught material (Bonwell and Eison 1991). A change of lecturing style or pace will ensure students are kept engaged with the teaching. Attributes like team working, peer discussions and more general feedback/feedforward, are central to active learning. Many of the ideas presented in the '30–60 minute activities' section are the building block for active learning, however we felt it was important to explore the concept of active learning within the toolkit further.

ENQUIRY-BASED LEARNING (EBL) is a pedagogic approach where knowledge is acquired through a learner-directed process stimulated by an enquiry. It is closely related to problem-based learning (see below) and the terms are often interchanged. EBL is often used in small group teaching, but with the correct setup it can also be used in large classes. When developing a module based on EBL for large cohorts, it is important to design a manageable assessment strategy (Almond 2009).

PROBLEM-BASED LEARNING (PBL) is similar to EBL; a student-centred pedagogic approach, where the students learn through solving a serious of problems. PBL originated from McMasters University, where medical students are taught in small groups through PBL. There are a number of approaches where the concept of PBL has been applied to large class teaching, either in the area of healthcare education or sciences, often through the use of a virtual (or real) patient or client (Strohfeldt and Grant 2010; Strohfeldt and Khutoryanskaya 2015).

The *FLIPPED CLASSROOM* approach transfers parts or all of the lecture content into pre-class activities. This approach can be very useful when dealing with large and/or diverse classes once it is applied with this cohort in mind. The application exercises can be tailored and a good understanding of your students' understanding can be established. Ensure you engage all students, e. g. by introducing regular diagnostic tests (Bates and Galloway 2012; Bergmann and Sams 2012).

TEAM-BASED LEARNING (TBL) is often seen as an extension to the flipped classroom, where a more formalised structure is applied to scaffold the teaching. It is also often seen as a further development to PBL, as individual team members cannot hide within TBL. TBL is often used for applied subjects, e. g. in the healthcare area or engineering, however it can also be applied to more theoretical subjects (Michaelsen 2008).

One example where the VLE is used extensively, is *BLENDED LEARNING*. As the name suggests, this is an approach that combines different teaching methods, typically face-to-face teaching 'blended' with online delivery to a varying degree. The key advantage is that students can gain some control over their learning (where and when), which can be especially useful in cohorts from diverse backgrounds. In contrast to distance learning, the students still benefit from face-to-face interaction. At the same time it is important to show an awareness that this form of teaching requires an enhanced understanding of student engagement, support and welfare needs (Graham 2006).

The *DEVELOPMENT PORTFOLIO* is an interesting 'tool', which allows you to include and monitor continuous learning and integration into the curriculum. These portfolios are mostly associated with healthcare professional training, however, there is no reason not to use it amongst other subject areas, as long as there is a clear aim for it. The portfolio accompanies the learner and their studies over a prolonged period and showcases their personal and academic development (Haughey, Hughes, Adair and Bell 2007).

6 Dissemination and impact

Dissemination of best practice was a key objective of this project as mentioned at the beginning of this paper. Therefore, we developed a dissemination strategy to ensure impact across the university. During the development of the toolkit and the project work, we raised awareness through our

T&L exchange blog, which keeps colleagues informed of the latest T&L developments. It is very important to keep in mind that the idea of this project was born by a group of academics brainstorming. The resource has been rightly created by academics for the use of academics in a 'bottom-up' initiative well supported by the university, not as a 'top-down' approach to improve the student experience.

Strategically, we started by targeting the T&L leadership within schools, divisions and programs. The aims were to strategically bring attention to large class teaching and its challenges, as well as improving the provision in order to raise the student experience. Therefore, a number of targeted training sessions were run, to explore this topic and to introduce colleagues to T&L leadership positions of the toolkit. In addition, we equipped these colleagues with the tools and opportunities to initiate local training sessions.

Furthermore, to the strategically placed dissemination sessions, we also offered a number of 'open' training sessions, which were advertised to all teaching colleagues. These, run at strategic points of the year, e. g. when colleagues started to prepare their next sessions, were supported by our centre for T&L training. We also took part in a number of university-wide T&L dissemination events, such as the Technology Enhanced Learning

Fest, etc.

Through our targeted dissemination approach, we managed to reach at least a third of our teaching academics, as evident through the distribution of hard copies of the toolkit. It is likely we have approached more colleagues, as we also publicised the online version of the toolkit, however, it is difficult to measure the impact of this means of advertising. Specifically targeting the T&L leadership within the division seemed successful, as they organised a number of local training and dissemination sessions.

We also actively disseminated the toolkit and our findings outside the university, mainly through presentation at a number of conferences for a variety of subject areas. The open-access online version of the toolkit, is equally successful and is now used at a number of universities, and has led to a number of invited conference presentations and workshops.

Literature

Almond, P. (2009). Using an Enquiry-Based Learning Project to Develop Criminological Understanding. *Web Journal of Current Legal Issues*, 3, o. S.

Bates, S. & Galloway, R. (2012). The inverted classroom in a large enrolment introductory physics course. A case study. Paper presented at HEA STEM Conference London, UK, 12.-13. April 2012.

Bergmann, J. & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. Washington D. C., US: International Society for Technology in Education.

Biggs, J. (1999). What the student does. Teaching for enhanced learning. *Higher Education Research & Development*, *18* (1), 57–75.

Bligh, D. A. (1998). *What's the Use of Lectures?* (5th ed). Earl Exeter, UK: Intellect, School of Art and Design.

Bonwell, C. C. & Eison, J. A. (1991). *Active Learning. Creating Excitement in the Classroom. 1991 ASHE-ERIC Higher Education Reports*. Washington D. C., US: Office of Educational Research and Improvement.

Brame, C. (2013). *Writing Good Multiple Choice Test Questions*. [Online]: https://cft.vanderbilt.edu/guides-sub pages/writing-good-multiple-choice-test-questions [29.09.2019]

Carbone, E. & Greenberg, J. (1998). Teaching large classes. Unpacking the problem and responding creatively. *To Improve the Academy*, *17* (1), 311–326.

Evans, C. (2014). Twitter for teaching. Can social media be used to enhance the process of learning? *British Journal of Educational Technology*, *45* (5), 902–915.

Graham, C. R. (2006). Blended learning systems. *The Handbook of Blended Learning*, 3–21.

Haughey, S. L., Hughes, C. M., Adair, C. G. & Bell, H. M. (2007). Introducing a mandatory continuing professional development system. An evaluation of pharmacists' attitudes and experiences in Northern Ireland. *International Journal of Pharmacy Practice*, *15* (3), 243–249.

Kay, R. H. & LeSage, A. (2009). Examining the benefits and challenges of using audience response systems. A review of the literature. *Computers & Education, 53* (3), 819–827.
Kokkelenberg, E. C., Dillon, M. & Christy, S. M. (2008). The effects of class size on student grades at a public university. *Economics of Education Review, 27* (2), 221–233.
Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2011). *Student Success in College: Creating Conditions that Matter*. Hoboken, US: John Wiley & Sons.
Lackovic, N., Kerry, R., Lowe, R. & Lowe, T. (2017). Being knowledge, power and profession subordinates. Students' perceptions of Twitter for learning. *The Internet and Higher Education, 33*, 41–48.
Michaelsen, L. K. & Sweet, M. (2008). The essential elements of team-based learning. *New Directions for Teaching and Learning, 2008* (116), 7–27.
Mulryan-Kyne, C. (2010). Teaching large classes at college and university level. Challenges and opportunities. *Teaching in Higher Education, 15* (2), 175–185.
Oud, J. (2011). Improving screencast accessibility for people with disabilities. Guidelines and techniques. *Internet Reference Services Quarterly, 16* (3), 129–144.
Rocca, K. A. (2008). Participation in the College Classroom. The Impact of Instructor Immediacy and Verbal Aggression. *Journal of Classroom Interaction, 43* (2), 22–33.
Strohfeldt, K. & Grant, D. T. (2010). A model for self-directed problem-based learning for renal therapeutics. *American Journal of Pharmaceutical Education, 74* (9), 173.
Strohfeldt, K. & Khutoryanskaya, O. (2015). Using problem-based learning in a chemistry practical class for pharmacy students and engaging them with feedback. *American Journal of Pharmaceutical Education, 79* (9), 141.
Strohfeldt, K. (2017). *Large Class Education Toolkit*. [Online]: https://www.reading.ac.uk/web/files/cqsd/V4_Interactive_Education_Toolkit.pdf [29.09.2019]
Wan, T. Y., Chapman, D. W. & Biggs, D. A. (1992). Academic stress of international students attending US universities. *Research in Higher Education, 33* (5), 607–623.
Weaver, R. R. & Qi, J. (2005). Classroom organization and participation. College students' perceptions. *The Journal of Higher Education, 76* (5), 570–601.

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