

# Exploring Student Engagement and Disengagement in University Education, Can Vocational Activities/Practice-Based Learning Help?

Paul Albinson

Computing in Education Research Group, Department of Computing and Informatics, Bournemouth University,  
Fern Barrow, Poole, Dorset, BH12 5BB, UK

palbinson@bournemouth.ac.uk

## Abstract

Student engagement is a commonly discussed term within education especially within Higher Education where academics regularly engage in research around the topic with the aim of improving engagement and the student experience. However, despite the focus on and recognised importance of engagement it has been observed, particularly by academic staff, that disengagement amongst students is increasing. This paper explores the possible reasons for reduced engagement in universities and contemplates whether the teaching approaches used in higher education are to blame. It looks at approaches that are better suited to adult learners to meet the way they approach education, their needs, complex lifestyles and so forth. A case study is presented, influenced by this literature, designed to improve engagement via a lab session which is vocationally relevant with examples that are more realistic to a work environment. This is done to help meet the growing trend of students wishing to see the vocational relevance of their studies. Results showed activities like this can increase engagement and enhance the student experience and student learning.

**Keywords:** Student Engagement, Student Disengagement, Work-Related Learning, Andragogy, Pedagogy

## **1.0 Introduction**

Student engagement is a commonly discussed term within education especially within Higher Education where academics regularly engage in research around the topic with the aim of improving engagement and the student experience. There is no denying that engagement is important for academic success as research [1 & 2] has shown a clear link between them.

Despite the focus on and recognised importance of engagement it has been observed, particularly by academic staff, that disengagement amongst students is increasing. Research has found [2 & 3] an increasing trend of declining attendance and lack of engagement within lessons. A key influence appears to be students' attitudes to learning shifting away from viewing education as an intellectual challenge and seeing value in the pursuit of knowledge towards being goal-oriented, typically influenced by work pressures and ambitions, and a desire to see a value in what they are learning (echoing the work by Knowles et al. [4]). Additionally, students' complex lifestyles can influence attendance and engagement with competing demands for their time such as work and family commitments (especially relevant for mature students who are more likely to have such pressures). Therefore, with a change in student attitudes to learning and an increased focus on work perhaps teaching should adapt accordingly?

This paper begins by exploring approaches to teaching to meet the needs of modern students with the aim of improving student engagement and student experiences. It then presents a case study, influenced by this literature, designed to improve engagement via a lab session which is vocationally relevant with examples that are more realistic to a work environment.

## **2.0 Engagement and Disengagement**

As discussed, increasing student engagement and reducing disengagement within lessons is a key goal for educators, but what do these terms mean and what can we learn from defining them?

### **2.1 Engagement**

As Baron and Corbin [2] discuss, different stakeholders view student engagement from different perspectives. Educational institutions and researchers ponder how student engagement can improve students' university experiences and academic achievements whereas policy makers use it to measure universities' performance. However, despite student engagement being a ubiquitous term there is little agreement on its definition.

Some scholars [5, 6 & 7] for example relate engagement to participation and how active students are in the classroom. Others [8 & 9] link engagement with energy (devoting energy to education), while some consider active participation in the university community as a vital part of effective student engagement [10 & 11].

Some studies [2] have considered engagement in greater detail by splitting it into different types: Behavioural Engagement (how students behave in class), Emotional Engagement (emotions/feelings about learning), and Cognitive Engagement (mental preparation and motivation). Some definitions seem to relate to one of these types (for example Schaufeli et al. [12] refers to emotional engagement while Booth [15] refers to behavioural engagement) but perhaps to fully describe engagement a definition should address all three types?

With so many different definitions of engagement various studies [2, 13 & 14] discuss how this makes measuring engagement difficult. Baron and Corbin [2] came to the conclusion that the reason why there is little agreement among definitions of engagement is they only describe parts of student engagement and approaches to measure it and a wider all-encompassing definition and approach to measure it is required:

*“...we propose a definition that combines the individual’s state of mind with a sense of community. Thus, the definition by Schaufeli et al. [12], together with definitions that emphasise community and social engagement, capture individual engagement for us. Therefore, we suggest that the engaged student is the student who has a positive, fulfilling and work-related state of mind that is characterised by vigour, dedication and absorption and who views him or herself as belonging to, and an active participant in, his or her learning communities.” [2]*

## **2.2 Disengagement**

It is not just a lack of engagement that is an issue, many academics comment on how they have observed an increase in disengagement with issues such as students wishing to spend as little time as possible on campus, doing minimal work (a surface learning approach), minimal participation, poor attendance, reliance on teaching materials and reluctance to do any self-study, etc. [15 & 16].

As Baron and Corbin [2] explain it is clear from this evidence that for engagement initiatives to succeed one must identify reasons for disengagement. The most frequently cited reasons are students’ increasingly complex lives and the effect this has on the relationship between universities and students [2]. This complexity is due to new relationships between work and study, an increasingly market-driven HE environment, and students increased expectations and priorities [17].

This complexity and time pressures can make it difficult for students to fully participate in the university community which is a concern as research [2] has shown a direct link between academic engagement and engagement with the university community.

## **2.3 Summary**

Therefore, in summary academic engagement involves students who are willing to participate fully with the university experience to not only participate within class but to engage with the wider university community and other learning opportunities available via self-study, networking, work-experience, etc. Students will be dedicated to their studies devoting significant amounts of energy into education to gain the maximum benefits from it. This dedication will require students to battle with factors that cause disengagement such as the complexities involved with modern life that may put demands on their time.

Therefore, while engagement is desired and the benefits for academic success and a good student experience are clear, the challenge is to find a way to foster academic engagement (and naturally encouraging increased attendance) in a way that meets the needs of adult learners and is suitable for students with complex lives and limited time to study. The presented case study shows one such approach.

## **3.0 Learning Theories, Approaches and Styles**

A variety of literature has explored the ways students learn and considered whether the current way we teach adults (such as in a university) is the best approach for their learning needs and styles. Massingham and Herrington [3] for example discuss how students' attitudes to learning has shifted away from viewing education as an intellectual challenge and seeing value in the pursuit of knowledge towards being goal-oriented, typically influenced by work pressures and ambitions, and a desire to see a value in what they are learning. This therefore casts doubt on whether the pedagogy/teacher-focused approach to learning typically used in universities, such as use of the lecture format (or similarly instructional based seminars) where students sit passively receiving information, is no longer fit for purpose for teaching modern day students and whether university teaching should be adapted accordingly. The goal-oriented nature of students discussed fits in with the work on andragogy (student-centred learning) by Knowles et al. [4] thus suggesting perhaps an andragogy approach is more suitable.

### **3.1 Adult Learning: Andragogy versus Pedagogy**

Although adult learning has existed for centuries until recently little has been researched about how to teach adults. However, teachers have always tended to teach adults differently to children as they realise they would benefit from a different style of teaching. They recognise teaching adults should be inquiry based to help students actively learn for themselves rather than passive learning where knowledge is dictated; this forms the basis for modern adult learning [4].

Teaching evolved through schools for teaching children and teachers developed an approach to teaching known as Pedagogy "literally meaning 'the art and science of teaching children,' (derived from the Greek words paid, meaning 'child,' and agogos, meaning 'leader of')" [4]. The pedagogic model [4] makes the teacher

responsible for students' learning: how teaching occurs, what, when and why topics are covered, defining assessment etc. It assumes that learners are dependent personalities who attend classes because they are told it is necessary, that they only require specific knowledge to pass the course (a subject-centred orientation to learning) and have no interest in why they are studying it. Students' prior experience and knowledge is of little value and is ignored in favour of the teacher or other scholar's experiences and knowledge.

However as teaching evolved scholars began to realise adults learn differently to children and queried whether an alternative approach to pedagogy would be better for teaching them. It became clear that an integrated framework to define adult learning was necessary. The term andragogy was used, meaning the "art and science of helping adults learn" [4]. A key figure in the development of adult learning theory was Malcolm Knowles [4] who investigated andragogy and developed assumptions based on it; his work helped significantly in the popularisation and adoption of andragogy.

Knowles [4] stated certain assumptions about adult learning as the defining characteristics of andragogy. Adult learners desire independence and to be seen as capable of self-direction, are self-motivated, and use education to meet their goals. They need to see relevance in why they are being taught something; for example, how could it be used, is it relevant to their lives and ideally their chosen career, etc.? Adults have a wider variety of prior experiences and knowledge than children (because they have lived longer) and consequently there will be more differences within groups of adult learners; they will have varied learning styles, motivations, backgrounds, goals, interests, etc. Therefore, teaching should take into account these differences and value students' prior experiences and knowledge so that students can relate new content to these to aid their understanding.

Andragogy takes into account Knowles' andragogical assumptions [4] and advocates that the student is central to the learning process which is similar to the concept of student-centred learning [4 & 18]. The key concept is for students to construct their own understanding and direct their learning; the teacher's role is to facilitate the students learning rather than the teacher-centred pedagogy approach where the teacher dictates how and what the students learn. Andragogy assumes learners are self-motivated and use education to meet their goals which is opposite to pedagogy's approach which assumes students are dependent personalities who attend classes because they are told it is necessary. Also opposite to pedagogy, students' experiences and knowledge are valued in andragogy and become part of the learning process.

In general adults prefer the andragogy approach as it appeals to their learning preferences and desire for independence, self-direction and self-learning. However, it is appropriate to use pedagogy in some situations such as to introduce entirely new topics regardless of age as students are unlikely to have any prior knowledge or experience of the new content so would need a teacher to explain it. As learners

mature they become less dependent and teaching that allows independence/self-directed study becomes more useful [4]. Therefore, as study increases and dependence decreases a pedagogy approach becomes increasingly inappropriate and an andragogy approach becomes more suitable.

Therefore, an andragogy student-centred approach to teaching should appeal to modern day students goal-oriented attitudes to learning and their need to see value in what they are studying. It can also help with their work-related ambitions, allows for flexibility to fit study around students' complex lifestyles and is well supported with the availability of modern technology and teaching resources.

### **3.2 Learning Theories**

Similarly, there are many learning theories and approaches to teaching which will now be considered in relation to adult learning. Constructivist and humanist theories influenced Knowles' andragogical assumptions and clearly match the ideals of andragogy. They are suitable for teaching adults as they allow learners to influence the learning process and their knowledge and experiences are valued which is desired by adult learners. They can also be considered for teaching children just adults will have a larger quantity of experiences and knowledge to draw on. Similarly, as cognitivism helps learners develop their own understanding of a concept rather than being told the teachers interpretation of the concept it aligns with andragogy and adults' desires for self-learning. Behaviourism does not naturally fit with andragogy or the desires of adult learners as it treats learners as dependents with no free will and dictates how they will learn. Finally, social learning theory is not specifically aimed at children or adults or the ideals of pedagogy or andragogy. It draws on behaviourism which aligns with pedagogy, and cognitivism which mainly aligns with andragogy. However, it is a student-centred approach so links well with andragogy and the desires of adult learners.

### **4.0 Case Study**

In response to observed engagement problems discussed above a case study was created to investigate if knowledge about engagement, disengagement and adult learning can be used to improve engagement in a lab session. It involved creating a lab session which is vocationally relevant with examples that are more realistic to a work environment than a traditional lab session. This approach should help improve engagement as research [2 & 14] has found increasingly students are looking for how university can help them with employment and how content covered is relevant to employment; consequently, universities are focusing on work-based/work-related learning and promoting courses' vocational value.

The lab session was designed to accompany the security lecture of the Web Technology Integration (WTI) unit for second year undergraduates to help them understand the topics the lecture covered. The lecture looks at vulnerabilities within web pages and approaches to solve them and the current/existing lab session involves students using code to test some of the vulnerabilities covered. The case

study's new lab session differs from the existing lab session by focusing on identification of security problems via some ethical hacking group activities. These activities are based around a website specifically created for the lab session which has some basic security flaws/vulnerabilities and the groups try to break into the site thus taking on the role of an ethical hacker (i.e. someone who tests for security weaknesses in systems). The existing and new labs will complement each other by looking at security from different angles, defence (existing) and attack (new).

It was originally intended that the new case study lab would replace the existing lab session but due to it being a trial it was felt it should be an additional optional session instead; this was because a) due to timing of the experiment it hadn't been planned into the teaching scheme and b) management felt trials should be optional sessions. The new lab was designed as a standalone session to allow any student to attend even if they hadn't attended the regular security lessons yet.

Unfortunately, due to various reasons the security lecture would occur after the new lab so the lab session started with a mini-lecture to provide students with the necessary knowledge to complete the tasks. It also included content for a discussion afterwards on defence to resolve vulnerabilities discovered while doing the tasks. The mini-lecture was useful for providing students with reference material for clarifying or refreshing knowledge/understanding and for assisting with lab tasks and revision; it did however reduce time for completing tasks.

The lecture slides and the lab worksheet could be downloaded from the accompanying website for the students to use. Having these resources available to download helps with diversity [19, 20 & 21] as students with different learning needs and styles can access the materials whenever they require them to help address their learning needs and preferred learning style. For example, it allows students: to read the materials at a pace suitable for them and to make adjustments to address their learning needs and preferred learning style (such as to increase text size, change colours, use a screen reader etc.), to reread/reuse the content to help them with the tasks and revision, etc.

Ideally resources such as lecture slides and lab worksheets should be available before teaching sessions to allow students to prepare for the sessions should they wish. This is especially useful for those with learning difficulties who may for example find reading difficult so would appreciate extra time to read lesson content. Unfortunately, this wasn't possible for this session as it was designed to be a challenge to complete within the session; however, this is not very inclusive so a way of helping students with learning difficulties without ruining the challenge aspect, such as providing a list of key topics to research, should have been considered.

The tasks were designed to be completed in groups of 3 to a) simulate a development team in a work environment, b) to develop team-working skills, and c) to allow students to help each other to achieve more in the time available.

The students were given 20 minutes to complete the tasks. This was followed by a discussion on what the students learned and how to resolve identified vulnerabilities. Next the students were asked to fill in a feedback questionnaire/survey followed by a discussion on if the session was useful and how they could use their new knowledge to enhance their assignment website to achieve higher marks. The lesson plan, lab worksheet and full survey results can be requested from the paper's author via email.

The session's feedback survey was completed anonymously and asked for opinions on statements regarding learning and understanding, session organisation, general opinions, and views on the case study lab versus regular lab sessions; possible answers/responses were Strongly Disagree, Disagree, Agree and Strongly Agree. There was also a free text box for any comments students wished to make about the session such as things they liked or disliked, areas that could be improved etc.

The reason for equal positive and negative responses was to force students to think more carefully about their answers and to avoid indecision and the temptation of answering with the middle/neutral option; Albinson [22] found that when surveys have middle/neutral answers people are tempted to choose that to avoid making decisions. On reflection this was not suitable for all questions as for some, such as comparing the new lab to regular labs, opinions could feasibly be the same i.e. they have no preference for either style of lab.

## **5.0 Application of Literature to the Case Study**

The new lab focuses on work-related tasks in a simulated work environment which allows students to take on the role of an ethical hacker to show them how knowledge learned is useful in the real-world. This appeals to adult learners' desires for vocational relevance in their studies [2 & 14] and the needs of modern students and their complex lives [2], shows how knowledge taught/learned is valuable and applies to students' lives, and follows Knowles' andragogical assumptions and recommendations [4].

In general, the lab matches social learning theory as it involves learning in a social context and interactions with other students. It also has links with cognitivist, constructivist and humanist learning theories as it allows learners to influence the learning process, respects their independence, and values their knowledge and experiences. This is achieved via group tasks, discussions during group work and the teacher-led discussions. Also by working on tasks that explore the role of an ethical hacker students can construct their own meanings/definitions of topics the tasks cover and see how they are useful and relevant. The cognitivist recommendation of breaking down concepts into smaller parts to aid understanding/cognition was not used in the mini-lecture due to the additional time this requires and there was limited time available. However, it was used in some parts of the session such as when students needed further explanations where breaking down a concept into smaller parts was useful. Also the tasks reinforced



learning to aid understanding and memory recall. These approaches meet the desires of adult learners and principles of andragogy, and aids motivation. Behaviourism was purposely avoided because it focuses on the teacher taking full responsibility for the learning process and does not respect student's free will or allow self-directed learning so is inappropriate for adult education [4].

## **6.0 Results**

The results from the student feedback survey were overall positive with the majority of responses (92%) being agree or strongly agree. Additional comments and unit leader feedback (omitted to save space) were also all positive. These and full survey responses can be requested from the author via email.

### **6.1 Learning and Understanding**

Responses relating to learning and understanding were all positive: 61.54% strongly agreed and 38.46% agreed the session helped them understand web security better; there was however a little less positivity on the session improving their understanding of ethical hacking with only 30.77% strongly agreeing to the statement but 69.23% agreed it helped them.

### **6.2 Session Organisation**

The majority of students (53.85%) strongly agreed that the session was well organised and the rest agreed (46.15%). Attitudes on the lab materials (worksheet and corresponding lecture) were a little more mixed: the majority agreed they were clear and informative (53.85%) with the rest strongly agreeing (46.15%); however, when asked about if the information was presented in a concise way some students disagreed (7.69%) and only 30.77% strongly agreed but the rest however agreed with the statement (61.54%). Unfortunately, there were no other questions that explored the reasons for this negativity and no comments were made about it either. Responses to related questions don't provide any insight either and some could be seen as conflicting; students say the content is clear and informative which could be due to longer explanations so while not concise it is useful for aiding understanding. However, these factors are not mutually exclusive so conciseness could be improved while maintaining clarity and necessary detail; perhaps by highlighting the main detail to show what is vital with the extra detail being kept for those that need it.

### **6.3 General Opinions**

When asked more general questions about their opinions of the lab session responses were more varied. When asked if the lab would make them better web developers or designers 38.46% agreed and an equal amount strongly agreed yet 23.08% disagreed. This is surprising considering there was no negativity when asked if the lab improved their understanding of web security and ethical hacking thus suggesting some students realised they learned information about these subjects but failed to see the value to it. The answers to the statement about if the

session was valuable and worth attending also contradicted this as there was no negativity on the responses with the majority strongly agreeing (53.85%) and the rest agreeing. Also contradictory was that all opinions were positive about if the session should be repeated in future years with 53.85% agreeing and 46.15% strongly agreeing. Additionally, the majority of students were positive that the lab would help them improve their assignment work with 61.54% strongly agreeing and 30.77% agreeing thus also showing they understood its value; however, 7.96% disagreed showing this was not the case for them.

#### **6.4 The New Lab versus Regular Labs**

Two questions compared the new lab, being a different style, to regular labs. One student didn't answer either of these questions perhaps believing none of the possible responses represented their opinion. It was perhaps an oversight not to allow a neutral response for these questions as students could feasibly have no preference over the style of labs. This could also mean some responses for these questions may be invalid/irrelevant as students may not be committed to the answer given and desired a neutral response option.

When asked about if they learned more in the lab than regular lab sessions the largest response was agree (46.15%), and 23.08% strongly agreed, however some disagreed (23.08%), and 7.69% gave no answer. When asked about if they enjoyed the lab more than regular labs the majority agreed (76.92%) and disagree, strongly agree and no answer responses all had 7.69% each. Thus these answers are a strong endorsement of the session's approach/style in comparison to regular lab sessions.

### **7.0 Discussion and Future Improvements**

Feedback was overall positive and shows the aims have been met. Observations showed students were engaged and their survey responses show they enjoyed the lab and overall saw value in it. Additionally, the survey results and the teacher-led discussion show students felt they learned the skills the lab aimed to teach and that it would help them improve their assignments. Observations also showed students understood the topics covered and were capable of doing the tasks. The aim of creating a session that could be used for the WTI unit was successful as the WTI unit leader felt it was worth repeating in future. Interestingly there were no strongly disagree responses for any survey question further adding to the conclusion the lab was a success. However, it was only 1 short session with a small amount of students therefore to properly assess this approach a wider sample over multiple sessions would be advantageous. A future plan is to try the approach over multiple lessons for all students studying the WTI unit. This will provide a larger sample size, the ability to assess progress over a longer period including use of more complex assessment, and more results to allow for a deeper analysis to take place.

Ideally students should be given the opportunity to continue working on lab work after the lab session and be able to use it for revision. However, the website used for the case study lab was placed on a temporary server and was only available for

the week of the lab. This was due to the lab being a trial, a need to quickly create the server, and for it to be a stand-alone server due to the vulnerabilities in the website. A future improvement would be to investigate a more permanent solution to allow students to use the website anytime for task completion, revision and to practice hacking. Due to purposely making the website vulnerable to attack security will need to be considered and monitored carefully to avoid making the server itself vulnerable to attack. Also the server should be stand-alone/isolated in case its security is compromised.

## 8.0 Conclusion

As discussed teaching adults is complex with many different approaches that can be used with numerous advantages and disadvantages. Keeping students engaged and avoiding disengagement can be difficult with students' complex lives [2] and many distractions making the problem worse. However, choosing the right teaching approach for the current situation and content you are teaching can help significantly. This paper presented one such way to improve a teaching session by making the session vocationally relevant with examples that are more realistic to a work environment. This makes use of a variety of learning theories, primarily social learning theory, and an andragogical approach to appeal to adult learners; adults like to see the relevance of content they are learning and tend to be vocationally focused so the session appealed to their desires and learning styles.

Results were overall positive and show real potential for sessions like this, however it was only 1 short session with a small amount of students therefore to properly assess this approach a wider sample over multiple sessions would be advantageous; as discussed a future plan is to do this to provide a larger sample size, the ability to assess progress over a longer period including use of more complex assessment, and more results to allow for a deeper analysis to take place.

## 9.0 References

- 1 Salamonson Y, Andrew S, Everett B (2009). Academic engagement and disengagement as predictors of performance in pathophysiology among nursing students, *Contemporary Nurse* 32 (1 -2), 123–132.
- 2 Baron P & Corbin L (2012). Student engagement: rhetoric and reality, *Higher Education Research & Development* 31 (6), 759-772.
- 3 Massingham P & Herrington T (2006). Does Attendance Matter? An Examination of Student Attitudes, Participation, Performance and Attendance, *Journal of University Teaching & Learning Practice* 3 (2), 82-103.
- 4 Knowles M. S., Holton E. F., Swanson R. A., *The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development*, 7th edition. Elsevier 2011, ISBN 978-1-85-617811-2
- 5 Ahlfeldt S, Mehta S, Sellnow T (2005). Measurement and analysis of student engagement in university classes where varying levels of PBL methods of instruction were in use, *Higher Education Research and Development* 24 (1), 5–20.

- 6 Akey T.M. School context, student attitudes and behavior and academic achievement: An exploratory analysis, New York, 2006.
- 7 Harper S.R & Quaye S.J, Beyond sameness with engagement and outcomes for all: An introduction, Student engagement in higher education, pp1–15, New York, 2009.
- 8 Kuh, G.D (2003). What we're learning about student engagement from NSSE: Benchmarks for effective educational practices, *Change* 35 (2), 24–33.
- 9 Krause K.-L. Engaged, inert or otherwise occupied? Deconstructing the twenty-first century undergraduate student, James Cook University Symposium, pp21-22, Townsville, Queensland, Australia, 2005.
- 10 Little B, Locke W, Scesa, A, Williams R (2009). Report to HEFCE on student engagement. Retrieved 7th March 2016, from The Open University: <http://www.open.ac.uk/cheri/documents/student-engagement-report.pdf>
- 11 La Trobe University (2010). Australasian Survey of Student Engagement (AUSSE). Retrieved 7th March 2016, from <http://www.latrobe.edu.au/students/leadership-volunteering/speak-up/australasian-survey-of-student-engagement-ausse>
- 12 Schaufeli W.B, Martinez I.M., Pinto A.M., Salanova M, Bakker A.B. (2002). Burnout and engagement in university students: A cross-national study, *Journal of Cross-Cultural Psychology* 33 (5), 464–481.
- 13 Ryan J.F (2005). Institutional expenditures and student engagement: A role for financial resources in enhancing student learning and development?, *Research in Higher Education* 46 (2), 235–249.
- 14 Bryson C & Hand L (2007). The role of engagement in inspiring teaching and learning, *Innovations in Education and Teaching International* 44 (4), 349–362.
- 15 Booth T (2001). Learning environments, economic rationalism and criminal law: Towards quality teaching and learning outcomes, *University of Technology, Sydney, Review* 3 (1), 17–39.
- 16 Rodgers J.R. (2001). A Panel-Data Study of the Effect of Student Attendance on University Performance, *Australian Journal of Education* 45 (3), 284-295.
- 17 James R (2002). Students' Changing Expectations of Higher Education and the Consequences of Mismatches with the Reality, *Responding to Student Expectations* 1, 71-83.
- 18 O'Neill G & McMahon G (2005). Student-Centred Learning: What does it mean for students and lecturers?, *Emerging Issues in the Practice of University Learning and Teaching* 1, 27-36.
- 19 Gravells A & Simpson S. *Equality and Diversity in the Lifelong Learning Sector*, 1st ed. Learning Matters Ltd, 2009, ISBN 1844451976.
- 20 Gravells A. *Preparing to Teach in the Lifelong Learning Sector: The New Award*, 5th ed. Learning Matters Ltd, 2012, ISBN 0857257730.
- 21 Petty G. *Teaching Today: A Practical Guide*, 5th Edition. Oxford University Press, 2014, ISBN 1408523140.
- 22 Albinson P (2013). *Computing in Education: A study of computing in education and ways to enhance students' perceptions and understanding of computing*, Masters Thesis (MSc). Bournemouth University.