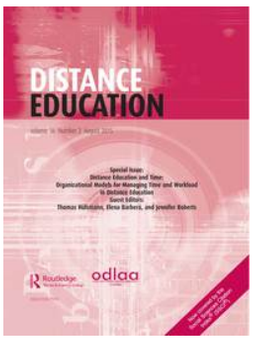

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Student workload: a case study of its significance, evaluation and management at the Open University

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Distance students are time poor and some drop out of their studies because they fall behind with coursework. This raises the issue of how course teams decide upon how many study hours should be included in a course. This article presents a number of Open University projects that have addressed student workload management and relates how learning design has incorporated these findings into advice for new module development. Moreover, the article also discusses how recent automatic feedback systems can motivate and support time-poor students when writing their assignments. This is an important finding as drop-out can occur when students are unable to devote the necessary time to their summative assessments and drop out of the learning process.

Keywords: assignment feedback; learning design; pedagogy; student-focused approaches; student workload; study time

Introduction

Student workload is a contentious issue and is viewed differently in face-to-face institutions where contact time is an agreed metric, while distance universities have chosen study hours as their yardstick. Whatever measure is used, there remains the perennial problem of circumscribing what should be taught and how long it should take the student to learn the key concepts in a given domain. There is no quick and easy solution to student workload issues. Some institutional practices may require change, coupled with the challenge of finding effective pedagogies for online teaching and assessment. This article therefore raises the following research questions:

- Can charting the findings from a collection of studies to address student workload at the Open University reveal how student *time on task* can be measured?
- What are the factors that impact on student study time as documented in the pedagogical literature?
- What practical initiatives undertaken recently at the Open University address these factors that impinge upon student workload?

A case study methodology (Gomm, Hammersley, & Foster, 2000) has been used to address these questions in order to create a narrative framework within which barriers and facilitators of student workload practice could be examined.

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The case study was an appropriate tool for this enquiry because it can:

> investigate a contemporary phenomenon within its real-life context especially when the boundaries between phenomenon and context are not clearly evident. (Yin, 2003, p. 13)

Understanding student workload relies on multiple sources of evidence and is not just a data collection point (Stoecker, 1991) or merely a solution in practice.

The procedures undertaken in this case study included desktop research into the history of student workload management projects at the Open University. A literature review of the salient factors that can impinge upon student workload management was analysed together with the research being undertaken at the Open University at the present time.

Background

Goodyear (2006) has referred to time as "strangely under-examined in the literature of elearning" (pp. 83–84). Researchers in distance education have more often focused on issues such as interaction and the possibilities enabled by computer-mediated communication (Anderson, Poelhuber, & McKerlich, 2010; Garrison, 1997; Vrasidas & Zembylas, 2003). However, there has been increasing public concern about the quality of the student experience, and the effectiveness of universities in terms of pass rates, retention and levels of student satisfaction. Such concerns are not recent phenomena for the Open University, which has for decades surveyed those who drop out of its courses, many of whom have identified time as a major influence on their decision to cease studying, as documented by Ashby (2004) and Thorpe (2006). Frequently a third or more of students who dropped out said that they fell behind with course work, or experienced unanticipated work or family pressures on their time. These experiences of study alongside the responsibilities of adulthood have typically been the most frequent reasons for dropping out cited by students. Although such responses may mask a host of other reactions to part-time study in adulthood, equally they cannot be ignored.

The question arises of how course teams decide how many study hours their courses should take. The main (though not only) determinant from the 1990s onwards has been to match what the higher education sector was perceived to be delivering. A figure of 10 h per credit awarded was then the accepted figure, leading to 600 h maximum for a 60-credit course (i.e., half a full-time year of 1200 h) and pro rata for smaller amounts of credit. Although we know of no source for this figure of 10 h per credit, it comes close to a calculation of what studying full time for 37 h a week over 30 weeks (then a typical semester size) would amount to, that is, 1110 h. However, face-to-face institutions seem not to have been driven by delivering a required number of teaching contact time in the way that the Open University has done.

Reports in *The Times Higher Education* over 2013/2014 have included concerns in the sector about falling study hours and also wide differences between subjects and between different institutions teaching the same subject. Acton (2013) reported that academics had become concerned in the 1990s about a perceived reduction in the amount of work required by comparison with earlier decades. The Higher Education Policy Institute conducted surveys in 2006 and 2007 which showed that the UK study time average had fallen to about 26 h a week. This was a measure of

overall study time not just contact hours, and Acton (Vice-Chancellor of East Anglia University) argues that quality time on task is a key measure of a high quality learning experience (Sastry & Bekhradnia, 2007). The Quality Assurance Agency (2011) produced a framework for explaining the role of contact time in students' learning and guidance for higher education institutions designed to help improve communication to students about contact hours in their subject of study.

Study time is of course difficult to measure accurately, and the data we have cannot be used to show a direct correlation between study hours and either exam success or quality of learning. However, the knowledge and skills required of present-day graduates have surely not decreased and the title of Acton's (2013) article reflects a common perception about learning: "you get out what you put in". Finding time to study for part-time students has always been challenging, and the goal has to be to maximise the quality of the learning that they feel they gain with each hour of their study time. With an open access system such as that in place at the Open University, students also differ in their starting points and in the amount of time that they need to meet the assessed learning outcomes. Ultimately, demonstrated achievement of learning outcomes is the key determinant of study success, not number of study hours spent. However, in the context of part-time and online or distance study, managing study time has often been perceived by students as a key factor in their ability to complete the course.

The Open University surveys its students about the quality of their experience, annually. Where students have reported excessive workload, the response of the Open University has taken a variety of forms. Course teams have reduced areas of their course content which have been identified as causing study overload. Assignments have been clarified so that students can develop their work with fewer queries and uncertainties. In addition to pragmatic responses of this kind, three other areas of action have been pursued: institutional action research, pedagogy research, and strategic development of course and learning design. Each of these will be described as tools for coming to understand and intervene in the study workload area.

Institutional action research

At the turn of the twenty-first century, the Open University launched a cross-university project on the subject of student retention. Regional action research made a strong contribution and focused on proactive student support. The approach was not focused on the amount of study but on the pacing of study and the key moments which focus student workload and decision-making: the submission of assignments, poor or low marks received for assignments, and attending the examination. Guidance to tutors has always included requests to contact students before submission of the first assignment, a key signal for whether students are on course or may be struggling or have even dropped out already. However, checks on tutor action found that not all tutors do contact all their students at this time. One region reported that two-thirds of their tutors did so, for example, and a fifth of tutors contacted half or fewer of their students at this time. Generally tutors were found to vary widely in their actions around contact and willingness to respond to initiatives targeting students not making positive progress. The response has been to put in place advisers in the regions who support the tutor's role by making contact with students directly, either when requested by a tutor or when the evidence of their non-submission of assignments suggests that contact and discussion with a supporter is required.

A new system of student support teams, introduced in 2014, includes this role as core to the student support service.

A second major cross-university project focused on the role of course design and the work of course teams. The Course Models Project 2003–2006 aimed to identify models in use in each faculty, from which more shared and effective models might be constructed. It came at a time when most new course teams were largely free to design their module as they saw fit, drawing on the expertise of their members and with specialist support from editors, media designers and librarians. New approaches to assessment or student support were more constrained by existing ways of doing things, but could also be adapted, sometimes significantly, to suit the needs of the course as perceived by the team. Superb courses might result from this craft process, but weaknesses could also be identified in terms of failure to learn from the experience of other course teams, inexperienced staff learning the hard way by making familiar errors, together with the view that a lack of templates of effective designs led to more costly and less effective teaching.

One of the challenges of undertaking such a project was to accommodate the diversity of pedagogical needs across Arts, Sciences, Technology, Health and Business teaching. The project team requested the Institute of Educational Technology to review the evidence from its annual course quality surveys of students, in order to see whether lessons could be learned about common pedagogical challenges. Student feedback is collected every year, and at the time, surveys focused on courses at a minimum of two points, often more, in their life. These surveys set students many questions about all aspects of their course, and also asked for an overall summary of their levels of satisfaction across 10 key performance indicators (KPIs). These performance indicators were generally showing high satisfaction, but a comparison of respondents who completed the course with the small number of respondents who completed the survey but did not complete the course (often by not taking the examination) showed marked differences in levels of satisfaction. These were anything up to 10% points lower across all the KPIs. But one of the most striking differences was feedback about study workload. For example, across Arts courses surveyed that year (2003), 40% of respondents who did not complete their course reported that time spent studying was a lot more than expected, in contrast to 25% for those who did complete their course. The average across all faculties on the same question showed that 37% of those responding to the survey who did not complete their course found study time a lot higher than expected by comparison with 25% of those who did complete their course.

Although these findings may change from year to year, it seems reasonable to assume that between a quarter and a third of students were likely to experience high student workload pressure. Although work and home pressures feed into the time challenges for students, the design and pacing of study tasks is a factor which course teams can take action on to improve the student experience. The Course Models project therefore used student workload as a tool that could be applied to course design across all faculties. While use of media, types of assignment, nature and types of study task are very different in different subject areas and levels of undergraduate study, all faculties use hours of study per week as a means of pacing study time and face the same challenge in terms of distributing study across the weeks, taking into account study level and known combinations of courses and qualifications that students may be undertaking.

Actions were taken to raise awareness of the importance of student workload and to refine the approach of course teams in this area. One change involved educating course teams about the realities of the student experience. Although course teams schedule study in terms of a maximum amount each week across the course duration, experienced teams know that students do not uniformly study in this way. Students may plan around known pressures of work or family, and try to get ahead before these pressures come in, or set times when they will catch up. In the week before an assignment deadline, students largely concentrate on getting their assignment completed, and if course teams set new work during this period, it is unlikely to get done, and thus creates the conditions in which students fall behind the study calendar. Because the course team creates a study calendar which sets tasks to start and finish on a week-by-week basis, they tended to assume that students would generally all be up to date. However, even successful students were often not exactly up to date and needed course teams to recognise this by designing the course in the light of study time realities.

The university introduced a new approach to study time management in a 2005 article which was accepted by the Learning and Teaching Board and by all faculties (Open University, 2005). Three core approaches to student workload were introduced. First, it was recognised that as courses proceed, students are often in a state of catching up rather than being exactly where the study calendar says they should be. Course teams were requested therefore to build in catch-up weeks, or review weeks, where little or no new material was set. This included the week in which an assignment deadline was set, where it is known that students' time is completely focused on completing the assignment to the best of their abilities.

Second, it was recognised that estimates of how much time tasks take to do can only ever be approximate—even where tasks are time-tested with students, though this should obviously provide much stronger evidence of likely real study time. Also, studying effectively requires activity that is not part of the course content and learning outcomes—setting up a new computer, sorting out breakdowns, using software, reading about how the Open University works, and so on. As a result, the university adopted a broad division between course-directed study time, and student-directed study time, in order to accommodate this reality. Some of the set hours (whether 600, 300 or whatever) could be set aside as student-directed study time, to provide flexibility for students around the business of completing a course successfully at a distance. Course teams might decide, for example, to set aside 10% of the designated hours as student-directed, leaving 90% as course-directed and therefore available for them to design the content and study activities to be achieved. The proportions allocated in this way are entirely within the course team and faculty to decide.

Third, a spreadsheet workload modeller was developed and disseminated across the university, as a tool that teams could use at any stage in the course life, including its production, in order to calculate and map the amount of time each component was expected to take to study. An Excel spreadsheet was used to provide a means for course teams to calculate the study time required by each item of course content, including media items where students might be watching and then undertaking study activities themselves, not purely reading. This requires the course team to estimate study time for such items and to input that time into the spreadsheet. Text-based content can be estimated using reading speeds, where 100 words per minute, for example, might be used for text that is considered easy to read, with 35 words per

minute for more difficult material. But the tool can also be modified to use any assumptions that the course team wishes, and has been modified to suit the requirements of, for example, mathematics and science courses. Some course teams have used the tool not only during production but also during course presentation to students, in order to help them identify exactly where a course perceived to be overloaded is creating the most problems for students, and therefore to find out more precisely which areas need improvement or reduction.

Pedagogical research

In addition to these practical strategies, research has explored pedagogies which influence the student experience and impact on study time. A study of the impact of online or computer-mediated interaction identified a wide range of student experiences arising from the many different forms of interaction that can be delivered using the Internet (Thorpe & Godwin, 2006). Interaction involves the idea of mutual influencing or reciprocity between two or more interactants. Wagner's (1994) definition, "interactions are reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutual influence one another" (p. 8), was used in a project which evaluated student response to a sample of 32 courses varying in the degree to which they used computer-mediated interaction and the extent to which this interaction was integrated within the course learning outcomes and assessment.

Interaction has been seen as core to education and successful learning (Laurillard, 2002) and an area of growing complexity as digital delivery of content and communication has enabled rich, synchronous, asynchronous and multi-sensory forms of study to be integrated with more familiar activities of reading and communicating. Researchers have therefore structured and categorised the nature of interaction and its key components. Moore's (1989) model of learner–content, learner–instructor and learner–learner modes has proved a robust framework for much research and practice (Bernard et al., 2009). Hirumi (2002) added learner-self-interaction as a first level onto which other forms of interaction can be built.

Key features of interaction identified in the literature include feedback and control. Feedback can occur in any of the modes of interaction, is a necessary condition for interaction (Berge, 2002; Borsook & Higginbotham-Wheat, 1991) and has been analysed in terms of its frequency, quality and quantity. Northrup (2002) undertook a study of 52 students studying an online master's in instructional technology, who rated timeliness of tutor response as more important than peer sharing and discussion. However, online peer discussion is often assumed to benefit higher order learning because it can support critical reflection on ideas and collaborative argumentation (Andriessen, Baker, & Suthers, 2003). Online environments set up to deliver this may be avoided by students because they fear they lack knowledge, may offend others by disagreeing or simply see the activity as too risky (Koschmann, 2003). Golanics and Nussbaum's research (2007) highlights that generating ground rules for the support of collaborative argumentation can also be time-consuming. Although they identified elaboration of discussion prompts as supporting more collaborative and balanced arguments, students with low starting knowledge tended to post late, and therefore had to read the extensive posts of more knowledgeable peers. The authors postulated that this increased cognitive overload:

> Such cognitive overload is a function of the cognitive affordances for reflection provided by asynchronous, computer-supported discussion, in interaction with individual knowledge levels. The computer environment imposed certain constraints … on how students processed information and how they participated in the discussions; it is unlikely that the same result would occur in face to face discussion. (p. 174)

Anderson (2003) addressed the familiar issue of the balance between interaction and independent learning in distance education and developed an equivalency theorem to guide thinking about interaction. He argued that high quality learning does not require all forms of interaction to be at a high level. Interpersonal interaction with a tutor, often the most valued, can be the most time and cost expensive, and it may be possible to trade off this aspect with other forms of interaction, such as interactive course materials or greater contact between peers. These forms of interaction may compensate for the absence of interaction with a tutor, for example. Online study now enables students to combine study on their own alongside communication with others, with whom they can work collaboratively, if that is part of the design. However, the implications for study workload are not neutral; reading forums or conferences itself adds time to study tasks, for example.

Research at the Open University has explored how students respond to new kinds of interaction as technology enables these to be introduced. The first uses of computer-mediated communication, for example, identified a common experience of mixed positive and negative effects. Most students found study less isolated, and many learned things from fellow students, but equally found reading conferences time-consuming and sometimes dispiriting (Thorpe, 1998). Kear (2001) undertook a study of the use of different conferencing systems and their effects on student discussion. While the content of discussions was not affected, a graphical user interface showing the structure and separation of discussion threads supported improved threading structure and usage. Isolated messages that are not threaded as part of the same discussion lead to perceptions of disorganisation and weaken students' ability to keep track of their discussion and participate effectively.

Later research into a stratified sample of courses representing most kinds of interaction in use during the first decade of the twenty-first century, identified the nature of the benefits in greater depth. Difficult concepts in science, where verbal explanations may not prove sufficient, could be effectively communicated by software showing visual or graphical models and processes. Time spent working through such content, where often the learner might interact with the representation in addition to reading and watching study material, proved time saving in terms of supporting improved understanding (Thorpe & Godwin, 2006).

Interaction with other students in online conferences, however, again showed very mixed effects. Conferences generated unpredictable amounts of added reading —hence could not be planned in the way that other aspects of course study can be planned. In order to contribute, students felt they had to read through a backlog of comments in online study forums. Student comments can help develop understanding but did not always clarify and could even be negative in impact, intentionally or otherwise. Confident remarks from students who were more knowledgeable or experienced can depress others. Furthermore, well-designed courses integrating high levels of online interaction generated high workload and time-constrained study tasks (Thorpe, 2008). Such designs require students to study in tightly defined time slots so that tasks can be done collaboratively, or in sequence where the end point can only be achieved by working through the earlier stages. Students can find this

more stressful than study, which is more directly under their personal control, as these extracts from student interviews indicate:

> Whilst thoroughly enjoying the content of this course, I find the restrictive timetable quite stressful. Conferences within specific dates, data collection, all go against the flexible ethos of OU study.

> While I like (the course) in general I find the workload overwhelming and having to do specific tasks at specified times can get in the way of trying to get ahead.

Time spent in conferences therefore requires two kinds of pedagogical expertise in order for it to make a positive contribution to study. First, course teams need insights into the kinds of activities and debates that will support students in achieving course learning outcomes. General exhortations to simply discuss issues are rarely enough. Second, where online groups have tutors, these staff need to watch conference process and make sure it proceeds in the best interests of all. Well-designed activities are extremely important and can reduce the need for skilled moderation, but the ability to intervene quickly when required is always necessary. The Open University in 2013/2014 requested all faculties to review their strategy for forum usage on its courses, providing examples of approaches developed on courses in different faculties. Most of these examples had amended their strategies after student feedback on their experience and often reduced the scale of activities and study time specified.

However, new forms of interaction and new media continue to be introduced, presenting new teaching scenarios for practitioners keen to innovate and use technologies that may be unfamiliar to at least some of their students. If possible, we need to find ways of using study time even more economically in order to create some space for new approaches that may be more time consuming, at least initially. Second, we need to continue to support course teams in the challenging practice of designing effective learning environments. The Open University has two new areas of action that address these two challenges from different viewpoints.

Strategic development of assignment feedback and learning design

Assignment feedback

Research into providing students with timely and automatic feedback on their assignments has been investigated. Preparing for summative assignments can increase student workload. This is certainly the case when Open University students return to study after some time in the workforce, and a significant period of time has passed since their last experience of writing academic essays. It is not surprising that many find this task difficult, and at times overwhelming, with respect to the amount of time and effort that is required and they may leave their course (Simpson, 2003). With this in mind, Van Labeke, Whitelock, Field, Pulman, and Richardson (2013) created a system known as OpenEssayist that can go some way to meeting these needs (http://www.open.ac.uk/researchprojects/safesea/). OpenEssayist is a software tool that analyses texts. When student essays are uploaded to it, the system provides feedback to the student through key phrase extraction and extractive summarisation. Key phrase extraction identifies which individual words or short phrases are the most suggestive of the content of an essay, while extractive summarisation essentially identifies whole key sentences which are key to the structure of the essay.

Based on these extractive processes, the system then presents the users with feedback on their writing in a number of different ways, including identification of the essay's most prominent words with graphical illustration of their use across the essay: identification of the essay's most representative sentences, with hints encouraging the user to reflect on whether these key sentences express, in their view, the central ideas of the essay.

The OpenEssayist analytical engine works by unsupervised graph-based ranking algorithms after Milhalcea and Tarau (2004) to automatically extract key words, phrases and sentences from students' essays (Figure 1).

OpenEssayist was used during the assignment work for the Open University master's module, H817 Openness and Innovation in eLearning in the 2013/2014 academic year.

Data were collected about the student use of OpenEssayist on H817 assignments, and these showed a correlation between students' grades and the number of drafts they submitted to OpenEssayist. The positive correlation, which was significant, occurred between use of OpenEssayist and grade awarded ($r = +.41$).

The cohort of students who had access to OpenEssayist also achieved significantly higher course grades than the previous year's students who did not have access to such supportive tools. However, what do these findings mean for student workload and management? Student interviews reveal that the system has altered the way they approach essay writing in terms of structuring and making arguments effectively. They said their grades had improved and they did not feel so alone or unsupported when drafting their tutor-marked assignments.

The students who used OpenEssayist during the drafting process were not only using the system to improve their work, but it was also supporting them to believe

Figure 1. Screen dump from OpenEssayist illustrating a dispersion graph of key words throughout an essay.

that they can improve their academic work and continue to study successfully. Thus, while their study time was not reduced initially, use of OpenEssayist supported productive use of study time and ensured that students developed successful assignments.

Improving assignment feedback

Students need to be able to act upon tutor feedback from one assignment to another and receive advice about how to improve upon their last assignment. Whitelock (2011) referred to this modus operandi as "advice for action" (p. 323). If this is achieved in a satisfactory manner, then student perception of increased workload should decrease when completing assignments. However, one of the problems with tutor feedback to students is that a balanced combination of socio-emotive and cognitive support is required from the teaching staff, and the feedback needs to be relevant to the assigned grade.

One approach taken by Whitelock and Watt (2007) was to build an electronic tool to support tutors with the feedback process, it is known as Open Mentor. It was designed as a training tool for tutors and allows them to also track their use of feedback to students.

Open Mentor is based on Bales (1950) interactional categories, which provide four main categories of interaction: positive reactions, negative reactions, questions and answers. These interactional categories illustrate the balance of socio-emotional comments that support the student. We found that tutors use different types of questions in different ways, both to stimulate reflection, and to point out, in a supportive way, that there are problems with parts of an essay. These results show that about half of Bales' interaction categories strongly correlated with grade of assessment in different ways, while others were rarely used in feedback to learners. This evidence of systematic connections between different types of tutor comments and level of attainment in assessment was the driver for the software development.

Open Mentor has also been used by King's College London and Southampton University (Recio Saucedo et al., 2013), again for training purposes with tutors. Supporting meaningful feedback to students has again been recognised by these universities as a way to ease the cognitive burden on students and support improvement.

Learning design

A second area of action has been to introduce an integrated learning design approach to qualification and module development. The term learning design refers to the processes involved in designing and developing activities and experiences to support intended learning outcomes. The Institute of Educational Technology at the Open University has introduced an approach which supports a consistent, structured design, specification and review process. This approach engages faculties in workshops where they discuss their design ideas and use a set of tools and resources that enable a student-activity–based approach to the development of courses. The tools help teams in defining their pedagogic approach and choosing and integrating an effective range of media and technologies, and they enable sharing of good practice across the university.

Table 1. Learning design taxonomy.

	Assimilative	Finding and handling information	Communication	Productive	Experiential	Interactive/ Adaptive	Assessment
Type of activity	Attending to information	Searching for and processing information	Discussing module related content with at least one other person (student or tutor)	Actively constructing an artefact	Applying learning in a real-world setting	Applying learning in a simulated setting	All forms of assessment, whether continuous, end of module, or formative (assessment for learning)
Examples of activity	Read, watch, listen, think about, access, observe, review, study	List, analyse, collate, plot, find, discover, access, use, gather, order, classify, select, assess, manipulate	Communicate, debate, discuss, argue, share, report, collaborate, present, describe, question	Create, build, make, design, construct, contribute, complete, produce, write, draw, refine, compose, synthesise, remix	Practice, apply, mimic, experience, explore, investigate, perform, engage	Explore, experiment, trial, improve, model, simulate	Write, present, report, demonstrate, critique

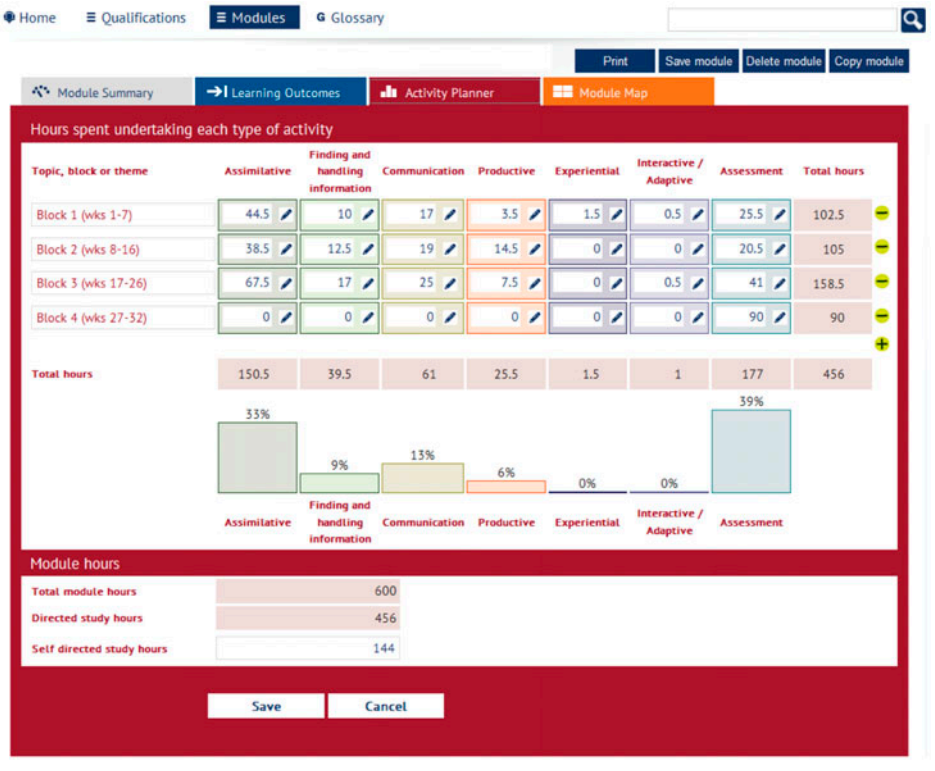

Figure 2. Screen dump from the university's learning design activity planner tool showing the balance of student activity through an introductory master's level module (*x*).

One of these tools captures descriptions of student activity through courses using a graphical learning design view called the *activity planner*. The activity planner captures both the types of activity that students engage in to learn and the amount of time they spend. It uses a taxonomy of student activity types developed by Conole, Dyke, Oliver, and Seale (2004) as detailed in Table 1.

Planned student activity can be viewed at an individual module level or combined to show a view of student activity types across a series of linked modules. The examples show the balance of student activity in the core introductory module of the university's Master in Online and Distance Education (Figure 2) and how the balance of activity in modules changes as students move towards increasingly independent and practice-based learning through the qualification (Figure 3).

The activity planner supports practitioners in maintaining a focus on student workload through the design and approval process, and in thinking critically, creatively and strategically about how to make best use of course-directed study time. For example, as was discussed earlier, collaborative forum activities might facilitate deeper, more contextualised learning but are time intensive, so are likely to be more appropriate at some points in the learning process than others.

Once approved, these design descriptions of student workload are then captured by university systems. This means that student activity information can be more consistently captured and compared across the university curriculum, and it is

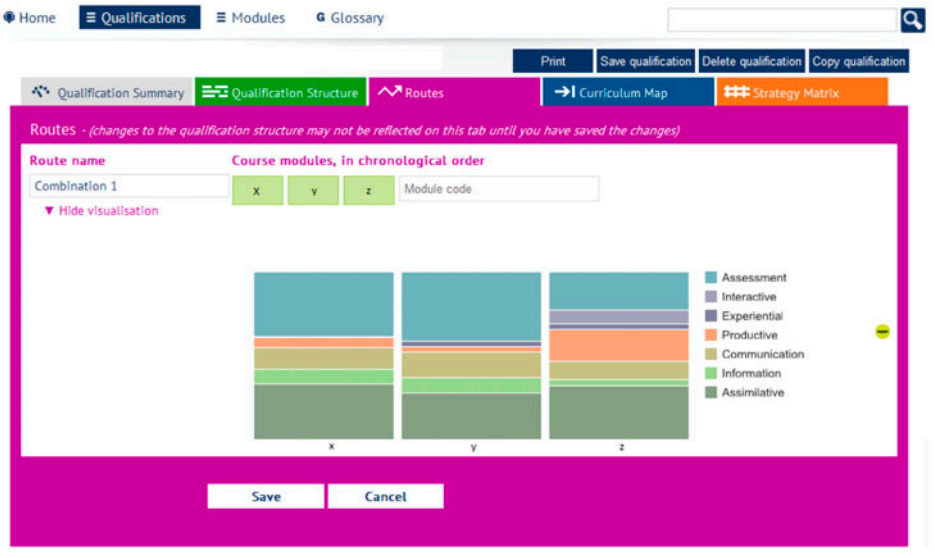

Figure 3. Screen dump from the university's learning design activity planner tool showing the balance of student activity across three modules (*x*, *y*, *z*) of a master's qualification.

becoming possible to interrogate the combined activity, feedback and outcome data in more sophisticated ways—for example, by using multivariate as well as descriptive techniques—providing a much more robust set of analytics. This will help the university to close the loop in terms of testing learning design and student outcome hypotheses on a macro scale and informing learning design practices as well as retrospectively evaluating them. For example, it will be possible to explore the relationship between student perceptions of their ability to manage their study workload and actual directed study times, and how far this relationship is influenced by the balance of activity types they are asked to engage in through a module.

Conclusion

Student workload is an integral element in how courses are designed and supported, and how they are experienced by students (Kember, Ng, Tse, & Wong, 1996). While it is notoriously difficult to separate out, the projects undertaken at the Open University have illustrated that a workload metric is difficult to derive but well-constructed KPIs can reveal how workload is experienced by students. About a quarter to a third of students were likely to experience high student workload pressure. Empirical data reveal the study schedule of students does not match the uniform pattern presented by the course team, and more flexible, student-focused approaches have been introduced. A workload modeller tool was developed and adopted by course teams to calculate the study time required by study tasks and resources. This has proved useful both in course production and presentation when used in conjunction with student feedback data.

With respect to the second research question, the pedagogies which influence the student experience and impact on study time include online or computer-mediated interaction. However, one of the barriers to successful interaction is that of cognitive

overload. Computer conferencing can increase workload if poorly structured or designed without careful integration alongside other core study activities. Careful design and pacing of study time however can deliver the benefits of online interaction without overloading students.

The more recent practical initiatives undertaken at the Open University, such as the introduction of OpenEssayist to support students writing their assignments before they are submitted for final marking, have shown that students who use the system do better and have altered their work practices. OpenEssayist usage gave the students an understanding of the structure of a good essay. This activity might be time consuming to begin with, but later becomes a transferrable skill, which eventually saves time and produces higher marks for the students. New learning design tools have been introduced to support course teams in maintaining focus on student activity and workload throughout the design and implementation process.

The introduction of new forms of interaction with new media which are continually introduced at the Open University merit further investigation since we need to find more pedagogically proficient ways of employing students' study time more economically when designing new learning environments for distance learning students. Interaction is valued as core to learning but more research is needed into student perceptions about the kinds of interaction they find helpful at different stages of their study. Qualitative studies of how students approach study tasks and how they manage workload would also support improved strategies for course design and student support.

This case study has provided possible ways of managing study time which offer support to both course teams and to students to help them ensure that time spent studying is as productive and effective as possible. However, study workload will always be challenging. Technologies are not in a steady state, and continuous change introduces new possibilities with unpredictable effects on workload. The tools we have developed offer a way of maintaining a focus on workload and taking action to refine courses in production and presentation, to better support students and ensure that their study time is used as effectively as possible.

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