Cape Peninsula University of Technology

THE TIME THAT DESIGN STUDENTS SPEND ON IN- AND OUT-OF-CLASS LEARNING ACTIVITIES AT A HIGHER EDUCATION INSTITUTION IN CAPE TOWN

By

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Declaration

I, Carike Abrahamse, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

Abstract

Student workload is measured by the time it takes to complete the learning activities. This study determines the workload of Design students by determining the time spent on in- and out-of-class learning activities of a Design course at a higher education institution in Cape Town. The Design learning process typically engages students in several of the following learning activities: problem solving; research and development of ideas; and the mastering of various skills relating to visual communication. These afore-mentioned activities span the duration of a design project crossing the boundaries between subjects. The teaching of Design occurs in various locations such as the design studio and site visits. It therefore becomes difficult to unpack the time spent on in- and out-of-class learning activities for the purposes of workload calculations as prescribed and defined by higher education institutions and educational policies worldwide.

Workload is a significant variable in the curriculum and is of importance in the quality of the teaching and learning process in higher education. An analysis of the literature determined that student workload could be viewed as objective workload (notional hours), the perceived/estimated hours worked (as highlighted in student course experience surveys) or the actual hours reported over a period of time. The resulting discussions focused on the comparability of students' workload to the expected notional hours and grades. Thus far none of the previous studies considered time allocation or the workload of the Design student or Design education. Can it be assumed that notional hours apply to all subject fields and therefore, the time allocated to in- and out-of-class learning activities should be equal as well? A timesheet diary was used to determine the time spent on learning activities. The population consisted of Interior Design students. Participants indicated what they were doing in the class as well as the amount of time spent on learning activities outside of timetabled hours.

This study determined that the time reported for text-based subjects aligned with the notional hours and timetabled hours. On the other hand, a drawing-related subject – because of project-based learning and individual crits – is allocated more timetable hours, which does not align with the notional hours. The contact time thus appears to be high in comparison to the notional hours and results in an overloaded timetable (28hrs). However, it was found that the individual average for in-class time (14hrs 54min) reported by the participants aligns with the notional hours. Further analysis of the reported time revealed that class duration should be considered in the light of the teaching methods. In addition the

average workload in this study of 53hrs 7 min per week exceeds the notional 40 hours per week. The average workload was compared to the participant's term results, the notional 40-hours, and the 50% required for passing a subject. This revealed that participants whose workload exceeded 40 hours were likely to pass. This supports the notion that provision should be made in the curriculum to afford students the time to meet the learning outcomes. However, due to the small sample available the impact of workload on student retention and student success could not be determined.

Keywords

Actual hours, Design students, notional hours, objective workload, student workload, subjective workload

Acknowledgements

I acknowledge that the initial idea for this research came from Roux Rossouw and our paper for DDR 2011 titled "One Size Fits All? Student workload in a Higher Education Faculty", which focused on the disparity in contact time in the faculty. Since then, the effect of Design students' workload on their well-being and the lack of available research to remedy the current situation became my quest.

I thank:

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Dedication

I dedicate this to all the Design students who have endured an all-nighter,

past, present, and future:

May you learn the value of time and manage time wisely

For a day is like a thousand years and a thousand years like a day.

What you do in a day, can last a thousand years.

Make every day and every design count!

Table of contents

List of Appendices

List of Figures

List of Tables

Terminology

The following list clarifies terms used in this study:

Course: Depending on the country and educational institution, a course is a unit of teaching which varies in length of time. After completion of a course, students are awarded academic credits.

Credits: The indicator of the volume of learning required by a student for the completion of a subject or qualification. It is the currency used in higher education institutions to measure learning equivalence.

Crit: In the field of Architecture and Interior Design the term 'crit' refers to the feedback and critique sessions between lecturer and student. Orr, Blythman and Blair (2007: 1) describes the crit as "*studio based formative or summative feedback in a small or large group situation with students and lecturers*."

Design education: Refers to the education of Design students. Capitals were used as design is used as a noun to describe a field of study and not as a verb.

Design student: A Design student is a student who is enrolled in a course that will enable him/her to become a designer.

In-class and out-of-class: In-class refers to the time spent or learning activities that take place in class/studio. This includes contact time and working independently during the allocated timetabled hours. Any learning activities that occurs outside of the allocated time or outside of the class/studio are thus 'out-of-class'. These terms resonates with the culture of the Design studio.

A variety of terms are used in the literature to indicate time spent depending on specific nuances of field of study, i.e. *Academic Learning Time (ALT); contact time; class time; time on task; study time; individual study time; time-use; time allocation; off-time; teaching time; time spent*

Less and few(er): In the case of time, which cannot be counted, the accepted practice is to use "less time" or "fewer hours". In reference to a specific number of hours, "few or fewer hours worked than…" is accepted practice. Nevertheless, in the case of hours in relation to mathematics and statistics, the determiner "less" is best practice and was applied.

Notional hours: The estimated number of hours it takes an average learner to achieve the expected learning outcomes

Programme: A purposeful and structured set of learning experiences that leads to a qualification. A programme has recognised entry and exit points. (Department of Education, 2007: 6)

Qualification: The formal recognition and certification of learning achievement awarded by an accredited institution (Department of Education, 2007: 6)

Workload: The term 'workload' in this study refers to the time a student spends on all forms of learning activities.

Acronyms

CATS	Credit Accumulation Transfer System
CEQ	Course Experience Questionnaire
CESM	Classification of Educational Subject Matter
CHE	Council on Higher Education (in South Africa)
CLAR	Crédito Latina Americano de Referencia
CPUT	Cape Peninsula University of Technology
ECTS	European Credit Transfer and Accumulation System
HEQF	Higher Education Qualifications Framework
HEQSF	Higher Education Qualifications Sub Framework
NSSE	National Survey of Student Engagement
NUS	National Union of Students
SAQA	South African Qualifications Authority
SASSE	South African Survey of Student Engagement
SCQF	Scottish Credit and Qualifications Framework
WPM	Words-per-minute

Chapter 1 Setting the Scene

"My favourite things in life don't cost any money.

It's really clear that the most precious resource we all have is time."

Steve Jobs 1955 -2011

1.1. Introduction

This thesis describes research that was undertaken to determine the time that Design students spend on in- and out-of-class learning activities at a higher education institution in Cape Town. The research is relevant to Design education because specific workload data are required to assist lecturers and administration to assign venues, staff, and funding.

The research follows on previous workload studies that focused on students in traditional university environments and engaged in conventional teaching and learning activities. The concept of workload is critically reviewed throughout this study as quality assurance agencies address student workload as a generalisation. Traditional workload studies hitherto have refrained from addressing the situation at vocational training institutes such as a university of technology, and in particular, the student workload in a Design course. The unique contribution of this research is towards the understanding of student workload in general and to the understanding of Design students' workload in Design education in particular.

Chapter 1 will introduce the concept of student workload and the challenges noted within the field of education around student workload. The impact, and relevance, to Design education will be established.

1.2. Background to the research problem

The mastering of concepts and skills requires time. In order to achieve the learning outcomes of a module, students should be allocated sufficient time to complete the learning activities. In higher education, time allocation is based on the assigned credits. This complex relationship between the volume of learning and time is called workload. If students have a heavy workload, it will influence their approach to learning and consequently their results. One would hope that a student engages with the content in order to develop a deeper understanding of it and the ability to apply it in the various contexts of the world of work rather than a surface approach, which results in rote learning. Thus "time is an essential prerequisite for learning" (Karjalainen, Alha & Jutila, 2006: 6).

Student workload comprises the time it takes to complete the learning activities. The ECTS (European Credit Transfer and Accumulation System) Users' Guide defines workload as "the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study, and examinations) required to achieve the expected

learning outcomes" (European Commision, 2009: 11). According to Kember (2004: 165) workload can be interpreted as the sum of the total number of hours worked. This includes the number of contact hours and time spent on independent study. This resonates with the Higher Education Qualification Framework (HEQF) (Department of Education, 2007: 6).

In higher education, credits account for the volume of learning achieved by estimating the amount of time required by the average learner, at a particular level, to achieve the outcomes. In other words, credits are a measure of the time it typically takes to complete the learning activities and is synonymous with workload. Credits are indicative of study time and notional hours, though they are independent of the mode of delivery, whereas level descriptors provide the guidelines for varying levels of complexity (Department of Education, 2007: 8–11).

Credits are the currency of learning used to assign value for the purposes of student workload, funding, credit accumulation, and transference internationally and nationally (Bekhradnia, 2004; CQFW, 2009: 32; European Commision, 2009: 11; CHE, 2013: 11). The use of credits or a Credit Accumulation and Transfer Scheme (CATS) is a standardised approach to enable students to transfer between institutions and qualifications. This concept and similar definitions of credits or CATS points are found in the literature and policies pertaining to credit systems, such as ECTS (European Commision, 2009), Scottish Credit and Qualifications Framework (SCQF) (SCQF, 2015: 1) and the Higher Education Qualifications Framework (HEQF) of South Africa. Although worldwide the concept of credits is recognised to be the volume of learning, variations of notional hours exist in specific contexts. These variations will be explored further in the literature review.

The South African Qualifications Authority, SAQA, (2000: 23) refers to notional hours of learning as the conceived amount of learning time it takes the average learner to complete the learning outcomes. Learning outcomes have replaced the traditional way of looking at course content as a deliverable package. Jenkins and Unwin (1996: 1) define a learning outcome as a "statement of what is expected that the student will be able to do as a result of the learning activity." The term 'learning outcomes,' addresses not only the knowledge but also the skills and attitudes of a course.

The concept of notional hours, according to SAQA (2000: 23), equates to 10 hours of study for every credit. Notional hours comprise all the activities students engage in to meet the learning outcomes, for example, completing assignments, writing formal assessments and

preparing for classes. According to Kilfoil (2015: 1) the 'rule of thumb' suggests that for every hour of contact time a student should be spending two hours studying. An academic year equates to 1200 notional hours or 120 credits (Department of Education, 2007: 8). Given that a week comprises 40 hours for work, the length of the academic year is considered to be 30 weeks in which the learning outcomes are to be met. Hence, most contact institutions allocate between 12 to 15 hours of contact time corresponding to the field and level of the course. This is not unique to higher education in South Africa – Nonis, Philhours and Hudson (2006: 121), Kolari, Savander-Ranne and Viskari (2008: 485), Tampakis and Vitoratos (2009: 2) and Hanson, Drumheller, Mallard, McKee and Schegel (2011: 23) report on a similar time allocation on the basis of the rule of thumb in America, United Kingdom and European universities.

Credits are at the centre of the development of a workload model. Bekhradnia (2004: 28) and Wagenaar (2015: 1) advocate that once the workload model is implemented, student surveys on course experience and engagement can be used as a benchmark. Further development is then recommended for individual courses, especially where vocational subjects are concerned (Bekhradnia, 2004: 28). Considering that Design education falls under vocational training, the development of workload models requires in-depth exploration of the field.

Along with the inception of the Bologna Process and the ECTS, a workgroup was establish to facilitate the adoption of the ECTS as a credit system in higher education across the members of the European Union. This project, titled 'Tuning Educational Structures in Europe' establish the Tuning approach to address the calculation of student workload (Gonzalez & Wagenaar, 2006). According to the Tuning approach (Gonzalez & Wagenaar, 2006), it is necessary to identify the types of learning activities and the estimated amount of time required for the activities in order to achieve the learning outcomes. Gonzalez and Wagenaar (2006) define educational activities according to the following aspects:

- **Modes of instruction**[1]**:** (types of teaching and learning activities): lecture, seminar, research seminar, exercise course, practical, laboratory work, guided personal study, tutorial, independent studies, internship, placement or 'stage', fieldwork, project work, etc.

[1] *Bekhradnia* (2004: 45) *uses the term 'types of course' instead of 'modes of instruction'*

- **Types of learning activities:** attending lectures, performing specific assignments, practising technical or laboratory skills, writing papers, independent and private study, reading books and papers, learning how to give constructive criticism of the work of others, chairing meetings, etc.
- **Types of assessment:** oral examination, written examination, oral presentation, test, paper/essay, portfolio, report about internship, report on fieldwork, continuous assessment, (final) thesis/dissertation, etc.

In most instances, student workload is based on the estimated time it would take to complete educational activities. Chambers (1992) and Lockwood (2005) suggest time allocation based on words-per-minute (WPM) calculations, taking into account the readability of learning materials. Learning activities for Design students typically involve non-textual elements which negate the use of time allocation based on textual elements as discussed in Chambers (1992), Lockwood (2005) and Karjalianen *et al*. (2006). Both Chambers and Lockwood admit that non-textual components pose a problem for workload calculation. There is a dearth of workload studies considering project based learning and non-textual learning activities. Further investigation into the time that Design students spend on learning activities requires supplementary information regarding modes of instruction, learning activities and assessments. Kilfoil (2015: 1) poses the problem: Can "the average student really spends 120 notional hours on a twelve-credit module in a semester system if the way we plan the learning facilitation and assessment do not oblige him/her to do so?" Therefore, it is the aim of this present study to determine how much of their time Design students spend on drawing activities, written components and attending studio sessions in comparison to the notional hours.

A number of workload studies have been published regarding the assessment of workload. Based on the review of the literature, four categories were distinguished:

- Actual time spent on activities (Nonis *et al.*, 2006; Hanson *et al.*, 2011)
- Students' perceptions of workload (Kember & Leung, 1998; Dee, 2007; Kyndt, Dochy, Struyven & Cascallar, 2011)
- Models for calculating workload (Gonzalez & Wagenaar, 2006; Karjalainen *et al.*, 2006; Malisa & Komenda, 2011; Bowyer, 2012)
- Estimated time for allocating workload (Chambers, 1992; Garg, Vijayshre & Panda, 1992; Lockwood, 2005)

Despite the fact that the assessment of student workload is frequently covered in educational literature, it has gone unnoticed in Design education. In the field of Architecture, Bachman and Bachman (2006) considered the effects of high workload on students by examining the expectations of lecturers and comparing these to the amount of time which students actually spend engaging in learning activities. By distinguishing between theory and practical subjects, the nuances of the learning environment of the architectural student are examined. Bachman and Bachman's (2006) study forms an integral part of the rationale for more exploration into the workload of an Design student.

According to Meng and Heijke (2005: 2) the learning environment, as well as the different types of academic learning activities and modes of delivery, should be taken into account when considering the rule of thumb concerning study time allocation for traditional universities and other higher education institutions. Their research compares the differences in reported student workload in learning environments where the teacher is seen as the main source of information as opposed to where project- and problem-based learning are the predominant mode of instruction. Their findings compare data collected from a variety of higher education institutions and lead to the conclusion that an average of four additional hours per week is spent in class at vocational training institutions. Therefore, instead of the average 13 to 15 hours per week in class at a university, students at technical or vocational institutions are spending between 20 to 22 hours in class (Meng & Heijke, 2005:18). A similar trend was noticed within the faculty at CPUT, where student timetables indicate that contact time varies between theoretical (text based) and practical (drawing based or non-textual) courses (Rossouw & Abrahamse, 2011).

Based on the credit allocation and the calculation of notional hours, the Design courses are in a crisis: allocated contact times exceed the norm set out by SAQA (Rossouw & Abrahamse, 2011). Does it infer that Design students have a higher than average workload or does it indicate that Design students do not have enough time to spend on independent learning activities? In our study regarding the variations in timetables in a Design faculty, Rossouw and Abrahamse (2011) discussed the impact of modes of instruction in relation to theoretical and practical subjects on student workload in Design courses. Recommendations from this study suggest that a deeper exploration into the specifics of contact time for Design students should be undertaken.

The position of Design education at a university of technology creates a unique context for the investigation of workload:

The merger of universities and former technikons in South Africa caused qualifications, previously offered only at these institutions respectively, to be brought together in a curriculum bouquet (Botha in Bitzer, 2009:164). Since the aforementioned transformation of higher education, Design courses are not only situated in universities of technology but also form part of the programme qualification mix of the larger traditional universities. Higher education transformation not only meant the physical restructuring and the changing of names but, with several qualification types to contend with, the establishment of a new Higher Education Qualification Framework (HEQF) was promulgated (Department of Education, 2007). The purpose of a single qualifications framework would be to align all higher education qualifications. The implementation of the HEQF will facilitate the positioning of the various qualification types in relation to one another, as well as assist with articulation and credit accumulation. According to Botha (Bitzer, 2009: 164) there is an overwhelming need to consider how credit can be given for work completed for one type of programme towards another type.

Since the introduction of the HEQF in 2007, several institutions voiced their concerns. In a reply to these concerns, the South African Council on Higher Education (CHE) (2011:12) illuminated certain general assumptions about credits and notional hours in the review of the HEQF:

> The assumption of 1 credit equalling ten notional hours appears to be well accepted and embedded. Less well shared is a common understanding of how such credits are calculated, which activities are included in such notional hours, or that notional hours are to be understood as the total learning time from the average student's perspective. Also not always well understood is the relationship of credit to real time, although this is articulated in the current HEQF. This needs to be better clarified.

In this regard, this study aims to investigate this relationship of credits and notional hours in relation to time spent on learning activities in a Design programme at a higher education institute in Cape Town.

With consideration to the complexity of the variety of learning environments in South Africa, Du Pré (2010: 9–13) explains the nuances of a university qualification in comparison to those

of a university of technology. In a university of technology, the focus shifts from the study of a particular field of knowledge to the study of "technology from the viewpoint of various fields of study" (Du Pré, 2010: 10). Du Pré (2010: 9) also elucidates technology as:

> …the effective and efficient application of the accumulated know-how, knowledge, skills and expertise that, when applied, will result in the output of value-added products, processes and services. In essence, it is the know-how to fabricate things, which includes creating and developing new technologies.

Among the primary concerns of a university of technology is the development of vocational and professional qualifications alongside the fact that technological capabilities are as vitally important as cognitive skills (Brook, 2000, in Du Pré, 2010: 10). Consequently, Design education fits into a university of technology domain rather than into that of a traditional university. The teaching of technology implies an understanding of a subject in its real world setting. Du Pré (2010: 11 – 13) explains this latter concept by using the example of the development of a jet engine:

> The Ph.D. candidate from a university will be engaged in advancing mankind's knowledge by thinking about some of the unsolved challenges relating to space travel – in other words, philosophising until one hits on a new and uncharted piece of knowledge that needs resolution. So, the Ph.D. will investigate the mathematics of how to send a spacecraft to another star, but the Ph.D. does not actually know how to make the spacecraft. This is where the Doctor of Technology candidate at a university of technology comes into the picture: the one who will apply the findings of the Ph.D. candidate and design, build and get the spaceship to its destination.

Another facet of the learning environment at a university of technology is equipping students with an understanding of the real world. Universities of technology serve as a simulation of the world of work. In Design education, the studio and project-based learning activities emulate the Design studio of the world of work. Students are provided with a range of knowledge that stems from a theoretical underpinning and has a practical application. Bachman and Bachman (2006:272) explain the nuances of the studio through a historical overview of the development of Architecture education. In South Africa, a similar model for Design education is applied. As with any vocational training, the approach emphasises that the student should be ready for work upon graduation.

This study deals with Design education situated in a university of technology, which implies the learning environment, and the learning activities are different from those of a traditional

university. The teaching and learning of knowledge are reinforced through practical application, which means that the student is engaging in not only the study of theory but also the acquisition of skills during the academic year. This learning environment creates an especially difficult context for workload calculation as the separation between practical skills, knowledge and theory integration results in learning activities that are not necessarily textual in nature. As stated previously, in courses that rely on text-based components for delivery, learning and assessment can refer to WPM methods for allocation of time, whereas Design courses may only partially contain textual learning and outcomes. Notional time, or rather, the 'rule of thumb' for contact time, would have to be adapted to take into account a wider variety of learning activities.

1.3. The context of Interior Design education

It was suggested in the previous section that Design education and Design learning activities might infer a different workload to that of the average student. This brief description of the learning environment of the Design student provides a background to contextualise the research problem presented. Kember, Charlesworth, Davies, McKay and Stott (1994) described the Design course purely from an education background to analyse students' approaches to learning and the relationship to workload. None of the other workload studies reviewed explored this relationship. Kember *et al*. (1994:148) describe curriculum characteristics of a design course as follows:

> …the curriculum is project based to emphasize the inter-relation of theoretical and practical design elements, and to create a flexible framework for individual discoveries. Projects are devised to pose problems, to identify topics for research, or to define materials and processes for exploration. Each project is a new situation in which the individual student identifies resources, methodologies for solving problems and originates ideas to be articulated verbally and visually… projects form a flexible framework to structure and integrate the separate components of design studies, while at the same time encouraging variety and performing a diagnostic process.

Based on the continuous assessment of practical work, the flexible framework and the type of study material of a Design course, which does not lend itself to conventional patterns of revising or rote learning, Kember *et al.* (1994: 149) proclaim "the course goals are clearly consistent with a deep approach". Although Kember *et al*. wrote these words 20 years ago, the manner in which Design students are assessed continues to be based on practical design

projects, supported by research to identify possible solutions (Koch, Schwennsen, Dutton & Smith, 2002; Hoadley & Cox, 2008; Lee, 2009; Dutton, 2011). Hoadley and Cox (Hoadley & Cox, 2008) examined how design knowledge is transferred and discuss two principles that are universal in design education: firstly, "good design is iterative", and secondly, "iterations only help if some feedback is used to improve the design for the next iteration". The individuality and originality of the solutions precludes any attempts to follow a surface approach. At that time, Kember *et al.*'s study did not investigate how this affects the workload of the student: "the Design course is not the main subject matter of this article" (Kember *et al.*, 1994: 149).

In order to clarify the context of this particular study several distinguishing features and characteristics of the studio, project-based learning and the crit are highlighted:

1.3.1. The studio - the learning environment

Numerous researchers address the aspects and the value of the studio in Design education (Carbone & Sheard, 2002; Duggan, 2004; Salama & Wilkinsan, 2007; Salmon, 2011; Smith & Smith, 2012: 92). According to Goldschmidt, Hochman and Dafni (2010: 285) and Duggan (2004: 70), the design studio is regarded as a working space in which Design students acquire design skills and knowledge, a space where work is generated, reviewed, displayed and stored. In the studio, students learn while doing. Students present their work (drawings, images, or diagrams) to either their peers or the lecturer for discussion.

Currently studio culture is diminishing and spaces are underutilised. According to Duggan (2004: 72), as institutions have become increasingly "aware of the economic effectiveness" of their facilities, the amount of studio space and the number of staff are under threat. Studio teaching methods are seen as "resource-hungry", while students complain of "poor storage facilities for their work and belongings, inadequate or non-existent technology provision, insufficient pin-up space, poor atmosphere and lack of companionship"; spaces and furniture are "often in a bad state of repair" (Duggan, 2004: 72). The collaborative working environment that was synonymous with Design and Architecture are disappearing rapidly. One-on-one teaching and the large spaces needed for studios have costly financial implications for institutions. Reports indicate that time allocation per student has decreased to as little as one, maximum two, 20-minute individual tutorial sessions per week (Swann, 2002; Duggan, 2004). The studio is rapidly being reduced to a slot in the timetable and a

meeting place. This study will explore the duration of the time spent in the studio, and whether it corresponds to the allocation resources on the timetable.

1.3.2. Project-based learning

According to Lee (2009), the term 'project-based learning' has not been widely used. Students learn through projects as is typical of practice-based education (Lee, 2009: 541). Design exercises or assessments are called 'projects' (Goldschmidt *et al.*, 2010: 285). This term is borrowed from professional practice. As in practice, the project is described in a 'brief'. The design brief describes the design problem, and expected learning outcomes. Lee (2009: 542-560) distinguishes six project types in Design education which range from small 10-minute activities to 12-week long projects. The emphasis is on authentic learning and inquiry-based learning. Aspects of project-based learning resemble elements of problem-based learning however, design projects pose ill-defined or wicked problems to the students: "…wherein every solution and partial solution must cater concurrently to several design consideration" (Goldschmidt *et al.*, 2010: 287), and the design project dictates the learning activities and outcomes of a combination of subjects. Thus far only Bachman and Bachman (2006) and Kingsland (1996) consider the effect problem-based learning has on the workload of Architecture students with reference to project-based learning.

1.3.3. The 'crit'

Orr, Blythman and Blair (2007: 1) explored the meaning of the 'crit' and defined the crit as "studio based formative or summative feedback in a small or large group situation with students and lecturers." Although their definition is different to that of the dictionary – crit as the short form for criticism, critic or critique (YourDictionary, 2015) – it describes the communication between the student and lecturer. This resonates with Goldschmidt, Hochman and Dafni (2010: 285) whom discuss several types of crits: during the project, such as "one-on-one crits", "group crits", and lastly, upon submission of the project. According to Goldschmidt, Hochman and Dafni (2010: 285) a crit typically lasts between 15 and 30 minutes. Students report on the progress of their design project and describe developments since the previous crit. At this time, the lecturer (or peers) may ask for clarification and the subsequent discussion is seen as a learning opportunity. Students may attach negative connotations to a crit, according to Piotrowski (2011: 8). Koch *et al*. (2002: 21) consider the effects and role of critics in Design education, from peers, tutors, lecturers to the critique from the assessment panel. Since this particular study is concerned with the

quantitative data, the only concerns are regarding frequency and duration of crits. In the timesheet diary and the interviews, the term 'crit' refers to the type of activity that students and lecturers engage in.

1.3.4. The position of Interior Design in the field

In South Africa as per the Classification of Educational Subject Matter (CESM) (2008), an Interior Design programme can either be registered under the Architecture and the Built Environment CESM 02 (2008: 48) or Visual and Performing Arts CESM 03 (2008: 51). Student engagement surveys often distinguish between CESM categories, i.e. Architecture and the Built Environment or Arts, rather than a particular course. Since Interior Design has dual CESM categories, the assessment of workload may benefit other courses as well. Although workload studies have been published in the field of Engineering or Architecture and the Built Environment, there is certainly a link between the design process followed by engineers, architects, and interior designers. This is noticeable in project-based learning where the projects are designed to simulate the world of work. By consulting Dubberly's Compendium of Design Models (Dubberly, 2004) and comparing the different design processes used in the profession and used in education, the Interior Design discipline draws on the artistic and aesthetic expression provided by art. The practical and functionality aspects draw on the technology expertise from engineering and architectural fields as illustrated in Figure 1.1.

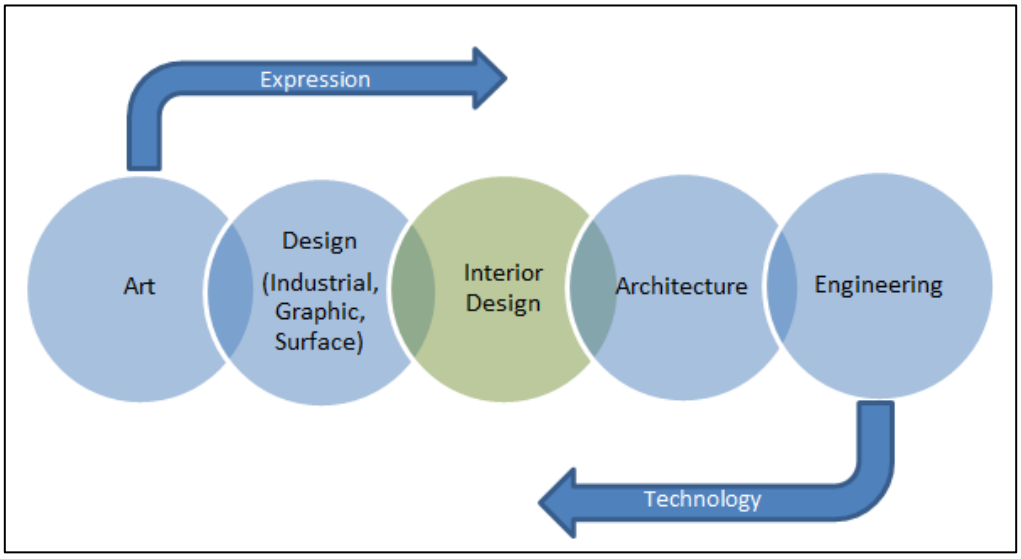


Figure 1.1 The Interior Design discipline draws knowledge and skills from various disciplines

A workload study of Interior Design students is unique and can be useful to a multitude of similar disciplines such as other design course and architecture.

1.4. Rationale

Previous workload studies established several reasons for assessing a student's workload. According to Bachman and Bachman (2006: 277), the amount of time students are required to work has psychological effects on students. Sleep deprivation affects their ability to function optimally and leads to anxiety and stress. Researchers have found a relationship between workload and approaches to learning: A perceived high workload or inappropriate workload positively relates to a surface approach to learning (Wilson, Lizzio & Ramsden, 1997; Kember & Leung, 1998; Kember, 2004; Kyndt *et al.*, 2011). Workload is one of the top four factors which influence students' perceptions of their learning environment (Ramsden, 1991; Strydom & Mentz, 2010; GfK Finance, 2011).

It is, therefore, that Karjalainen *et al*. (2006: 7) state that "time is an essential prerequisite for learning to take place" and Bachman and Bachman (2006: 275), among others, note time allocation for contact time and independent learning should be carefully considered. The purpose of workload calculations is to ensure that students will have enough time for high quality learning (Karjalainen *et al*., 2006: 7) and to enhance optimal performance levels (Bachman & Bachman, 2006: 275).

However, in the Design field, there is a dearth of information with which to estimate the amount of time it takes a student to complete his/her projects. Koch *et al*. (2002: 8) state that "the nature of studio coursework is time consuming, therefore it is essential to examine the critical aspect of time". Although their report outlines the hard work and dedication required from architecture students, it fails to examine the workload critically. Can design students do what we expect from them in the given amount of time? Are we expecting more of the students than is possible within a given period? Are we setting them up for an unbalanced lifestyle?

An analysis of methods for assessing student workload is required to create a suitable instrument to provide the data to determine the time design student spent on completing learning activities.

1.5. Research problem

Workload calculations for students take into account the amount of time, which the average student spends, on learning activities. These activities can be measured based on words-per-minute models. Such calculations do not work in the case of Design education where a significant part of the course is based on practical work. Investigations into the type of learning activities, which are primarily based on the design process, are required. In conjunction with an analysis of the type of learning activities, the time spent on these learning activities has to be considered for workload calculations with regard to Design students.

1.6. Research paradigm

This study follows a positivist approach, which is suitable for a quantitative method of assessing to assess student workload. Numerous studies rely on students' perception of workload to gain insight into the relationship between the psychological or physiological effects of workload or learning methodologies and workload. However, this study is aimed at discovering the actual amount of time that students spent working on in- and out-of-class learning activities in order to address time allocation; therefore, it is an objective look at the quantitative data collected. This is not about what the student believes to be real or what the policy makers believe to be true. It is aimed at discovering the actual amount of time and not a perception of time spent. The methods employed ensured that there is distance between the subjective biases of the researcher and the subjective biases of the participants.

1.7. Aim of the research

The aim of this research is to determine the amount of time a Design student spends on learning activities in- and out-of-class in order to calculate the workload of a Design student.

1.8. Research questions

In order to achieve the aim of the research, the following two questions have been formulated:

1. How much time do Design students spend on in- and out-of-class learning activities?
2. In what learning activities do Design students engage?

1.9. Objectives

More specifically, the objectives of the research are:

1. to determine the time a student spends on learning activities in- and out-of-class in order:
    - to investigate the relationship between the average time spent per week (workload) and the notional hours, and whether there is a link between the average time allocated for each subject and the rule of thumb for contact time based on the notional hours;
    - to determine the average time spent on in- and out-of-class learning activities reported per subject and the relationship to the class duration reported per subject;
    - to investigate the relationship between student workload and the average term mark. Are students able to complete the learning activities successfully within the available time?
2. to determine the various learning activities in which Design students engage:
    - How much time do students spend on drawing-related learning activities in comparison to text-based learning activities and assessments? This might infer that, owing to the portion of text-based learning activities, words-per-minute calculations have limited application in a Design program at a University of Technology.

1.10. Assumptions

This study is based on several assumptions:

- It is assumed that a Design student's workload with regard to notional hours differs from that of students in other fields of study because of the nature of the learning activities of Design education.
- It is assumed that, although design courses differ in content, knowledge and skills, the teaching pedagogy is similar and the design studio is at the centre of learning activities. This is evident in Design research where the description of the studio, the crit, and project-based learning correlate among the various fields of design study.

- Furthermore, it is assumed that visual representation is regarded as a product; therefore, the process of creating it is not focused upon. This study does not attempt to differentiate between work done by hand and work done by computer.
- It is assumed that the sample size of the South African Survey of Student Engagement (SASSE) report and its findings are not adequate as a benchmark for the workload of Design students because it does not provide a breakdown of time spent per faculty or per course but rather per institution.

1.11. Research methods

1.11.1. Research design

This study adopted a descriptive, quantitative research approach (Leedy & Ormrod, 2005: 179) which explored existing phenomena in an attempt to investigate the current situation of time spent on learning activities. Interior Design students completed a timesheet diary over a period of four weeks – during the third term in 2014 and the third term 2015 – indicating the time that they spent on learning activities in and out of class. The period was selected to coincide with the length of a design project to determine the average time spent per week.

According to Iida, Shrout, Laurenceau and Bolger (2012: 278), the advantage of diary methods is an increase in ecological validity because participants are temporarily close to the experience under investigation. This reduces retrospection bias that is associated with survey design. Bolger, Davis and Rafaeli (2003: 580) describe this as a "reduction in the likelihood of retrospection achieved by minimizing the amount of time elapsed between an experience and the account of the experience". When retrospective bias is limited, the data yielded by a diary become more reliable.

The advantages of diary methods allow for the examination of the data in the following categories as described by Iida *et al*. (2012: 278) and Bolger *et al*. (2003: 579):

a) obtaining reliable person-level information, which indicates the average experiences of an individual and how much the experiences vary over time,
b) obtaining estimates of changes within persons over time, which may indicate systematic change in experiences across days, and whether such trajectories differ across persons,

c) conducting a casual analysis of changes within persons and individual differences in these changes; looking at what processes underlie a person's changes and how people differ in this process.

Based on the quantitative data obtained from the timesheet diary and the objectives of the study which focus on time spent on learning activities to determine averages rather than the individual student' experiences, the examination of the data aligns with category a) and b), and not c).

This study investigates the time that students spend on learning activities, which indicates that this is an event-contingent study in which participants report only their time spent on learning activities, and nothing else has to be reported upon (Bolger *et al.*, 2003: 587). Event-based diaries should provide participants with clear definitions as to the events to be recorded (Bolger *et al.*, 2003: 591). The disadvantage is the possibility of confusion as to whether the event should be reported upon, and under which predefined classification. This creates participant burden and the risk that a given event may not be recorded. To avoid confusion, the list of activities were predetermined and explained to the students. For clarification of the list of activities, and the terms used, nine participants and two lecturers were interviewed. This was done after the conclusion of the academic 2014 year to provide context and to ensure the reliability of the timesheet diary. According to Kember (2004: 169) the addition of interviews after diary collection provides a holistic view of workload as in-depth aspects can be analysed and scrutinised.

In the definition of workload, notional hours apply to the successful achievement of the outcomes. This indicates that there may be a correlation between the hours worked and the marks. After the analysis of the diaries, the average hours worked per week were compared to the students' results.

1.11.2. Research instrument

The timesheet diary was developed to simulate the timesheet, which designers complete in the profession. A seven-day week template was provided with a letter of consent to be completed. The first page included instructions on how to complete and return the timesheet diary. Students were requested to complete the diary for a period of four weeks. They were asked to indicate only time spent on academic-related activities which were provided.

1.11.3. Sampling

For the purposes of collecting time-expended data, a convenience sample of Interior Design students was selected. Second and third year students were selected in order to maintain objectivity. During the two years that the study was conducted, the researcher was teaching in first year, one level below the two levels that participated.

1.11.4. Research process

The strategic timing of data collection in workload studies is important. In this scenario, the third term was chosen. Third-year students would be back from their internship period and would have resumed normal workload. During their internship period, students were required to keep a logbook and the timesheet therefore would be familiar to them. During the third term the second year, students submit budgets for the subject, Professional Design Practice, and a timesheet exercise would be beneficial to highlight the value of reporting time to the employer. Since the aim of the research is to establish the variety of learning activities in the sequence and timing of occurrence within the framework of a design project, a period of four weeks was decided upon.

Following the advice of Nulty (2008: 303), frequent messages were sent via sms to all the students as a reminder to complete the timesheet and to email it, once completed, to a specific address. At the end of the four weeks, data were organised chronologically. Interviews were scheduled for the end of the 2014 academic year to verify the learning activities list in the timesheet diary.

Since it is a relatively small convenience sample, the timesheet diary was done two years in a row, during the same time in the academic calendar, to ensure the reliability of the instrument. By cross-referencing entries with class registers and interviews with lecturers, the data were triangulated to ensure the validity of the results.

Participants were informed that their reports might be used for research purposes and that their participation was voluntary and would not influence their marks negatively. To ensure anonymity no personal data were collected and all participating students were assigned a code to obscure their identity.

1.11.5. Analysis and interpretation of data

Participants completed the timesheet diary in Excel on a template. Once the data were cleaned, and validated, all entries were collated into a singular spreadsheet for further analysis:

Time spent:

Pivot tables were used to calculate the total time participants spent on in- and out-of-class learning activities. The average time thus spent by each group was calculated and the averages of the various groups were then compared. The timetables and credit information for the various subjects were used to calculate notional hours. The time spent on learning activities was compared to the notional hours and the timetabled time. The variations between these were explained by calculating the duration of time individual participants spend in class.

The relationship between average time spent and results:

There are two ways to monitor whether the amount of time allocated was adequate: Does it resonate with the notional hours (objective workload), and were students able to complete successfully the learning outcomes? Data for 2014 and 2015 were compared to determine whether there is a correlation between time spent by a student and their end of term results.

Learning activities:

Data saturation was achieved within a few responses. The quantity of responses allowed for the triangulation of the events. Since several students worked on the same project, it was possible to determine the learning activities within the studio and outside of class. By triangulating the responses with the attendance register, verification of the events that took place was established. Learning activities were arranged according to subjects, in- and out-of-class occurrences, time spent and whether the listed activities involved drawings or text. Terminology used in the context of the studio environment was derived from informal interviews with participants and lecturers to distinguish between drawing and text-based learning activities in Design education.

1.12. Limitations of the study

Because the learning activities relates to a specific Design field – Interior Design in this instance – only a small sample of participants is available. Therefore, the impact of workload on retention rates and students success could not be determined.

In general, when using an event-based diary as a method for collecting data, saturation occurs within the small sample. Homogeneous answers were expected, since participants were enrolled for the same subjects and follow the same timetable. However, in the Design studio, participants may report different learning activities occurring at the same time (heterogeneous). Although this limits the usefulness of the data for other Design programs, it will likely increase the reliability of the timesheet diary as a tool for similar studies to follow.

Mindful of participant burden, the diary entries were limited to academic activities. Location of where activities occurred was not requested; neither the methods nor the media used for visual presentations. It is not the aim of this study to replicate existing research on the use of CAD (computer aided drawing) versus drawing by hand (Bilda & Demirkan, 2003).

Mature students were selected instead of first-year students based on the similarity of subjects in the second and third years of study thus permitting the comparison of workload between these groups. There is a shift in the syllabus from generic skills acquired in the first year of study to field-specific knowledge in the second and third years.

This study takes a quantitative look at workload. It does not take into consideration the students' perceptions of workload, which would necessitate additional qualitative data regarding their perception of the workload. The purpose of the interviews was to determine the type of learning activities and the associated terms used in the context of the Design studio. Therefore, the interviews were not analysed concerning students' opinion of the course, learning styles, time management or their workload.

Lastly, because of ethical considerations and the effect that observing and timing the students while they work would have on the results, it was decided that their account of the events, triangulated among them, the attendance registers and the word of the lecturers would be sufficient data.

1.13. Potential contributions of the study

With the restructuring of qualifications, based on the HEQSF, and the rationalisation of programmes, the allocation of credits and timetables are being reconsidered. In terms of volume of learning Design education is dealing with a variety of unknowns, such as the learning activities, modes of instruction, and assessment practices, which are not adequately defined in educational terms. According to Lee (2009: 541), the literature on project-based methods of education from both a Design education perspective, as well as from the broader

educational community perspective, is underdeveloped. This limits Design educators' ability to participate in broader educational discussions and to influence policy (Lee, 2009: 541).

It is the objective of this study to contribute to the body of knowledge regarding the calculation of student workload in Design education by determining the time spent on in- and out-of-class learning activities.

1.14. Outline of the thesis

Chapter 1 describes workload calculation in the context of education. It highlights the problem that Design educators face when attempting to determine student workload based on the rule of thumb for notional hours.

Chapter 2 discusses the origins of the 40-hour week, credit allocation and the calculation of notional hours in order to provide the parameters for academic workload. The chapter then analyses previous workload studies, various student course experience surveys and workload models to determine whether the workload of Design students were addressed. Particularly the existing methods for determining workload are analysed to justify the specific methods chosen to determine the time Design students spend on learning activities. The chapter concludes with a conceptual framework for assessing student workload.

Chapter 3 describes the methods used for the collection of data to support the aims of this study. The design of the timesheet diary is explained in terms of the supporting research. The chapter further explains the analysis of the timesheet diaries, the equations used to calculate the average time spent notional hours per week and the method followed for calculating class duration. The learning activities were arranged in order of the number of reported instances.

Chapter 4 discusses the findings, focusing primarily on a summary of the data collected in the timesheet diary. The findings are organised according to the research questions and the conceptual framework. This shows the comparison of actual hours reported in comparison to the objective workload, as set out per notional hours and the time allocation on the timetable. The disjuncture between objective workload and the reported hours are discussed. Class duration in comparison to the individual time participants are investigated and clarified. In addition to the objectives of this present study, it was discovered that the average time spent per week per subject aligns with the design process: design development followed by design technology and presentation of the project. Furthermore, the learning activities reported aligns with the assumptions that in this particular design course

participants spend the largest portion of their time on drawing-related activities as appose to text-based learning activities.

Chapter 5 presents concluding remarks and recommendations to address workload assessment in higher education institutions, in particular in Design courses.

1.15. Conclusion

This chapter introduced the concepts concerning student workload, notional hours, design education and the rationale for workload studies in Design Education. A research process for answering the question concerning the time spent by interior design students within the studio and outside of teaching hours is proposed. Although the findings are limited to a relatively small population of design students, it may create an awareness of the role of workload in higher education, especially in the creative industries. This thesis may ultimately lay the foundation for more research into student workload that may lead to a better understanding of the unique challenges students face in universities of technologies.

Chapter 2 Review of the Literature

"*Achievement is maximized if time spent increases to the point where it equals the amount of time actually needed to learn*"

(Carroll's 1963 model, in Gijselaers and Schmidt 1995, 185)

2.1. Introduction

This literature review aims to expose the lack of information regarding the calculation and assessment of student's workload in the field of Design Education. In order to assess a student's workload, clarity concerning notional hour calculation, learning activities and actual time on task is required.

The aim of the research is to determine the time a Design student spends on learning activities. As a starting point, this section firstly determines the context of workload; the origin of the 40-hour workweek and credits; the purpose of credits in relation to student workload through investigating current international and local educational practice and policy to clarify objective workload.

From there, methods for assessing of student workload will be analysed i.e. actual time, perceived and estimated time; sampling i.e. number of participants and field; instruments i.e. diaries, Likert scale questions, interviews; and findings i.e. hours spent in- and out-of -class.

Furthermore, various student experience surveys at national and institutional level will be analysed in terms of students' workload. The formulation of workload models, that involve learning activities and time on task, are identified and discussed.

The last part of the literature review will discuss the development of a conceptual framework for the assessment of student workload.

The review of the literature follows the structure used by Hellsten (2012) to compare several sources (books, articles, seminars) regarding time management to identify common threads. Also the thematic approach used by Garrouste (2010) to compile a contextual database, provided insight regarding the use of tables to cover several years of literature.

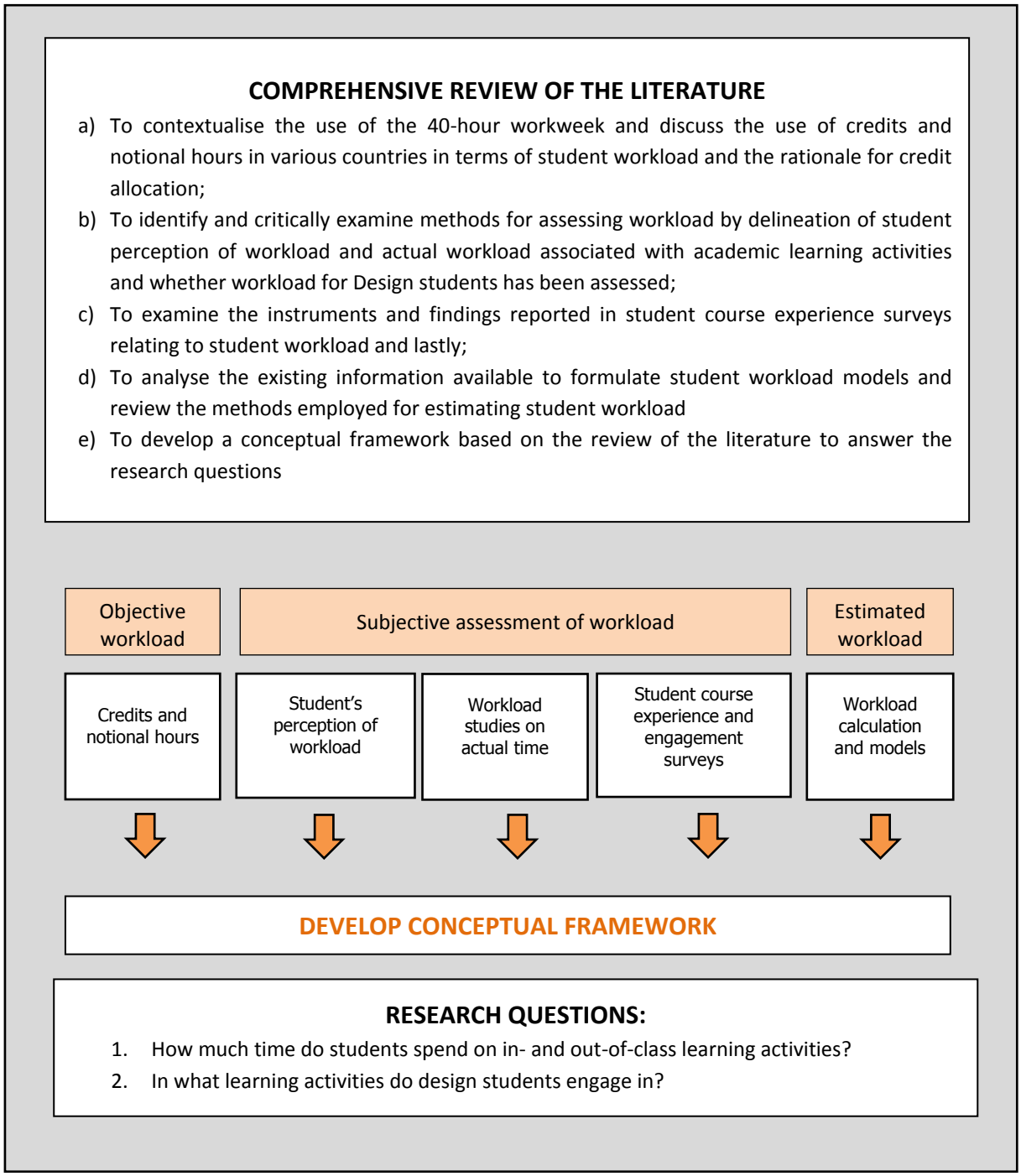


Figure 2.1Outline of the Literature Review

2.2. Purpose

The purpose of this comprehensive review is to examine existing published literature relating to the assessment of student workload. More specifically, the purposes of this chapter are:

(a) to contextualise the use of the 40-hour workweek and discuss the use of credits and notional hours in various countries in terms of student workload and the rationale for credit allocation;
(b) to identify and critically examine methods for assessing workload by delineation of student perception of workload and actual workload associated with academic learning activities and whether workload for Design students has been assessed;
(c) to examine the instruments and findings reported in student course experience surveys relating to student workload;
(d) to analyse the existing information available to formulate student workload models and review the methods employed for estimating student workload, and lastly,
(e) to develop a conceptual framework based on the review of the literature to answer the research questions.

2.3. Methods

In order to structure this chapter, a framework for discussing the literature was developed as seen in Figure 2.1. First, in order to describe the background and current context for student workload, literature regarding educational frameworks was consulted, focusing on the use of credits to determine notional hours. Secondly, literature regarding the assessment of student workload was reviewed, including student course experience surveys and workload models for calculating workload. Lastly, based on the findings, a conceptual framework was developed to answer the research questions.

Articles on student workload were located using online database searches (e.g. ProQuest Education, Eric, EBSCOhost, and Google Scholar.) and a manual review of references in these articles was cross-referenced to locate additional sources. Keywords used in the search included 'higher education', 'student workload', 'credits', 'notional hours', 'Design education', 'academic workload', 'time on learning activities', 'time-use', 'time management', 'workload models', 'educational framework', 'qualification framework', 'student course experience surveys', 'actual workload', 'perceived workload' and 'student diaries'. Since many of the keywords on their own yielded thousands of results, key authors, such as Chambers (1992)

and Kember (Kember *et al.*, 1994; Kember & Leung, 1998; Kember, 2004), were identified to determine the relevance of the research in relation to the assessment of student workload.

Based on a broad overview of the literature, the following Venn diagram (Figure 2.2) was developed to illustrate the approximate extent of the research regarding student workload and how closely the topics are related to each other.

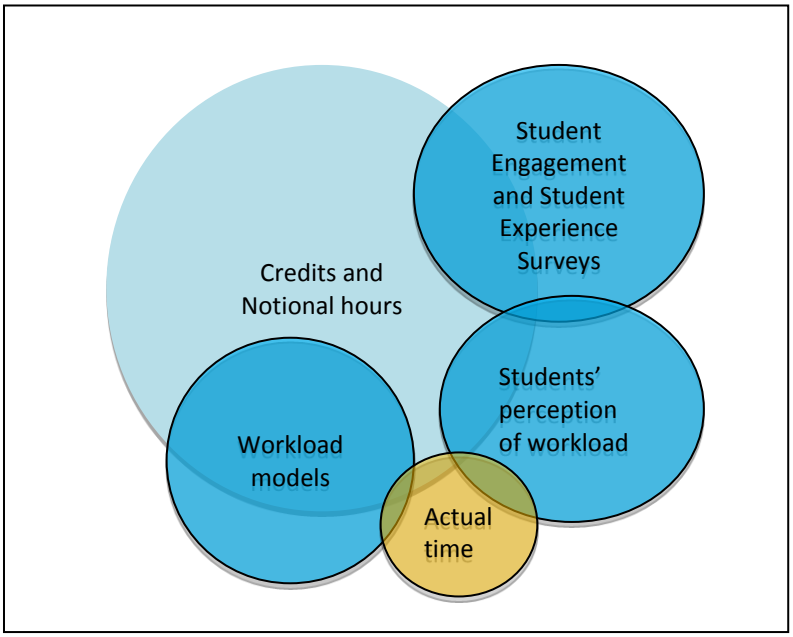


Figure 2.2 Position of this study in the literature

Each circle in Figure 2.2 shows the approximate standing of the research into student workload: There is an abundance of information available relating to educational frameworks, credit and notional hours, followed by a substantial amount of research dedicated to student engagement surveys and relevant reports. There is a vast amount of research concerning students' perception of their workload followed by investigations into workload models. Studies, such as the present investigation into the actual time students spend, are limited.

To establish whether workload for Design students has been determined either in policy, workload models, or through surveys or diary methods, this literature review will focus on all contexts of workload in published literature and policies.

2.4. The context of student workload

In order to discuss student workload, a brief overview of world events regarding workload in general is necessary.

2.4.1. The origin of the 40-hour work week

During the eighteenth century, the Industrial Revolution transformed the lives of many. People of all ages were expected to work long hours in factories where conditions of work were unregulated and consequently affected health, welfare and morale (Arts Victoria, 2015: 1). Education for the poor consisted primarily of Sunday school and a few "schools of industry" that provided elementary instruction (Gillard, 2011). The 1800s were characteristic of long hours of labour and workers demanding better working hours and better living conditions. Robert Owen, (1771 - 1858) a British socialist and wealthy factory owner, introduced reforms in education and factory conditions to improve the quality of life of many (Miliband, 1954: 235). Nevertheless, it took several years for Owen's socialist ideals to be introduced into the labour laws known today. It is unclear by whom or where the first eight-hour workday or 40-hour week was implemented. Several accounts trace the Eight Hour Movement or 40-hour workweek back to Owen (Miliband, 1954: 234), the Stonemasons of Melbourne strike in 1856 (Arts Victoria, 2015: 1) and to 1926 when Henry Ford implemented shorter working hours for higher wages (History, 2015). According to Rosenzweig (1983: 1) "Eight Hours of Work, Eight Hours for Rest, Eight Hours for What We Will" appeared on banners for the Eight Hour Movement in the late 1889. Arts Victoria (2015: 1) claims that it was Owen who coined the phrase "eight hours of labour, eight hours of rest, eight hours of recreation". Green's (2007) account of the First Labour Movement and the subsequent riots in Chicago on 4 May 1886 suggests these events are the origins of International Labour Day celebrations which are celebrated yearly on 1 May.

Today, the 40-hour[2] workweek is well-established and regulated by law, as seen in South Africa's Labour Law (Department of Labour, 2014: 25). As notional hours suggest, students should also work for 40 hours a week. This is in line with national and international trends regarding the workweek.

[2] A 45 hour workweek includes one hour lunch a day thus a total of 40 hours for work

2.4.2. The origin and purpose of credits in higher education

During the past hundred years the continued use of credits in higher education has persisted: from a measure for the purposes of funding (Bekhradnia, 2004); a measure of the volume of learning (Department of Education, 2007; SCQF, 2015); an indication of academic time (Wellman, 2005; Department of Education, 2007) and more recently to facilitate student transfer between higher education institutions (Department of Education, 2007; European Commision, 2009). Where did credits originate?

With the societal changes that occurred in the early nineteen hundreds, and the availability of government funding for primary and secondary schools, many more citizens had access to education and subsequently higher education (Gillard, 2011). With an increase in students eligible for higher education, additional funding for further education became a concern. Private foundations, such as the Carnegie Foundation, became providers of funding (Wellman, 2005). It is speculated that the original use of credits in education derived from administrative purposes to accredit students for the purposes of entering higher education (Shedd, 2003; Wellman, 2005). Although it is unclear when credits for the purposes of funding were implemented, the Carnegie Foundation is regarded as the first to use credits as a measure of student time in order to award funds to faculty members (Wellman, 2005: 20).

Modularisation can be traced back to 1869 when Harvard University introduced the elective system to replace the set curriculum (Dochy, Wagemans & De Wolf, 1989: 9). In time, this necessitated a measurement system to quantify learning towards obtaining a degree. To this end, classroom contact hours were used as an indication and thus emerged the use of a credit system to quantify learning (Dochy *et al.*, 1989: 9). Nowadays credit systems accommodate a variety of approaches to learning beyond modularisation: from contact to distance learning, online learning and the recognition of prior learning including life credits.

According to Bekhradnia (2004: 32) the use of credit accumulation and transfer systems (CATS) originated in North America to facilitate students transferring between colleges and universities. The use of credits for the purposes of transfer between institutions negates a common understanding of qualifications under a singular framework.

In Europe, the increase in international students and employment mobility due to the creation of the European Union was cause for the development of a unified credit transfer system (Biggs and Tang 2011, 8). To this end, the European Ministers of Education came

together on 19 June 1999 to discuss the challenges of higher education. They signed a joint declaration known as the "Bologna Declaration" (Van der Wende, 2000: 305).

According to Bekhradnia (2004: 1), the Bologna Process, following the implementation of the Bologna Declaration, aims to harmonise the European higher education systems. Van der Wende (2000: 305 – 306) summarises its objectives as

- the adoption of a system of easily readable and comparable degrees on under- and postgraduate level;
- the adoption of a credit accumulation and transfer system (CATS);
- the establishment of a system of credits, i.e. the European Credit Transfer System (ECTS);
- to promote mobility and access, in order to further lifelong learning;
- to promote quality assurance and enhancement of qualifications.

South Africa (with the implementation of the HEQSF) have engaged in similar re-structuring activities with the aim to "improve the coherence of the education system and facilitate the articulation of qualifications, thereby enhancing the flexibility of the system and enabling students to move more efficiently over time from one programme to another…"(DHET 2007:3).

Developments, such as the Bologna Process and the adoption of the ECTS, renewed a focus on student workload. European universities alike are required to align their credits with those set out by the ECTS (Van der Wende, 2000; European Commision, 2009; Tampakis & Vitoratos, 2009). According to Biggs and Tang (2011: 8), in order to meet this objective, each country operates a quality assurance agency to ensure that institutions, programmes and qualifications follow adopted policies and participate in regular programme reviews. This practice provides assurance that quality and accountability are being achieved. Similarly, in South Africa, it is the role of SAQA to ensure that qualifications meet the appropriate criteria as determined by the Minister of Education and are internationally comparable (CHE, 2015). However, with only one South African Survey of Student Engagement (SASSE) project's results, it would be difficult to establish whether there is a consistent misalignment between what SAQA discloses as notional hours, and the hours reported by the students.

The project, Tuning Educational Structures in Europe, stems from the Bologna Declaration and is designed as an independent, university-driven project (Wagenaar 1999: 223). More than a 100 higher education institutions in the European Union and European Economic Area

actively participate in the project. The European Commission co-financed the project (Pouyioutas, Gjermundrod & Dionysiou, 2012: 136). According to the website the name 'Tuning' was chosen for the project to reflect the idea that universities do not and should not look for uniformity in their programmes but should focus on points of reference, convergence and common understanding (Wagenaar, 2015).

The Tuning Approach (Wagenaar, 2015), as it is now known, has developed into an internationally recognised approach "to (re)design, develop, implement, evaluate competency–based study programmes" and to " develop cycle (level) descriptors for a growing number of subject areas and develop new teaching and learning methods." These tools, which were developed for higher education, include a workload calculator, which will be discussed under 'Workload Models'.

Across the world countries are working together to formulate credit systems in higher education that are aligned and compatible. The Tuning Approach for example has members from across the world, including China, Latin America, Africa and Australia (Gonzalez & Wagenaar, 2006; Alarcón, Beneitone, De Armas, Kieling, Suñé, Veneros, 2013).

The use of credits in relation to student time and funding has become the norm, along with the 40-hour week and 1200 notional hours per year (SAQA, 2000: 23; Wellman, 2005; Bates, Baume & Assinder, 2010: 359). The relationship between credits and funding is not included in this discussion. South Africa, like the rest of the world, uses credits to indicate student time for the purposes of funding. The focus of this literature review is on credits as an indication of the time required to achieve the learning outcomes.

2.4.3. What are the notional hours in relation to credits?

Student workload should be considered in relation to what the educational framework considers as the average time spent by the average learner. Therefore' an examination of what is considered as 'average' time is necessary.

The common understanding of the relationship between notional hours and credits is perpetuated in education policies worldwide. Credits are equated to notional hours. There is, however, a difference between the various frameworks regarding the number of credits assigned to each year and the number of credits that can be transferred. These are context-specific and dependant on the qualification framework.

Table 2.1 shows a summary of how the various systems indicate notional hours in relation to the allocated credits.

Table 2.1 Educational framework, credits and notional hours per country

System/framework	Credits	Notional hours
SAQA **HEQSF (South Africa) (SAQA, 2000)**	1 Credit 120 Credits / year	10 Notional Hours 1200 hrs/year
United Kingdom (Bekhradnia 2013:10)	1 Credit 120 Credits	10 Notional Hours 1200 hrs/year
SCQF (Scotland)(European Commision, 2009)	120 Credits	1200 hrs/year
ECTS (Europe) (European Commision, 2009)	1 Credit 60 Credits / year	25 – 30 hrs per credit 1500 to 1800 hrs/year
CAT (North America) (Wellman, 2005)	1 Credit	1 contact hour
CLAR (Credit reference system in Latin America) **(Alarcón *et al.*, 2013)**	1 Credit 60 Credits / year	24 – 33 hrs per credit 1440 – 1980 hrs per year
CQFW (Wales) (CQFW, 2009)	1 Credit	10 hours of learning time

Notional hours in South Africa are the same as notional hours in the United Kingdom and Scotland. The European Credit and Transfer System refer to one credit as twenty-five to thirty hours of work per credit.

In North America credits are based on the number of contact hours (Wellman, 2005: 20). A contact hour includes any form of teaching where a professor is present. Awarded credits represent three Semester Credit Hours (SCH), and represent between 45 to 48 hours of contact. The credit hour is regarded as contact time whereas the ECTS and the HEQSF focus on the total amount of time: contact and study time.

According to Alarcón *et al*. (2013: 170) Latin American countries did not have a shared credit system until 2012. During the period from 2004 to 2007, the Tuning Latin America project initiated research into student workload to establish the CLAR (Credit reference system in Latin America, *Latin American Reference Credit).* The allocation of credits takes contact hours and classroom work into account which assigns the active role to the professors and the passive role to the students (Alarcón *et al.*, 2013: 171):

> Practical activities for students such as laboratories, workshops and field activities are utterly undervalued – even more than independent student work. It is common

> that 1 contact hour per week is required to achieve 1 credit but at least 2 to 3 hours per week of practical work and activities to obtain the same credit.

Based on the experiences of Alarcón *et al*. in Latin America, there appears to be a similar problem concerning the allocation of time for practical work and related activities.

The Credit and Qualification Framework for Wales (CQFW) (2009: 32) defines Learning time as "the number of hours it notionally takes a learner on average, to achieve a learning outcome" and acknowledges that "Learning time excludes learner-initiated private study over and above that expected within the defined terms." Furthermore, "taught or contact time may vary according to the mode of delivery, but Learning time will not." If understood correctly, all activities, i.e. structured learning, assessments, private study and revision, including any amount of contact time, should add up to the Learning time without exceeding the assigned time.

Notional hours provide very little guidance as to the proportion of contact time in relation to time spent studying (Rossouw & Abrahamse, 2011). Karjalainen *et al*. (2006: 9) state that the relationship "between time and learning is one of the most perplexing questions in teaching, something which probably every teacher has contemplated." According to Deepwell and Malik (2008: 5), notional time, from the students' perspective, is under threat based on external demands of generating income to cover fees and living expenses, social pressures and an overloaded curriculum among others.

Therefore, to conclude, notional time is a guideline for allocating time to academic activities and not a tool for allocating time to individual activities. It is not prescriptive about the relationship between contact time and self-directed learning, modes of delivery or types of assessments. It is merely a proposed guideline to facilitate the allocation of time in relation to credits without consideration as to the amount of time required for specific learning activities, such as practical work in the case of Design education.

2.5. Literature on the assessment of workload

The body of literature on workload in general spans over a century (Miller, 2001: 4) while literature concerning the assessment of student workload in higher education by large appear from the 1970s onwards (Karjalainen *et al.*, 2006: 10). With the development of educational qualification frameworks to harmonise qualifications, the focus on student workload became apparent especially regarding the alignment of credits and the

improvement of teaching and learning. Literature from 1990 onwards was selected for this review. Studies that report on time, time allocation and workload models with regard to students in higher education were the primary focus. This meant that studies discussing workload with reference to time spent studying, in- and out-of-class ratios, time use; and estimates for workload models were selected.

The belief is that research on student time is "virtually non-existent" (Stinebrickner & Stinebrickner, 2004). Close scrutiny of the literature reveals that a fair number of articles have been published on the assessment of workload. It can be explained by the numerous terms used by researchers to describe the time students spend on academic activities. More than forty articles were analysed that relate to time and workload of students in higher education. Additional research on workload perception, workload models and student course experience surveys were analysed separately to determine whether workload in Design Education is discussed.

An overview of the literature on workload studies revealed the absence of a theoretical framework for assessing student workload despite the fact several studies accepts that workload is an important aspect of effective teaching and learning (Marsh, 2001: 185; Kember, 2004: 181 –182; Karjalainen *et al.*, 2006: 10–13).

The literature was purposefully studied to ascertain how to assess student workload. Definitions of student workload and the drivers for research into student workload are unpacked. Key issues, instruments for assessing workload, including additional instruments, and samples of questions, are summarised. Administration of surveys, timing and duration of the data collection as well as the reliability and validity of the methods are discussed. Factors for rewarding of participants are considered. Sample sizes of students in various fields of study are noted. Data analysis, presentation of findings and hours reported are presented. Lastly, methodological considerations are formulated.

2.5.1. What does the literature define as 'student workload'?

The term 'student workload' appears in various settings of education: quality assurance, policy documents, student course experience surveys, study process questionnaires, workload models and workload research. Based on the literature, student workload comprises the time it takes to complete the learning activities in order to meet the outcomes set out in the curriculum. According to Kember (2004: 165) and as observed throughout the literature review, instruments that evaluate the quality of teaching and learning oftentimes

make reference to workload in the wording of the questions where workload was defined as: "Pressure placed on students in terms of demands of the syllabus and assessment tasks" (Entwistle & Ramsden (1983:124) in Kember, 2004: 168).

Student workload is often discussed in conjunction with other issues such as grading, credits, time on task, the learning environment, learning activities, out-of-class activities, contact hours, contact time, class attendance, self-study, class preparation, time allocation, study time, and instructional time. According to Pogacnik *et al*. (2004: 256), actual student workload is challenging to measure with precision. As stated by Pogacnik *et al* (2004:256), it firstly could be defined as the timetabled class contact hours plus the time required for understanding the course content that depend on whether the students work during the semester or focus their energy on the final exams. Secondly, the time to complete the set assignments, which relates to the guidelines set out by Karjalainen *et al*. (2006), and lastly, the time to study for the final exams. The ECTS User Guide (European Commision, 2009: 18) differentiates four factors in order to calculate workload:

- the contact hours for the educational component (number of contact hours per week x number of weeks)
- the time spent on individual or group work required to complete the educational component successfully (i.e. preparation beforehand and finalising of notes after attendance at a lecture, seminar or laboratory work; collection and selection of relevant material; required revision, study of that material; writing of papers/projects/dissertation; practical work, e.g. in a laboratory)
- the time required to prepare for and undergo the assessment procedure (e.g. exams)
- the time required for obligatory placement(s)

According to Lam *et al*. (2012: 3) student workload is complex and it should be considered with regard to issues pertaining to time commitment, the quality and nature of the work, students' engagement with activities in activities in and outside of the curriculum, and lastly, students' characteristics and motivation.

Thus, once learning activities and time spent have been identified it is possible to calculate a student's workload. This literature review focuses on student workload with regards to how previous studies were conducted in order to discover what a conceptual framework of student workload would look like and whether any existing such framework relates to Design students.

2.5.2. What are the drivers of workload research?

One of the purposes of workload assessment is to reveal what students are doing with their time. If the students are not attending classes, what are they doing? One such study (Hanson *et al.*, 2011) focused on the use of technology and social media. This relates to Pogacnik *et al.*'s research (2004) in which students was surveyed to discover the ratio of independent learning to class attendance. The student course experience questionnaire, for example (NUS, 2008; GfK Finance, 2011; Shaw, Quigg, Murch & Wunsch, 2014), compares contact time and time spent on independent learning among several higher education institutions. Lecturers would like to know what their students are doing in order to plan in accordance.

Carroll's 1963 work stimulated the development of instructional theories regarding the role of time for learning, with the main aim being: "…those individual students will master instructional objectives to the extent that they are allowed and are willing to invest the time needed to learn". (Carroll, 1963 in Gijselaers & Schmidt, 1995:183)

Carroll's theory is based on two individual time variables: time spent and time needed. Carroll argues that "Achievement is maximized if time spent increases to the point where it equals the amount of time actually needed to learn" (in Gijselaers & Schmidt, 1995:185). Therefore, students who spend the given time to learn should succeed in all likelihood. However, if the time needed does not equal the available or allocated time, achievement is unlikely. Besides scheduled time, the use of instruction time is thought to have an impact on learning (Gijselaers & Schmidt, 1995: 186)

In addition, Gijselaers and Schmidt (1995: 185) identified time-related variables in addition to time spent and time needed, which should be considered along with learner characteristics: perseverance, ability, aptitude.

Workload, from a student's perspective, is an important aspect of higher education. Kember (2004:168) believes workload is important on account of the wide spread inclusion of workload items in student feedback questionnaires. Over the course of 30 years, both Marsh and Kember have written extensively on the topic of student workload and admit there continues to be a lack of clarity regarding the complexities of student workload (Marsh, 2001; Kember, 2004; Kyndt *et al.*, 2011). Research into workload continues to be an important aspect of effective teaching as well as student wellbeing. Jacobs and Dodd (2003: 296) provide evidence to suggest a correlation between subjective workload and student

burnout and thus conclude that further research is required to understand these complexities.

In Kyndt *et al.*'s (2014) conceptual framework, student workload is presented as a complex construct of which the dynamics and the interrelationships among the components require special attention. This will be discussed at the end of this chapter.

2.5.3. What are the key issues in student workload research?

As mentioned previously, the literature concerning student workload rarely uses the same terminology to discuss the time students spend on learning activities. Therefore, to establish where this particular study fits into the literature the aims and objectives of each paper were reviewed. The key issues were identified as:

a. the actual[3] time students have spent on activities
b. the time students perceive or estimate to have spent on activities
c. credits and notional hours in relation to workload
d. workload in research based on student course experience surveys
e. the relationship of workload to factors in teaching and learning[4]
f. the activities on which students spend their time i.e. study, workplace, social media
g. the relationship between time spent, time allocated and grades
h. the development of student workload models – whenever this column is ticked, further review is documented under a separate heading 'Workload models'.

Table 2.2 shows the key issues with corresponding authors:

[3] McCormick (2011) uses the term "direct entry" instead of actual hours, to distinguish between hours recorded and perceived workload

[4] This study focuses on the quantitative data but acknowledges the qualitative effects of workload on teaching and learning

Table 2.2 Key issues identified in the assessment of student workload

Key issues	Actual hours	Perceived hrs / estimated workload	Credits /notional hours	Student course experience	Workload Relationships	Activities (studying, social media, other)	Grades	Workload Model
References:	a	b	c	d	e	f	g	h
(Gonzalez & Wagenaar, 2006)		x	x			x		x
(Kyndt *et al.*, 2014)		x			x			x
(Rožman & Leser, 2014)		x	x					
(Meeuwisse, Born & Severiens, 2013)	x				x			
(Bowyer, 2012)		x	x		x	x	x	x
(Lam *et al.*, 2012)	x	x			x			
(Rust, 2012)	x					x		
(Pouyioutas *et al.*, 2012)	x		x					x
(Hanson *et al.*, 2011)	x						x	
(Malisa & Komenda, 2011)		x	x					x
(Ruiz-Gallardo, Castaño, Gómez-Alday & Valdés, 2011)	x		x		x	x		
(Lindsay & Rogers, 2010)		x			x	x		
(Balascio, Benson, Hotchkiss & Balascio, 2009)	x		x			x	x	
(Ercan, Karaağaç & Emekli, 2009)	x	x	x			x		x
(Tampakis & Vitoratos, 2009)		x	x		x		x	
(Deepwell & Malik, 2008)		x	x	x		x		
(Garmendia, Guisasola, Barragués & Zuza, 2008)	x		x			x	x	
(Kolari *et al.*, 2008)	x					x	x	
(Quyen, 2008)	x		x		x			
(Tanner, Stewart, Maples & Totaro, 2008)	x	x				x		
(Dee, 2007)		x		x		x	x	
(Bachman & Bachman, 2006)		x	x		x	x	x	
(Karjalainen *et al.*, 2006)		x	x		x	x		x
(Kember & Leung, 2006)		x		x	x			
(Kolari, Savander-Ranne & Viskari, 2006)	x		x					
(Nonis & Hudson, 2006)		x			x			
(Nonis *et al.*, 2006)	x			x		x	x	

Key issues (Table 2.2 continued)	Actual hrs	Perceived hrs / estimated workload	Credits /notional hours	Student course experience	Workload Relationships[5]	Activities (studying, social media, other)	Grades	Workload Model
References:	a	b	c	d	e	f	g	h
(Lockwood, 2005)		x						x
(Meng & Heijke, 2005)		x		x	x			
(Kember, 2004)	x				x			
(Pogacnik *et al.*, 2004)		x	x			x	x	
(Stinebrickner & Stinebrickner, 2004)	x		x		x			
(Zuriff, 2003)	x		x				x	
(Jacobs & Dodd, 2003)		x			x		x	
(Lawless, 2000)		x	x			x		
(Kember & Leung, 1998)	x	x			x		x	
(Van den Hurk, Wolfhagen, Dolmans & Van der Vleuten, 1998)		x					x	
(Greenwald & Gillmore, 1997)		x		x			x	
(Innis & Shaw, 1997)	x					x		
(Kingsland, 1996)		x		x		x		
(Gijselaers & Schmidt, 1995)		x					x	
(Chambers, 1992)		x			x	x		x
(Garg *et al.*, 1992)		x	x					x
(Wade, 1991)		x	x			x		
Totals [44]	**19**	**27**	**21**	**7**	**16**	**21**	**15**	**10**

The above table summarises the key issues in student workload studies along with the corresponding authors. Many articles were reviewed but only forty-four were found to meet the criteria of this study. Of the forty-four articles, only nineteen articles were found to assess student workload using a direct entry approach to report the actual hours spent. Of the nineteen only two articles (Garmendia *et al.*, 2008; Balascio *et al.*, 2009) report on student workload, notional hours, activities, and grades, the combination of which resonates with this particular study. However, a synopsis of student workload research is discussed briefly.

[5] Workload relationships can be described as any study that investigates workload in relationship to another aspect that affects student's course experience.

Objective workload is described as student workload in terms of credits and notional hours (Chambers, 1992; Kyndt *et al.*, 2014). Several articles report on credits and notional hours in relation to the actual hours recorded (Pogacnik *et al.*, 2004; Kolari *et al.*, 2006; Balascio *et al.*, 2009; Malisa & Komenda, 2011; Bowyer, 2012)

Along the same lines as objective workload, studies investigate the teacher estimate versus student estimate of time spent (Garmendia *et al.*, 2008; Tampakis & Vitoratos, 2009) and contact time variation between developed and developing countries (Quyen, 2008).

Many researchers have been interested in how students spend their time, more specifically, the activities that students engage in outside the classroom (Innis & Shaw, 1997; Pogacnik *et al.*, 2004; Kolari *et al.*, 2006, 2008; Nonis *et al.*, 2006; Hanson *et al.*, 2011). In each instance, students were required to complete a diary to indicate the amount of time they spent on specific activities ranging from online social interactions (Hanson *et al.*, 2011) to the amount of time spent on independent learning (Pogacnik *et al.*, 2004; Kolari *et al.*, 2008). Nonis *et al.*'s (2006) research considered all activities, not only academic activities, to distinguish between campus-centred students and life-centred students. Besides the time spent on learning activities (Lam *et al.*, 2012), several studies are concerned with the time students spend on all activities i.e. online social interactions (Tanner *et al.*, 2008; Hanson *et al.*, 2011). In each of the cases of actual workload research, the focus is on what students are doing with their time, how they manage their time and what their results or grades are in relation to the amount of time spent on academic activities.

In addition to credits, notional hours and activities several studies investigate course specific aspects in relation to workload, i.e.:

- course to course comparison of workload (Meng & Heijke, 2005; Dee, 2007; Bowyer, 2012),
- teaching, teacher-student relationship, student-student relationship all in relation to perceived workload (Kember & Leung, 2006),
- course satisfaction and experience (Meng & Heijke, 2005; Bachman & Bachman, 2006: 281; Kember & Leung, 2006; Nonis *et al.*, 2006; Deepwell & Malik, 2008),
- correlation between perceived workload, class hours and independent study (Kember & Leung, 1998: 300; Lam *et al.*, 2012: 3),
- the nature of the learning activity (Lawless, 2000: 100),
- time spent on virtual learning technologies (Deepwell & Malik, 2008: 9),

- the learning environment (Meng & Heijke, 2005; Nijhuis, Segers & Gijselaers, 2008),
- workload after changing the teaching system from lecture to problem-based learning (Ruiz-Gallardo *et al.*, 2011: 622),
- problem-based learning (Kingsland, 1996; Meng & Heijke, 2005; Bachman & Bachman, 2006). Meng and Heijke (2005) distinguishes between the teacher as the main source of information and understanding; and project-and problem-based learning as factors which influence students' workload.

The perception of workload and the approaches to learning are based on constructivist learning theories. This indicates that there exists a relationship between student workload, study material, study time and learning strategies (Kolari *et al.*, 2008: 493). Karjalainen *et al.* (2006: 10), Kember and Leung (2006:186) and Kyndt *et al.* (Kyndt *et al.*, 2011, 2014) express concerns regarding high course content and learning strategies such as rote learning; problems distinguishing relevant from irrelevant, leading to memorisation; students experiencing of overload are prone to surface approaches to learning.

According to Miller (2001: 5), physiological measurement of workload is based on the evidence that increased mental demands lead to increased physical responses from the body. Although these are difficult to assess in an educational environment, Bachman and Bachman (2006:280 -281) and (Lindsay & Rogers, 2010: 167) examines the correlation between workload and students' experiences of academic stress, social support (i.e. family and friends), self-efficacy (their believes with regards to academic ability), sleep patterns, anxiety, depression and motivation.

Evidence supports the notion that there is a positive correlation between time spent and grades obtained. Half of the literature reviewed, discusses the relationship between the time students spend in correlation to their grades. For instance, Garmedia *et al.* (2008) investigate the number of hours required in order to pass a course and whether the time spent fluctuates throughout the course. Greenwald and Gillmore (1997:743) consider whether courses in which students obtain higher grades have a lighter workload; also, whether, based on the amount of time spent, students anticipate a definite grade. Pogacnik *et al.* (2004) consider the relationship between attendance and grades, and between grades and outside study. Besides individual case studies into the time demands which students' employment makes on their study time and grades (Bachman & Bachman, 2006: 281;

Lindsay & Rogers, 2010: 167), national student course experience surveys characteristically include a range of questions relating to employment.

The grades were either self-reported by the students in the survey (Pogacnik *et al.*, 2004: 260; Bachman & Bachman, 2006: 280) or obtained from administration (Kember & Leung, 1998; Balascio *et al.*, 2009).

Despite varying results, the aim of actual workload research is to discover how students manage their available time. From this follow strategies for propitious time management for programme design and for individual students (Pogacnik *et al.*, 2004; Nonis *et al.*, 2006). Actual workload research provides the quantitative data for programs in order to consider the influences of workload as reflected in students' perceptions of their workload (Kember & Leung, 1998; Kember, 2004; Kyndt *et al.*, 2011). Kember (2004: 171) suggests that actual workload, although informative, should be accompanied with qualitative data, such as previously mentioned course experience surveys and interviews, to provide detailed insights into the construct of the specific workload.

Based on the survey of key issues (Table 2.2), research with regard to learning activities, time spent and grades obtained have been pursued. This will be a useful comparison to the findings of this particular study of Design students.

2.5.4. What instruments were used to assess workload?

To assess student workload the measurement instrument should be carefully considered. The literature was reviewed and organised according to the instruments used. Five categories were identified:

a. workload determined through diary methods: using a time use journal, , a timesheet, a time-use report, a time diary or learning diary,
b. perceived (or reflective) workload measured using Likert scales,
c. secondary instruments, such as course experience surveys,
d. workload calculated based on course content and credits,
e. workload determined through interviews or focus groups.

Table 2.3 shows instruments with corresponding authors. Diary methods correspond with actual time reported (19=19) whereas methods for perceived or estimated time vary from using Likert scales to interviews.

Table 2.3 Instruments used to determine student workload

Instruments used to determine student workload *References:*	Diary methods	Lickert scale	Secondary Survey instrument	Course content/ description	Interviews/ focus group
(Rožman & Leser, 2014)	x				x
(Meeuwisse *et al.*, 2013)	x		x		
(Lam *et al.*, 2012)	x	x	x		
(Rust, 2012)	x				
(Hanson *et al.*, 2011)	x		x	x	
(Ruiz-Gallardo *et al.*, 2011)	x			x	
(Lindsay & Rogers, 2010)		x			
(Balascio *et al.*, 2009)	x			x	
(Tampakis & Vitoratos, 2009)		x	x	x	x
(Deepwell & Malik, 2008)			x		x
(Garmendia *et al.*, 2008)	x			x	x
(Kolari *et al.*, 2008)	x				
(Quyen, 2008)	x			x	
(Tanner *et al.*, 2008)	x		x		
(Dee, 2007)		x	x		
(Bachman & Bachman, 2006)		x	x	x	
(Kember & Leung, 2006)		x	x		
(Kolari *et al.*, 2006)	x			x	
(Nonis & Hudson, 2006)	x	x			
(Nonis *et al.*, 2006)	x				
(Meng & Heijke, 2005)		x	x	x	
(Kember, 2004)	x	x	x		x
(Pogacnik *et al.*, 2004)		x			
(Stinebrickner & Stinebrickner, 2004)	x			x	
(Jacobs & Dodd, 2003)		x	x	x	
(Zuriff, 2003)	x		x		
(Lawless, 2000)		x	x		
(Kember & Leung, 1998)	x	x	x		
(Van den Hurk *et al.*, 1998)		x			
(Greenwald & Gillmore, 1997)			x	x	
(Innis & Shaw, 1997)	x				
(Kingsland, 1996)		x	x		
(Gijselaers & Schmidt, 1995)		x		x	
(Wade, 1991)		x			
Totals [34][6]	19	17	17	13	5

[6] The number of references is less since 10 studies were using estimated time to develop workload models. These will be discussed under the heading 'Workload models'.

According to Meng and Heijke (2005: 16) the best way for students to remember how they spent their time is to keep a diary. Since activities are reported continuously, the two problems of recall and averaging are eliminated (Zuriff, 2003: 72). Based on the studies that Kember (2004: 166) reviewed, he concludes that recorded hours should ideally be collected via an hourly diary rather than asking students to reflect on the time they spent on studies after the fact. This should give feedback that is more reliable. Kember (2004: 166) makes a note of the fact that the effort to complete the diary can become a burden so that very few useable diaries are returned. The student diaries may either return qualitative data and/or quantitative data. With qualitative data further analysis were required to determine themes.

Another type of measurement presents the student with options for types of activities with a scale to indicate, for example, level of difficulty, levels of stress, amount of sleep and approach to learning. In purely quantitative diaries, activities were predetermined and students reported on every hour what they did in that hour. Lastly, diaries could be used by students to report on their actual amount of time spent on learning activities (Kolari *et al.*, 2008; Balascio *et al.*, 2009).

Two studies report using a focus group as the primary source of data. (Deepwell & Malik, 2008: 8; Rožman & Leser, 2014) were interested in whether there is a difference between actual workload and perceived workload. In order to test their hypothesis, they conducted a focus group during which students completed a questionnaire. It was discovered that students lack an understanding regarding "which time to count as workload" (Rožman & Leser, 2014: 1414). To circumvent this problem, most student diaries for reporting actual workload are designed to give students a variety of activities to choose from (Innis & Shaw, 1997: 85; Nonis *et al.*, 2006: 123; Lam *et al.*, 2012: 3). This approach lessens the participant burden and produces clearer responses.

2.5.4.a. Instruments used to collect qualitative data

Owing to the complex nature of the variables that influence the time students record, Kember (2004: 168) suggests that a range of various instruments should be used in combination to examine workload holistically. Thus, besides time diaries and questionnaires to determine the time students spend on learning activities, researchers often employ additional instruments, especially where workload is considered in relationship to another aspect. Since it is not the aim of this study to investigate how students perceive their

learning environment or what approaches to learning they employ, the following is a list of the questionnaires that were found to be useful in qualitative assessment of workload:

- Approaches to Studying Inventory (ASI) – Developed by Ramsden and Entwistle in 1981 and 1983, used by Lawless (2000) and Kember (2004),
- Course Experience Questionnaire (CEQ) – Developed by Ramsden in 1991 (Wilson *et al.*, 1997; Lizzio, Wilson & Simons, 2002),
- The Maslach Burnout Inventory (MBI) – Developed by Maslach and Jackson in 1981, adapted for students by Jacobs and Dodd (2003: 296),
- Study Process Questionnaire (SPQ) – Developed by Biggs in 1987, used by Kember (2004),
- Form X – Experimental form used by the University of Washington (Greenwald & Gillmore, 1997),
- Rose-Hulman student ratings – Tulane University (Dee, 2007).

Often workload studies base their questions on the CEQ (Wilson *et al.*, 1997; Lizzio *et al.*, 2002). According to Graduate Careers Australia (2013: 1), the CEQ contains four items under Appropriate Workload Scale to assess whether workload levels hinder deeper forms of learning. Since 1993, the CEQ forms part of the annual Australian Graduate Survey. The five-point response format ranges from 'strongly disagree' to 'strongly agree'. It does not require students to reflect on the actual amount of time as can be deduced from the following examples of questions:

> "I was generally given enough time to understand the things I had to learn."
> "The sheer volume of the work to be got through in this course meant it couldn't all be thoroughly comprehended."
> "The workload was too heavy."
> "There was a lot of pressure on me as a student in this course."

This particular student experience survey does not address the actual workload or the estimated time students spend on academic activities. On the other hand, these questionnaires used in combination with student time diaries do provide insightful correlations between actual workload, perceived workload and estimated workload.

2.5.4.b. Typical survey questions concerning students' perception of workload

Often, in the case of student questionnaires, perceptions of workload are obtained in the form of a Likert scale. Likert scales, or psychometric response scales, are used primarily to obtain a participant's preference or degree of agreement with a statement or set of statements (Ginns, Prosser & Barrie, 2007). It does not equate to actual workload. These types of questions are indicative of students' perception of their workload and rarely useful for calculating course workload. According to Kember (2004: 165), students' perceptions of workload are influenced by content, difficulty, type of assessment, teacher–student, and student-student relationships. These relationships are examined in surveys focusing on students' perceptions, and using a Likert scale and questions as evident in the following examples:

- "The workload for this course in relation to other courses of equal credit was…": Scale ranged from heavier; much heavier; about the same; lighter; much lighter" (Dee, 2007: 71),
- "The workload for this course has been heavier than expected…"
  scale ranged from definitely disagree to definitely agree (Kember, 2004: 170),
- "The heavy workload in this course causes a great deal of stress for me…:
  scale ranged from Definitely disagree to Definitely agree" (Kember, 2004: 170).

Instead of keeping a diary to record actual hours, students respond to questions regarding the hours they worked post facto:

- "Estimate the number of hours per week spent on this class, including attending classes, doing readings, reviewing notes, writing papers and other course related work" (Greenwald & Gillmore, 1997: 746). Options were "under 2 hours" to "22 hours or more".
- "Presence at lectures" (Pogacnik *et al.*, 2004: 260): Indicate by selecting: a) Less than 25%; b) Between 25% and 50%; c) Between 50% and 75%; d) Between 75% and 100%.
- "Estimate time spent for preparation (in hours = 60 minutes)" (Pogacnik *et al.*, 2004).
- "How many hours did you put into your study this week?" and
- "How many hours of paid employment did you do this week?" (Lindsay & Rogers, 2010: 168). Weekly responses were collated into five-hour categories 0; 1-5; 6-10; 11-15; etc.

Not all of the studies reviewed in the literature include examples of their surveys or questions. However, there is a distinct difference in the data obtained from Likert scale questions on hours worked and students reporting their activities in a diary. The former are meant to test perception and workload relationships, whereas actual hours spent are more useful for time allocation and workload models.

It can thus be argued that students who report their workload in interviews and Likert scale surveys do not accurately report the actual hours worked. This is of importance to note, as these results cannot be used to generalise or to use their hours for course planning purposes.

2.5.4.c. Objective workload measures

As noted in Table 3, several researchers used course credits, course content or course description to obtain an objective measure of workload (Jacobs & Dodd, 2003: 297; Garmendia *et al.*, 2008; Balascio *et al.*, 2009: 9; Tampakis & Vitoratos, 2009). Jacobs and Dodd (2003: 297) compare the effect of both the objective workload and subjective workload as a factor in student burnout. This indicates that credits, and therefore notional hours, should be considered as part of student workload assessment.

2.5.5. How were the instruments administered?

Questionnaires and diaries were either handed out in class (Garmendia *et al.*, 2008: 465), emailed (Kember & Leung, 2006: 190) or made available online (Bachman & Bachman, 2006: 208). Zuriff (2003) implemented the use of index cards: Each card represented a week and students were to record every minute spent on academic activities. Every Tuesday the cards were collected in the class. Rust (2012) expected students to complete the questionnaire, with predetermined activities and timeslots, during class under the guidance of the lecturer.

According to Nulty (2008: 302) online surveys are much less likely to achieve response rates as high as surveys administered on paper. The problem with handing out paper surveys in class is the reliability of the responses. According to Garg *et al*. (1992: 22), students may feel pressurised to be on par with the lecturers expectations.

2.5.6. Timing and duration of data collection

When conducting student workload research the timing of the survey is directly related to the outcomes. According to Nonis and Hudson (2006: 153), the timing of the data collection should be considered carefully. Student motivation, academic and work-related activities, i.e. main stream activities, are likely to vary during the beginning, middle and end of a semester (Innis & Shaw, 1997: 87; Nonis & Hudson, 2006: 153).

Table 2.4 organises the literature according to the time of administering the instrument/time of the data collection, as well as the length of the instrument. In cases where student course experience questionnaires were used to measure workload among other factors, the students filled out the forms in class at the end of the course (Dee, 2007) or once during the semester (Greenwald & Gillmore, 1997).

Ruiz-Gallardo *et al.* (2011: 625) repeated a similar study with two different groups of students over the course of two years, using the same instrument to demonstrate the suitability "to find out the time students spend on a subject, not only in terms of effort, but also how it is distributed throughout the course".

A few studies collected data before the semester commenced to discover whether a relationship exists between lecturers' estimates, student estimates, the actual time spent and grades (Kolari *et al.*, 2006; Tanner *et al.*, 2008; Tampakis & Vitoratos, 2009).

Zuriff (2003: 73) indicates that methods to obtain student workload using only one-week surveys are unreliable since student effort varies substantially during the semester. Kember and Leung (1998: 201) point out that the selected timeslot should be a reasonable representation of the period with which the workload is concerned by identifying a point midway in the year when normal patterns have been established and far enough away from end-of-year examinations. Diary instruments ranged from a 24hr-day account (Stinebrickner & Stinebrickner, 2004: 22), a week (7 days) journal (Kember & Leung, 1998: 200) to a whole semester, approximately 12 to 15 weeks. It depends on whether it was a slice of time or a continuum of time during which fluctuations of workload were explored. Thus, there is a relationship between the timing, duration and frequency to be understood when determining the instrument for collecting workload data.

Table 2.4 Timing and duration of data collection

When were the surveys conducted and for how long? (in cases where data were recorded for an extended period of time, the number of weeks is indicated in brackets)	Before: Estimate Time [7]	Once during the semester	Several weeks during the term	1 Week during the term	At the end or afterwards
References:					
(Rožman & Leser, 2014)		x			
(Meeuwisse *et al.*, 2013)			x (2)		
(Lam *et al.*, 2012)			x (13)		
(Rust, 2012)				x	
(Hanson *et al.*, 2011)				x	
(Ruiz-Gallardo *et al.*, 2011)			x (16)		
(Lindsay & Rogers, 2010)			x (15)		x
(Balascio *et al.*, 2009)			x (15)		
(Tampakis & Vitoratos, 2009)	x				x
(Deepwell & Malik, 2008)		x			
(Garmendia *et al.*, 2008)	x		x		x
(Kolari *et al.*, 2008)			x (8)		
(Quyen, 2008)				x	
(Tanner *et al.*, 2008)	x			x	
(Dee, 2007)					x
(Bachman & Bachman, 2006)		x			
(Kember & Leung, 2006)		x			
(Kolari *et al.*, 2006)	x		x		
(Nonis & Hudson, 2006)				x	
(Nonis *et al.*, 2006)				x	
(Meng & Heijke, 2005)					x
(Kember, 2004)				x	
(Pogacnik *et al.*, 2004)					x
(Stinebrickner & Stinebrickner, 2004)[8]				x (6)	
(Jacobs & Dodd, 2003)		x			
(Zuriff, 2003)			x (15)		
(Lawless, 2000)					x
(Kember & Leung, 1998)				x	
(Van den Hurk *et al.*, 1998)			x		
(Greenwald & Gillmore, 1997)		x			
(Innis & Shaw, 1997)				x	
(Kingsland, 1996)		x			
(Gijselaers & Schmidt, 1995)					x
(Wade, 1991)		x			
Totals [34] [9]	4	8	11	13	5

[7] *Estimates of time based on course content and difficulty*

[8] *The six surveys were based on alternating 24hr and 7days surveys, done throughout the year*

There is evidence to suggest that the exact time to collect workload data depends entirely on the design of the instrument (a diary over a period of time or a once off survey), type of activity (i.e. class attendance) and the duration of the activity (i.e. a course that runs for a semester). The sample size in relation to the duration of the study may be considered – participants drop out during a longer study period – which reduces the number of responses. There are insufficient studies to indicate whether there is a relationship between students who drop out of the survey and grade point averages to suggest that only the above average students participate in such studies.

2.5.7. Reliability of the methods used to collect workload data

According to Garmedia *et al*. (2008: 464), the assignment of learning times is based on relative workload and estimates. They acknowledge that relative workload is difficult to define and methods, such as the administering of student questionnaires, lack reliability. Garmedia *et al*. note that teaching staff are sceptical and doubt that the students' answers are true. However, Garmedia *et al*. refute this claim based on educational research, which maintains that questionnaires that are formulated, managed, and processed properly have offered consistent answers. Students are part of the teaching-learning process. As active participants, their opinion should be taken into account. According to Pogacnik (2004: 256), students' perceptions play a role even in cases where realistic data are asked for.

According to Kember and Leung (1998: 297), diary methods require considerable co-operation, but are seen as much more accurate than retrospection. When recalling time, various variables that affect the perceptions of the workload have been proven to come into play (Kember, 2004; Deepwell & Malik, 2008). All hope to discover reliable data should not be abandoned. The use of statistical data and large sample sizes can negate student opinion to an extent. Studies on time will always have an element of perception attached to them, despite efforts to discover realistic answers. Diary methods have proven to be valid and reliable to an extent where correspondence between diaries, timetabled classes and events reported by lecturers are verified (Kember & Leung, 1998: 297).

[9] The number of references is less since 10 studies were using estimated time to develop workload models. These will be discussed under the heading 'Workload models'.

2.5.8. How were the participants rewarded?

According to Lindsay and Rogers (2010: 169), the responses are only meaningful if they are authentic: The authenticity of the responses may be questionable if participation was compulsory. However, students may engage differently if the purpose of the survey shifts from being an educational exercise to being a research instrument. Rewards vary from:

- awarding extra points or bonus marks to the volunteers (Bachman & Bachman, 2006: 280; Ruiz-Gallardo *et al.*, 2011: 624), or marks as part of a course outcome (Balascio *et al.*, 2009; Lindsay & Rogers, 2010),
- "Each student got a ticket entitling them to have a free coffee and a bun" when they returned a weekly journal (Kolari *et al.*, 2008: 486), and
- students received a gift voucher for the university gift shop when they completed the time-use journal for eight weeks (Kolari *et al.*, 2008: 487),
- Hanson *et al.* (2011: 25) provided food to focus groups as an incentive for volunteering.

2.5.9. How big are the samples in workload studies?

The size of the sample depends largely on the number of students in the course in cases where actual hours are looked at. Where more than one course is surveyed, larger sample sizes can be expected. The sample size of each study depends largely on the purpose of the study. If the aim of a study is to investigate the average workload irrespective of the particulars of a course then random sampling was done within the institution.

Table 2.5 and Table 2.6 are summaries of workload studies[10] with regard to the student population, sample size and field / faculty / department that were surveyed.

Despite reports in the media (Monaghan, 2001; Stott, 2015) and the student experience reports (NUS, 2008) indicating the long hours that Architecture students are spending on academic activities, only two workload studies have been found (Kingsland, 1996; Bachman & Bachman, 2006). Both these studies based their findings on students' estimates of their workload during a once off survey. Although the Design students, which are the subjects in this study, are registered in the field of Interior Design, there are similarities between Architecture and Interior Design relating to content, studio pedagogy and projects. No studies were found that investigated the relationship between studio pedagogy and actual

[10] Workload models were omitted from these lists due to the absence of sampling

workload. Remarkably, however, studies concerning student workload and the effect of workload on student burnout based on psychological measures were conducted in Architecture (Bachman & Bachman, 2006) and Liberal Arts (Jacobs & Dodd, 2003).

Most of the studies were conducted in the fields of Business and Engineering followed by studies using a random sample of students. Some made use of purposive sampling to represent a variety of students (Dee, 2007; Deepwell & Malik, 2008; Tampakis & Vitoratos, 2009). Random sampling may occur in a specific field where students from first year to final year are invited to participate or across a wider range of fields and institution types (Meng & Heijke, 2005).

Smaller samples were used in studies where the aim was to look at the specific influences of teaching and learning on the time students spent, i.e. changing to project learning (Kolari *et al.*, 2006: 503).

Table 2.5 Sample size in relation to the faculty or field of study

Field / Faculty /department	**Size of sample; response[11] rate in brackets**	***Reference:***
Teacher Education	174 of 211 (82.5%) 114 of 128 (89.1%)	(Ruiz-Gallardo *et al.*, 2011)
Physics department	4 courses: 72;64;63;54;	(Tampakis & Vitoratos, 2009)
Architecture	242 [random sample]	(Bachman & Bachman, 2006)
Veterinary Sciences	1,425 and 1082	(Pogacnik *et al.*, 2004)
Liberal Arts	306 of 426	(Stinebrickner & Stinebrickner, 2004)
Liberal Arts	149 [random sample]	(Jacobs & Dodd, 2003)
Psychology	17 of 24 (70%)	(Zuriff, 2003)
Pre-clinical students of Medical School	"About 150 of 200" 65% responded	(Van den Hurk *et al.*, 1998)
Architecture	131 (70%) [random sample]	(Kingsland, 1996)
Medical School	65 courses	(Gijselaers & Schmidt, 1995)

[11] In the literature, (see table 2.5 and 2.6) the term return rate was applied to instruments administered over a period whereas response rate was used where a single survey was administered. In this particular study, the term 'return rate' therefore applies.

Table 2.6 Sample size in Business, Communication, Engineering, Mathematics, Humanities and random sampling

Table B: Sample size *References:*	Size of sample - return [12] rate in brackets	Business	Communication	Engineering	Mathematics	Humanities	Random sample
(Rožman & Leser, 2014)	1 Focus group	x					
(Meeuwisse *et al.*, 2013)	48	x					
(Lam *et al.*, 2012)	1504 of 11255 (13%)						x
(Rust, 2012)	1004	x					
(Hanson *et al.*, 2011)	294 of 490 (62%)	x	x				
(Lindsay & Rogers, 2010)	238		x	x			
(Balascio *et al.*, 2009)	206			x			
(Deepwell & Malik, 2008)	237 of 267 (89%)						x
(Garmendia *et al.*, 2008)	209 from 4 courses			x			
(Kolari *et al.*, 2008)	54 (50%)			x			
(Quyen, 2008)	104 and 140	x					
(Tanner *et al.*, 2008)	212	x					
(Dee, 2007)[13]	238 of 700			15%	15%	13%	
(Kember & Leung, 2006)	3320 of 5613 (59,5%)						x
(Kolari *et al.*, 2006)	1 course (2 credits)			x			
(Nonis & Hudson, 2006) (Nonis *et al.*, 2006)	264 of 440 (60%)	x					
(Meng & Heijke, 2005)[14]	18532						x
(Kember, 2004)	266						x
(Lawless, 2000)	841 of 1321 (64%)				x		
(Kember & Leung, 1998)	167 of 174 (96%)			x			
(Greenwald & Gillmore, 1997)	205 courses						x
(Innis & Shaw, 1997)	163 of 613 (27%)						x
(Wade, 1991)	367 of 500 (73%)						x
Totals		8	2	7	2	1	8

[12] In the literature, (see Table 2.5 and 2.6) the term return rate was applied to instruments administered over a period whereas response rate was used where a single survey was administered. In this particular study, the term 'return rate' therefore applies.

[13] (Dee, 2007): data collected over a five year period

[14] (Meng & Heijke, 2005: 10) graduates from nine European countries

2.5.10. How were the data analysed and the findings presented?

Time is understood, measured and recalled in hours and minutes. Most studies relate their findings in hours and minutes. There are numerous ways in which the data can be analysed Instead of filtering each study through a table; a list was compiled of data analyses used to present the findings:

- analysis of variance using SAS General Linear Models procedure with weights option (Balascio *et al.*, 2009),
- descriptive statistics: minimum; maximum; mean; standard deviation (Nonis *et al.*, 2006: 124; Quyen, 2008: 764),
- measurement models (Bachman & Bachman, 2006: 294),
- Spearman's rho correlation (Dee, 2007: 70),
- structural models (Greenwald & Gillmore, 1997),
- used Pearson χ^2 to show the correlation between grades and class attendance (Pogacnik *et al.*, 2004: 258),
- Pearson's correlation and reliability coefficients (Nonis *et al.*, 2006: 124),
- variance-coherence matrix (Kember & Leung, 2006: 192)

How the data are analysed depends on whether actual hours, estimates or perceived workload were looked at. Another aspect to consider is whether correlation between other factors in teaching and learning was investigated. Since perceived workload can also be seen as qualitative research, structural models can be used. In this particular study, the data analysis methods align with the research questions and thus average hours suffice using a standard equation to calculate the average of the time spent per week and per group.

2.5.11. What has been reported regarding the number of hours spent on academic activities?

Not all studies report on the time spent on learning activities, especially where perceptions or estimates were investigated. Thus only studies that published their findings in terms of time (hours and minutes) spent on academic activities, in and out of class, were collated in Table 2.7 and Table 2.8 Kolari *et al*. (2006: 502) devised a similar table to compare the results gathered from unpublished studies done with Engineering students in Finland. The sample sizes ranged from ten students to 1158 students with average times ranging from 19 hours to 33 hours per credit unit per week.

Ruiz-Gallardo *et al*. (2011:620) conclude that numerous studies show that not all learners are the same and thus require different amounts of time for the same learning objectives. Discovering the average student is possible. However, it is not only the average time that counts but planning for a reasonable workload that can productively use the time available so that most students can be accommodated, not only the fast learners and not only the academic students.

Table 2.7 Student workload per course

Course	Findings	References:
Architecture	72 hrs/week	(Bachman & Bachman, 2006)
Architecture	Qualitative	(Kingsland, 1996)
Veterinary Science	More contact hours demand more independent work	(Pogacnik *et al.*, 2004)
Teacher Education	Average of 111,92 hrs/year (should be 42 hrs for the term)	(Ruiz-Gallardo *et al.*, 2011)
Liberal Arts	3.39 to 3.52 hrs/day study (contact time unknown)	(Stinebrickner & Stinebrickner, 2004)
Physics	Varies: results per subject in the course	(Tampakis & Vitoratos, 2009)
Pre-clinical students of Medical School	Lowest 10hrs/ week on study Highest 21hrs/week on study	(Van den Hurk *et al.*, 1998)
Psychology	3h40m per day on study 7.4 hrs/day study during exams	(Zuriff, 2003)

Course (Table 2.7 continued)	Findings	References:
Engineering	2-3 hrs out of class per contact hour	(Balascio et al., 2009)
Engineering	Qualitative	(Dee, 2007)
Engineering	Between 33.6 and 40.8 hrs/week	(Garmendia et al., 2008)
Engineering	18.963 hrs/week in class; 27.338 hrs/week studying	(Kember & Leung, 1998)
Engineering	40.3 hrs/week	(Kolari et al., 2008)
Engineering	Relates to a 2 credit course	(Kolari et al., 2006)
Engineering and Communication	Over 21 hrs/week (10%) 10-20 hrs/week (20%) 5 hrs or less / week (40%)	(Lindsay & Rogers, 2010)
Business and Communication	11.91 hrs /week studying, 12.35 hrs/week in class	(Hanson et al., 2011)
Mathematics in Distance Learning	10-15 hrs per unit	(Lawless, 2000)
Ethnic minority vs. Ethnic majority in Business Administration	3.55hrs/day (1.16 hrs in class) 2.4 hrs/day on study	(Meeuwisse et al., 2013)
A variety of students form Business courses	12.94 hrs/week outside class (SD 8.57)	(Nonis & Hudson, 2006)
A variety of students form Business courses	12.94 hrs/w eek outside class 14 credit hours expected	(Nonis et al., 2006)
Psychology and Economics in Business	Vietnamese: 30h of contact; 8,2hrs/week study Dutch: 12hrs of contact; 18hrs/week study	(Quyen, 2008)
Business students	Actual time = perceived time	(Rožman & Leser, 2014)
Business students	12,45% of free time on academic activities	(Rust, 2012)
Business students	<u>Actual:</u> 9.66 hrs/week study 12.20 hrs/week in class 20.51 hrs/week working <u>Perceived:</u> 7.40 hrs/week study 15.37 hrs/week in class 19 hrs/week working	(Tanner et al., 2008)

Table 2.8 Student workload based on random sampling

References:	Findings
(Lam *et al.*, 2012)	From 21.7hrs/w to 33.86hrs/w to 40.22 hrs/w at end of term
(Deepwell & Malik, 2008)	(10%) Over 21hrs/w (47%) Between 11-20hrs/w
(Meng & Heijke, 2005)	Compares graduates in nine European countries: **Traditional University:** In class 16h20m Self- study: 15h17m **Problem Based Learning:** In class 20h40m Self-study: 13h46m
(Kember, 2004)	From 22hrs to 64hrs/w
(Greenwald & Gillmore, 1997)	Various {relativity to grade and credit =factor analysis}
(Innis & Shaw, 1997)	38.8hrs/w
(Wade, 1991)	(82%) Less than 20hrs/w (34%) Less than 10hrs/w (25%) No study time per week

There is a disjuncture between the amount of time policy indicates, what lecturers estimate and how many hours students actually work (Pogacnik *et al.*, 2004; Kolari *et al.*, 2006; Balascio *et al.*, 2009; Malisa & Komenda, 2011; Bowyer, 2012). Credits offer objective workload, lecturers approximate the time to complete outcomes and students will do the minimum. According to Kelly and Johnson (2005: 511), the ability to use time efficiently is an important skill in academic settings as students constantly work towards deadlines. Students and lecturers should be clear on the outcomes, the tasks to be completed and approximately how long it takes to complete them in order to allocate sufficient time.

With regard to workload in particular learning environments, Meng and Heijke (2005: 18) found that students taught according to the 'problem-based learning with teacher' manner spend roughly four (4) hours more than students in a 'traditional learning environment' in class, but indicate less time spent on self-study.

Kember (2004) examined the works of Mckay, (1978), LaPalio (1981), Parer and Benson (1989), Lee (1991), Vos (1991), Wade (1991), Chambers (1992). He notes that "the number of hours a week spent in class plus time studying independently for an average full-time student normally seems to come out to be a little above 40 hours" (Kember, 2004). Significantly, these studies were conducted from 1978 to 1992, whereas Kember's own

study, conducted fifteen years later, concludes that students are still working an average of 40 hours a week.

Conversely, in cases such as Bachman and Bachman (2006), lecturers estimate that students should be working for a minimum of 72 hours a week, and after conducting a survey it was discovered that students are on average spending even more hours on academic work to meet the outcomes.

As seen in Tables 2.7 and 2.8 of reported findings, there are variations in contact time and study time: Quyen (2008) shows that these variations differ between developing and developed countries, whereas Meng and Heijke (2005) infer that the learning environment and the type of institution account for variations in contact and study time. Wade (1991:15) was disturb by the fact that 25% of students do not appear to study during the semester, which indicates that study only occurs in preparation for examinations.

On the other hand, owing to statistical analysis, Kingsland (1996), Greenwald and Gillmore (1997), and Rust (2012) present time as a fraction or percentage. Although their findings are significant, their results cannot be compared to other studies.

Kolari *et al*. (2006:501) surveyed student times in many fields of Engineering education to assist with curriculum development. By identifying course specific averages, recommendations can be made to enhance teaching and learning in a particular course. Random sampling can provide benchmarks for time allocation, whereas detailed time results can be useful for time allocation in workload models.

2.6. Student workload concerns raised in student engagement and student experience surveys

Reports on student engagement focus on the behaviour of students whereas student experience surveys focus on their perceptions. The focus in this section is primarily with the portrayal of student workload within these surveys. In several studies a comparison is drawn between a specific group of students' workload and the number of hours spent as reported by student engagement surveys, i.e. the National Survey of Student Engagement (NSSE) and student experience surveys, i.e. The Student Academic Experience. Deepwell and Malik (2008: 9) state that "while the context and scale of these two studies are different, there is a close correspondence in the proportion of time that students spend on independent learning".

Thus, a brief overview of the most recent findings in student engagement and student experience surveys will be discussed to answer the question whether the average time in the present study compares to national benchmarks, such as the SASSE report.

2.6.1. Workload in the context of student engagement and student experience surveys

Based on the need for quality assurance, institutions participate in national quality assurance exercises, such as student course engagement surveys and national student engagement surveys, to look at the various factors that influence student experiences. Among the aspects focused on in the surveys is student workload.

Everywhere in the world, universities are interested to discover what students' perceptions are of their academic experiences for the purposes of comparability and to understand the changing needs of students. Students are frequently asked to rate their course, their lecturers or their overall experiences of the course or the institution (Kolari *et al.*, 2006: 500). In an introduction to student engagement, Trowler (2010: 2) unpacks the origination of several kinds of student surveys in order to formulate a definition or description of what student engagement refers to. According to Trowler (2010: 2), all the surveys serve a similar purpose: "to establish robust correlations between student involvement in a subset of educationally purposive activities".

A variety of terms are used throughout the world to refer to student engagement, such as: students' Course Experience Questionnaire (CEQ) (Ramsden, 1991); student satisfaction (Kingsland, 1996; Bachman & Bachman, 2006); student evaluation of teaching (SET) (Marsh, 2001: 183); student feedback (Richardson, 2005); students' academic experience surveys (Bekhradnia, 2009, 2012, 2013); and students' engagement (Strydom & Mentz, 2010; Trowler, 2010; NSSE Institute, 2012).

Trowler's (2010: 3) portrayal of student engagement resonates with the present study on student workload:

> Student engagement is concerned with the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimise the student experience and enhance the learning outcomes and development of students and the performance, and the reputation of the institution.

In an overview of student experience questionnaires used in North American, British and Australian higher education institutes, Richardson (2005) addresses the type and wording of the questions, practical utility of the instrumentation, and timing and frequency of administering the survey. Several similar reviews of student course experience surveys have been conducted throughout the past 40 years, implying that student workload is a significant factor in students' course experience (Marsh, 1980; Richardson, 2005; Howell & Buck, 2012).

Howell and Buck (2012: 215) distinguish four variables influencing students' course satisfaction: factors relating to the relevancy of the subject matter, faculty subject-matter competency, faculty classroom management and student workload. According to Howell and Buck (2012: 215), the workload measured in students' course experience surveys relates to the reasonableness of the work in the course: the volume of work in the course, the amount of course content for the period of the course, the timing and scheduling of course assignments, study time and class preparation. In their proposed conceptual framework regarding student course satisfaction (Figure 2.3), they originally identified eleven variables that could significantly influence students' course satisfaction. It is thus significant to note that, after their analysis, student workload came out among the top four influential factors as seen in Figure 2.4. A workload that is perceived as too demanding can have a negative impact on student satisfaction. Recommendations from Howell and Buck (2012: 227) include "providing clear assignment objectives and expectations upfront, as well as giving attention to the timing and scheduling of formative and summative course assignments".

Marsh (1980) was among the first researcher to notice the importance of workload in student course evaluations. Later, Marsh (2001: 183) maintains that a factor analysis of workload in Student Evaluations of Teaching (SET) reveals that difficulty, workload, pace and hours per week outside class consistently form a significant part of most course evaluations. Students' course experience questionnaires form an integral part of workload research. Their results often signify what students perceive or believe to be a reasonable workload – even if it is lower than the notional hours.

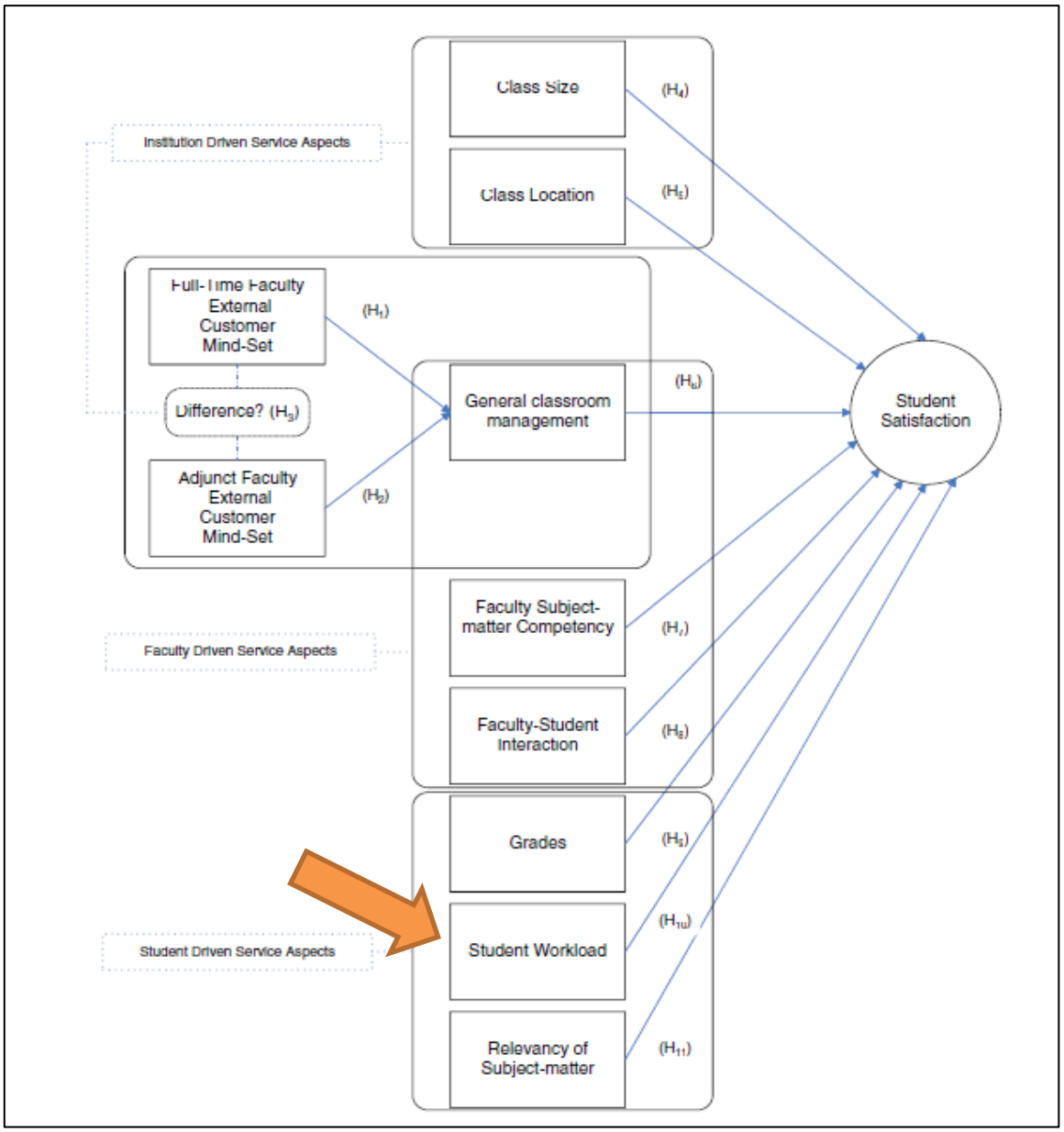


Figure 2.3 Howell and Buck's (2012: 217) conceptual framework regarding student course satisfaction

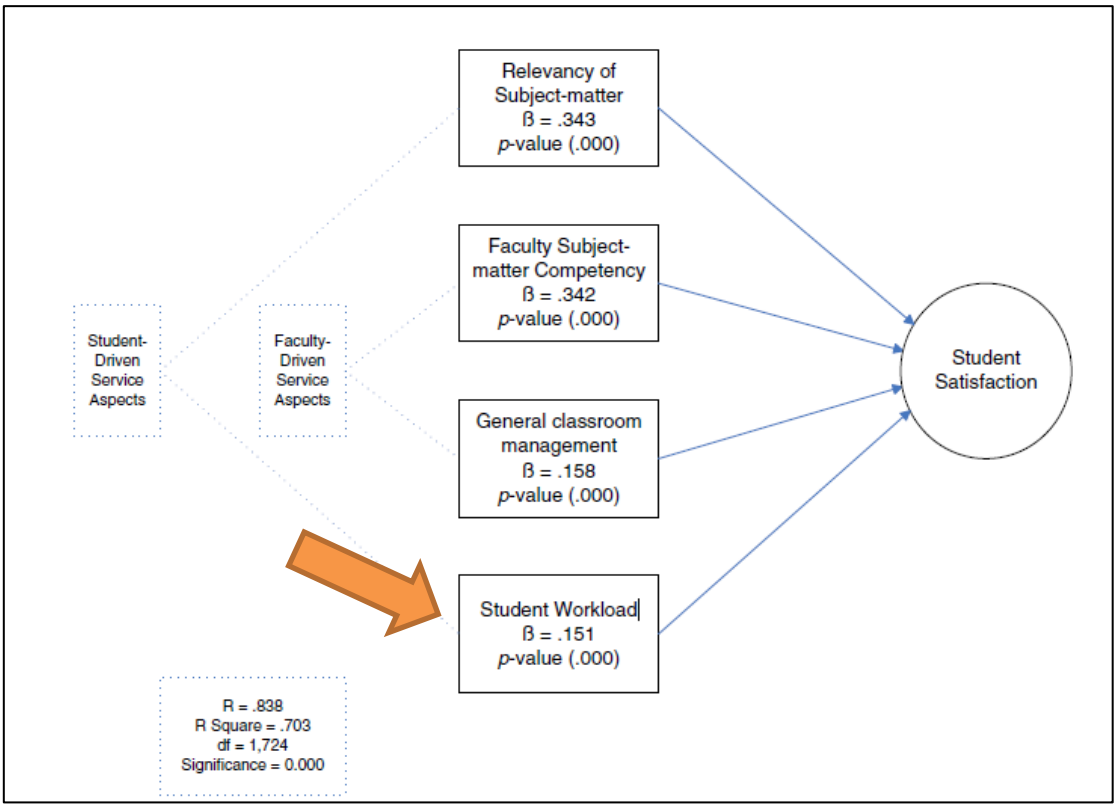


Figure 2.4 Howell and Buck's (2012:224) service model of student course satisfaction

2.6.2. Findings reported in student experience surveys

The ensuing reports indicate that there is a significant variation between the workload perceived by students and reported in student engagement questionnaires, and notional hours. The investigation was driven by the need to discover what various countries consider to be an average student workload with regard to Architecture and Design courses. It is unclear whether these countries see Interior Design as part of the Architecture faculty, as it often does, or whether Interior Design forms part of a design faculty. However, as noted in Chapter 1, Interior Design is closely associated with Architecture in terms of the body of knowledge, the projects and the studio culture.

2.6.2.a. The experience of CLAR credit in Latin America

In Latin America, the need for a unified credit system to align with the ECTS of the European countries has prompted a study into the workload of students in that region. The proposed credit system, Crédito Latina Americano de Referencia (CLAR), is based on the Tuning Latin America project initially developed during the period from 2004 to 2007 (Alarcón *et al.*,

2013: 180).The report done by Alarcón *et al*. (2013) shows the variations of student workload among the participating institutions and presents the findings of various fields of study. The average student reports spending between 1440 and 1980 hours a year on learning activities. Without a unified system of credits in place, the reported hours spent on learning activities are not correlated to the notional hours but suggest that they are significantly higher than the notional hours set out by the ECTS (European Commision, 2009). Architecture and the Built Environment collectively report students spending an average of 57.56 hours per week and consequently, 1589.94 hours per year on learning activities (Alarcón *et al.*, 2013: 176). This appears relatively high considering that the suggested notional hours for that region are 50 hours per week compared to the 40 notional hours of the United Kingdom (Bekhradnia, 2013) and South Africa (CHE, 2013).

2.6.2.b. The Student Academic Experience Survey

This survey of students' experiences in English universities is published frequently. This section briefly captures the latest issues raised concerning workload.

The Academic Experience of Students in English Universities 2013 was placed under a critical microscope for reporting that students, on average, are doing 900 hours of work a year (Bekhradnia, 2013). This is a problem since the Quality Assurance Agency (United Kingdom) assumes that 1200 hours is the norm. Concerns have been raised about the equivalence of degree standards because of the large variations reported in student workload (Matthews, 2013). The role of a quality assurance body is to structure and uphold the quality of the educational framework. The purpose of such an endeavour is to ensure equality of qualifications.

Bekhradnia[15] points out that previous surveys and the 2013 survey reveal that there is a definitive difference among universities and among subject areas regarding the allocation of workload. Bekhradnia (2013: 4) further explains the importance of contact time, study time and effort:

> More important than contact hours is the total amount of effort that students are required to devote to their studies in order to obtain a qualification. Total study time combines contact hours and private study, and to some extent these are

[15] Bahram Bekhradnia is the director of the Higher Education Policy Institute in the United Kingdom. HEPI, established in 2002, is an independent and non-partisan institute that supports higher education through independent research initiatives such as the HEPI – HEA Student Academic Experience Survey

> different sides of the same coin – all else being equal, the less contact, the more private study might be expected.

This raises the question of comparability of standards. Matthews (2013: 1), report that there are discordant variations on the workload theme. Issues that were of concern were the number of students who partook in the survey, the preparedness of students for higher education, and the standards and variations among the different subject areas. Matthew's report specifically noted that in Architecture the workload amounted to 40 hours a week of study compared to the 23 hours for Mass Communication and Documentation. There should be more clarity:

> If it becomes known that it is 'easier' to obtain a qualification in one university than another, then that will in due course damage the reputation of the entire UK higher education system. (Bekhradnia 2013:4)

This becomes clear when the results from the 2013 (Figure 2.5) and 2014 (Figure 2.6) Academic Experience of Students in English Universities surveys are viewed in light of the total time spent on studying – although contact and private study times vary, the two combined, more often than not, are comparable. It is understandable that various institutions and therefore, various programmes follow different teaching strategies with regard to contact time and class attendance. However, in the end the student workload should be comparable. Bekhradnia (2013: 11) draws attention to unlikelihood of students obtaining the same outcomes with less than half the time studied: "and yet almost all obtain degrees, no matter the differences in the amount of studying they have done".

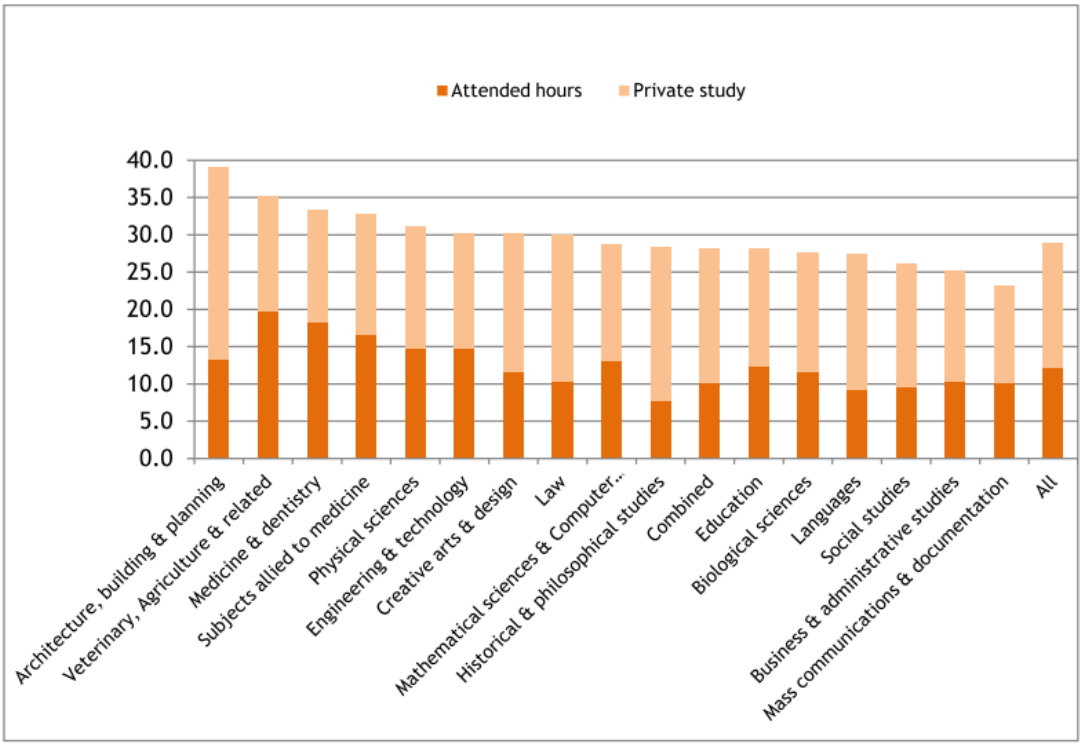


Figure 2.5 Total study time by subject (private study + class attendance)

(Bekhradnia, 2013: 9)

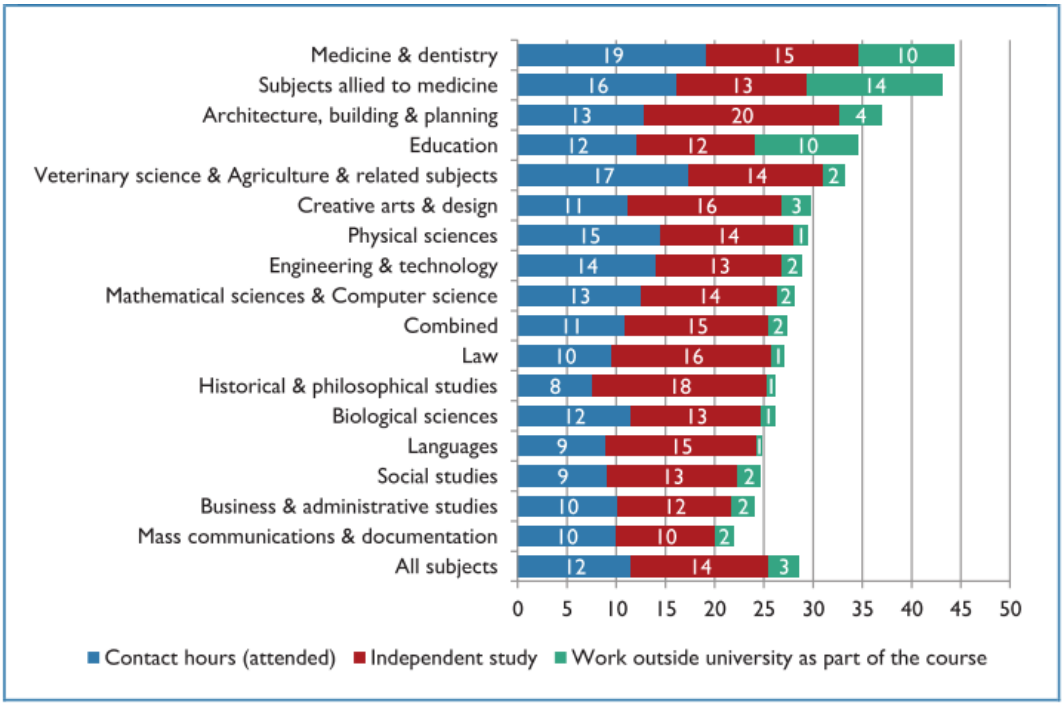


Figure 2.6 Average contact hours attended, independent study, and work outside institution as part of the course by subject (HEA & HEPI, 2015: 4)

Figure 2.6 were taken from the 2014 report, published in 2015. Here Architecture maintains the third position in terms of workload. The Architecture students in Latin America reported considerably more hours than time reported in the figures above.

In the 2013 report it has become evident that English students are working on average less (900 hours) than their European counter parts (1500 hours) (Bekhradnia, 2013: 10; Matthews, 2013: 1). According to the report by the Higher Education Policy Institute, new guidance on student workload should be issued by the Quality Assurance Agency (in Matthews, 2013: 1). The Quality Assurance Agency focuses "on processes, not on standards", according to the report by the Innovation, Universities, Science and Skills Committee (in Matthews, 2013: 1). Although most workload studies cannot account for standards, it does show that at one institution, Engineering students spend an average of 20.6 hours on study, including contact time, and that Engineering students at another university study an average of 47.2 hours per week (Matthews, 2013: 1). Since workload is by definition an indicator of the amount of time a student takes to master the learning outcomes, one can, therefore, ponder whether there is a discrepancy in the standards at the various universities surveyed.

2.6.2.c. The National Union of Students (NUS) Student Experience Report

The National Union of Students (NUS) Student Experience Reports (NUS, 2008; GfK Finance, 2011) provide an overview of students' experiences across several types of institutions. They consider a larger sample size of students than the Student Academic Experience Report from HEPI discussed in the previous section. The two NUS reports (2008 and 2011), were compared to establish whether the results remained similar for the average time students spend on their studies. Of particular relevance to this present study, were the results for Questions 15 and 18 in the 2008 and 2011 NUS reports.

The average contact time reported in 2008 was 14 hours, and the average study hours reported were 16 hours (GfK Finance 2008:10). In 2011, the reported contact hours had dropped to 13.4 hours (GfK Finance, 2011: 16). Refer to Figure 2.7.

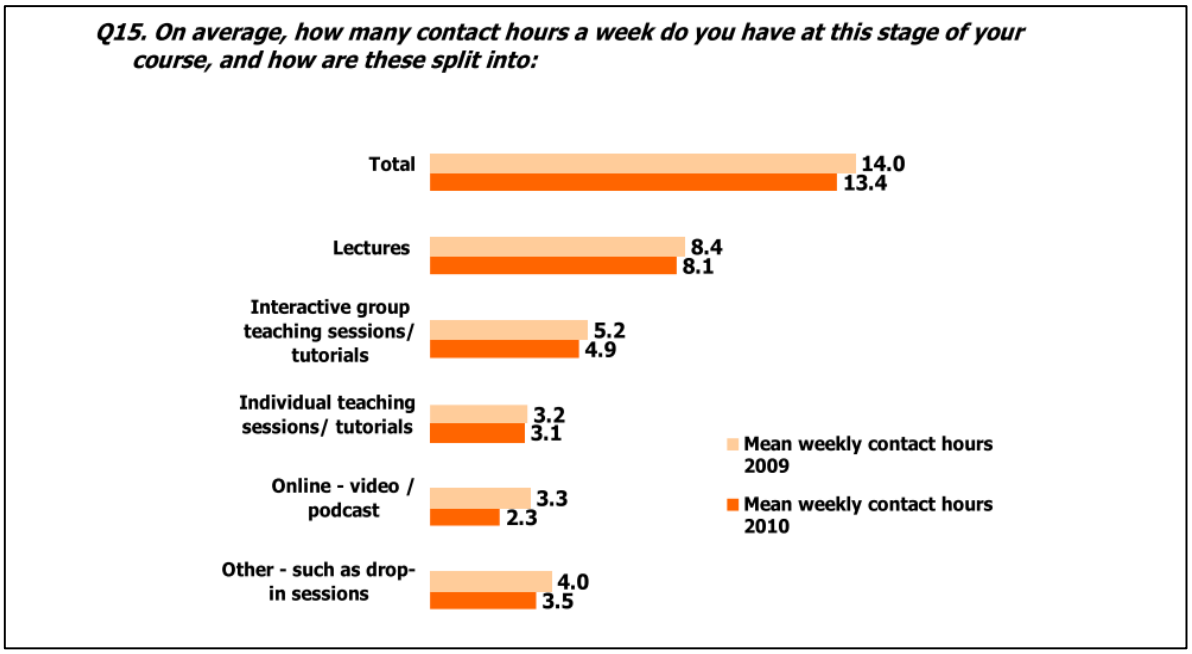


Figure 2.7 Chart 5 of the 2011 NUS report - average contact hours (GfK Finance, 2011: 16)

According to GFK Finance (2011:17), the majority of those contact hours were provided through lectures. From the results of Question 15, students were asked to split the total contact hours into lectures, interactive group teaching, teaching sessions/tutorials, and individual teaching sessions/tutorials (Refer to Figure 2.7). In addition to contact hours in Figure 2.7, students noted receiving two (2) hours of contact with a tutor (GfK Finance, 2011: 17)

The NUS report states that there is a steady decrease of contact hours irrespective of the type of institution. Medicine, Dentistry, Engineering and Technology have been experiencing the largest decrease in hours when the results are compared (NUS, 2008: 10; GfK Finance, 2011: 17). Not only has the amount of contact time been decreasing but the amount of time spent on private hours has also decreased. This is in sharp contrast to the notion that less contact time will "increase dependence on self-study for courses" (GfK Finance, 2011). Students who reported spending between 25.2 and 27.1 hours in 2009 are now spending 15.4 and 15.0 in 2011 (GfK Finance, 2011: 21). This appears to be an on-going trend as Bekhradnia (2013) and Matthews (2013) reported similar decreases in the HEPI Student Academic Experience results.

"What would improve the quality of the teaching and learning experiences at your university?" (GfK Finance, 2011: 24). Students' answers to this question reveal that they

want "more interactive group teaching sessions and tutorials; more individual teaching sessions and tutorials; more contact with personal tutors; and lecturers/ tutors with better teaching skills" (GfK Finance, 2011: 24). These results match previous reports. It also resonates with their need to have "inspiring lectures" and "getting value for money" (GfK Finance, 2011: 23).

The 2011 report did not provide a detailed breakdown of contact hours per subject area to Question 15; however, the 2008 report indicates that Medicine and Life Sciences are at the top of the chart with 19 contact hours. Table 2.8 shows a detailed breakdown: Architecture comes in at 14 contact hours and Creative Arts and Design at 13 hours (NUS, 2008: 10). Thus, Architecture and Creative Arts and Design are similar to the average contact time reported in the 2011 survey.

The 2008 report indicates that Architecture, Building and Planning students were spending 20 hours on private study and Creative Arts and Design students were spending 18 hours on private study. The recorded average private study hours of between 15 and 17 hours are much higher than the average reported in Chart 11 of the 2008 report (NUS, 2008: 12). In addition, the time spent on private study was much higher than reported in any of the other subject areas, including Medicine. Refer to Table 2.8 based on Chart 9 in the NUS report 2008 (NUS, 2008: 11).

This substantiates the assumptions made in Chapter 1 regarding the decline in student contact time in the studio and the high number of hours students in Design-related fields are spending on out-of-class learning activities. Furthermore, the findings of this present study will investigate the number of contact hours students report in relation to the number of notional hours to see whether the findings correlate with the NUS reports.

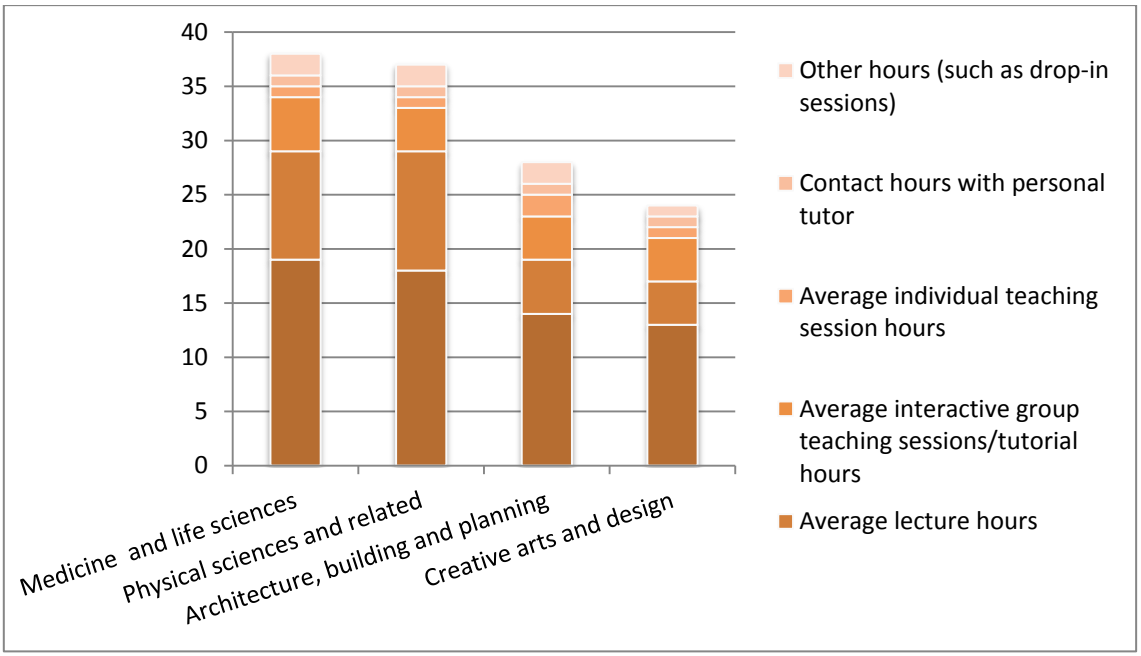


Figure 2.8 Contact hours per subject area based on Question 15 (NUS, 2008: 10)

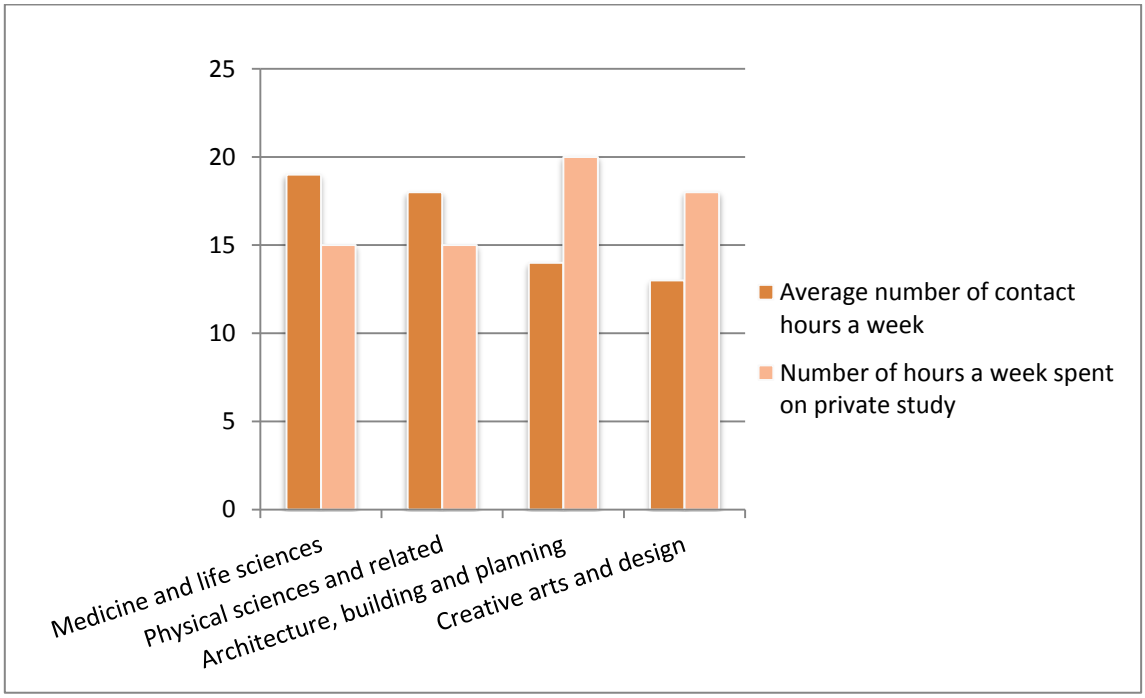


Figure 2.9 Contact hours and private study hours – comparing results from Question 15 and 18 (NUS, 2008: 11)

2.6.3. Findings reported in student engagement surveys

2.6.3.a. The National Survey of Student Engagement (NSSE)

This survey conducted in the USA and Canada forms the basis for the SASSE report in South Africa (Strydom & Mentz, 2010: 2). The survey was launched in 2000 and assesses the extent to which students engage in educational practices (NSSE Institute, 2012). In order to ensure that students interpret the questions as meant by the researchers, a validity focus group was held at several of the participating universities and colleges. The academic workload items were questioned by the students as they found it difficult to recall the amount of work done in the previous semester (NSSE Institute, 2000). This brings into question whether the same can be said of the items recorded under time-on-task. Student workload in the NSSE is assessed using the following question set: (*Full segment in Appendix A*)

> About how many hours do you spend in a typical 7-day week doing the following?
>
> - Preparing for class
> - Participating in co-curricular activities
> - Working for pay on campus
> - Working for pay off campus
> - Doing community service or volunteer work
> - Relaxing and socialising
> - Providing care for dependants
> - Commuting to campus

Each sub-question is followed by a scale ranging from 0 hours in increments of 4 hours each up until 30+ hours. The provision of increments can be interpreted as allowing the students to estimate the time they spend on each activity. The term "relaxing and socialising" was deemed by the focus groups to be the most challenging (NSSE Institute, 2000). The paper does not reveal why students found this question to be challenging. However, in the 2014 NSSE results (2014: 18), the amount of time students spent relaxing and socialising was found to be unrelated to their overall performance.

In 2007, the NSSE results indicated that the number of hours full-time students spend studying had remained constant since 2001 (Hanson *et al.*, 2011: 23). According to Hanson *et al.* (2011: 23), the 13 to 14 private study hours indicated in the report, are about half the number of hours recommended by the faculties. With reference to the same category, the

2014 NSSE results show a slight increase in the number of private study hours of 14 to 17 (NSSE Institute, 2014: 18). It is important to remember that in North America, credits are based on contact hours and not notional hours as in the ECTS, HEQSF and the United Kingdom. The report discusses the importance of knowing how students spend their time. Students who spent more time studying performed within their grade expectation. These results, therefore, "point to the importance of educationally purposeful activities" (NSSE Institute, 2014: 18).

The number of hours reported for contact and private study resonates with the report of HEPI and NUS discussed in the previous sections.

2.6.3.b. The South African Survey of Student Engagement (SASSE)

In 2009, The Council of Higher Education commissioned the first South African Survey of Student Engagement (SASSE) to understand better what it is that the students do while they are at university (Strydom & Mentz, 2010: 6). According to Strydom and Mentz (2010: 6) The SASSE was designed based on the National Survey of Student Engagement (NSSE), which is used in North American universities to monitor and compare the various aspects affecting students' experiences of higher education. Thus far, in South Africa no subsequent surveys have been conducted.

According to Strydom and Mentz (2010:6), student engagement can be defined by two key components: firstly, what students do (the time and the energy they devote to educationally purposive activities) and secondly, what institutions do to induce students to benefit from allocated resources in terms of services and learning opportunities. The report outlines five benchmarks that institutions can use to improve on. Under the Level of Academic Challenge, questions represent the number of hours students spend on academic activities. Examples of activities listed are studying, reading, and writing. The key objective is that, with the information from SASSE, institutions can benchmark themselves. This relates to the equality of qualifications. However, the SASSE report does not differentiate between subject fields nor gives benchmarks that can be applied to a Design programme.

Prominently, in the analysis of the results of the survey, Strydom and Mentz (2010: 28) account for the fact that participants come from either a traditional university, comprehensive university or a university of technology. Therefore, under Level of Academic Challenge the researchers state "*students at the universities of technology reported*

significantly lower levels of academic challenge than all the other students, while students at the universities reported the highest levels of academic challenge". Nevertheless students at universities of technology spend significantly more time preparing for class than their peers at other institutions (Strydom & Mentz, 2010: 28).

The SASSE report (Strydom & Mentz, 2010: 17) indicates that students spend an average of 10 hours per week preparing for class and 16 hours in class. The report is unclear on how much time students in the various subject areas spend on academic activities, but it notes that the results contravene notional hours and the longstanding convention of two hours of study for every hour spent in class. Less than 10% of the respondents are, in fact, spending 25 – 30 hours a week on preparing for class and studying (Strydom & Mentz, 2010: 17). This will be compared to the amount of time spent by the participants in the present study of Design students' workload.

2.6.4. Concerns

The reports from these surveys reflect students' experiences across a wide range of aspects, which include workload. However, these reports are useful as a barometer or a benchmark. No indication is provided concerning a specific course's workload in such detail as required for planning and implementation of curricula. Site-specific investigations are required. In Slovenian higher education, since the introduction of ECTS, it is mandatory to continuously evaluate students workload in correlation to the credits (Rožman & Leser, 2014: 1412). They indicate that, although general a benchmark is necessary; it is the mandate of every lecturer to ensure proper workload for his or her courses. It is evident that South African higher education has not engaged sufficiently with issues relating to the workload of students and the resulting effects.

2.7. Workload models

During the search for clarification regarding the time Design students should be spending on learning activities, workload models proposing time and learning activities were analysed.

The aim of workload models is to provide lecturers and students with guidance regarding the amount of time allocated to various learning activities to meet the learning outcomes. For brevity's sake, Table 2.9 provides a summative view.

Table 2.9 Summary of workload models

Based on:	Description	References:
Practical example/estimated time	TUNING Approach - Planning Form for an educational module using ECTS	(Gonzalez & Wagenaar, 2006) Based on ECTS Cited in (Bekhradnia, 2004; European Commision, 2009)
Excel spread sheet	Course development - Massey University, New Zealand	(Massey University, 2015) cited in (Du Pré, 2010: 17)
Estimated time based on credits	Workload model for Law Faculty	(Bowyer, 2012) also cited in (Rožman & Leser, 2014)
Software package	ReProTool Version 2.0 Software package designed to collect workload based on ECTS	(Pouyioutas *et al.*, 2012)
ECTS as barometer	Credits and notional hours for Mechatronics and Robotics	(Malisa & Komenda, 2011)
Desktop gadget	To record actual hours as students work: "Helo[16] Gadget" and "Helo Teacher" for ECTS	(Ercan *et al.*, 2009) also cited in (Rožman & Leser, 2014: 1413)
WPM calculation/ estimated time	A Practical Guide for Curriculum Design	(Karjalainen *et al.*, 2006) cites (Chambers, 1992; Garg *et al.*, 1992; Lockwood, 2005)
WPM calculation/ estimated time	Planned project for Law and Social Sciences	(Lockwood, 2005)
WPM calculation/ estimated time	Workload model for Physics course	(Garg *et al.*, 1992) based on Chambers, 1992
WPM calculation/ estimated time	Distant learning modules in: Art and humanities	(Chambers, 1992)

2.7.1. Setting up a workload model

In the development of a course, the credits may be seen as the starting point for developing the course. The volume of learning, measured in notional hours, becomes the available time wherein the course should fit. This means that all instruction, all learning and all assessment should occur during that time.

According to Gonzalez and Wagenaar (2006), "the teacher should have a notion of the average student work time required for each of the activities selected for the module /course unit". The responsibility of knowing how much time to allocate rests with the lecturer of the subject. The notional hours represent the average time needed to achieve the academic outcomes of the subject and lecturers should try not to exceed that time when structuring

[16] The name 'Helo Gadget' and 'Helo Teacher' is taken from the published paper and is not a spelling error.

their courses. When students are overloaded their approaches to learning are influenced negatively. According to Lawless (2000), "Lecturers may pay insufficient attention to workload because they have a predetermined notion of what the syllabus must include and the need is to get students through it".

Another course of action would be to do a post facto survey and evaluate the course to determine the volume of learning and adjust the credits (Garg *et al.*, 1992). Refer to Figure 2.10.

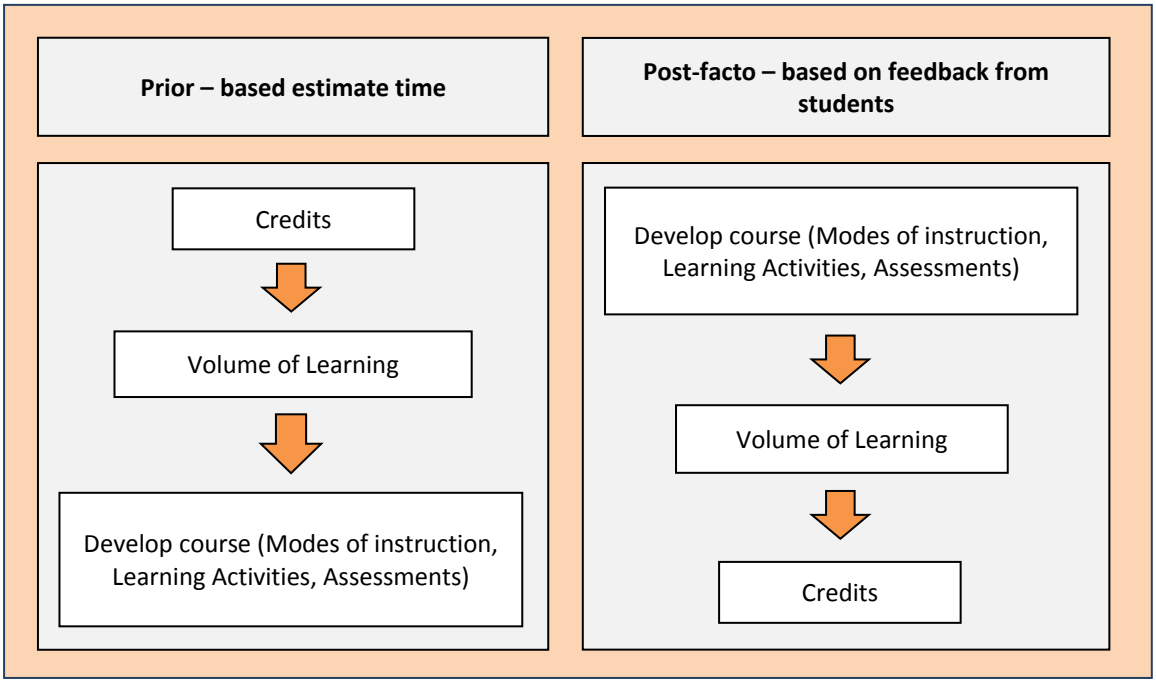


Figure 2.10 Credits and course development (Garg et al. 1992:22)

Although this approach is not feasible or probable, the active reflection by lecturers regarding the workload of their students may assist with the allocation of time. Change may involve reducing volume and a focus on cognitive development. Research by Ruiz-Gallardo *et al*. (2011)) has shown that students' estimation in such surveys are reasonably valid. It may not be necessary to analyse a large number of results, and it is useful for planning before the beginning of a course; then to check whether any of the subjects are over-/under-loaded and find out where to increase or reduce contents, etc. Among the disadvantages, as recognised by Ruiz-Gallardo *et al.*, is that by applying a rule, the average may not be very accurate. Setting the time for tasks, such as laboratory practice or problem solving, is tricky (Garg *et al.*, 1992; Lawless, 2000), although this could be resolved by exploratory work with a small and representative group from the total number of students.

In all instances, course review is necessary to ensure that the course outcomes are achievable within the allocated time. Since the implementation of ECTS, Slovenia's higher education institutions are obliged to measure students' workload every academic year to ensure it corresponds with the number of credits (Rožman & Leser, 2014: 1412).

Nor, Saad and Mansor (2005: 128) explored the use of a formula for calculating workload. They considered elements, such as delivery method for teaching, weight of the delivery method and time, to calculate how much time the student should be allocated for studying. This calculation method and its user interface were develop as a computerised system to simplify the manner in which workload can be calculated.

Kolari *et al*. (2006: 505) discovered that the calculation for workload, using credits as a baseline, provided the students with more time for self-study than they were spending studying. They were concerned that students were on average spending more time in class than on self-study. This indicates that students should be allowed more time to engage with the study material, and lecturers should tutor their students about efficient time use and study methods.

2.7.2. The use of words-per-minute (WPM) Calculations

Most of the workload models upheld in the literature refer to a rule of thumb using words-per-minute (WPM) calculations to determine the amount of work that an average student can accomplish in the given time. According to Chambers (1992), a workload model can be determined by setting aside hours based on the amount of time it takes to read the prescribed text. Time should be adjusted taking the complexity of the reading material into account. The time for comprehensive reading suggested in Chambers (1992: 147) follows from the work done by Lockwood *et al*. (1988)(in Chambers, 1992):

- An easy read = 100 WPM
- A fairly straightforward text = 70 WPM
- A dense/difficult text = 40 WPM

Several researchers (Garg *et al.*, 1992: 23; Lockwood, 2005: 3; Karjalainen *et al.*, 2006: 55; Kilfoil, 2015) refer to the use of the WPM calculation, as set out in Chambers (1992: 147). In South Africa, Kilfoil (2015) raised questions regarding the applicability of these calculations in situations where English as the medium of instruction may not be the student's first language. In such instances, Kilfoil recommends that the calculation should be

adjusted to allow for slower reading speeds. The example given by Kilfoil (2015) shows the use of WPM calculations in cases where the course consists of text-based learning activities *(see Appendix B).*

Lockwood (2005: 3) reflects on the research of Chambers (1992) and Garg *et al*. (1992) regarding the rule of thumb: "it relates to study time – the time to comprehend the material, to relate the ideas and concepts, and to reflect". Therefore, when using computer software to analyse WPM reading statistics, lecturers should be mindful of what that time includes and allow additional study time. Lockwood (2005: 3-4) presents a framework which provides estimates based on the findings – refer to Table 10. In all cases, calculations should also take into account that, for deep learning, text may be read more than once, accommodating time for reflection and comprehension of text (Karjalainen *et al*., 2006: 55).

Table 2.10 A framework within which to estimate student workload (Lockwood, 2005)

Teaching Material	Method of Calculation
Textual materials: Study guide, set books, articles and extracts	Rule of Thumb based on: 'easy' 100 WPM 'moderate' 70 WPM 'difficult' 40 WPM
Activities associated with textual materials: Self-assessment questions, exercises, experiments, reflection and practice	Estimate time within which a majority ($^{3}/_{4}$ or $^{2}/_{3}$) of students could complete the activities satisfactory
Non-text and audio visual materials: Photos, maps, charts, diagrams audio and video resources – CD or online	Depending upon the teaching purpose of the image/element, estimate likely study time
Face-to-face sessions: Seminars and tutorials, laboratory sessions, field trips and day schools	Estimate study time likely to be consumed – before, during and after the sessions
Electronic media: Computer mediated communication, email, computer-based training, computer assisted learning and web-based resources	Estimate essential online time
Assignments: Computer-marked assignments, project work, examinations and other assessed work	Estimate time associated with these tasks

Lockwood (2005: 3) further considers the study of non-textual components. He lists the study of a map, chart, diagram, photograph, drawing or similar material as 'observation work'. Activities, such as exercises and in-text questions, require time for reflection, thinking or practice. According to Lockwood (2005: 3), "the study time associated with these

components bears no relationship to the amount of words or pages associated with them". It is evident that both Lockwood and Chambers consider using WPM and readability statistics as insufficient information to enable the calculation of student workload. In the absence of sufficient information, estimates based on the 'Rule of thumb[17]' are frequently observed and have proved remarkably resilient across many subject areas (Lockwood 2005: 3).

Despite evidence that WPM models work, there are not enough textual components in the Design curriculum to apply this method for calculating workload.

2.7.3. Example from Massey University

Massey University, New Zealand, provides lecturers and students with guidance to structure their courses and their workload using an excel spreadsheet. Massey University (2015: 1) groups learning activities as:

- *Teacher-Student Contact Time* - Their recommendation for contact time is 12.5 hours a week.
- *Directed Learning Activity* - These are "*resulting in student activity*" (Massey University, 2015) which are planned by the teaching staff but not attended by teaching staff i.e. small group sessions, preparation sessions, assessed performances etc. Additional time are recommended for peer activities (Massey University, 2015)
- *Independent Learning Activity*- There is several time allocations indicated for activities such as reading, information collection and preparation for assessment.

Significantly, the spreadsheet indicates that the lecturer should consider how students use their study time by planning for directed learning activities. However, non-textual elements are not covered.

2.7.4. Reflecting on workload models

The purpose of a workload model is to plan the volume of learning appropriate for the course in question. It is necessary to reflect on the time students have available for learning

[17] In workload research, there are two instances where the "rule of thumb" appears: for calculating study time based on the amount of contact time (1:2) and for estimating the amount of time required for reading and writing (WPM).

activities to ensure that the factors discussed, i.e. perception of the learning environment, are considered.

In order to utilise time effectively, individuals must first be able to predict how much time is needed for the activity (Kelly & Johnson, 2005). An individual will become effective in using his/her time only when the individual clearly knows what s/he wants to do, what needs to be done, and for which specific target date (Hellsten, 2012: 4).

In conclusion, the rule of thumb for calculating workload based on WPM has proven remarkably resilient since it was first published more than 25 years ago. No one, however, sheds any light on the amount of time to be allowed for Design students' learning activities, visual learning materials or skills-based courses.

2.8. Conceptual framework

This section looks at the conceptual framework of this study. The conceptual framework is predominately based on the research of Miller (2001) and Kyndt *et al*. (2014).

2.8.1. Classification of workload measures

According to Miller (2001:5), there are three main classifications for the measurement of workload: physiological, subjective and performance-based measures. Miller's review of workload measures discusses at length the various measures in order to classify a measure as physiological, subjective or performance-based. If the measure relates to the human body (mental and physical effort) it is categorised as physiological. These measures are devoted primarily to continuous measurement of the physical responses of the body (Miller, 2001: 5). Subjective measurements are defined by Miller as any measure wherein the subject (or participant) is responsible for entering the data. It uses rankings or scales to describe the level or complexity of the workload. According to Miller, performance-based measurements involve a third party evaluating the performance of the individual. This could be physical or mental performance.

2.8.2. Categorisation of student workload assessment

From a research methodology point of view, the assessment of student workload can be viewed as either an objective measure or subjective measure providing either quantitative or qualitative data.

To distinguish between objective and subjective time in student workload assessment Rust (2012: 10215) refers to Kaufman-Scarborough and Lindquist (1999:290) who looked at productivity in the workplace:

> …objectively time is characterized by concrete or measurable quantities of time, which people actually have to work with. Subjectively time is based on people's perceptions of the amounts of time available, relative to the things they have to do…

According to Kyndt *et al*. (2014: 685) and Bowyer (2012: 243), student workload can be distinguished as objective whereby objective workload is measured based on the amount of credits specified or subjective which refers to perceived workload. Chambers (1992: 147) refers to the 40 hours' work per week as the "objective measure". Jacobs and Dodd (2003: 295) determined "objective workload" based on the number of credits for which participants were enrolled.

Kyndt *et al*. (2014: 685) differentiate between quantitatively perceived workload and qualitatively perceived workload and propose that both quantitatively and qualitatively perceived workload are subjective workload assessments (see Figure 2.11).

Quantitatively perceived workload measures require students to report on the actual time invested (Kyndt *et al*, 2014: 685). Based on the review of the literature, nineteen studies were found that investigated actual time (*Refer to Table 2.2 Key issues identified in the assessment of student workload*). A comparison between measure used and a description of the research methodology provided no clear evidence to support Kyndt *et al*.'s categorisation of 'quantitative perceived workload' as a subjective measure or even an objective measure. However, many researchers maintain that self-reporting diaries to collect actual hours may be subject to perception (Greenwald & Gillmore, 1997; Innis & Shaw, 1997: 86; Lindsay & Rogers, 2010). Kyndt *et al*. (2014: 394) states that owing to "the difficulty of determining a truly objective measure for workload, research has almost always measured the perception of the students." Their study was unclear regarding which methods should be considered for collecting actual hours as their study focused on students' perception of workload.

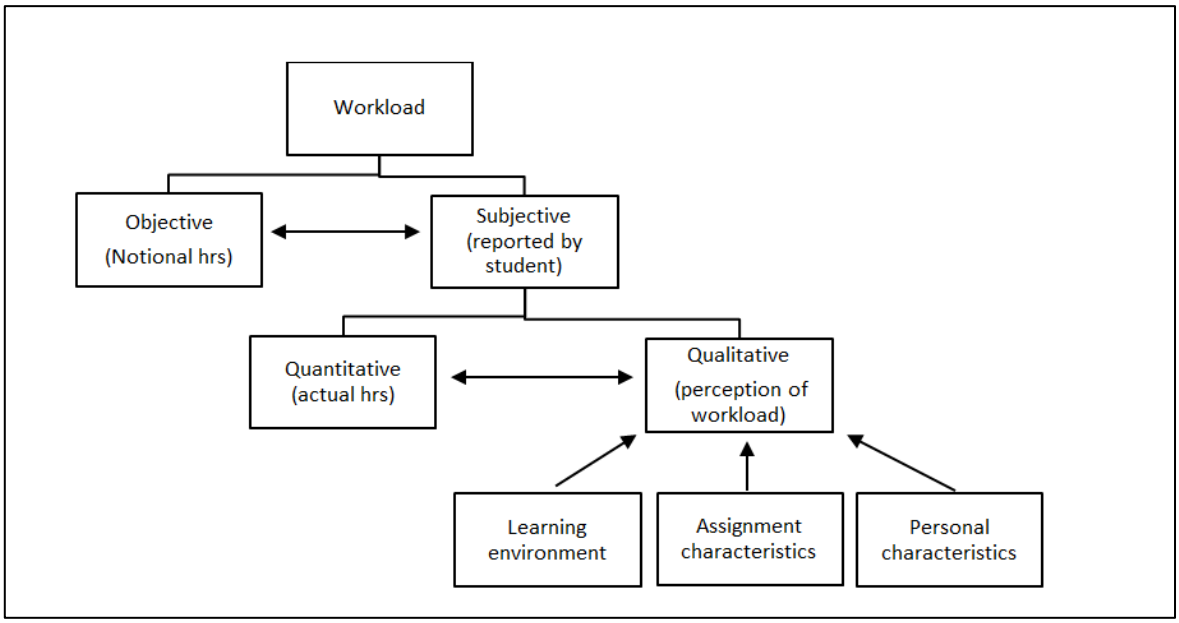


Figure 2.11 Conceptual model for student workload by Kyndt et al. (2014: 688)

Qualitative measures employ a Likert scale, or multi-choice type questions, to report workload. Factors, such as the learning environment, assignment characteristics and personal characteristics, which influence perceived workload, are prevalent in education research (Kember & Leung, 1998; Kember, 2004; Kyndt *et al.*, 2011). Kyndt et al. (2014) based their argument for subjective qualitative measures on Kember and Leung (1998), as well as Kember (2004) who determined students' perception of workload, using a small sample. These studies looked at how characteristics of the learning environment, characteristics of the assignments and personal characteristics influence subjective workload. However, Kember and Leung (1998) and Kember (2004) based their research instruments on Biggs' 1987 Learning Process Questionnaire and Biggs' Study Process Questionnaire. Biggs (according to Kember, Biggs & Leung, 2004: 264) originally conceived the notion that student learning forms part of a total system which can be schematised as the Presage-Process-Product (3P) model. Based on the 3P model and Kyndt *et al.* (2014: 687), the following resonates with student perception of their workload:

- *Characteristics of the learning environment:*

This refers to the design of the course in terms of: teaching methodology, type of assessments, the intervals between assessments, the relationship among students and how they help each other to cope with the workload, the student-to-teacher relationship (here the report on the perceived workload is influenced by the morale of the group and their rapport with the lecturer), teaching that promotes an active learning environment, and assessments that focus on understanding rather than

memorising facts. The latter increases perceptions of high workload and decreases motivation.

- *Characteristics of the assignment:*

Assignment reviews in terms of content and difficulty

- *Personal characteristics:*

Attitudes towards studies including approaches to learning and motivation

As seen in Figure 2.11, the above should be considered when assessing students' perceptions of their workload, irrespective of quantitative or qualitative measures.

This concept model was developed to look at students' perception of workload. In other words, do the learning environment, assignment and personal characteristics affect students' views of their workload? There was no indication of actual hours reported. Thus, for this present study, a revised conceptual framework is necessary.

2.8.3. Considerations for workload calculation

As discussed in Chapter 1, as per the Tuning Approach, modes of instruction, types of learning activities and types of assessment should all be considered in order to calculate workload (Bekhradnia, 2004; Gonzalez & Wagenaar, 2006). This forms an integral part of any workload study: understanding what the students are doing within the time allowed for achieving the learning outcomes (Marsh, 2001; Bekhradnia, 2004; Karjalainen *et al.*, 2006).

Among these, there is no particular description of what the learning environment encompasses. It may perhaps include the teaching and learning methodology, i.e. Problem-Based Learning (Meng & Heijke, 2005), the physical environment, i.e. laboratories, and learning in the workplace, i.e. experiential learning. For the purposes of this particular study the learning environment is seen as the teaching and learning methodology and the facilities of a Design course at a university of technology.

Starting with the existing descriptions taken from the Tuning Approach (Bekhradnia, 2004; Gonzalez & Wagenaar, 2006), the current study will investigate the time students spend on learning activities to achieve the learning outcomes.

2.8.4. Proposed conceptual framework for the assessment of student workload

Both Miller (2001) and Kyndt *et al.* (2014) considered the relatedness of various workload measures and workload research in terms of their own research. Since neither aptly addresses the issues of this particular study, a collective framework was considered. Diagrammatically speaking, Kyndt *et al.*'s (2014: 688) conceptual model of workload can be expanded to include Miller (2001) as shown here in Figure 2.12:

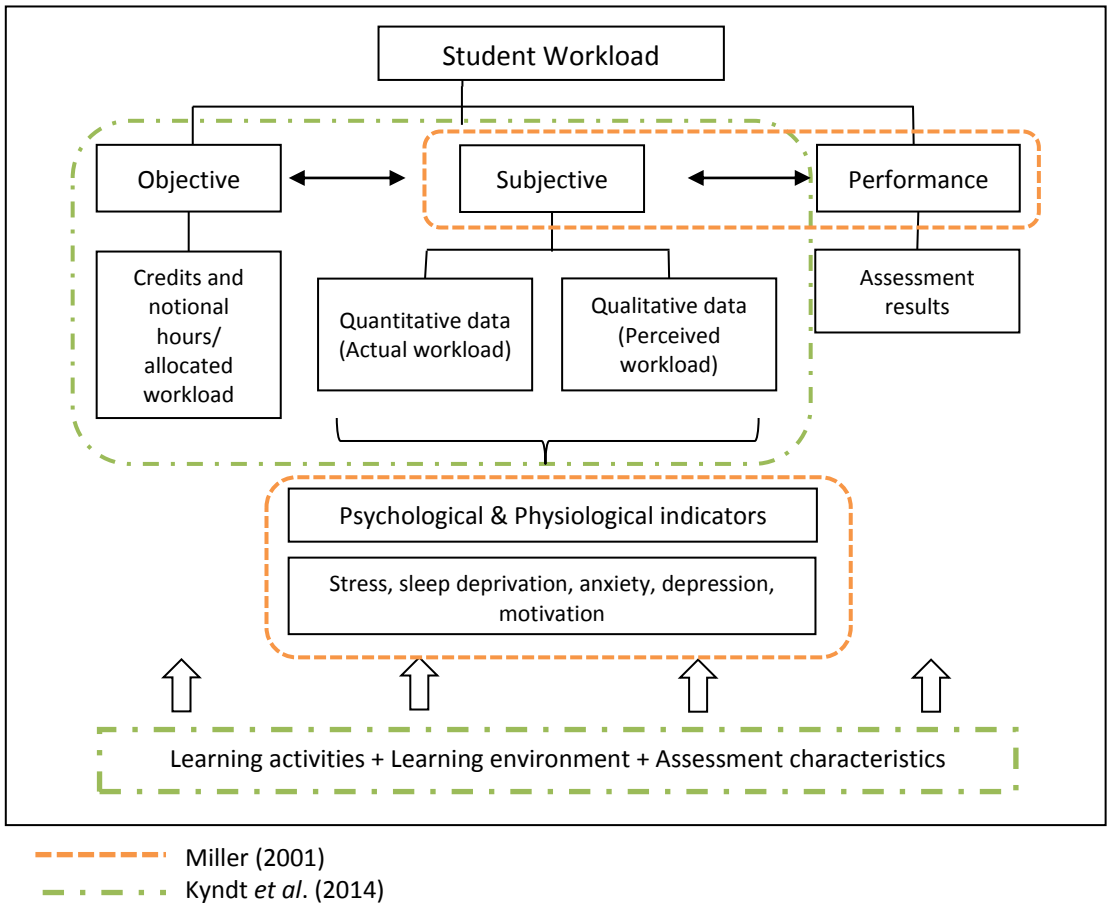


Figure 2.12 Miller (2001) and Kyndt et al. (2014): combined framework

As illustrated above in Figure 2.12 and based on the review of several workload studies, workload can be assessed in terms of several relationships:

- the relationship between objective (notional hours) and subjective (actual workload or perceived workload),
- the relationship between objective (notional hours), subjective (actual hours) and performance (results /grades),
- the relationship between perceived workload and psychological indicators,
- the relationship between perceived workload and the physiological indicators.

In addition, the factors that influence a student's perceptions of workload can be added as another layer to the model, as seen in Kyndt *et al.*'s model (2014) in Figure 2.11. This adds another dimension to the assessment of workload, which does not form part of the current study. Thus for this particular study the conceptual framework is depicted in Figure 2.13.

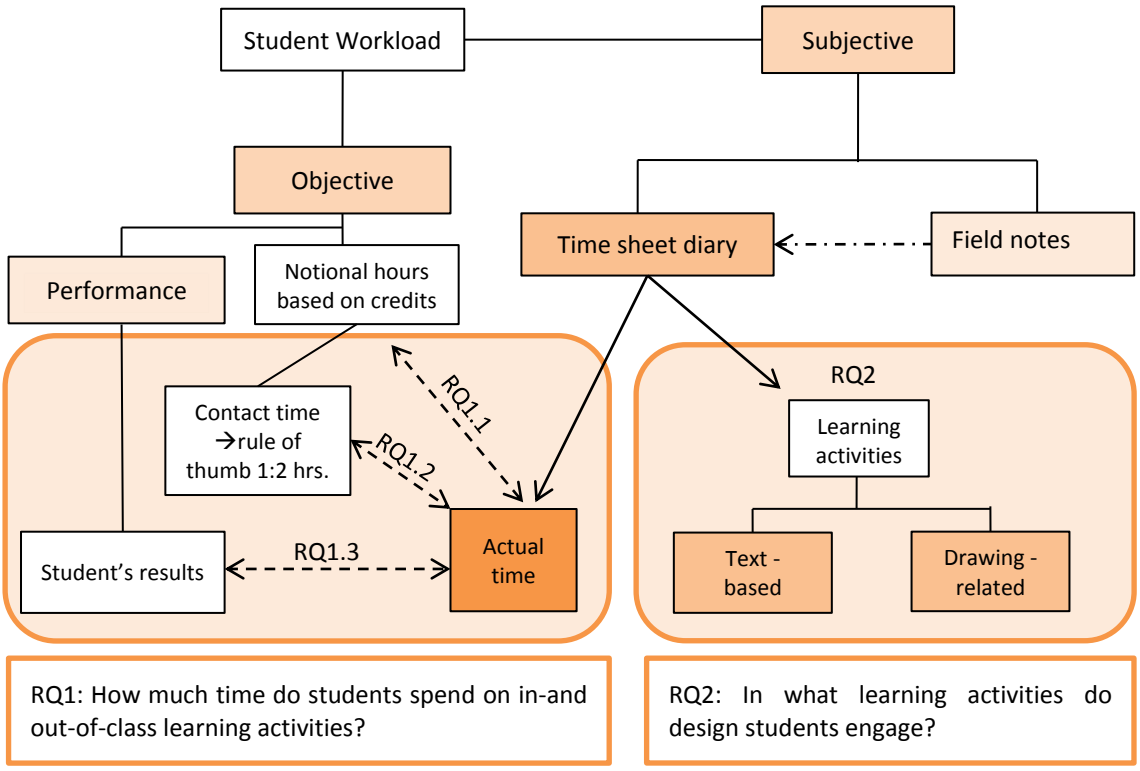


Figure 2.13 Conceptual framework for this study

Based on a review literature it was found that Kyndt *et al.*'s (2014) classification of quantitative and qualitative perceived are not in accordance with the norms of objective and subjective research methodologies. 'Objective' and 'subjective' in this study refer to the sources of the data. Quality assurance bodies such as SAQA predetermine the allocation of credits and are thus objective data. Performance is evaluated by lecturers and is, therefore, an objective measure of the workload. Subjective measures, according to Miller's research, refer to data entered by the participants in a study. In this case, the participants entered the time spent on learning activities in a timesheet diary.

Figure 2.13 indicates the questions that this particular study will investigate:

- actual time reported in the timesheet diary in relation to the notional hours,

- actual time reported in-class and out-of-class verified against the timetable in relation to the rule of thumb based on notional hours (for every one hour in class: two hours of studying),
- the possible correlation between hours reported and the students' results,
- the separation of the reported learning activities in the timesheet into text-based and drawing-related activities per subject.

The interviews were used to validate the reliability of the timesheet diary as instrument. The timesheet diaries were used to indicate the learning activities, and the interviews were used for triangulation and the refinement of the instrument.

2.9. Conclusion

A review of the relevant literature concerning student workload shows that there is a dearth of current and relevant literature on the topic of Design student workload. The purpose of this chapter was to contextualise the use of the 40-hour workweek and discuss the use of credits and notional hours in various countries in terms of student workload and the rationale for credit allocation. In this regard, educational frameworks provide the objective measure for workload in terms of credit allocation. They provide definitions and descriptions but are not prescriptive concerning how time could be allocated in terms of the various learning environments in higher education. There is thus scope for institutions to interpret and implement structures as they relate to the specific context of a course.

The literature review identified and critically examined methods for assessing workload by delineation of student perception of workload and actual workload associated with academic learning activities, and whether workload for Design students has been assessed. Most studies are concerned with workload of a student as meaning the total amount of contact time versus self-directed learning and the credit allocation. Alternatively, researchers consider the relationship between workload and grades. There appears to be a limited amount of research into discipline specific learning activities and time - and even these are text-bound activities.

The instruments and findings reported in student course experience surveys relating to student workload were examined. Workload measured in actual hours using a diary has the advantage that it can be compared to credits and grades in order to determine whether the average time allocated is sufficient. In addition, interviews may be conducted, and when combined with quantitative data, may provide a rich resource for the development of a

workload model. This methodology, which will be discussed in Chapter 3, was adopted to calculate the time Design students spend on learning activities.

Student experience questionnaires present valuable benchmarks of student workload to institutions and programmes. Their aim is to inform and provide guidance regarding what the average student workload is rather than what it could be. They provide guidance for the development of workload models. The manner in which the data are reported points towards a perception of workload rather than the quantitative report of actual hours.

An analysis of the existing information available to formulate student workload models, as well as a review the methods employed for estimating student workload, concluded that no methods or information is available to allocate time towards drawing-related learning activities.

The last part of Chapter 2 discussed the development a conceptual framework based on the review of the literature to answer the research questions. Kyndt *et al.*'s (2014) conceptual model was used as a point of departure. However, based on the review of the literature a revised conceptual framework was developed to cover all aspects and measures concerning student workload assessment. From there the model was reduced to relate to the present study. This model will be used as a framework to answer the question of how much time Design students spend on in- and out-of-class learning activities and will be used to structure the findings in Chapter 4.

Chapter 3 Research Methods

"That, which is measured,
is generally taken seriously.
So what should we measure?"
(Bates *et al.*, 2010: 357)

3.1. Introduction

In this chapter, methods for collecting data pertaining to student workload, i.e. the time spent on in- and out-of-class learning activities will be discussed. Previous workload studies, as discussed in the literature review and research methodology literature, were drawn upon to discover best practice. The design of the timesheet diary will be discussed.

3.2. Research design

As discussed in the literature review and the subsequent conceptual framework, student workload can be looked at as either quantitative (actual hours worked) or as qualitative data, i.e. obtained through surveys using open and Likert scale answers. This study adopted a descriptive quantitative research approach which explored existing phenomena in an attempt to investigate the current state of affairs with respect to time and its relation to learning activities (Leedy & Ormrod, 2005: 179). The quantitative data were collected by means of a timesheet diary that resembled a timesheet as seen in design practices. The primary data from the timesheet diary are quantitative. Terminology noted in the informal interviews was used to correlate the terms in the design of the timesheet diary and to triangulate the data.

Interior Design students completed the timesheet diary over a period of four weeks in 2014, indicating the duration of time that they spent on learning activities in and out of class. The survey was repeated 2015. According to Iida *et al*. (2012:278), the advantage of diary methods is that it increases the ecological validity because participants are temporarily close to the experience which reduces the retrospection bias associated with survey design. Bolger *et al*. (2003: 580) describe this phenomenon as the "reduction in the likelihood of retrospection achieved by minimizing the amount of time elapsed between an experience and the account of the experience". When retrospective bias is limited, the data yielded by a diary becomes more reliable than student questionnaires completed at the end of a course.

The advantages of diary methods are that they allow for the examination of the data as described by Iida *et al*. (2012: 278) and Bolger *et al*. (2003: 579), which resonates with the objectives of this study: Diary methods allow for the collection of reliable person-level data concerning students' average experiences as these vary over a period of time and may indicate the systematic change in accounts across a given period.

This being an investigation into the duration of time that students spend on learning activities indicates that it is an event-contingent study in which participants report only their time spent on learning activities and therefore, nothing else has been reported (Bolger *et al.*, 2003: 587). Event-based diaries should provide participants with clear definitions as to the events to be recorded (Bolger *et al.*, 2003: 591). The disadvantage is the possibility of confusion as to whether the event should be reported and under which predefined term. This creates participant burden and the risk that a given event may not be recorded.

Recommendations by Innis and Shaw (1997: 85 – 89) were given due consideration in the research design of this study:

- providing students with clear definitions of pre-determined activities in order to distinguish between study related and private activities,
- the pressure on student time when completing a diary,
- preliminary consultations with students,
- the chosen period should be representative of the overall time of the course,
- should focus on full-time students,
- briefing sessions to be held before and during the period ,
- coding to be used for venues and activities can become ineffective if made to complicated,
- marketing of the project,

According to Innis and Shaw (1997: 88),

> It should be clearly understood that this research, its methods and procedures are closely matched to the course culture, contexts, delivery and management systems that operate [within the specific institution] and as such, would be unlikely to transplant directly to another institution – without some bespoke tailoring.

Therefore, although the timesheet diaries for the second- and third-year students bear similarities, for each a list of their subjects, lecturers and learning activities was included. The same would have to be done if another group of students was to make use of this instrument.

In addition to the timesheet diary, individual interviews were conducted in 2014. Although these were insightful, the qualitative data were not considered in this study. This was done after the conclusion of the academic year to provide validation and clarification of the learning activities recorded in the timesheet diaries. However, the interviews could not be

repeated with the 2015 cohort due to the student protest that prematurely ended the academic year. It was therefore not possible to compare the answers from the 2014 interviews with the participants from 2015. It was thus decided to exclude the qualitative data from the research for that reason. The notes from interviews provided insight into the terminology used by lecturers and students. Changes to the list of learning activities were made before sending out the revised list of learning activities for the 2015 data collection. According to Kember (2004: 168), the addition of interviews after diary collection provides a holistic view of the in-depth aspects of the learning environment, assignment characteristics and the learning activities can be analysed and scrutinised.

Together with the definition of workload, the achievement of the learning outcomes is a prominent condition of notional hours. This indicates that there may be a correlation between the hours worked and the marks. After the analysis of the diaries, the average hours were compared to the assessment results of the students to see whether there is any correlation between the amount of reported hours and the results.

The research process is set out in Figure 3.1:

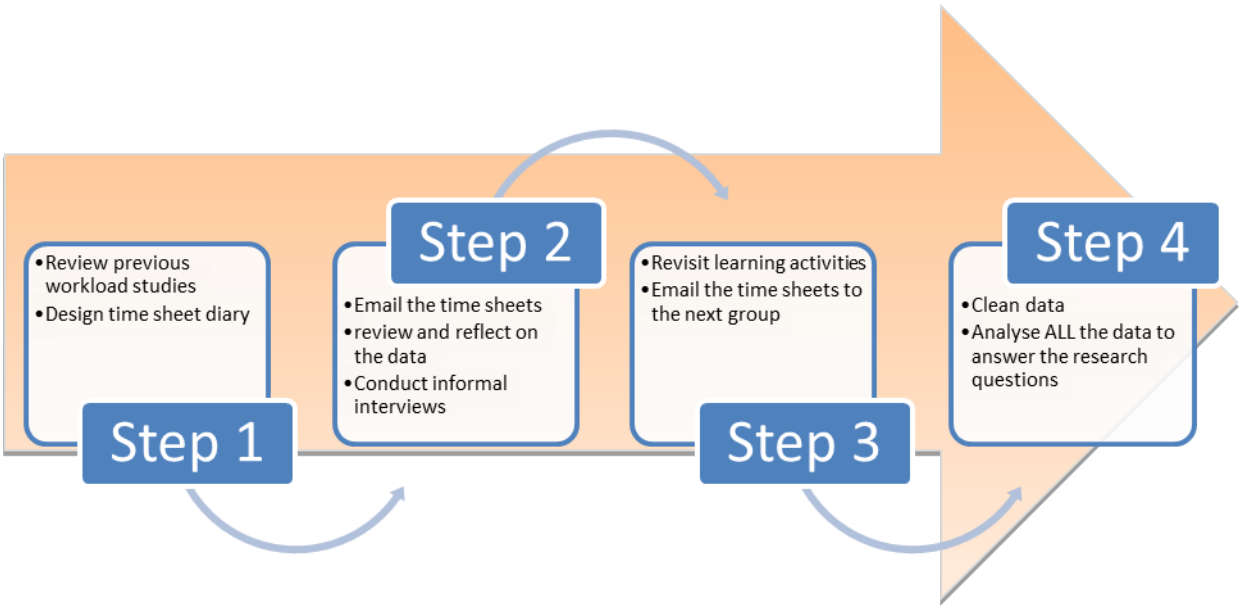


Figure 3.1 Graphic illustration of the research process

Step 1 was to consult previous workload studies to ascertain how to proceed with the assessment of Design students' workload. It was found that, based on the review literature; a timesheet diary would be an appropriate instrument to collect the data.

Step 2 was to administer the instrument. Students were briefed in the studio and a timesheet diary template, with instructions, was emailed to them. Once the data had been collected, they were authenticated by means of the attendance registers and events, i.e. site visits, according to the majority of reports. The informal interviews (field notes) were used to corroborate the learning activities.

Step 3 was based on a preliminary review of the data, it was concluded that a second round of data collection was required to ascertain the reliability of the instrument and to gather more data for comparison. It was decided to repeat the data collection a year later with a different group of students. In order to verify the reliability of the instrument the same design projects were repeated and the same time of year utilised so that the later data would be comparable with the previous data collected. The learning activities from the original list were slightly amended in line with the reports and informal interview results.

Step 4**:** After data clean-up, all the data were analysed and arranged according to the research questions.

3.3. Research instrument

Data regarding the actual amount of time that students spent on learning activities were collected through self-reporting diaries. Examples from the literature were reviewed in order to structure the research instrument. A diary approach was used to record daily activities. This instrument follows a similar approach as used by Nonis, Philhours and Hudson (2006: 123), Kember (2004: 165) and Quyen (2008: 764). A seven-day electronic diary template was developed using MS Excel, modelled on timesheets typically used in the design industry to report billable hours (Balascio *et al*., 2009: 9). This served three objectives in line with Balascio *et al*. (2009: 9):

- It provides a learning experience using timesheets and become familiar with MS Excel. This forms part of the learning outcomes for Professional Design Practice.
- It indicates to students the number of hours they spend on their studies. A total number of hours were calculated as entries were made.
- It provides data in an electronic format ready for analysis.

The timesheet diary contained a covering letter, seven separate daily sheets, an example of a completed timesheet and a consent form. The first sheet contained a covering letter that, as seen in

Figure 3.2 provided space for participants to include their email address and contact number in order to send them reminders to complete the diary. Instructions, detailing a return address and contact details of the researcher, were included below the personal details. Links to each day of the week and a link to the consent form were also provided. Refer to Figure 3.3. The aim was to make the template user-friendly to excel novices.

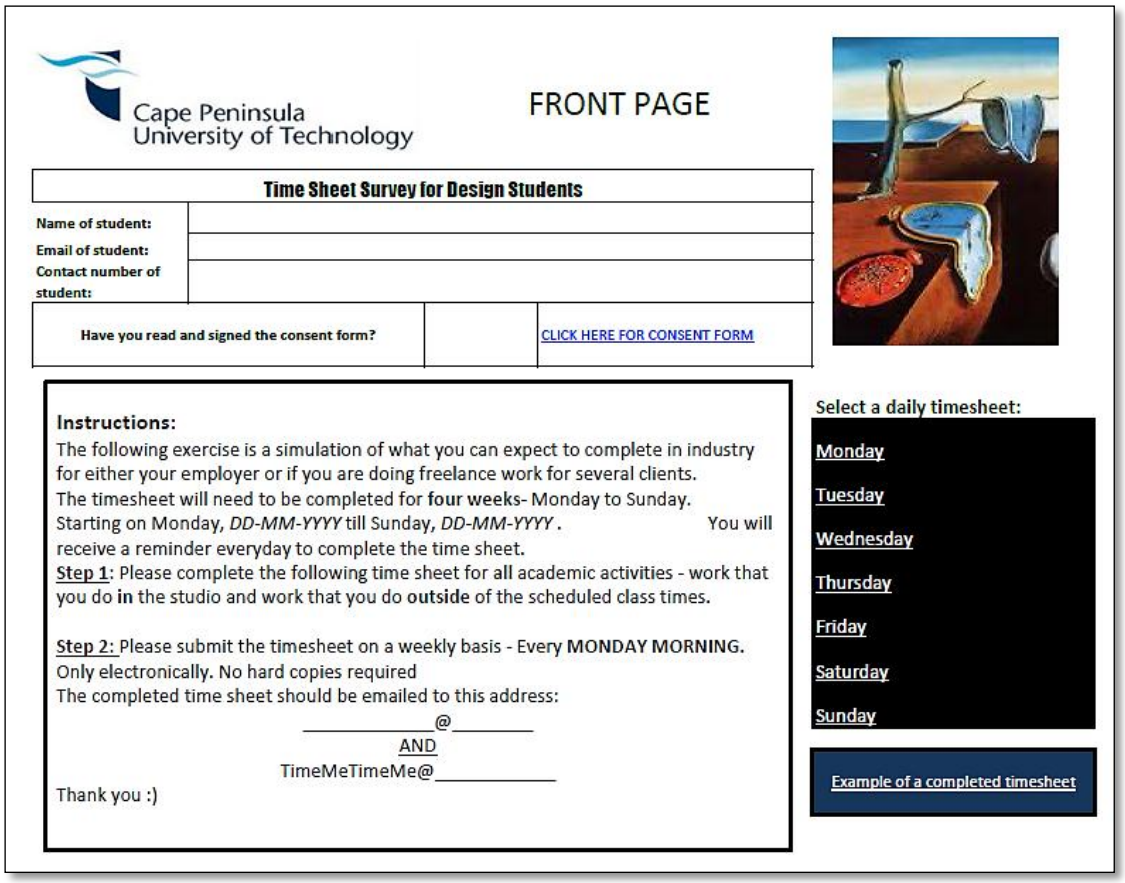


Figure 3.2 The front page of the timesheet diary

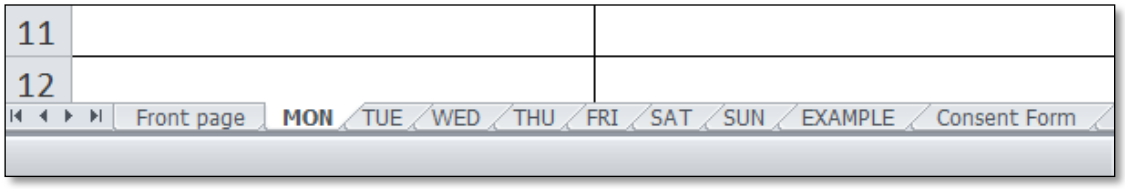
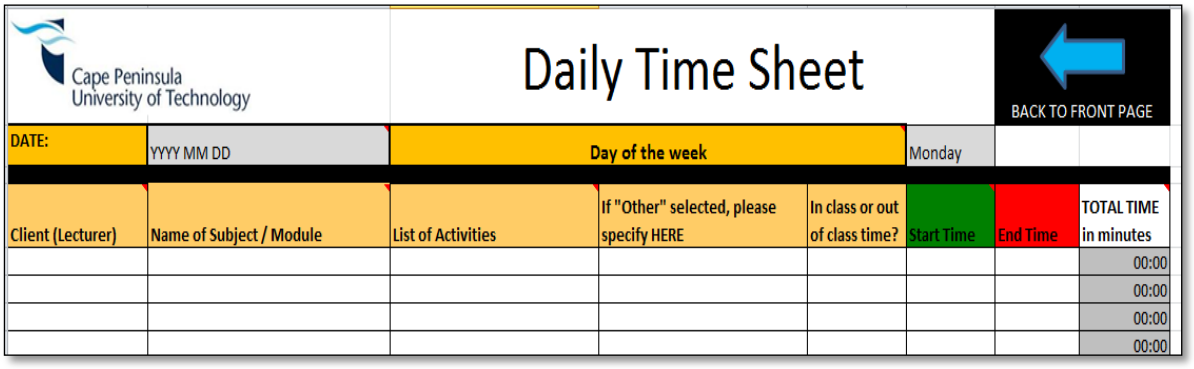


Figure 3.3 The selection of daily timesheets in the timesheet diary

The daily timesheet was designed in consultation with the Professional Design Practice lecturer in order to relate it to a professional timesheet. Every aspect of the timesheet was considered with the end-user in mind: How can it be made easy to use, limiting the amount of time students would need to complete each entry. For example: Each day starts on a new

sheet and can either be accessed via a link on the front page, a "Back to front page" link on each sheet (Figure 3.4), or on the tabs labelled per day of the week, as seen Figure 3.3.

The daily sheets looked identical. Nothing regarding the layout was changed between the first year of data collection and the next year. Figure 3.4 is a screen-shot of one day's template looked like.


Cape Peninsula University of Technology

Daily Time Sheet

BACK TO FRONT PAGE

DATE:	YYYY MM DD	Day of the week			Monday		
Client (Lecturer)	Name of Subject / Module	List of Activities	If "Other" selected, please specify HERE	In class or out of class time?	Start Time	End Time	TOTAL TIME in minutes
							00:00
							00:00
							00:00
							00:00

Figure 3.4 A template for a day in the timesheet diary

Participants would see a pop-up message box to provide explanations of what was required when they linger the mouse over any cell. Any academic activity would be entered by entering or choosing:

1. The date and day of the week.
2. The client (lecturer names available from a drop down list).
3. Name of the subject (drop down list).
4. List of activities (drop down list – refer to Table 3.1).
5. If "other" selected, participants were required to specify what occurred.
6. In-class or out-of-class time? (Choice of 'in' or 'out').
7. Start time.
8. End time.

Total time was calculated by means of a formula: end time minus start time. In case of entries exceeding midnight, participants would insert 24:00 plus the additional hours or add another entry staring at 00:01.

The original list of learning activities was based on the researchers' own teaching experience. The list was designed in consultation with the students and the lecturers to ensure that terms were clear. This saved participants time when entering data and when the data were

analysed. After the first round of data collection in 2014 and interviews with students and lecturers, a few changes were made: the original list did not provide for "*writing a test"* although "*study for test"* was included. The design of the time sheet diary included a list of activities – see Table 3.1. The list of activities was amended in 2015 based on the responses from the 2014 timesheet diaries collected and explanations provided by lecturers and students during informal interviews.

Table 3.1 List of activities for 2014 and 2015

2014	2015
List of Activities:	List of Activities:
Construction drawings or documentation	"new" Construction drawings (CAD/freehand)
Consulting with industry	unchanged
Consulting with other students	unchanged
Development of concepts or ideas	unchanged
Drawing (CAD/freehand/ other)	"new" Design Drawings (CAD/Sketchup/freehand)
Feedback[18]	unchanged
Formal lecture	unchanged
Group crit	unchanged
Group discussion	unchanged
Group work	unchanged
Hand in project/report/ other	"new" Hand in work
Individual crit	unchanged
Individual work	unchanged
Informal lecture	"DELETED" no clarity on use of term
Presentation of project	"new" Divided into:
	(Photoshop/rendering/other) and
	Verbal presentation of project
Research (Internet/library/book/magazines)	unchanged
Site visit	unchanged
Study for test	unchanged
Working on presentation of project	unchanged
Write test (added at end)	changed to be included from start
Written reports/assignments	unchanged
Other (please specify)	unchanged
	"new" Working in studio
	"new" Write in journal

[18] Most students and lecturers refer to feedback as an activity that occurs after assessment whereas crits occur before hand-in. In the case of drawings, crits is often used although feedback would be more appropriate.

A standard CPUT consent form was used and inserted into the template (*see Appendix C*). Details of the study and the purpose of the study were described. Since this study was concerned with time and learning activities, participants' personal demographic details were not required. Participants' privacy was protected as only academic activities were looked at; time for socialising and relaxing was of no consequence, neither were locations or travelling for the calculation of student workload.

3.4. Sample

For the purposes of collecting time-expended data, full-time students in their second or third year of studies in the Interior Design programme were provided the opportunity to participate in this study. This was a convenience sample. Mature students were selected instead of first-year students based on the similarity of subjects in the second and third years of study. These students have adapted to the academic environment of the course, and are likely to have established routines for coping with the workload. It was the aim of this research to study these established routines in order to explore the average duration of time students spend on learning activities.

It was mandatory for second-years to complete a timesheet for the learning outcomes of their subject, Professional Design Practice, whereas third-years were invited to participate for bonus marks in the Interior Design Practice subject. None of the participants were under any obligation to give consent to the use of data derived from their information. According to Lindsay and Rogers (2010: 169), there is a balance between the ability to generalise from the volunteers to non-volunteers versus the authenticity of responses given only because responding is compulsory. In other words, if students volunteer there is a risk that the data may provide a skewed representation and hence could not be used to generalise. However, if the student were obliged to complete the survey there is a risk that the data may not be authentic. Another consideration is the perception that completing the timesheet increases their workload. However, by focusing their attention on their workload they increase their awareness of the latter. Koch *et al*. (2002: 8) believe "that an increased awareness of work habits and emphasis on successfully utilizing the time must exist in the design studio". Karjalainen *et al*. (2006: 70) also note that "time diaries can have powerful side-effects by intensifying students' use of time – they can thus also be intentionally used as tools for promoting students' working methods." Thus, completing the timesheet diary can be beneficial to the students as they may become more aware of their time use and may recognise the value of planning their time in future.

At the end of the collection period all students who submitted a diary were given bonus marks for each week they submitted, irrespective of whether they gave consent.

3.4.1. First round of data collection - 2014

a) 2014 Second-year students:

Twenty-eight students were enrolled for second-year. Of the twenty-eight students, twenty-two were enrolled for all five subjects, including Professional Design Practice 2 (PDP200S) and were, therefore, eligible for this study. Seventeen students submitted timesheet diaries but only fifteen consented. After reviewing the diaries and triangulating the data, one participant was omitted from the study because of incomplete time and date entries. The final number of participants was, therefore, fourteen.

b) 2014 Third-year students:

Seventeen students were registered and enrolled for all the subjects. Of these, twelve students submitted timesheet diaries. Ten of the twelve consented to the research. After reviewing the diaries and triangulating the data, it was discovered that one participant completed 22 days before falling ill and some did not submit all the timesheets. Therefore only six students' timesheet diaries were found to reflect four complete weeks.

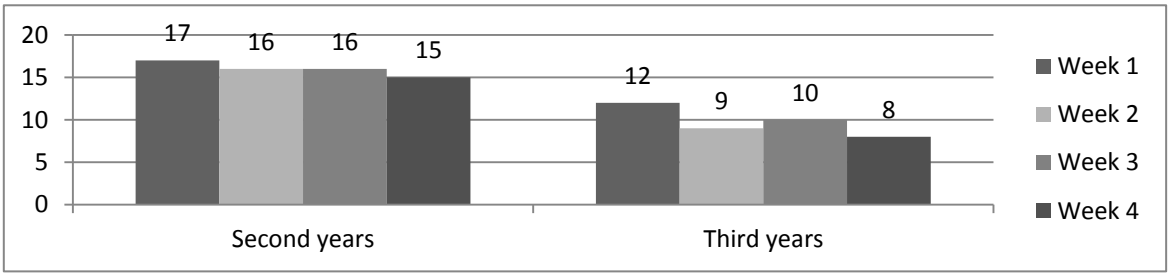


Figure 3.5 Diaries received per week in 2014 from Second- and Third-year students

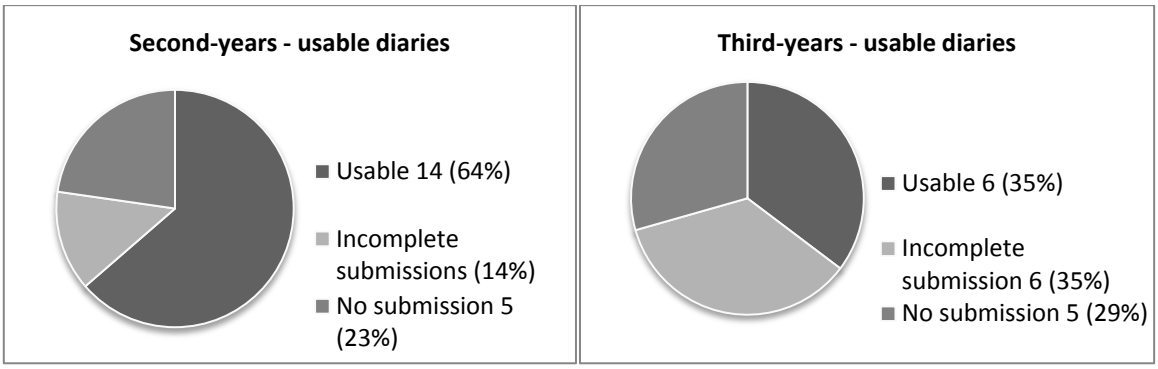


Figure 3.6 Usable diaries for 2014

3.4.2. Second round of data collection - 2015

a) 2015 Second-year students

Twenty-two students were enrolled for second year. Of those, nineteen students were registered for Professional Design Practice 2 (PDP200S). Three passed PDP200S the previous year and therefore, were not eligible for this study. Sixteen of the nineteen submitted usable diaries, which is a return rate of 84%.

b) 2015 Third-year students

Twenty-three students were enrolled for third-year. Only one student was not registered for all subjects and thus not eligible for the study. During the first week of data collection eleven diaries were received. During the next three weeks only nine diaries were received. After the data had been authenticated against the events that occurred during the time period, it was discovered that one student had copied data from Week 4 into Week 3. This student's submission was rejected resulting in only eight usable timesheet diaries. Refer to Figure 3.7 and Figure 3.8:

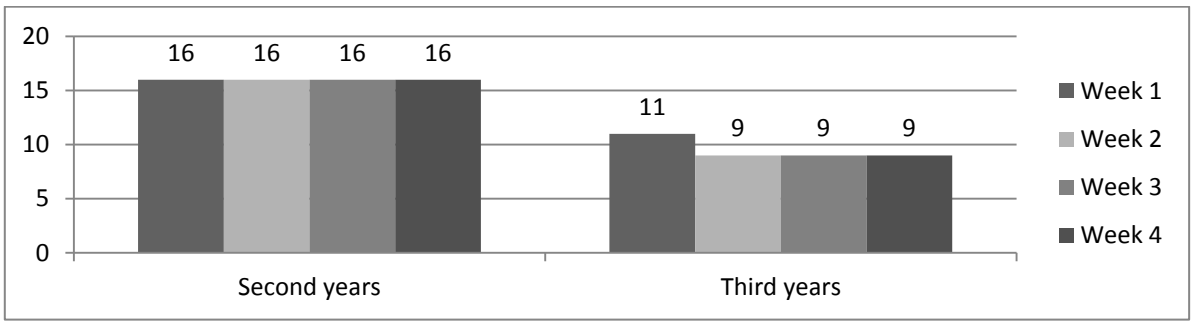


Figure 3.7 Diaries received per week in 2015 from second and third year students

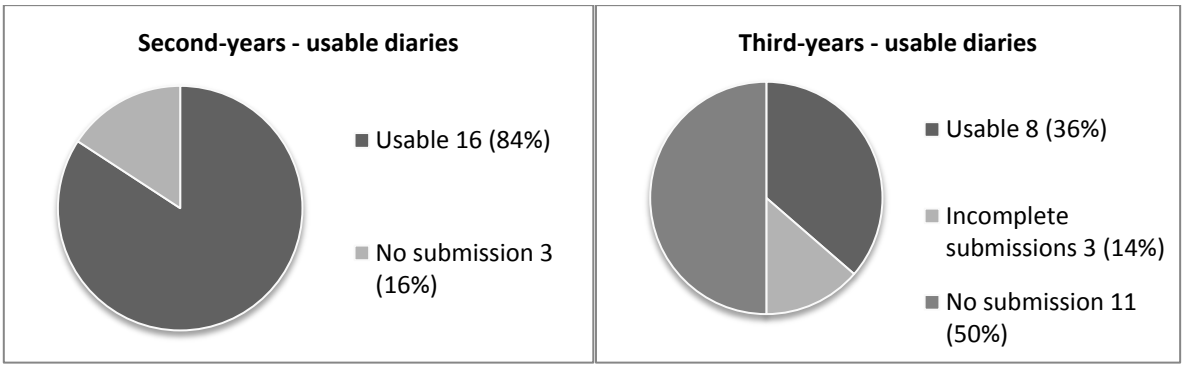


Figure 3.8 Usable diaries for 2015

3.4.3. Comparing the return rate for 2014 and 2015

From 2014 to 2015, there was an increase of diaries submitted by both groups. Second-years increased from fourteen to sixteen, which resulted in a 20% increase in the return rate. Third-years increased from six to eight. However, the return rate of the third-years remained constant. Refer to Figure 3.9 and 3.10.

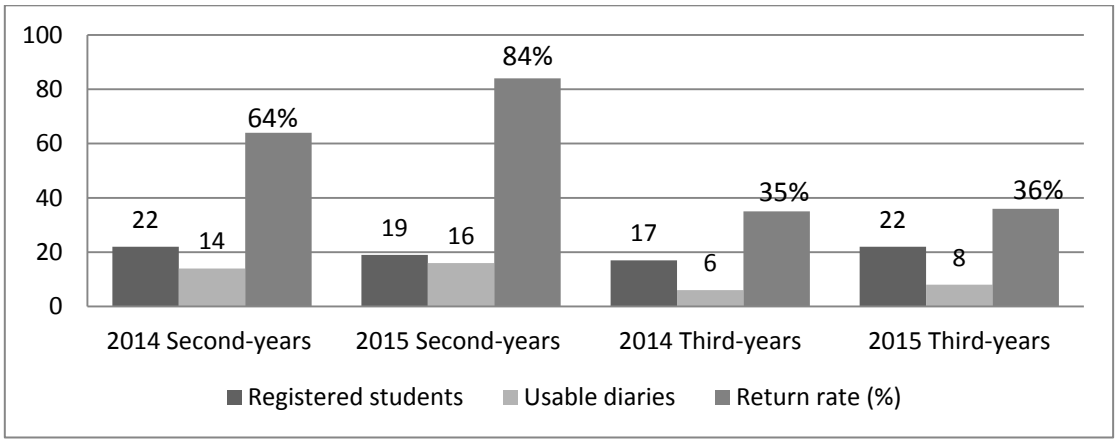


Figure 3.9 Comparing the return rate for 2014 and 2015

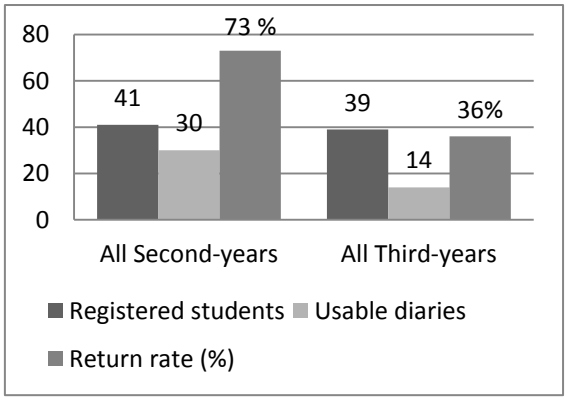


Figure 3.10 Combined return rate

3.4.4. Return rate[19]

Figure 3.10 illustrates the combined return rates for 2014 and 2015. There was concern about the return rate for the third-year group. According to Nulty (2008: 303), the response rate for online surveys of students varies greatly from paper-based surveys. In most cases the response rate for paper-based surveys is higher than 75%, whereas the response rate for online surveys is between 33% and 43%. Nulty explains that surveys conducted face-to-face also yield higher a response rate. In order to boost online response rates, Nulty recommend that students could be sent reminders, and offered a small grade incentive. SMS reminders were sent on alternating days to students, which included time management quotes. This worked well in the case of the second-year students and a good response rate was achieved. Despite employing both recommendations the response rate of the timesheet diary for the third-years was relatively low in comparison with the second-year participants but still on par with a minimum response rate for student surveys at 33%.

In light of the research questions, the data obtained from the timesheet diaries proved to be very comparative. Students' reports were triangulated with attendance records. Scheduled assessments were preceded by some form of preparation in the days leading up to the assessment. Although similar, diary entries were distinct enough. The timelines tell a parallel story, yet each participant has his or her own unique routine. To ensure that work was not copied, all the entries were placed alongside one another and compared. It was expected that class times would align; however, studio times were definitely unique for each individual.

3.5. Administration and timing of the data collection

On average the duration of a design project is six weeks. A period of four weeks was selected in the middle of the design project to represent the average time spent on learning activities related to the project. During the first week of a term, students are returning from recess and it takes a while for them to establish what it is that is required by the project brief. The last week would yield very few returns, as students prefer to work alone. The data from the last week would either yield inflated results or participants may be too focussed on

[19] In the literature (see Table 2.5 and Table 2.6) the term return rate were applied to instruments administered over a period whereas response rate were used where a single survey were administered. In this particular study the term 'return rate' therefore applies.

completing the project and forget to return the timesheet. Therefore, a period in the middle of the third term was selected.

The selection of the period is in accordance with Kember (2004: 169) who maintains that the period during which data are collected should be representative of normal workload patterns. This excludes periods of assessments where deadlines occur and periods with low activities, such as the first week of a term. The period should also be far enough into the year when students have established routines to contend with the workload. Figure 3.11 shows the period of time for which the students were asked to complete the timesheet diary. The orange represents the selected period for 2014 and the light blue for 2015. The dashed vertical line at the end of each term represents the submission of marks. Hand-ins is usually scheduled before the due date for the submission of the marks to allow lecturers time for marking. The asterisk indicates the time at which the interviews took place in 2014.

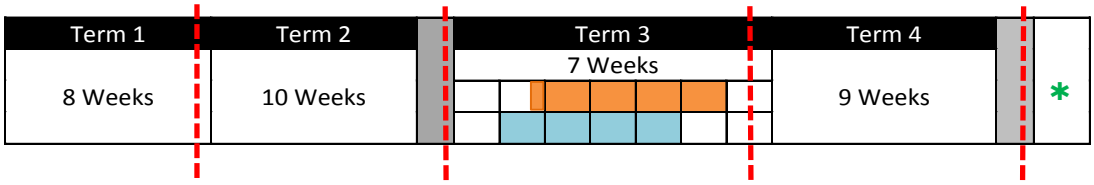


Figure 3.11 Graphic representation the period of data collection within the academic year

Term 1 is unsuitable for calculating average time as students are in the process of establishing routines, and due to the length of the term, a design project may run over the short recess period between Term 1 and 2. Term 2 is often characterised by public holidays and university holidays and therefore, unsuitable for assessing average workload. Term 4 is characteristically the period during which students prepare their portfolio for the final assessment. These events could influence the calculation of average time spent.

According to Kember (2004: 169), when collecting data with different groups of students, it is unnecessary for the chosen weeks to be identical for all courses as long as the period is approximately equivalent.

The timesheet diary was emailed to the students shortly before the intended period. During a timetabled slot, the lecturers briefly introduced timesheets as an instrument used in the profession for fee calculation. As per the project-based nature of the course, students were given the timesheet as a project to be completed. Instructions on how to complete the timesheet were demonstrated and brief clarifications of each learning activity were discussed. Students were also given an explanation of the research project and how the data

would be used to calculate average time spent. They were given the assurance that their personal information would remain confidential. In terms of consent, it was made explicitly clear that though they were required to complete the timesheet as an exercise to meet the learning outcomes. As it would be rewarded with marks, no student was obligated to sign the consent form at the end of the period, and that the timesheets of those who did not consent would be removed from the researcher's database.

3.6. Analysis of the data

Since the timesheet diary was designed with data analysis in mind, MS Excel was used throughout the design, data collection and analysis stages of this study.

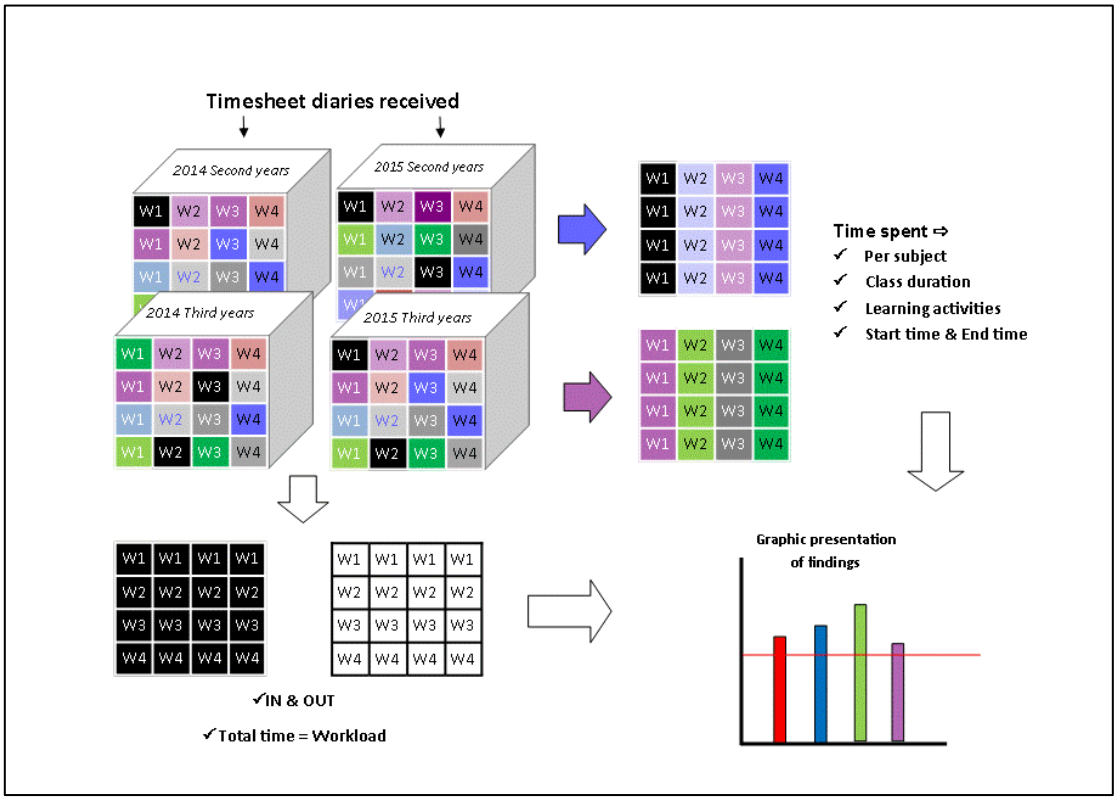


Figure 3.12 Analysis of the useable diaries to answer the research questions

3.6.1. Data clean up

The timesheet diaries were received via email. Participant codes were used to trace entries back to the original email. This helped clarify the dates as participants often omitted to enter or change the date from one week to the next. Dates of the emails were used to double check the dates filled in. Entries before and after the selected period were omitted from the study. Once the dates were determined, entries were validated against other participants

and the class registers. Events, such as hand-ins and tests, included all participants and could be used to determine validity.

A few entries omitted subject names or names of lecturers. In these instances, either would be sufficient to allocate the learning activities to the specific subject for analysis. Another glitch that was picked up afterwards was the total time calculation for hours worked after midnight. Participants overrode the formula that caused problems in later use of the data. Indicating 24:00 plus the added hours, i.e. 23:00 – 02:00, was unacceptable due to the formula for calculating total time and was thus changed to 23:00 - 26:00.

Excel files became corrupted or infected as participants transferred files between their personal computers and the computer lab. These were retyped into clean timesheet templates to preserve the data and to prevent further corruption. Notes were kept regarding each instance where entries were altered as per the above, along with the original emails.

3.6.2. Analysing the usable diaries

As discussed in the sampling section, timesheet diaries were analysed and arranged according to the weeks. Diaries, which could not be validated because of incomplete dates, were omitted from the study. According to Kember (2004: 170), inclusion of partially completed diaries would artificially lower the average figures.

The timesheet diaries reported two issues: Learning activities and time. Regarding learning activities, the aim was to obtain an indication of the time spent on drawing-related activities and the time spent on text-based activities. This aligns with the research problem that WPM assessment of workload might not apply to the Design student.

Time is a more abstract concept, and thus descriptive statistical analysis was adopted. In order to calculate the weekly averages, only diaries with verifiable entries for the four weeks were analysed.

To analyse the timesheets all data were pasted into a single sheet in Excel. First the daily entries were copied into a single sheet per week, and thereafter all four weeks were copied into a single sheet. Three additional columns were added – participant code, week (W1, W2, W3, and W4) and date (i.e. Mo17; Tu18). The week and date columns were used to sort the data in order to see what happened during a particular time slot. This assisted with the validation of the data. Pivot tables were used to answer the research questions pertaining to in- and out-of-class times, total times, and average time spent.

3.6.3. Total hours and average hours

The weekly average per student and per year group was calculated using Equation 3.1. The average of every week per participant was calculated and added to the average of the week thereafter for four weeks. At the end of the four weeks the average was calculated by dividing the total by four.

Equation 3.1 Average time spent per week per participant

$$Average\ per\ week = \frac{(W1 + W2 + W3 + W4)}{4}$$

The weekly average for a group was calculated using Equation 3.2. The averages of all participants were added up and then divided by the total number of participants in the specific population (*N*)

Equation 3.2 Average per group

$$\overline{x} = \frac{\sum x}{N}$$

$$\bar{x} = \frac{x_1 + x_2 + \cdots + x_N}{N}$$

N = population

This group average could then be compared to the 40 notional hours.

3.6.4. Notional hours and the timetable

Credits are the objective workload expected of the average student in order to achieve the learning outcomes. Based on the number of credits, notional hours were calculated. The subjects of the Interior Design course are outlined in Table 3.2 for the subsequent purpose of comparing the average time, which students spent, with notional hours and the timetable. The second year of the Interior Design course consists of five subjects. The third year of the Interior Design course consists of six subjects. One hundred and twenty (120) credits are assigned to each year of the course, and consequently, the students accumulate 360 credits in total over the three years.

Table 3.2 Credits per subject

Second year course	Credits	Third year course	Credits
Interior Design 2	24	Interior Design 3	30
Design Technology 2	36	Design Technology 3	30
Presentation Methods 2	36	Presentation Methods 3	24
Professional Design Practice 2	12	Professional Design Practice 3	12
Design Theory 2	12	Design Theory 3	12
		Interior Design Practice 3[20]	12
TOTAL	120	TOTAL	120

In South Africa, 10 notional hours per year are allocated to each credit. Therefore, a course of 120 credits is allocated a total of 1200 notional hours per year. Based on the average academic year of 30 weeks, 40 notional hours are allocated per week. The calculation of notional hours per subject is shown in Equation 3.3:

Equation 3.3 Notional hours per subject

Notional hours per year = Credits allocated x 10

= 120 credits x 10

= 1200 hrs per year

Thus per week = 1200 hrs / 30 academic weeks

= 40 hrs per week

$\therefore$ Notional hours per subject $= \frac{(Credits\ allocated\ x\ 10)}{30\ weeks}$

Table 3.3 shows the notional hours per week for the second- and third-year Interior Design programme in relation to the timetabled hours for each year. The student timetables for 2014 and 2015 are appended – refer to Appendix D.

[20] Interior Design Practice 3 concerns students' placement in the workplace for six weeks after their mid-year portfolio review. The data were collected after their return to class and therefore, no activities were reported for this subject

Table 3.3 Notional hours and the timetable

2nd Year	Notional hrs/week:	Weekly Timetable:	3rd Year	Notional hrs/week:	Weekly Timetable:
Design 2	8:00	10:00	Design 3	10	8:00
Design Technology 2	12:00	8:00	Design Technology 3	10	10:00
Presentation Methods 2	12:00	6:00	Presentation Methods 3	8	6:00
Professional Design Practice 2	4:00	2:00	Professional Design Practice 3	4	2:00
Design Theory 2	4:00	2:00	Design Theory 3	4	2:00
			Design Practice 3*	4	1:00
TOTAL	40 hrs /w	28 hrs /w	TOTAL	40 hrs /w	29 hrs /w
Support[21]		[2:00]	Support[22]		[2:00]

3.6.5. Class duration

To compare the duration of the class with the student timetable the start and end times of the class were determined by analysing the reported times. Lecturers kept attendance registers, and the students reported their individual times spent with the lecturer. In most cases more than one student would report the same starting time but different end times. Their learning activities would then distinguish between individual crit, group crit, or individual work, for example. It was, therefore, possible to determine the class duration. In-class time refers to the average amount of time an individual student spent with the lecturer or working in the studio and might be slightly different to the time indicated on the timetable.

3.6.6. The learning activities

To answer the research question, 'in what learning activities do Design students engage?' the timesheet diaries were collated into a single Excel sheet. The learning activities were organised according to the subject, in- and out-of-class occurrences and listed in the order of the time reported. Since the project for 2014 and 2015 remained the same, it was possible

[21] The timetable makes provision for students to consult with an additional lecturer on a Friday. This is part of the programme's provision for student support. Several of the participants noted time spent in consultation on a Friday afternoon. These reports were dealt with as in-class activities.

[22] In order to provide the Extended Curriculum students in the course with support until they complete their studies, the Friday afternoon slots on the timetable are dedicated for undergraduate students who require additional support in any of their subjects. This programme is open to all students who are deemed at risk

to determine the type and number of instances of learning activities for each subject. By distinguishing between the numbers of instances that a particular learning activity was reported, it was possible to discern whether a subject can be classified as being predominantly based on text- or drawing-related learning activities.

3.7. Validity and reliability of the timesheet diary

A timesheet diary was developed to collect data regarding the time that students spend on their learning activities. The data collection was repeated in 2015 and only some of the terms, referring to learning activities, were amended based on the results of the 2014 timesheet diaries and discussions with lecturers and participants. Innis and Shaw (1997: 86) advise that the instrument should be matched very closely to the course culture, context, delivery and management systems that operate in a particular institution. The timesheet diary proved to be a valid and reliable instrument because it yielded the data required to answer the research question on both occasions (2014 and 2015) with different groups of students.

In order to check the validity of the students' entries, class registers were collected to verify their attendance. Student-to-student comparisons were conducted to look for any discrepancies. Although entries regarding class attendance could be verified, the start and end times varied among participants. Work done outside the class could not be verified although the activities and project due dates gave an indication of whether students were required to do individual work.

3.8. Conclusion

This chapter highlights the reasons for using a diary method and the design of a timesheet diary to answer the research questions of this study. The sampling and return rate was explained using tables. The design, administration and timing of the timesheet diary were explained using literature to support the various elements. Methods for analysing the quantitative data were explained to determine the time spent on in- and out-of-class learning activities. Equations for calculating the average time spent per week and the average per group are set out, along with calculations for the notional hours per subject. The findings derived from the timesheet diaries are presented in the next chapter.

Chapter 4 The Findings

"Learning takes place in the student's time and through student's learning activities".

(Karjalainen *et al.*, 2006: 2)

4.1. Introduction

The purpose of the research was to determine the time that Design students spend on in- and out-of-class learning activities. A thorough review of the available literature, student engagement studies and workload models revealed a gap regarding information on the time required for Design programmes. However, the review also revealed that using diary methods is considered the best instrument to answer the research questions. The design of the timesheet diary was discussed in Chapter 3. The data from the timesheet diaries were first organised per participant and then per subject to enable a comparison with the class registers. Once each timesheet had been checked it was collated in a single excel sheet to reveal the average workload for the groups. All the data for each subject per year and per group are available in Appendix E to Appendix L as evidence to support the summative findings. This chapter presents a summation of the findings based on the conceptual framework. (refer to Figure 4.1)

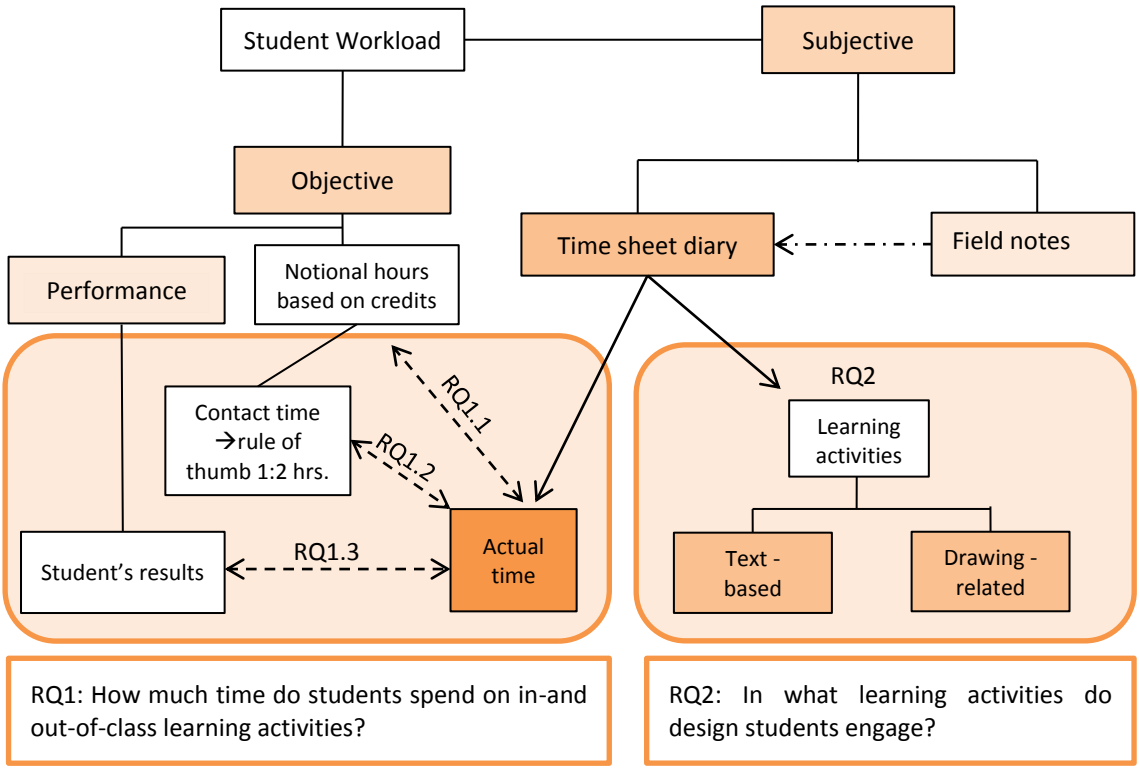


Figure 4.1 An overview of research questions in relation to the conceptual framework

The conceptual framework indicates that workload should be viewed in terms of relationships between objective workload, subjective workload as reported by the student, and performance of the student. Lastly, the learning activities were analysed. Therefore, the findings were arranged according to:

- Objective workload: Comparing the findings to the credits, notional hours and the timetable;
- Subjective student workload: The combination of the total time spent in class and the time spent out of class;
- Performance: Comparing the average time spent by students with their results;
- Learning activities: Discerning between learning activities that are text-based or drawing-based.

Results from the timesheet diaries will be discussed to answer the research questions:

1) How much time do students spend on in- and out-of-class learning activities?
2) In what learning activities do Design students engage?

4.2. How much time do students spend on in- and out-of-class learning activities?

The purpose of this question was to determine the time a student spends on learning activities in- and out-of-class. Participants reported their time spent in class and time spent out of class by indicating the start time and end time of a learning activity and the associated subject. From this, the average subjective workload per student (Refer to Equation 3.1) and the group (Refer to Equation 3.2) was calculated. In order to compare the objective workload to the subjective workload, the notional hours were calculated (refer to Equation 3.3) as well as the contact time based on the 'rule of thumb' (for every one hour in class, two hours on studying). A comparison was made with the student timetable to discuss the allocated contact time. Further comparisons were made to the students' results to determine whether the average time a student spent was enough to meet the learning outcomes and whether the time available and the time needed are comparable as per Carroll's theory of time use (in Gijselaers & Schmidt, 1995: 183).

Consequently, the following section discusses objective workload vs. subjective workload vs. performance:

- the average time spent per week (workload) compared to the notional hours

- the average time allocated to each subject and the 'rule of thumb' for contact time
- the average time spent on in- and out-of-class learning activities reported per subject
- the class duration reported per subject in relation to the individual time reported per student
- the average time reported for out-of-class learning activities
- the average time per student compared to their term average
- the average time reported per week per subject

In addition to the average reported time over the entire period it was interesting to see how in-class and out-of-class times varied over the duration of the four weeks in every year. This was done by calculating the average time reported per week. This phenomenon will be discussed at the end of the section.

4.2.1. The average time spent per week (workload) compared to the notional hours

Students reported the time spent on various activities in the timesheet diary. Their time spent in class and out of class per week was combined and averaged in order to compare it to the notional hours set out by SAQA (refer to Equation 3.3). Figure 4.2 shows the individual group average per year and the combined average of the four groups. The notional hours of 40 hours per week is shown on the horizontal axis.

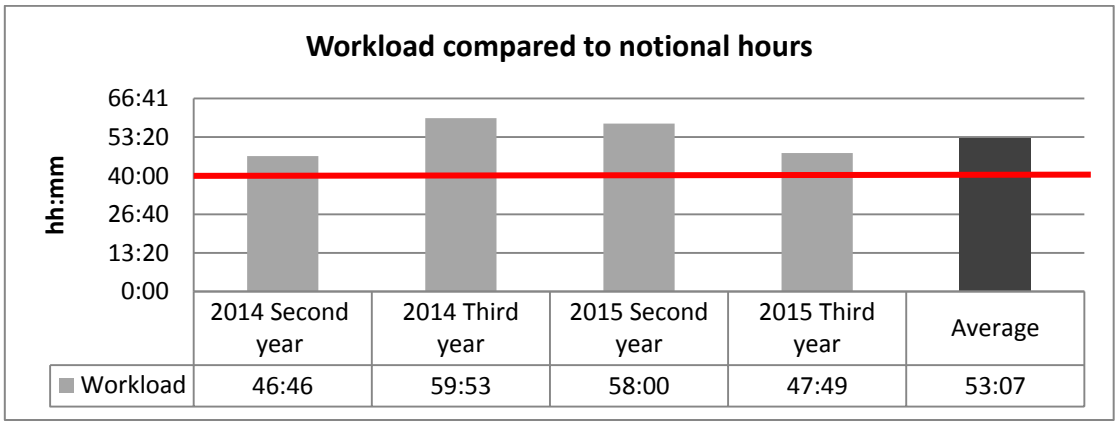


Figure 4.2 The average workload per week compared to the notional hours per week

The average time spent by the students is higher than the 40 notional hours. This corresponds with national student surveys done in Latin America (Alarcón *et al.*, 2013) and the National Union of Students report (GfK Finance, 2011) in that students in Architecture and the Built Environment experience, on average, a higher workload and are expected to work for longer than the notional hours.

This raises the question whether this is true for all the students in this study. The following chart depicts the number students who reported less than 40 hours, those who spent more than 40 hours and the number of students who spent above 50 hours on average. The sample size is indicated next to the applicable bar.

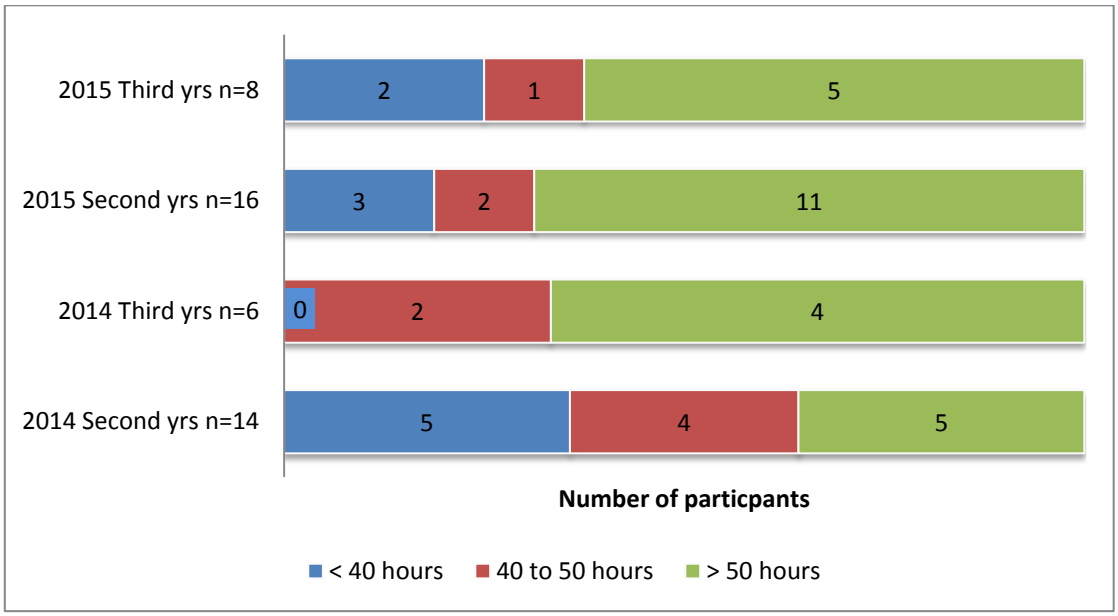


Figure 4.3 Breakdown of workload per sample

As shown in Figure 4.3 more than half the participants indicated that they work above an average of 40 hours per week. The sample size for third years was not big enough to generalize the findings to the larger population, but is representative of the small population available in Interior Design.

4.2.2. The average time allocated to each subject and the rule of thumb for contact time

Workload equates to the total time spent, irrespective of contact time or study time. In the literature the 'rule of thumb' for allocating notional time towards contact time and study time is represented by the ratio of 1:2, inferring that for every hour of contact a student should

be afforded two hours to study. The time indicated on the student timetable is compared to the total notional hours in Table 4.1.

Table 4.1 Notional hours in relation to the student timetable

	Subjects:	OBJECTIVE WORKLOAD					
		Notional hours/week		Contact time		Study time	Weekly Timetable
Second Year	Interior Design 2	8:00	=	2:40	+	5:20	10:00
	Design Technology 2:	12:00	=	4:00	+	8:00	8:00
	- Construction	*"6:00"*	=	*1:40*	+	*3:20*	*4:00*
	- Materials	*"3:00"*	=	*1:00*	+	*2:00*	*2:00*
	- Services	*"3:00"*	=	*1:00*	+	*2:00*	*2:00*
	Presentation Methods 2 (incl. CAD)	12:00	=	4:00	+	8:00	6:00
	Professional Design Practice 2	4:00	=	1:20	+	2:40	2:00
	Design Theory 2	4:00	=	1:20	+	2:40	2:00
⇨	TOTAL hours	40:00	=	**13:20**	+	26:40	**28:00**
Third Year	Interior Design 3	10:00	=	3:20	+	6:40	8:00
	Design Technology 3	10:00	=	3:20	+	6:40	10:00
	- Construction	*"5:00"*	=	*1:40*	+	*3:20*	*06:00*
	- Materials	*"2:30"*	=	*0:50*	+	*1:40*	*02:00*
	- Services	*"2:30"*	=	*0:50*	+	*1:40*	*02:00*
	Presentation Methods 3 (incl. REVIT)	8:00	=	2:40	+	5:20	6:00
	Professional Design Practice 3	4:00	=	1:20	+	2:40	2:00
	Design Theory 3	4:00	=	1:20	+	2:40	2:00
	Interior Design Practice 3[23]	4:00	=	1:20	+	2:40	
⇨	TOTAL hours	40:00	=	**13:20**	+	26:40	**28:00**

Based on the 'rule of thumb' the contact time and study time for each subject/module is calculated as shown in Table 4.1. The time indicated on the timetable is shown next to each corresponding subject. No correlation between the timetable and the notional contact hours was found. Considering that the concept of notional hours by definition, involves all learning activities (attending classes, tutorials, and studying) it appears that the number of contact

[23] Interior Design Practice 3 concerns students' placement in the workplace for six weeks after their mid-year portfolio review. The data were collected after their return to class and therefore, no activities were reported for this subject or time allocated on the timetable.

hours allocated to practical subjects in relation to notional hours is high. In every instance subjects are afforded more contact time on the timetable than the 'rule of thumb' suggests. Figure 4.4 illustrates the disjuncture.

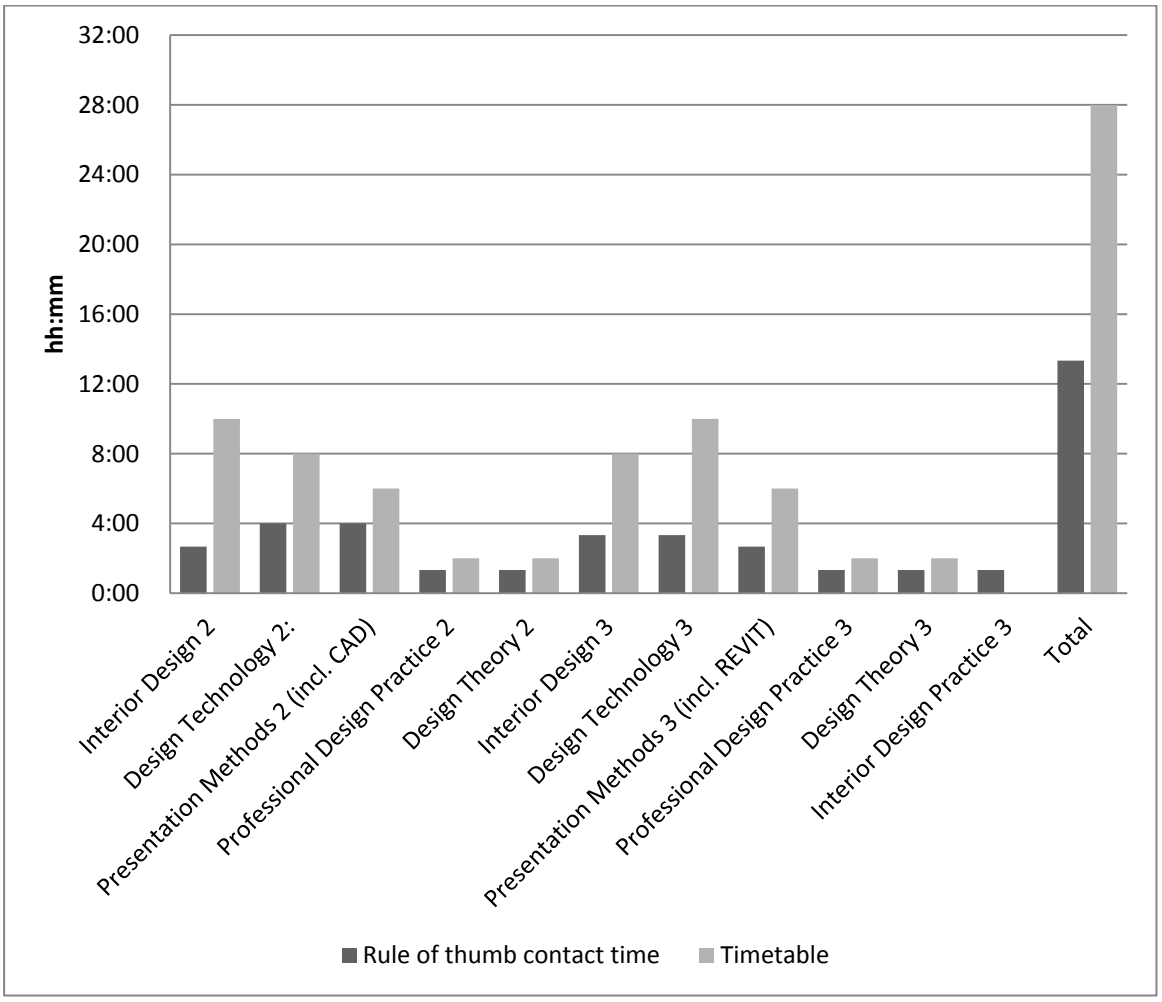


Figure 4.4 Notional contact time compared to the timetable

4.2.3. The average time spent on in- and out-of-class learning activities reported per subject

In order to answer the question whether the time students reported corresponds to the timetable or the notional hours or the 'rule of thumb', the in-class and out-of-class times were calculated. This was done using a pivot table to filter the time indicated by the participants as being in class or working on out-of-class learning activities. Often participants would be on campus or in the studio but would be working on a different subject than that which the timetable indicates. This is part of the reason why a timesheet diary was required instead of only referring to the class registers kept by lecturers. Class registers do not reflect

the time which the student spends working, but instead their presence at the time of the lecture or in the studio.

Figure 4.5 indicates the amount of time reported by individual participants compared to the notional hours. Twenty-eight hours, as per the timetable, are indicated as a thick red line.

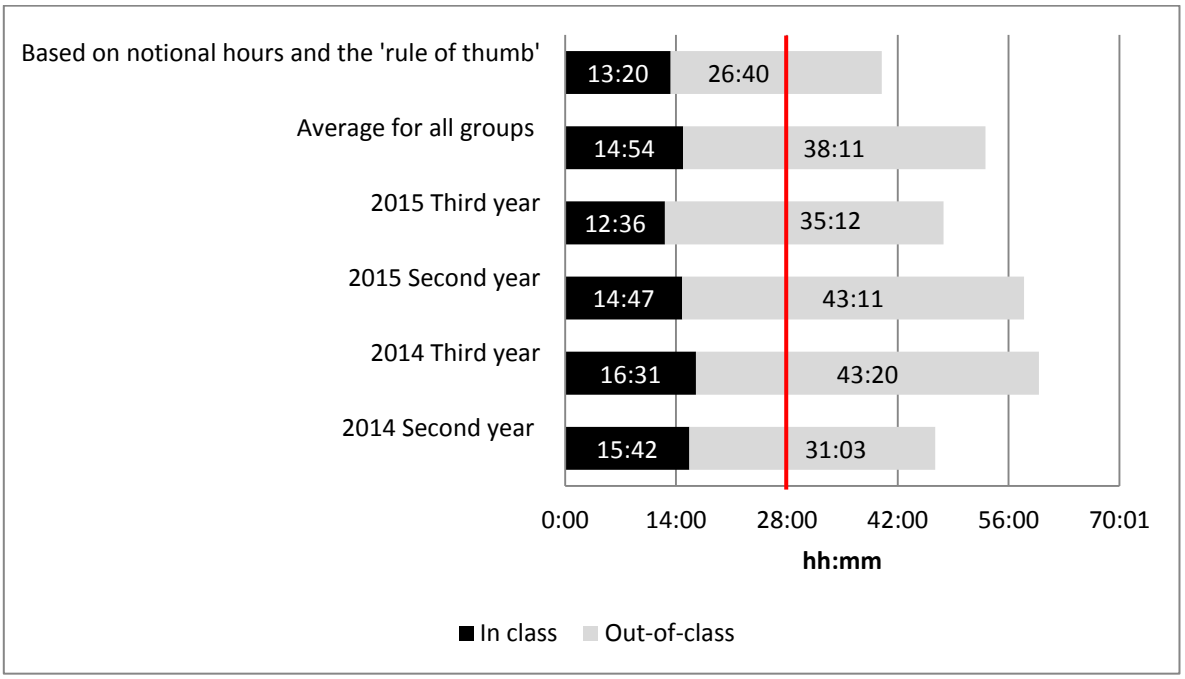


Figure 4.5 Reported time spent in class and out-of-class compared to the notional hours and the timetable hours

Participants' individual time spent on in-class learning activities correlates to the notional hours and not to the expected 28 hours indicated on the timetable. However, it is clear that the individual participants in this study did manage to spend a large portion of their time on out-of-class learning activities (independent learning time). The timetabled hours are, therefore, not a reflection of the amount of contact time a student receives but rather an objective time allocation that allows students to make use of the facilities and consult their lecturers. The time spent in-class is thus a better indicator of the contact time of the individual student than the contact time indicated on the timetable. In the light of this, the reported in-class time resonates and is, indeed, comparable to the national and international average for contact time.

The next correlation under investigation is the ratio between in-class and out-of-class time and whether the 'rule of thumb' is true for these students. The time spent on in- and out-of-class learning activities was calculated for each subject and can be viewed in Appendices G, H, I, and J. For brevity, the summative data were chosen as displayed in Figure 4.6.

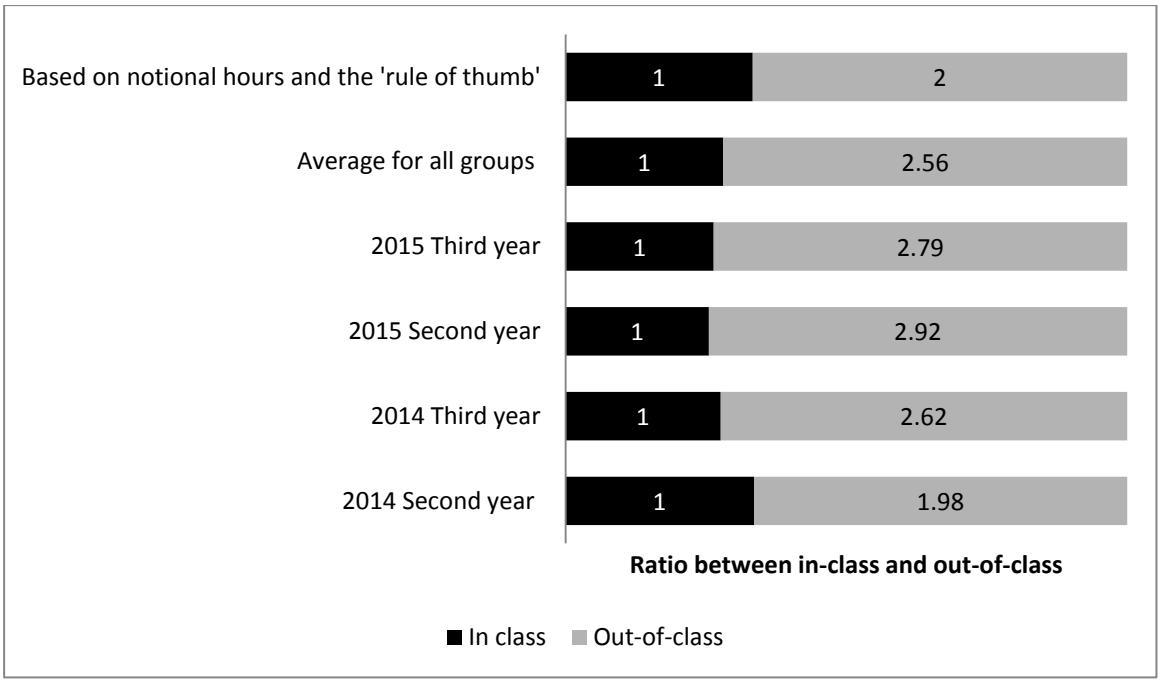


Figure 4.6 The ratio between time spent in-class and time spent out-of-class

The ratio of the reported time spent in-class versus the time spent out-of-class does not correlate with the accepted 'rule of thumb' used across higher education to allocate contact time.

This finding reveals that, despite the timetable and the assumption that students receive an excessive amount of contact with a lecturer, there is an even larger number of hours being spent on independent learning.

4.2.4. The class duration reported per subject

This section looks at the phenomenon of why in-class time spent does not equate to the contact time allocated on the timetable.

To understand the actual amount of time students spent in class compared to the timetable and the notional hours, the duration of class time was calculated. Class duration refers to the length of time that the lecturer was available in the studio as indicated by the participants in the timesheet. To calculate this amount of time, the start and end time for each participant was considered and not the amount of time the individual participant spent with the lecturer or reported in class. For example, in Interior Design students reported their crit times with the lecturer, which could range from 15 minutes to 1 hour, depending on whether they reported an individual crit or a group discussion. The rest of the time they indicate to continue either with individual work, design drawings or construction drawings. Thus the

duration of class is determined by when the first crit is reported until when the last crit is reported. It can also be seen as the amount of time, which the lecturer spent in the studio from the students' perspective rather than from the timetable perspective. Table 4.2 indicates the contact time based on notional hours and the 'rule of thumb', the time indicated on the time table and the class duration reported by the participating students.

Table 4.2 Contact time based on notional hours in relation to class duration

	Subjects:	OBJECTIVE		TIME SHEET DIARY		
		Contact time	Weekly Timetable	2014 Class Duration	2015 Class Duration	Average Class Duration
Second Year	Interior Design 2	2:40	10:00	9:07	8:48	8:57
	Design Technology 2:	4:00	8:00	9:24	7:06	8:15
	- Construction	*1:40*	*4:00*	*5:37*	*3:07*	*4:22*
	- Materials	*1:00*	*2:00*	*2:10*	*1:41*	*1:55*
	- Services	*1:00*	*2:00*	*1:37*	*2:18*	*1:57*
	Presentation Methods 2	4:00	4:00	3:45	2:55	3:20
	Professional Design Practice 2	1:20	2:00	1:29	1:04	1:16
	Design Theory 2	1:20	2:00	1:37	3:03	2:20
⇨	TOTAL hours	**13:20**	**28:00**	**25:22**	**22:56**	**24:09**
Third Year	Interior Design 3	3:20	8:00	9:37	7:53	8:45
	Design Technology 3	3:20	10:00	7:44	5:24	6:34
	- Construction	*1:40*	*06:00*	*5:00*	*2:30*	*3:45*
	- Materials	*0:50*	*02:00*	*1:22*	*1:32*	*1:27*
	- Services	*0:50*	*02:00*	*1:22*	*1:22*	*1:22*
	Presentation Methods 3	2:40	6:00	3:37	4:30	4:03
	Professional Design Practice 3	1:20	2:00	1:21	1:30	1:25
	Design Theory 3	1:20	2:00	1:44	2:30	2:07
⇨	TOTAL hours	**13:20**	**28:00**	**24:03**	**21:47**	**22:55**

In Table 4.2 there is a noticeable difference between the timetabled time and the duration of class. The duration of lectures for Materials, Services, Professional Design Practice and Design Theory is, on average, within the timetabled hours, although slightly higher than the notional contact time. On the other hand, the duration of class for Interior Design, Construction and Presentation Methods shows no correlation with the timetabled time. A

reason for this relates to the greater amount of time required for individual crits as opposed to the shorter time required for formal lectures that occur with large groups.

Another reason for this phenomenon relates to the reported times and the sample size: In the case of the second-year students the return rate was high and therefore, a better account of the events was reported. However, in third year, with only six (2014) and eight (2015) participants, the latter reported the time spent in the studio as it related to their personal times rather than the time which the lecturers spent in the studio. For instance, if none of the participants reported a time for a particular subject it does not necessarily mean that there was no class on that day, it only means that none of the six (2014) or the eight (2015) participants attended the class on that day.

The data for the combined reported time with the number of participants who reported the time is available in Appendix L. Figure 4.7 shows the breakdown of in-class hours reported based on the number of participants in each category. The categories reflect those participants who, on average, spent less than 10 hours a week in class, between 10 and 15 hours (to correspond with notional hours), between 15 and 20 hours, and 28 hours (to indicate that it is exceptionally rare for any student to attend all the classes for four weeks).

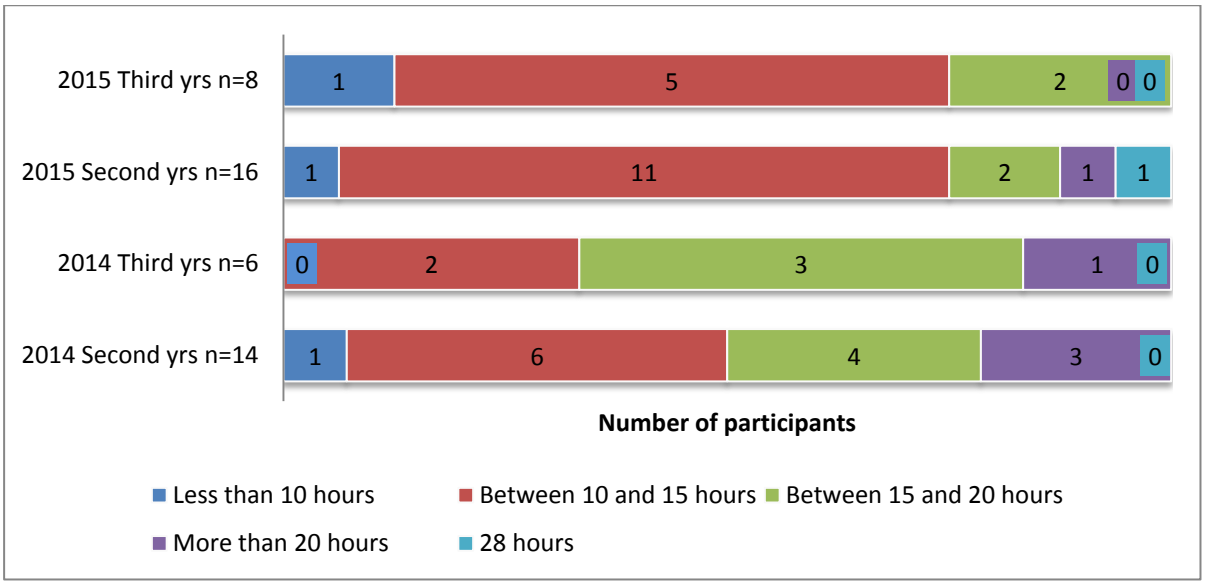


Figure 4.7 Breakdown of reports of time spent on in-class learning activities

Noticeable in Figure 4.7 is that only one student reported attending all the timetabled classes. Upon enquiring, the lecturers and the participant revealed that this is true. The student uses the equipment and facilities to complete the learning activities during the day and often continues to work past the official end of class time indicated on the timetable. It

is uncertain whether more such instances existed as many participants would indicate the time spent on work beyond that indicated on the timetable as being out-of-class. Although the list of activities provided an option for students to select that they were working in the studio and that it was an out-of-class activity, very few participants chose this route to indicate what they were doing.

Despite the fact that a true record of the length of the crit in the studio was unobtainable based on the small sample of participants, the data from the time sheets did indicate that the length of time allocated on the timetable is not a true reflection of the contact time experienced by the students. Thus the lecturer was available for the duration of the class as indicated by the timetable and the start and end times of the students. However, this time does not correlate with the average time an individual student spent in class as discussed in the previous section.

4.2.5. The average time reported for out-of-class learning activities

Another aspect of the argument is whether the 'rule of thumb', as applied to the contact time afforded on the timetable, provides the student with enough time for independent learning. In other words, the 'rule of thumb' is defined as for every hour of contact time the student should be afforded two hours for studying. Thus if a student happens to attend the full 28 hours as indicated on the timetable s/he would have to spend an additional 56 hours on independent learning. That is 84 hours a week! Although there were a few students who reported working for up to 100 hours a week it is not a common occurrence. Figure 4.8 shows a breakdown of the time students reportedly spent on out-of-class learning activities.

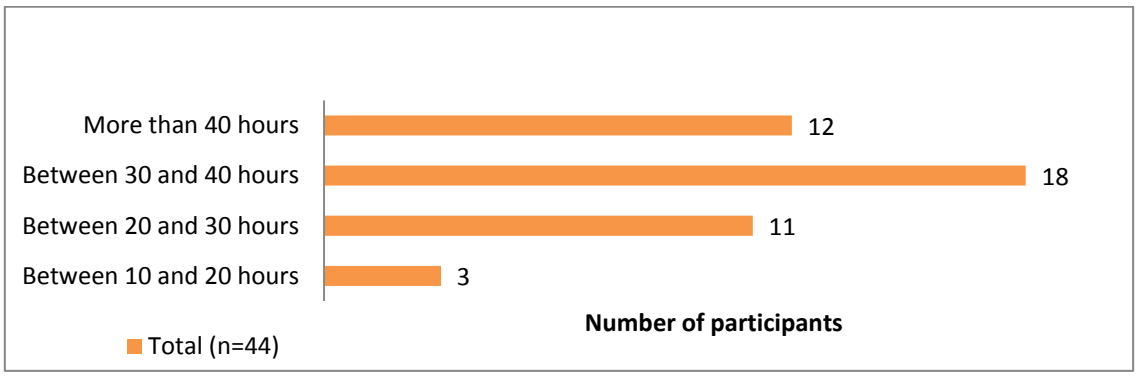


Figure 4.8 Breakdown of reports of time spent per week on out-of-class learning activities

Previous calculations suggest an average of about 26 hours for independent study (out-of-class leaning activities). The literature suggests that between 20 to 30 hours of study are necessary to complete the learning outcomes. It appears that in this particular study most of the participants were spending more time per week than what is expected. However, in order to determine whether they were able to complete the learning activities in order to pass, a comparison with their results is required.

4.2.6. The average time compared to the term average

In order to see whether the amount of time correlates with the results the following graph (Figure 4.9) was compiled using the average mark obtained per student for the five subjects. (A complete breakdown of the individual results can be viewed in Appendix F – Second-years and Appendix G – Third-years.)

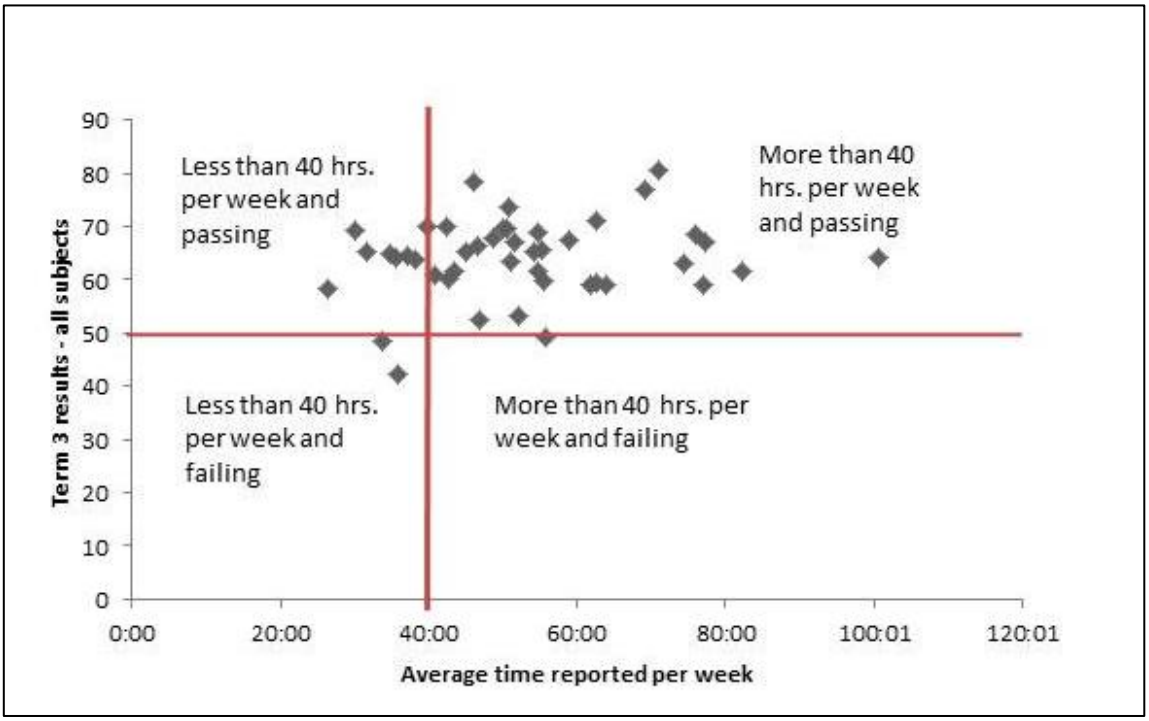


Figure 4.9 Annotated graph of results compared to the average time reported per week

According to the data, four quadrants can be seen:

- students reporting less than 40 hours per week and passing;
- students reporting more than 40 hours per week and passing;
- students reporting less than 40 hours per week and failing;
- students reporting less than 40 hours per week and failing.

Figure 4.9 shows that most of the participants, in this study, were spending more than 40 hours a week, and passed their course. Two of the participants achieved just below a 50% average and another failed the course. There are a number of the participants, who managed to pass the course while spending less than 40 hours per week on their studies. Unless they did not report all the hours spent on learning activities this indicates that it may be possible to have a balance between studies and personal life while studying Interior Design. One of the participants indicated that s/he spent 100 hours on average on learning activities. The reason for this exceptional amount of time was that the use of the computer lab on campus was required. The lecturers and participants confirmed this. Several participants did not have access to the software and Wi-Fi at their place of residence in Cape Town. In order to complete their work they relied on the facilities and support from other students. Even participants with personal computers made use of the computer lab for similar reasons.

The position on the graph of participants with the highest average results indicates that the old adage of hard work paying off rings true in this particular study. There will always be an exception to the rule, but these cases are in the minority. It takes time to develop design proposals and construction drawings while learning to use a variety of software in the process. The results from the four groups are split into second-years and third-years to show that third-years spend a little less time in order to pass. Since the return rate of the third-years was low, it would be dangerous to speculate. Figure 4.10 and Figure 4.11 show the difference between the second- and third-years:

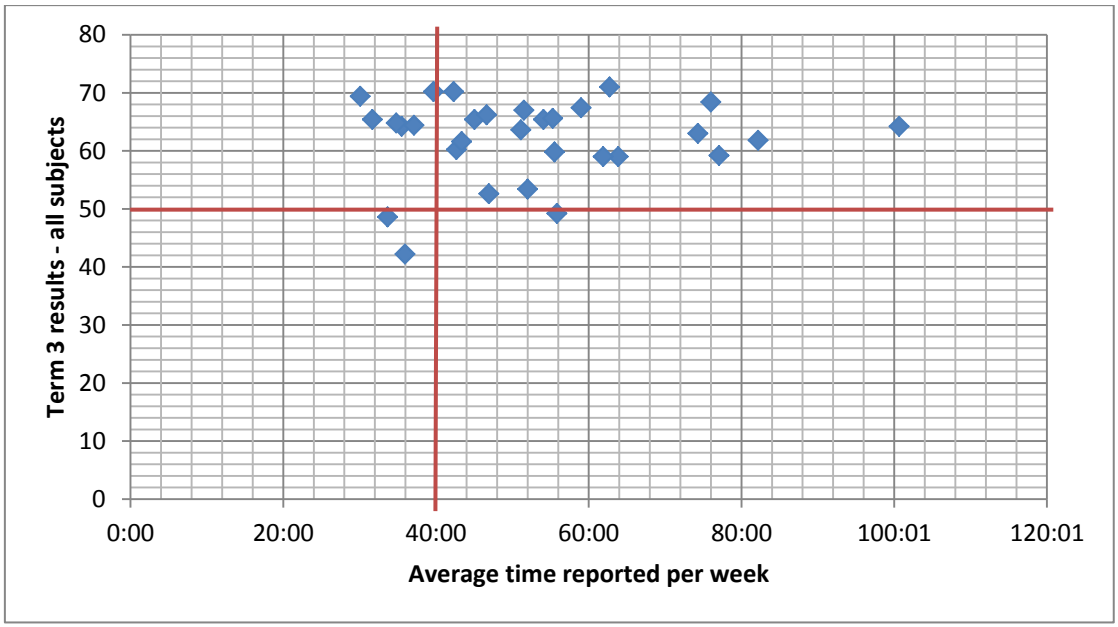


Figure 4.10 Second-years – Average time reported per week and Term 3 results

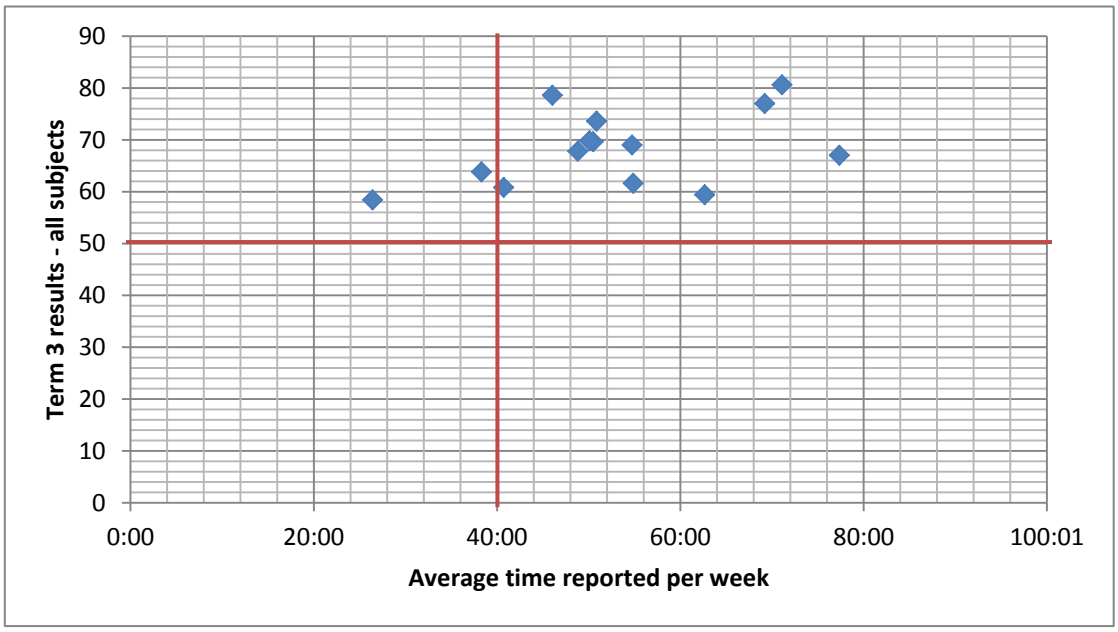


Figure 4.11 Third-years - Average time reported per week and Term 3 results

Third-years participated on a voluntary basis for bonus marks and as it turned out, none of the participants were failing the course. The rules for inclusion of data that were set up at the beginning of this study required a minimum of four weekly timesheets. This precluded participants with fewer than four timesheets and subsequently, the return rate dropped considerably. By including incomplete timesheet diaries, the data would have been skewed, as it was not an equal representation of the average time. On the other hand, the incentive

for the second-years to complete the timesheet was directly related to the outcomes of their course. However, they were given the option to consent and could withdraw from the study.

The analysis of the second-years represents a better indication of whether the 40 notional hours can be used as a benchmark for time allocation. Very few participants spent less than 40 hours a week and managed to complete the learning activities. Most of the participants were spending more than 40 hours a week in order to complete the learning activities successfully. The high number of timetabled hours for class attendance did not affect the participants' ability to spend time on out-of-class learning activities.

Therefore, Figure 4.9 can be viewed as an illustration of the overall summary of the results in comparison to the time spent which could be used as a guideline in similar studies.

4.2.7. The average time reported per week per subject

The primary focus of this study was to determine the time students spent on in- and out-of-class learning activities. However, as the data were analysed the time spent per week proved to be interesting. Design projects are developed to include learning outcomes for Presentation Methods, Design Theory and Design Technology. How students reported their time often reflected their working on concept development, drawings, construction drawings and presentation of the project regardless of the subject name. The students, therefore, reported these learning activities under the subject of Interior Design rather than the subject or lecturer under which the outcomes would be assessed. By charting the percentage of time reported per subject this inclination is proven. Figure 4.12 and Figure 4.13 show that both second- and third-year participants reported the highest portion of their time spent on the subjects Interior Design followed by Design Technology (Construction) and Presentation Methods.

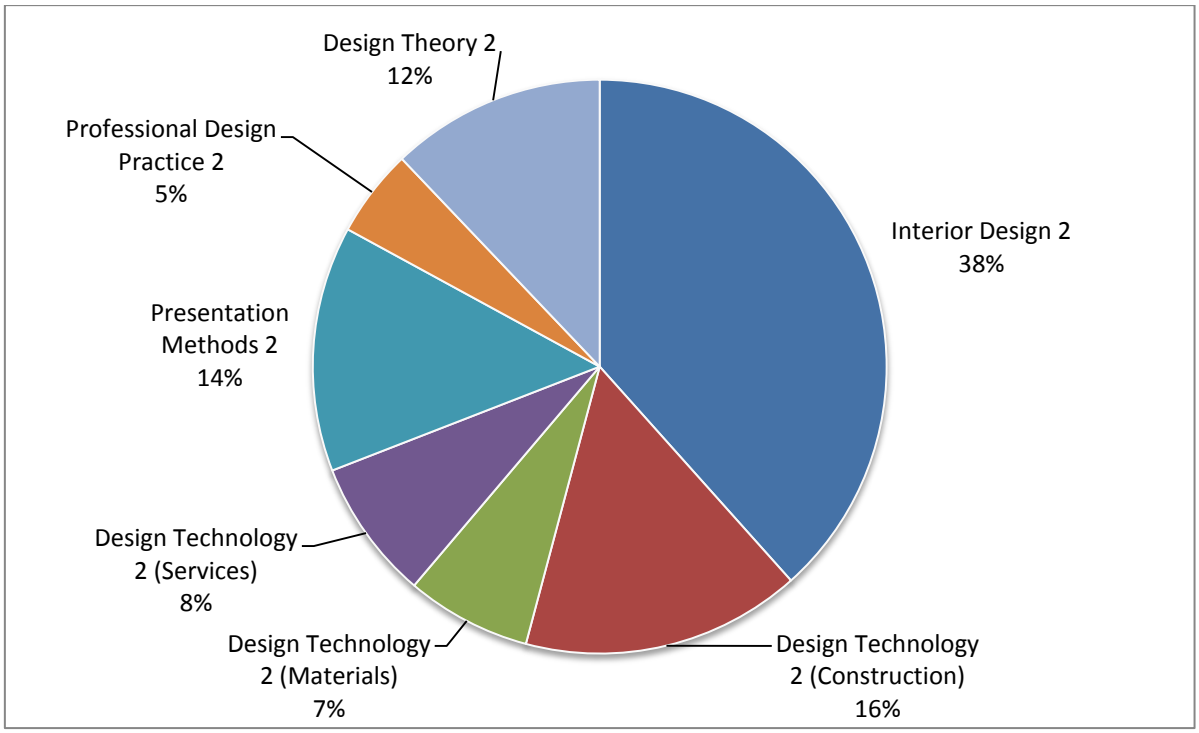


Figure 4.12 Second-years: percentage of time spent per subject

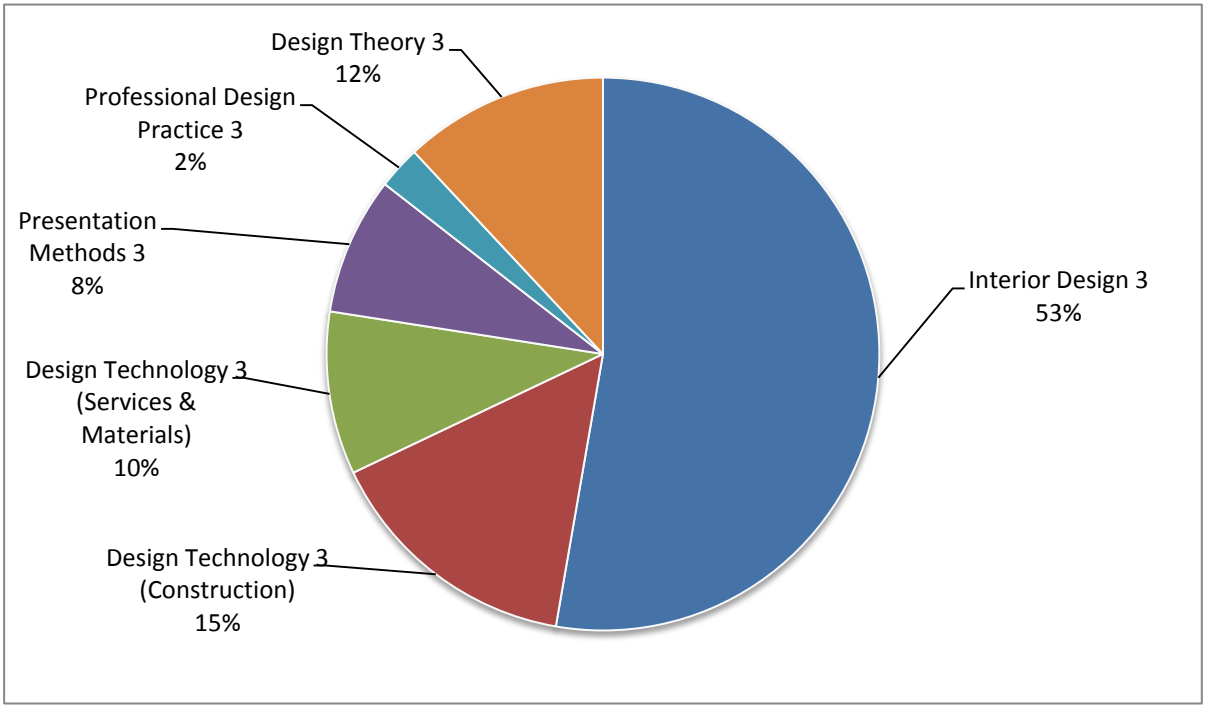


Figure 4.13 Third-years: percentage of time spent per subject

Despite the high number of hours allocated to Presentation Methods, participants' reported time bears no relation to the allocated time, although the duration of time spent in total with the lecturer does correspond to the allocated time. This was substantiated by the reports of learning activities for 'working on the presentation of the project' listed in the Interior Design time slots and under the subject Interior Design. Further analysis revealed that very few hours were reported for out-of-class learning activities in Presentation Methods. (Refer to Appendix K.6. 'Presentation Methods 2 & 3'). By comparing, the distribution of the credits in second-year and in third-year courses (Figure 4.14), and the distribution of time spent reported by the participants, a correlation could be seen in second-year. However, the time reported for Design Theory in third-year (see Figure 4.13) is slightly higher than the credit distribution. Similarly, the time spent on Professional Design Practice does not correlate with the amount of credits assigned. A possible explanation relates to the design project with which the students were engaging at the time of the study. Each project may have a slightly different focus and may require time to be distributed as needed. Further investigation into each project would be required to see whether, over the period of a year, each subject is proportionally addressed.

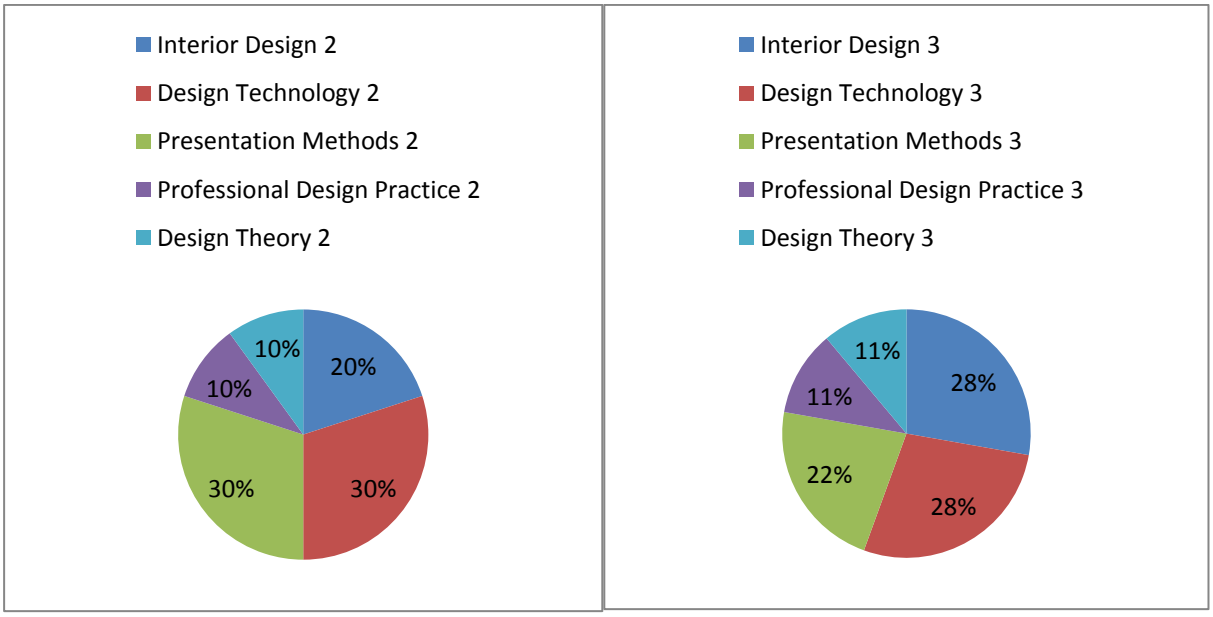
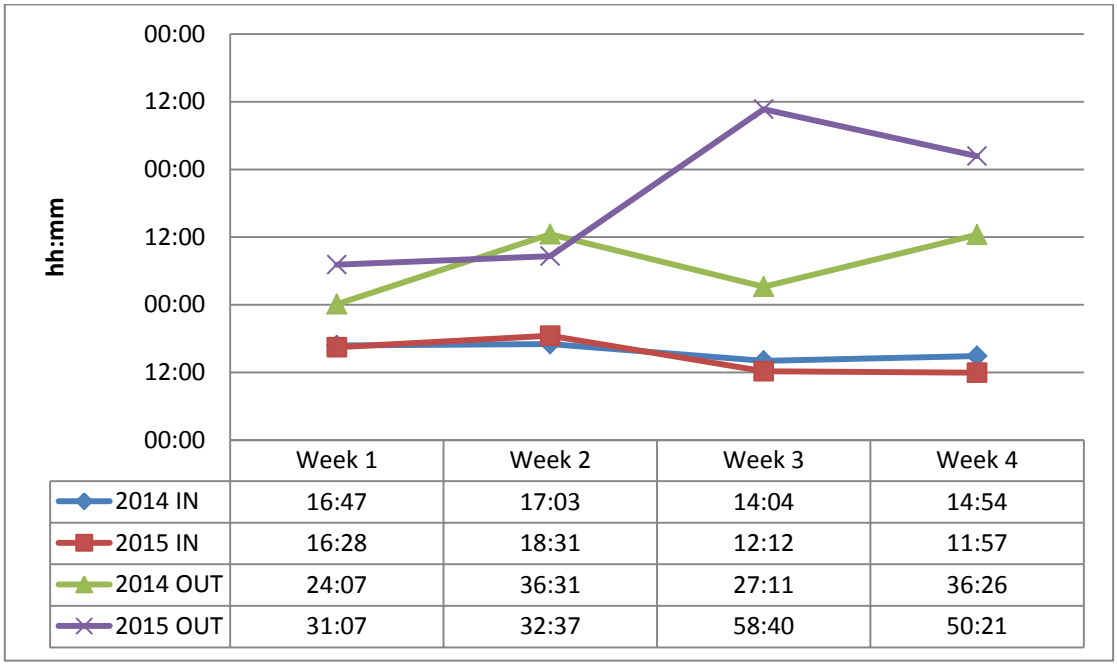


Figure 4.14 The distribution of credits among the subjects in second-year and in the third-year courses.

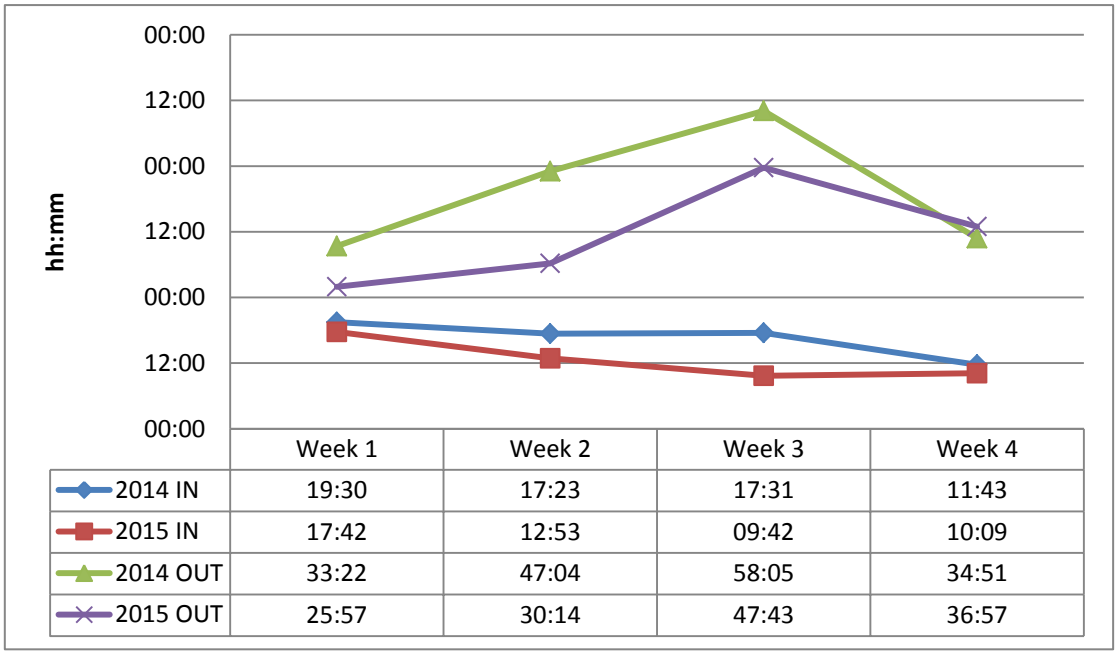
Another interesting phenomenon relates to fluctuations in the time spent in class and out of class over the period of the project. Figure 4.15 and Figure 4.16 show a breakdown of the

time reported with respect to in-class and out-of-class activities over the period of four weeks.



	Week 1	Week 2	Week 3	Week 4
2014 IN	16:47	17:03	14:04	14:54
2015 IN	16:28	18:31	12:12	11:57
2014 OUT	24:07	36:31	27:11	36:26
2015 OUT	31:07	32:37	58:40	50:21

Figure 4.15 Second-years combined – an average of the weekly reports of time spent on in- and out-of-class learning activities



	Week 1	Week 2	Week 3	Week 4
2014 IN	19:30	17:23	17:31	11:43
2015 IN	17:42	12:53	09:42	10:09
2014 OUT	33:22	47:04	58:05	34:51
2015 OUT	25:57	30:14	47:43	36:57

Figure 4.16 Third-years combined – an average of the weekly reports of time spent on in- and out-of-class learning activities

Based on the reports for the average time spent per week, there was a drop in attendance before the hand-in of the project. Students were permitted to hand in digital copies of their design projects for feedback before the final submission of the printed project. Thus after the crit session, some had much more work to do whereas others could return to a more normal routine. In the literature, most of the workload studies conducted indicates that students report an increase of independent study time leading up to the examination period. Since the course in this study follows a project-based teaching methodology, the graph shows that students work continuously throughout the duration of the term. The four weeks shown here exclude the first week and the last week of the term to represent an average account of time spent.

Another plausible explanation for the drop in time reported comes from the literature. The participants may have forgotten to log entries due to the increased focus demanded by their work. However, since the timesheet diaries were compared – each week and among the participant - to the class registers, there is little evidence to support the drop in time based on failure to report time spent. Participants who did not submit four weekly timesheets were omitted from the onset of the data analysis.

In terms of project-based learning, the findings from the pie charts (Figure 4.12 and Figure 4.13) illustrate that the three subjects on which students spent the most time in second-year were: Interior Design 2, Design Technology 2 (Construction) and Presentation Methods 2. This is due to the design brief wherein the learning outcomes for Interior Design, Presentation Methods, and construction drawings were described. To investigate how the time reported for these subjects varied over the period of four weeks, a line graph was chosen. Refer to Figure 4.17.

By placing these three subjects together on a line graph a relationship can be seen to the interior design process:

- research and concept development (all subjects);
- design development;
- supporting construction detailing and working drawings;
- design communication (final presentation and construction drawings)

Therefore, participants' reports for activities relating to construction drawings and presentation increase as design activities decrease.

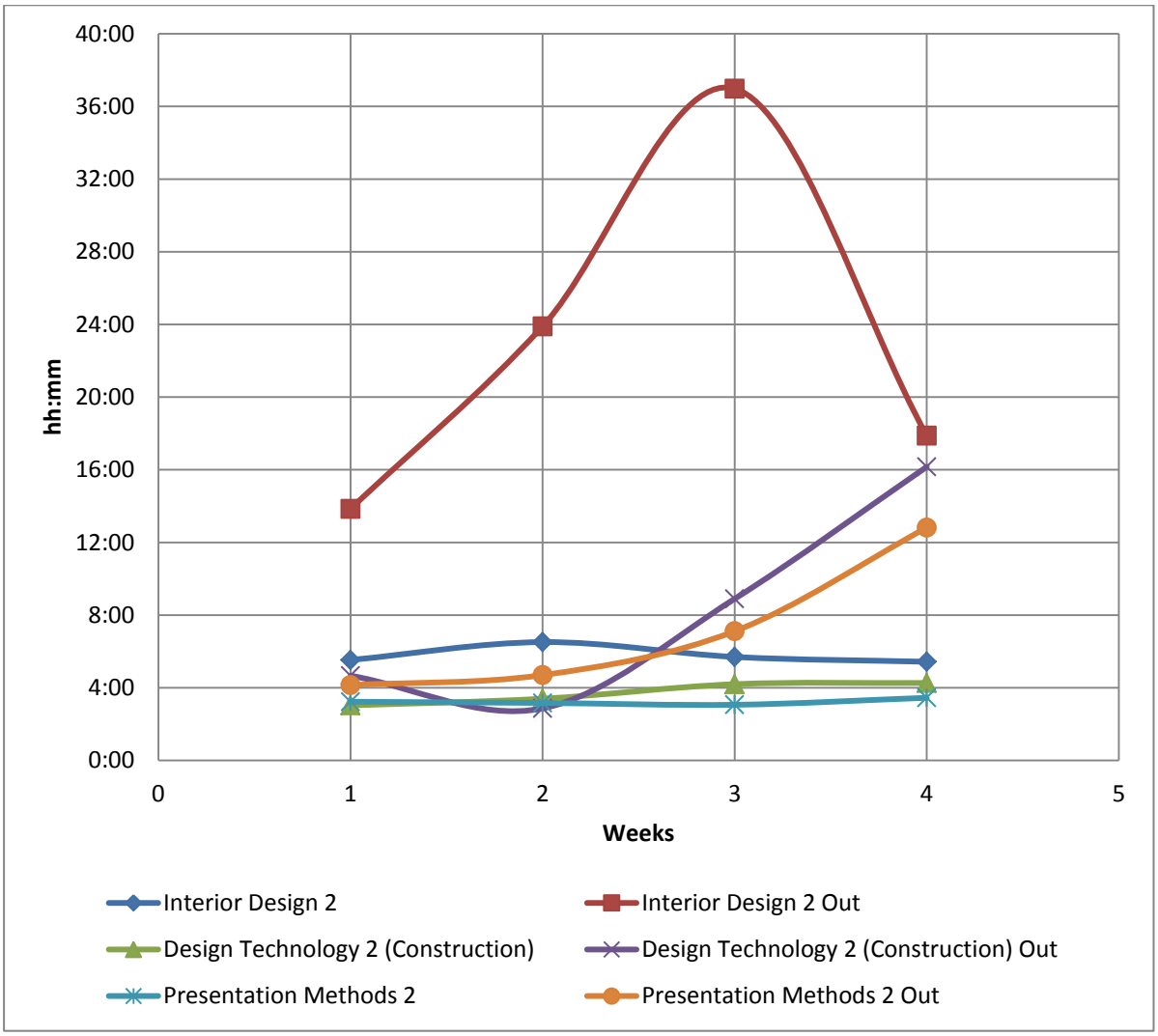


Figure 4.17 Comparing Interior Design 2, Design Technology 2 and Presentation Methods 2

The breakdown of time reported by the third-years showed that Interior Design and Design Technology (Construction) are the main subjects (Refer to Figure 4.14, Figure 4.15, and Figure 4.16). However, third-years have a good foundation in Presentation Methods and thus reported fewer hours compared to the second-years. Design Theory 3, on the other hand, becomes more interlinked with the design project at third-year level than at second-year level. A line graph of Interior Design 3, Design Technology 3, Presentation Methods 3 and Design Theory 3 depicts the following (Refer to Figure 4.18):

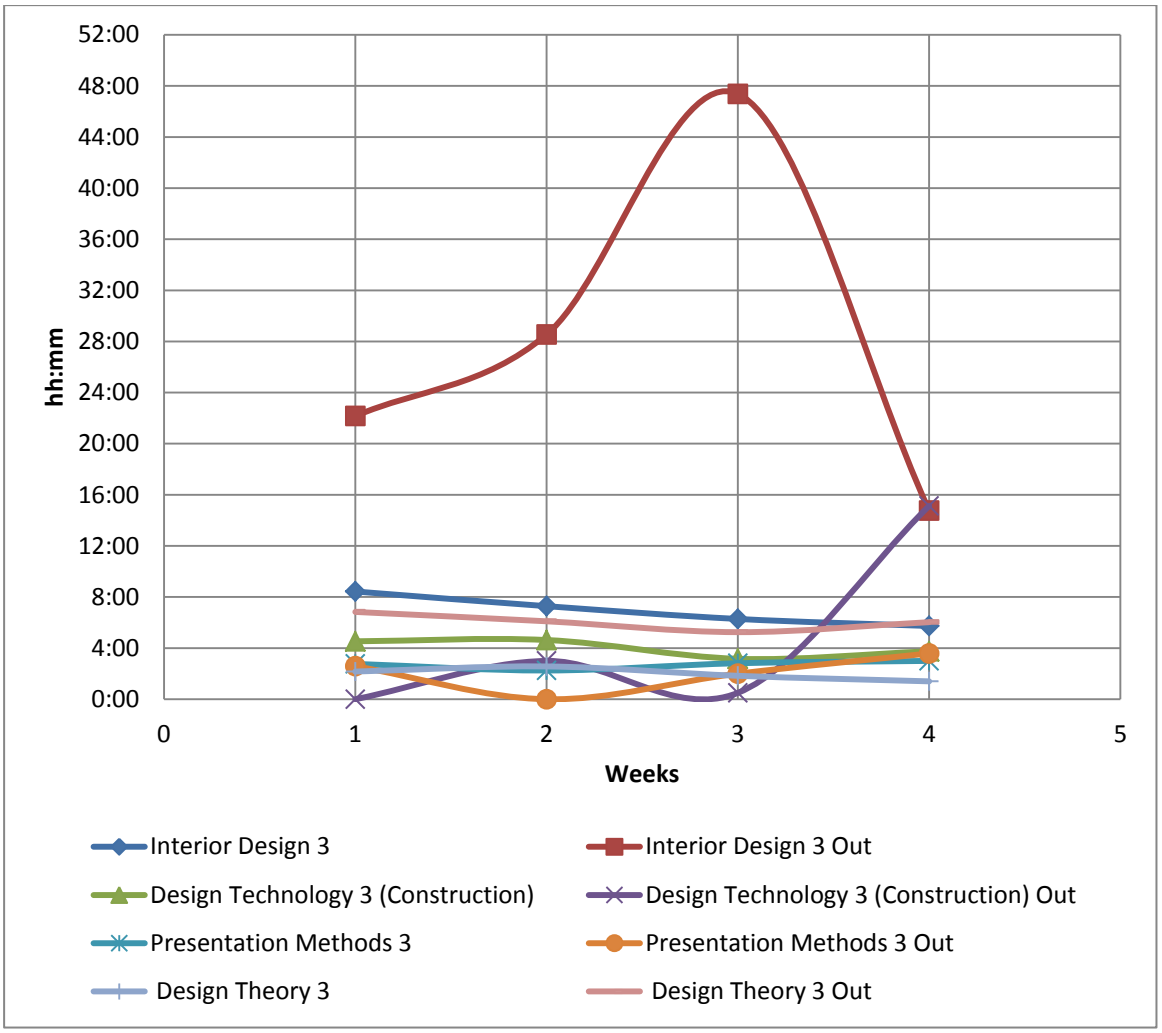


Figure 4.18 Comparing Interior Design 3, Design Technology 3, Presentation Methods 3 and Design Theory 3

In Figure 4.18, the line depicting Interior Design 3 follows a similar path to that of Interior Design 2 (Figure 4.17). Similarly, Design Technology 3 (Construction) and Presentation Methods 3 follow an inverse path. From the design briefs received the due dates indicated that the construction drawings were due after the design hand-in. Thus, participants were shifting their focus to spending time with the technology outcomes for the project.

Despite the high number of hours reported for Design Theory 3 – in comparison to the timetable and the notional hours – participants appear to be dedicating a similar number of hours per week over the period.

Based on the above figures and tables there appears to be a difference between the amount of time participants report for drawing-related subjects compared to text-based subjects.

4.3. In what learning activities do Design students engage?

The purpose of this question was to determine whether Design students spend more time engaging in drawing-related activities than text-based activities. This would indicate whether the WPM calculations for Design courses would be applicable or useful to allocate time for in- and out-of-class activities.

The act of drawing is well documented and associated with Design courses. The term 'drawing-related' was considered a good description of activities that include the act of drawing as well as the use of drawings to communicate. The means by which to generate a drawing are not discussed as they can range from quick sketches done by hand to using complex rendering software to create fly-throughs. Similarly, 'text-based' refers to any activity that includes reading or writing.

Data from the timesheets were verified during the interview process, and terminology for the classification of learning activities was changed slightly during the second round of data collection. The purpose of the informal discussions was to determine whether the lecturers and students' understanding of the terms was in accordance with the list of learning activities provided in the 2014 timesheet diary. To prevent students from selecting a neutral activity such as 'independent work', which can not necessarily be categorised as text-based or drawing-related, some of the learning activities were slightly improved. However, it must be understood that 'independent work' refers to the homework, which students do in out-of-class time.

Only one learning activity could be selected in a row. This meant that, when participants moved from one learning activity to the next, a new time slot was required to avoid overlapping times and learning activities. In cases where students chose the option 'other' an explanation was required. In most instances it was possible to select the learning activity closest to the explanation provided, thus eliminating entries for 'other'.

By using pivot tables, the learning activities were sorted according to a subject. It was discovered that the total time spent per activity ranged from 10 minutes for hand-ins, between 15 to 30 minutes for crits and up to 2 hours in formal lectures. Participants indicated that they spent several hours in the studio working on drawings and independent work in order to prepare for crits. Because of project-based learning in the Design course, participants were not able to report the precise time spent per subject but rather per learning activity. Mixed reports were received in several timetabled studio subjects, which

indicates that participants did not necessarily focus on the subject on the timetable but rather on the demands required from their individual learning experiences to complete the project, as is evident in Figure 4.17 and Figure 4.18. Further qualitative research would be required in order to discover the learning activities associated with the design project irrespective of the subject.

Figure 4.19 depicts a bubble chart to show which learning activities featured most. The size of each bubble corresponds to the number of instances reported. Based on the number of instances, subjects that feature drawing-related learning activities could be distinguished from subjects with reported text-based learning activities. These are shown separately under the corresponding headings to follow.

Figure 4.19 Bubble chart of learning activities and corresponding subjects

4.3.1. Text-based learning activities

In Chapter 1, the statement was made that, based on the type of learning activities in a Design course, WPM calculations and the 'rule of thumb' are of limited use to drawing-related subjects and therefore, the learning activities pertinent to Design Education should be investigated. By using pivot tables to sort the subjects and the learning activities it was discovered that the subjects Design Theory, Professional Design Practice and the modules, Services and Materials, listed under Design Technology, feature primarily text-based learning activities.

Table 4.4 is a list of the reported learning activities in Design Technology 2 (Services and Materials), Professional Design Practice 2 and Design Theory 2. Table 4.5 is a list of the reported learning activities in Design Technology 3 (Services and Materials), Professional Design Practice 3 and Design Theory 3.

The list of learning activities was sorted, firstly, according to the number of instances reported and secondly, according to the number of hours reported. Refer to Table 4.4 and Table 4.6. In- and out-of-class learning activities were combined for brevity. (Appendices G, H, I, and J contain the breakdown of the in- and out-of-class learning activities per subject.) The second last column in each case shows the number of instances where participants selected the learning activity. This column was sorted from highest to lowest number of instances. The last column shows the total amount of time participants spent on each of the learning activities. When these two columns are compared, there is a change in the order of the learning activities as seen in Table 4.3.

Table 4.3 Top five learning activities in text-based subjects in second-year

Second-years	
Top 5 learning activities according to number of instances reported	**Top 5 learning activities according to the total amount of time reported**
Formal lecture	Written reports / assignments
Written reports / assignments	Formal lecture
Study for test	Individual work (home work)
Individual work (home work)	Study for test
Write test	Research (Internet/library/books/magazines)

This change in order suggests that students spend more time on self-directed learning activities, which aligns with the 'rule of thumb' time allocation wherein more time should be allocated to independent learning than time spent in class (Refer to Table 4.3 and Table 4.5).

Table 4.4 Second-year: learning activities in text-based subjects

Learning activities reported instances per subject and total hours [*n*: 14 (2014) +16 (2015)]	**Design Technology 2 (Materials)**	**Design Technology 2 (Services)**	**Professional Design Practice 2**	**Design Theory 2**	**Grand Total**	**Total hours**
Formal lecture	45	80	66	30	**221**	328:45
Written reports/assignments	27		13	97	**137**	426:33
Study for test	3	53	13		**69**	161:41
Individual work (homework)	7	10	15	36	**68**	201:49
Write Test		37	9		**46**	47:50
Research (Internet/library/book/magazines)	10	3	4	26	**43**	103:18
Verbal Presentation of project				35	**35**	68:40
Group discussion	2	1	6	11	**20**	27:26
Group work	1	2		14	**17**	28:35
Site visit	11			6	**17**	31:15
Hand in work	3		2	8	**13**	11:00
Guest lecture				13	**13**	19:11
Presentation (Photoshop/rendering/other)				11	**11**	21:12
Working on presentation of project	1			4	**5**	16:00
Construction drawings (CAD/Freehand)		4			**4**	20:33
Group crit				3	**3**	5:00
Consulting with industry	2		1		**3**	3:20
Working in studio	1				**1**	1:42
Individual crit	1				**1**	0:20
Grand Total	**114**	**190**	**129**	**294**	**727**	**1524:10**

Table 4.5 Top five learning activities text-based subjects in third-year

Third-years	
Top 5 learning activities according to number of instances reported	**Top 5 learning activities according to the total amount of time reported**
Written reports / assignments	Written reports / assignments
Formal lecture	Individual work (home work)
Individual work (home work)	Formal lecture
Guest lecture	Group work
Feedback	Research (Internet/library/books/magazines)

Table 4.6 Third-year: learning activities in text-based subjects

Learning activities reported instances per subject and total hours [*n*: 6 (2014) +8 (2015)]	**Design Technology 3 (Services & Materials)**	**Professional Design Practice 3**	**Design Theory 3**	**Grand Total**	**Total hours**
Written reports/assignments	9		59	**68**	197:57
Formal lecture	15	37	3	**55**	80:45
Individual work	20	1	18	**39**	94:21
Guest lecture	11		5	**16**	18:45
Feedback	7		8	**15**	16:55
Research (Internet/library/book/magazines)	4		10	**14**	27:26
Group work	13		1	**14**	47:49
Verbal Presentation of project	5		8	**13**	25:30
Hand in work			8	**8**	8:50
Group discussion	3		4	**7**	10:30
Write Test	6			**6**	7:20
Consulting with industry	6			**6**	6:05
Group crit			5	**5**	6:01
Study for test	3			**3**	9:30
Individual crit	1		2	**3**	5:30
Working on presentation of project			2	**2**	3:55
Site visit	1	37		**1**	1:45
Grand Total	**104**	**38**	**133**	**275**	**568:54**

Considering that the time period was midterm and did not include the last week of summative assessments, Table 4.4 and Table 4.6 may not reflect all the time spent on assignments and tests. It appears that the participants were given a range of learning activities. Although the item 'formal lecture' appears at the top of the list, it should be considered in relation to what proportion of time it occupied of the total time allocated to all the other learning activities listed. Table 4.6 illustrates clearly that the third-year students spent less time in formal lectures and more time on written reports.

The objective of this research question was to determine whether WPM calculations could be useful for this particular course. Based on the 32% of time spent on these subjects in second-year and 24% in third-year (Refer to Figure 4.12 and Figure 4.13), it would be

applicable to only a small number of learning activities. Furthermore, the percentage of time spent on drawing-related subjects and learning activities exceeds text-based subjects and learning activities.

The next section reflects on drawing-related learning activities.

4.3.2. Drawing-related learning activities

Based on the bubble chart, Figure 4.19, drawing-related learning activities were reported under Interior Design 2 and 3, Design Technology 2 and 3 (Construction), and Presentation Methods 2 and 3. Table 4.8 and Table 4.10 list the learning activities reported by second-years and third-years respectively.

The list of learning activities was sorted, firstly, according to the number of instances reported and secondly, according to the number of hours reported. In- and out-of-class learning activities were combined for brevity. (Appendices G, H, I, and J contain the breakdown of the in- and out-of-class learning activities per subject.) The second last columns show the number of instances where participants selected the learning activity. This column was sorted from highest to lowest number of instances. The last column shows the total amount of time participants spent on each of the learning activities. When these two columns are compared, there is a change in the order of the learning activities as seen in Table 4.7 and Table 4.9.

Table 4.7 Top five learning activities for drawing-related subjects in second-year

Second-years:	
Top 5 learning activities according to number of instances reported	**Top 5 learning activities according to the total amount of time reported**
Design Drawings (CAD/Sketchup/freehand)	Design Drawings (CAD/Sketchup/freehand)
Individual work	Individual work
Formal lecture	Construction drawings (CAD/Freehand)
Individual crit	Formal lecture
Construction drawings (CAD/Freehand)	Presentation (Photoshop/rendering/other)

Table 4.8 Second-years: learning activities in drawing-related subjects

Learning activities reported instances per subject [*n*: 14 (2014) +16 (2015)]	Interior Design 2	Design Technology 2 (Construction)	Presentation Methods 2	Grand Total	Total hours
Design Drawings (CAD/Sketchup/freehand)	381		24	405	1531:37
Individual work	208	71	35	314	1252:45
Formal lecture		67	41	108	286:40
Individual crit	53	25	29	107	218:56
Construction drawings (CAD/Freehand)		96	2	98	351:28
Working on presentation of project	63		15	78	248:15
Presentation (Photoshop/rendering/other)	36		27	63	283:28
Development of concepts or ideas	35		8	43	86:51
Research (Internet/library/book/magazines)	18	20	4	42	89:02
Group crit	32	5	2	39	97:44
Verbal Presentation of project	26			26	59:50
Working in studio	10	7	5	22	50:23
Consulting with industry	12		2	14	27:44
Written reports/assignments		13		13	25:56
Hand in work	3	2	3	8	4:35
Group discussion	4	1	2	7	25:39
Feedback			2	2	5:00
Grand Total	881	307	201	1389	4645:53

Table 4.9 Top five learning activities in drawing-related subjects in third-year

Third-years:	
Top 5 learning activities according to number of instances reported	**Top 5 learning activities according to the total amount of time reported**
Individual work	Individual work
Design Drawings (CAD/Sketchup/freehand)	Design Drawings (CAD/Sketchup/freehand)
Individual crit	Working on presentation of project
Development of concepts or ideas	Individual crit
Drawing (CAD/Freehand/ other)	Development of concepts or ideas

Table 4.10 Third-years: learning activities in drawing-related subjects

Learning activities reported instances per subject [*n*: 6 (2014) +8 (2015)]	**Interior Design 3**	**Design Technology 3 (Construction)**	**Presentation Methods 3**	**Grand Total**	**Total hours**
Individual work	143	18	4	165	633:14
Design Drawings (CAD/Sketchup/freehand)	98	12	3	113	416:49
Individual crit	43	20	22	85	198:30
Development of concepts or ideas	51		1	52	172:59
Drawing (CAD/Freehand/ other)	47			47	158:20
Presentation (Photoshop/rendering/other)	37		7	44	163:57
Working on presentation of project	40		2	42	213:20
Construction drawings (CAD/Freehand)	4	32		36	125:55
Formal lecture	6	7	15	28	78:00
Verbal Presentation of project	19		2	21	75:30
Research (Internet/library/book/magazines)	16			16	46:30
Group crit	12	1		13	25:45
Working in studio	12			12	38:45
Site visit	6			6	12:15
Group discussion	2	3		5	12:50
Other (please specify)	4			4	4:45
Written reports/assignments	2			2	6:40
Write in journal	2			2	6:00
Consulting with other students	2			2	0:40
Grand Total	**546**	**93**	**56**	**695**	**2390:44**

Unlike the top five learning activities listed under text-based subjects, the learning activities listed for drawing-related subjects remain in order irrespective of whether reported instances or time was considered. However, in terms of formulating a workload model based on estimated time using WPM calculations, Figure 4.19 shows that a large percentage of time was spent on drawing-related learning activities, which implies that WPM calculations could not be used to calculate the estimated workload. An alternative method for calculating workload in drawing-related course should be considered. The following section discusses a possible categorisation of the learning activities, based on whether the time spent on the activity was reported as an in-class or out-of-class activity.

4.3.3. Categories of learning activities for workload calculation

In terms of student workload models, the learning activities can be grouped into the three categories defined in Massey University's student workload calculator (Massey University, 2015). This classification is based on in-class time spent on the learning activity, in-class time spent working on a learning activity while in studio (but not for the subject listed on the timetable) and learning activities listed as being done while outside of the studio.

Teacher-Student Contact Time – the time spent in lectures (in studio). In this study it could also refer to the time, which students spent on crits

Text-based subjects
- Formal lecture
- Guest lecture
- Group discussion /Group crits
- Hand-in work
- Feedback
- Individual crit
- Write a test
- Verbal presentation of project

Drawing-related subjects
- Individual crit
- Group discussion /Group crits
- Design drawings
- Construction drawings
- Working on the presentation of a project
- Verbal presentation of a project
- Working in studio (lecturer present)

Directed Learning Activity - These are "resulting in student activity" (Massey University, 2015: 1) which are planned by the teaching staff but not attended by teaching staff i.e. small group sessions, preparation sessions, etc. In this study, this would include activities done in class but not for the subject listed on the timetable i.e. working in the studio while waiting for a crit.

Text-based subjects
- Group discussion (out-of-class)
- Group work (out-of-class)
- Site visits/ Consulting with industry
- Written reports / assignments

Drawing-related subjects
- Group discussion (out-of-class)
- Group work (out-of-class)
- Consulting with other students
- Site visits /Consulting with industry
- Working in studio

Independent Learning Activity - Such as reading, information collection, portfolio development and preparation for assessment.

Text-based subjects
- Written reports / assignments
- Study for test
- Individual work (homework)
- Research (internet/library/books/magazines)
- Working on presentation of project
- (Photoshop/rendering/other)

Drawing-related subjects
- Individual work (homework)
- Development of concept or ideas
- Research
- (internet/library/books/magazines)
- Consulting with industry
- Design drawings
- Construction drawings
- Working on presentation of project

It was not the purpose of this study to allocate time to individual learning activities. Qualitative data would be required to unpack the various components in the drawing process to assign meaningful time. The ultimate purpose of grouping the learning activities would be for considering the development of a workload model wherein time may be allocated to learning activities in a meaningful manner, allowing students and course coordinators to see how much time should be set aside for the particular subject. In terms of allocating time for a crit, some indication of staff-to-student ratio would be required, although this applies primarily to drawing-related subjects. Further research is recommended to develop a student workload model for implementation in Design courses.

4.4. Conclusion

The timesheet diary was distributed to second- and third-year students in 2014 and 2015. A total of forty-four timesheets were analysed in order to collate the findings. The resulting data showed that the timesheet diary proved to be a reliable instrument to determine how design students spent their time in and out of class.

The origins of the 40 hour workweek, credits and notional hours laid the foundation for the objective measurement of student workload. This was used as a comparison to the reported time spent. It was found that the average individual time spent in class per week per participant is in accordance with the 'rule of thumb' for calculating contact time. Based on the study time calculated, using the 'rule of thumb', the average time spent on out-of-class learning activities was exceeded. The allocated timetabled time was found not to be related to the notional hours or to the time reported by individual participants. This led to the investigation of the timeline of the daily activities. Class duration was calculated based on the first and last entry of the day and validated among the participants along with the attendance registers. The supposition that Design students work long hours and thus require 24-hour access to studios is justified (Stott, 2015). However, the amount of time allocated on the time table does not reflect the amount of time a student spent in class or with a lecturer. In this regard the timesheet diary helped to comprehend how students are spending their time.

It also provided insight into the amount of time, which students use, the allocated timetabled time, as well as how the amount of time spent on various subjects changed for the duration of the project. The learning activities provided conclusive evidence that most of the time students are engaging with drawing-related learning activities rather than text-based

learning activities. These findings align with the objectives of the study and answer the research questions: How much time do students spend on in- and out-of-class learning activities and in what learning activities do design students engage.

Chapter 5 Conclusion

It's about time.

(Idiomatic expression)

5.1. Introduction

The preceding chapters of this study focused on the assessment of student workload in education – specifically Design education – by referring to previous studies and adapting prevailing research methods. The purpose of this last chapter is to present a summary of the research and discussion of the findings. The chapter concludes with recommendations for further research, policy making and practice.

5.2. Summary and discussion of the findings

Chapter 1 discussed the landscape of higher education in South Africa with reference to credits as an objective measure for student workload. The specifics of the learning environment of a Design course were discussed to elaborate on the nuances that make this study unique in the context of student workload. The research questions were articulated through a review of the literature and based on the background of the South African University of Technology landscape, in particular the unique settings created for vocational training.

The aim of the research was to determine the number of hours that Design students spent on in- and out-of-class learning activities in order to calculate their workload. Furthermore, the aim was to distinguish between text-based and drawing-related learning activities to ascertain whether WPM calculation of workload can be applied.

The rationale for the assessment of student workload in this research relates to the particular nature of Design education. Without knowing how long it takes for a student to complete drawing-related learning activities, affording the student enough time becomes problematic for the lecturer and maintaining the expected and desired work standards becomes problematic for the student. Hence the research problem was related to the application of WPM calculations in a design course in which the types of learning activities are drawing-related and not text-based.

A purposeful review of the literature was conducted to determine whether previous studies discussed the time that Design students spend on in- and out-of-class learning activities. Although no corresponding studies were discovered, the analysis of the literature provided a thorough overview of previous workload studies with regard to the instruments used for assessing student workload. Four themes were identified in the literature:

1. objective workload whereby the notional hours are used as a benchmark for the allocation of time,
2. measuring subjective workload by either diary methods or surveying students' perception of workload,
3. models for calculating workload which are based on estimates and WPM calculations,
4. student engagement surveys that report on and compare average workload across several courses or institutions.

Thus the literature review served the following purposes:

(a) to contextualise the use of the 40-hour workweek and discuss the use of credits and notional hours in various countries in terms of student workload and the rationale for credit allocation,
(b) to identify and critically examine methods for assessing workload by the delineation of student perception of workload and actual workload associated with academic learning activities, and whether workload for Design students has been assessed,
(c) to examine the instruments and findings reported in student course experience surveys relating to student workload,
(d) to analyse the existing information available to formulate student workload models and review the methods employed for estimating student workload, and lastly,
(e) to develop a conceptual framework based on the review of the literature to answer the research questions.

The analyses of previous methods revealed that a diary method over an extended period of time should be used to determine actual hours worked. In addition, psychological research methods using event-based diary methods were referred to. The structure of such diaries, called event-contingent research, led to the design of the timesheet diary as outlined in Chapter 3.

The data from the timesheet diaries were analysed according to the methods described in Chapter 3. The weekly average per participant was calculated; thereafter the average workload for the total time period could be calculated. Student workload, by definition, is the total amount of time spent on all learning activities, including assessments and irrespective of modes of teaching. This was done for each of the four groups of students as described in the sampling section of Chapter 3. Furthermore, the notional hours per week were calculated per subject and for the course in order to compare the objective workload to the subjective workload obtained in the timesheet diary.

In Chapter 4, the findings were discussed in the order of the conceptual framework. The following is a synthesis of the findings.

1) How much time do students spend on in- and out-of-class learning activities?

Objective workload versus subjective workload

It was found that the average time spent by the students (workload) is higher than the 40 notional hours. Based on the 'rule of thumb' for allocating contact time, the timetabled hours are not a true reflection of the time, which, according to the 'rule of thumb' should be spent in class. However, the reported in-class time corresponds with the 'rule of thumb' for contact time. The reported class duration bears similarities to the notional hours of text-based subjects but not to all drawing-related learning activities. The time spent per week on Design spikes during the third week and decreases in the last week, whereas the time spent on the Presentation Methods and Construction components of the project increased towards the hand-in date. This corresponds to the design process.

Performance versus subjective workload

The relationship between workload and student performance indicates that some participants were able to complete the learning activities within the notional hours; however, most participants required more time.

2) In what kind of learning activities do Design students engage?

It was found that more time was spent on drawing-related subjects than text-based subjects. This negates the use of WPM workload calculation. The learning activities in Design education should be further explored in order to assemble a workload model for drawing-related subjects.

The design of the timesheet diary to record the time spent on daily learning activities and respective subjects proved to be more than adequate to answer the research question relating to the time spent. The account of the time spent per subject along with the learning activities provided a timeline that reflects the learning outcomes in accordance with the project-based learning.

The findings were prepared according to the structure set out in the conceptual framework to compare the results of the timesheet diary to the notional hours, the timetable and the performance of the student. The results of the comparison between the notional hours and the student's individual averages and their performance revealed that, on an individual basis, the time spent was, indeed, comparable to the national and international benchmark for contact and study time.

5.3. Discussion:

5.3.1. Methodological reflection

The decision was made to focus primarily on the number of hours and the learning activities. This was done to obtain data that can be compared to notional hours and the results of the students. By following a positivist approach this study focuses on the actual number of hours that students spent on in- and out-of-class learning activities and not on the student perception of workload. The information obtained through the timesheet diary provided the quantitative data necessary for comparison. The literature suggests that by comparing the students' perception of their workload and the subsequent influences on their learning styles, workload issues may be resolved. Since the learning styles were not considered in this study, students' perceptions of their workload would not have yielded the data necessary for a comparison between actual hours spent, the notional hours, the allocated timetabled hours and the average term mark.

The timesheet diary was appropriate for this particular design course. As with any timesheet design, it should be made to fit that which it is intended to measure. A different course would have to customise the dropdown lists for lecturers, subject names and learning activities in order to perform a similar workload assessment.

In some studies the actual location where learning occurred was required from the participants. However, it was dismissed as an option in the design of the timesheet diary for two reasons: Firstly, privacy. Students should be free to extend their learning to any environment. Interior Designers explore spaces as part of learning. Secondly, the additional entry per instance would increase participant burden. It is well documented that if a survey takes too long to complete, the return rate drops significantly after the first week. One of the considerations taken from previous studies was to make the diary user-friendly and quick to

enter new information. As a trade-off, two locations were, however, offered in the list of learning activities, namely 'working in the studio' and 'site visits'.

The list of learning activities proved to be adequate. After the return of the 2014 timesheet dairies and casual discussions with lecturers and students, a few minor adjustments were made to the terminology used. This concurs with previous studies in which it is recommended that the instrument should be tested as part of a pilot study.

It was the purpose of this study to discover the split between text-based and drawing-related learning activities. This was done to show the limited usefulness of WPM workload calculation in this Design course. It also emphasised the high number of hours spent on drawing-related learning activities. Only a handful of the participants noted the purpose of the drawings, thus the cognitive aspect of the design process was put aside. It was not the objective of this study to determine the cognitive aspects of drawings as learning activity since several books and journals have been dedicated to this topic.

Taking into account the changed role of the design studio, the timesheet diary proved to be a valuable exercise for lecturers and students to see where and how time is being spent. It is recommended that this exercise becomes part of the second-year syllabus. It may assist students with the concept of time keeping and time management.

5.3.2. Substantive reflection

The workload reported on in this study resonates with the workload reported on in the literature review. The reported contact time ranges from 10 hours a week (Wade, 1991; Van den Hurk *et al.*, 1998; Lawless, 2000; Tanner *et al.*, 2008), to between 12 and 16 hours a week (Meng & Heijke, 2005; Lindsay & Rogers, 2010; GfK Finance, 2011; Hanson *et al.*, 2011), to above 20 hours a week (Kember & Leung, 1998; Meng & Heijke, 2005; Garmendia *et al.*, 2008). The latter contact times were observed in the engineering and medical fields. The average for the two years and two groups of this study was 14 hours 54 minutes. The 'rule of thumb' for allocating contact time based on credit or notional hours as described by Nonis *et al*. (2006: 121), Kolari *et al*. (2008: 485), Tampakis and Vitoratos (2009: 2) Hanson *et al*. (2011: 23) and Kilfoil (2015) suggests that contact time should be between 12 and 15 hours. It varies slightly, depending on the notional hours assigned to each credit, but the calculation remains: for every hour in class the student should be afforded two hours for studying. However, the twenty-eight timetabled hours for this course do not align with the

notional or proposed contact time which necessitated further investigation as indicated by Rossouw and Abrahamse (2011: 3). In order to understand this phenomenon the individual times reported by the participants were placed on a timeline to indicate how the contact hours were used. This number of hours was named 'class duration' to distinguish between the time on the timetable, the notional hours and the individual reported hours. The class duration resonated with the findings reported by Meng and Heijke (2005): problem-based learning with a lecturer requires more contact time than other formats of teaching.

The average workload of 53 hours and 7 minutes exceeds the national averages published in the SASSE report (Strydom & Mentz, 2010). It also exceeds the notional time allocation. On the other hand, the workload resonates with the findings for Architecture students in the NUS report (GfK Finance, 2011) and the findings made by Alarcón *et al*. (2013).

The students' average term results were used to discuss the relationship between time and performance. The aim of the study was to test the applicability of WPM workload estimation on Design students' workload and to compare their actual time spent to the notional hours. In order to see whether the notional hours were enough, the time was compared to individual performance. However, a separate analysis would be required to compare the link between in-class time and performance, out-of-class time and performance, and learning activities and performance.

The learning activities could not be compared to previous studies as learning activities in the design field are noted as part of the design process rather than educational terms. However, by plotting the time spent in the various subjects and on learning activities over the time period, the resulting graphs bears a resemblance to the stages of the design process.

5.3.3. Contribution of this study

Literature considering the assessment of student workload and spanning a period of twenty-five years was analysed. Instruments, methods and findings of several studies were analysed to inform the development of a conceptual framework and a timesheet diary for the assessment of student workload. Before this present study was undertaken, no other studies had been committed to the assessment of a Design student's workload. Although workload has been identified as a factor that influences students' learning approaches and their evaluation of teaching, the assessment of workload in the design field has been neglected. This study reported its findings by viewing workload in relation to the objectives set by

quality assurance bodies and compared it to the students' performance to establish whether enough time was spent on learning activities and whether the average workload are in accordance to the notional hours. This method of assessing workload has been employed in a limited number of studies (Garmendia *et al.*, 2008; Balascio *et al.*, 2009) and has not been done in South Africa at a university of technology.

As far as South African studies into workload are concerned, only one student engagement survey has been conducted with a random sample that revealed very little about the assessment of student workload. The SASSE report (Strydom & Mentz, 2010) did highlight the fact that students reported less time spent on studying than the notional hours propose. As for individual courses, one study was found that discussed the time which Business students spend studying in their free time (Rust, 2012). The working document by Kilfoil (2015) is similar to other institutional policies regarding the allocation of time and the development of a workload model. As far as allocating time to drawing-related learning activities, or contact time for vocational courses, is concerned, no guidance was found in either institutional policies or educational documentation published by SAQA, CHE or the Department of Higher Education.

This is in strong contrast to the directive of the TUNING approach, which emphasises the importance of time allocation and quality assurance through the frequent assessment of workload. Examples of frequent workload assessment are evident in Slovenia (Tampakis & Vitoratos, 2009), Latin America (Alarcón *et al.*, 2013), England (Bekhradnia, 2009, 2012, 2013) as well as the European countries covered in the NUS report (NUS, 2008; GfK Finance, 2011).

Despite the limited application of the findings of this study to the development of a workload model, the findings do show that students in a Design course have a heavy workload. However, it has also become clear that their individual times are comparable to other studies. The timesheet diary proved to be a valid instrument to assess workload and to investigate time-related nuances of project-based learning. The timesheet diaries may also be made applicable to other courses by changing the dropdown lists for subjects, lecturers and some learning activities. As discussed in Chapter 3, an event-based diary should be clear regarding the activities in question in order to minimise participant burden and to obtain useable data.

Furthermore, the time spent was analysed with reference to the teaching methodology (design process), learning activities and students' results. None of these relationships have been previously reported upon in Design education and this, therefore, makes this study unique. The studio and all-nighter culture as described in the literature – ArchDialy reports of an all-nighter culture (Stott, 2015: 1) – was substantiated by the entries in the timesheet diary. In addition, the long hours could be verified and compared to the results in other reports- that have not been done previously in the Design field. However, the impression that many students rely on the resources of the institution could not be proved using quantitative methods.

5.4. Recommendations

From an administrative perspective, the timetable presents a problem for the calculation of notional hours. If the notional hours for the individual student are calculated without consideration of the current teaching methodology, design courses are in danger of losing student-lecturer contact time. Based on the literature and the reports from the students, a design crit lasts 15 to 30 minutes per student. When one considers that the average student-to-lecturer ratio in this Design course starts at 40 students in first year, then the current 6 hours per studio session allows for an average of 9 minutes per student. The retention rates of the past three years indicate that the average class size for second and third year was 25 students. Although still a high student-to-lecturer ratio, the average crit time, therefore, increases to 14.4 minutes. The data from the timesheet diaries support this. Therefore, contact time allocation should be revisited, both from a financial and a practical implementation point of view.

Suggestions that have been implemented include group crits and peer review sessions. In 2002, Swann implemented a four-day timetable for lecturers. Studio time was considerably reduced. Allocating eight students to one tutor in a crit slot on a rotational basis ensured that the students were more prepared for their crits with the lecturer. The one-on-one crit with the lecturer was done by appointment only and covered more specialised knowledge relating to the individual design solution (Swann, 2002: 53). This arrangement offers limited reprieve in programmes with limited student numbers where access to tutors is restricted by the small number of senior students. When students enter the *production of drawings* and the *construction drawing* phases of the design process, they require individual specialised support. The nature of problem-based and project-based learning has been beneficial to student learning. However, the time implications have not been studied at length.

Considering the phases of a project, perhaps the timetable should reflect the programme over an extended period of time instead of for a week.

Another implication of the long studio hours on the timetable is that it impacts students' working habits. While the literature romanticises the culture of the design studio as an environment in which students are supported and can make use of the facilities, the reality is that students often see the studio as a time to socialise and would rather stay at home where they can work. This prompted the introduction of consultation times in the third-year studio in 2015. Instead of waiting for their turn to crit and being without computers - which ideally should be situated in the studio - students opted to make appointments with the lecturers. Further research over a period of time is required to show whether this scenario is more time-efficient. It will also require the students to be better prepared for a crit to optimise the time spent with the lecturer.

Flexibility is required in the design of the timetable, although this may prove difficult in terms of allocation of resources and staff as required by university administration. As the findings indicate, project-based learning moves through four phases during which students require a variety of support. As illustrated by Figures 4.17 and 4.18, the presentation and construction needs may require more attention towards the end of the project where it is needed most. On the other hand, design support tends to drop towards the end of the project as students move into the presentation phase. Recommendations may include scheduling a generic studio slot on the timetable in which staff can be rotated as per the need of the project. A reduction of contact hours for the staff over the course of the project could be considered. To illustrate this point, consider the following: a student spends 15 minutes on a day with the design lecturer, returns the next day to spend 15 minutes with the presentation lecturer and the day after 15 minutes with the construction lecturer. By having all three lecturers in the studio at the same time, the students can rotate between them. This may result in saving daily commuting time by travelling in for only three days a week instead of five. Swann (2002: 50–58) suggests timeslots for students to prepare for a crit, and that technical skills should be learnt remotely or online through short courses rather than in the studio. In the informal discussions, students mentioned that learning new skills no longer required them to attend class or the presence of a person but rather access to online videos.

If we are going to change the way in which we allocate time, the result could benefit the student who is already struggling to pay for travelling. Part-time lecturers will be able to be in the same studio at the same time for shorter sessions. Spaces could be utilised to

accommodate two groups of students, as they would be present on alternate days instead of having studios stand open during times of independent work.

The problem impeding the implementation of a more flexible timetable is university administration. Lecturer allocation is based on the total number of students in the course – irrespective of lecturer workload or course requirements - thus allocating two staff members on the timetable during the same time slot, albeit for different subjects, causes administration related problems with employment contracts and remuneration.

As the world moves towards open education and blended learning, administration systems will have to be amended to serve new teaching methodologies. The current financial model would have to be revised. The one-size-fits-all scenario that exists with regard to credit allocation, funding and workload allocation will have to adapt to include a wider range of teaching and learning methods.

The literature review showed that there is no substantial research in the field of student workload with regard to drawing-related learning activities. The amount of time that used to be spent in the studio, learning drawing skills, should be reconsidered. Whereas in the past the studio was the only place where drawing skills could be honed, students nowadays resort to online tutorials. The impact of online or blended learning on the workload of the student has yet to be investigated. As for the variation in contact time between vocational university courses and traditional university courses, no research was found to support the findings of this study. Further research is necessary in the field of workload and vocational courses such as Design.

Based on the small sample available, it was not possible to make generalisations regarding workload and its impact on student's success and retention rate that could assist other Design courses. The suggestion, therefore, is made that similar studies should be conducted in other Design courses to determine the time spent on in- and out-of-class learning activities. Together with the time spent, the relationship between the performance of the student and in-class and out-of-class time could provide insight into the appropriateness of the workload. Findings from similar studies can then be used to make informed decisions regarding student and staff workload.

This study laid the foundation for more research into student workload that may lead to a better understanding of the unique challenges faced by students at universities of technology. As stated above, this research is limited to a small sample of Design students

and has only begun to unravel some of the issues related to the assessment of student workload in a vocational and drawing-related context. Nevertheless, it revealed a number of as yet unanswered questions that can only be satisfied through further development of:

- the use of online tools or mobile apps for the assessment of student workload (At the time of this study this was still in the developmental phase with several pilot studies being tested.),
- a flexible timetable system that is based on the requirements (in time) of the various subjects in relation to the length of the design project,
- a workload model that may be applicable to Design courses, using drawing-related learning activities (This would necessitate in depth analyses of the time it takes to draw, similar to the WPM data which are currently available.),
- a workload model for lecturers that considers the impact of problem-based and project-based learning on contact time, and
- a typology for learning activities in the field of Design education.

Problem-based learning is well-documented; however, the associated workload for staff and students is a neglected issue. Questions have been raised regarding how time could be best managed. An option based on consultations by appointment has been presented. However, this assumes that the student comes prepared for the consultation rather than working in the studio while waiting to receive feedback. Since problem-based learning is synonymous with a deep approach to learning resulting workload issues may be worth investigating.

The amount of time that Design students spend on drawing-related activities should be considered in terms of the relationship between good and bad workload. Marsh (2001) investigated the effectiveness of teaching and the corresponding perception of workload. The effectiveness of teaching can be improved not by decreasing the workload but by incorporating meaningful learning activities that are challenging. Bachman and Bachman (2006) illustrate this using a Wundt curve (Refer to Figure 5.1).

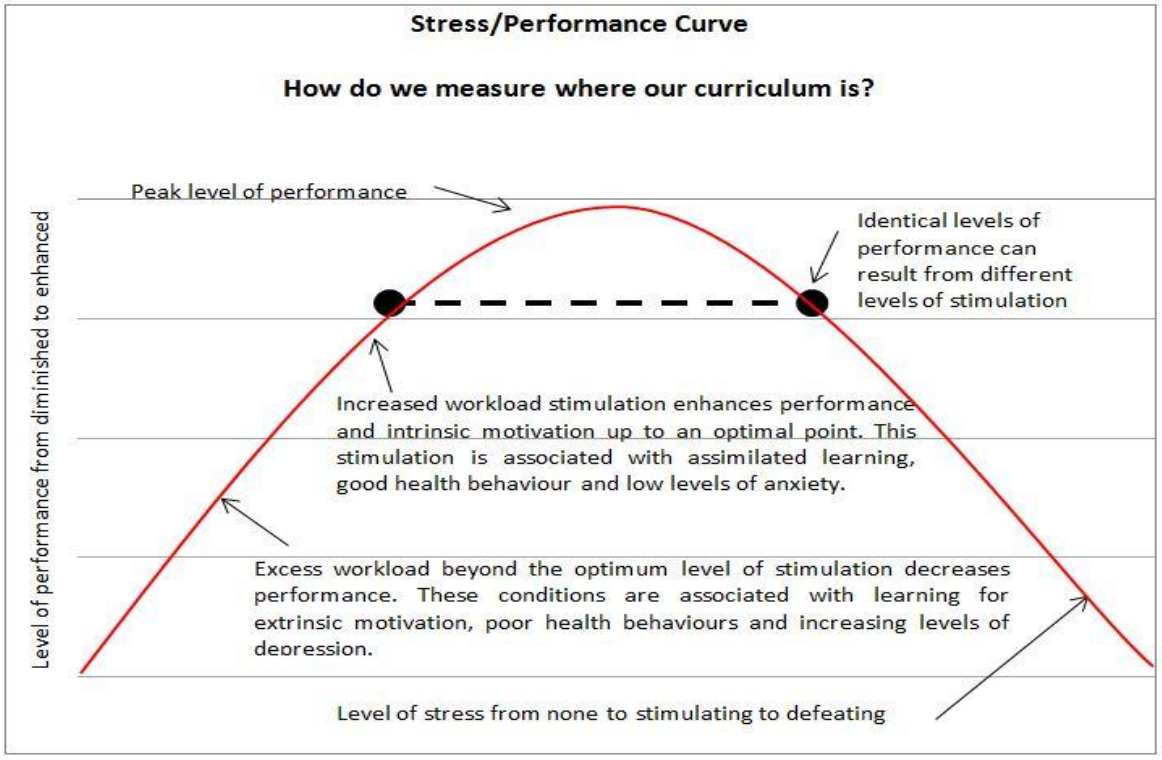


Figure 5.1 A stimulation and performance relation diagram based on the Wundt curve (Bachman & Bachman, 2006: 275)

Further research is required to determine whether the Design course is considered balanced in terms of workload and academic challenge. This would necessitate a qualitative approach to the assessment of the workload combined with a study process questionnaire or similar instrument.

In general, there appears to be a disjuncture between the time available to students for independent learning and the time students are expected to spend. Additional inquiries into the factors that impact on students' perceptions of workload in the unique South African higher education landscape are required.

These recommendations are put forward to assist students and lecturers to address time allocation and time management issues in Design education.

References

Alarcón, F., Beneitone, P., De Armas, R., Kieling, S., Suñé, L. & Veneros, D. 2013. Student workload and degree profiles: the experience of CLAR credit in Latin America. *Tuning Journal for Higher Education*. (1):165–186.

Arts Victoria. 2015. *History of the eight hour day*. [Online], Available: http://www.8hourday.org.au/pdf/888_fact_01_history.pdf [2015, July 29].

Bachman, L. & Bachman, C. 2006. Student perceptions of academic workload in architectural education. *Journal of Architectural and Planning Research*. 23(4):271–304.

Balascio, C.C., Benson, E.R., Hotchkiss, L. & Balascio, W.D. 2009. A study of student-reported out-of-class time devoted to engineering technology courses. *Journal of Engineering Technology*. 26(6):8–14.

Bates, I., Baume, D. & Assinder, S. 2010. Focusing on student learning to guide the use of staff time. *Innovations in Education and Teaching International*. 47(4):357–367.

Bekhradnia, B. 2004. *Credit accumulation and transfer, and the Bologna process: an overview*. [Online], Available: http://www.hepi.ac.uk/wp-content/uploads/2014/02/13CATFullReport.pdf [2015, July 05].

Bekhradnia, B. 2009. *The academic experience of students in English universities - 2009 report.* [Online], Available: http://www.hepi.ac.uk/files/40Theacademicexperienceofstudents2009.pdf [2015, July 05].

Bekhradnia, B. 2012. *The academic experience of students at English universities - 2012 report.* [Online], Available: http://www.hepi.ac.uk/wp-content/uploads/2014/02/AcademicExpereinceStudentsEnglishUnivesitiesReportFullNoEmbargo.pdf [2015, July 05].

Bekhradnia, B. 2013. *The academic experience of students in English universities - 2013 report.* [Online], Available: http://www.hepi.ac.uk/wp-content/uploads/2014/02/HEPI-Report-61-2013-Student-Academic-Experience-Summary-Report.pdf [2015, July 05].

Biggs, J.B. & Tang, C. 2011. *Teaching for Quality Learning at University*. New York: Open University Press.

Bilda, Z. & Demirkan, H. 2003. An insight on designers' sketching activities in traditional versus digital media. *Design Studies*. 24(1):27–50.

Bitzer, E. 2009. *Higher education in South Africa - A scolarly look behind the scenes*. E. Bitzer, Ed. Stellenbosch: SUN Media.

Bolger, N., Davis, A. & Rafaeli, E. 2003. Diary methods: capturing life as it is lived. *Annual Review of Psychology*. 54:579–616.

Bowyer, K. 2012. A model of student workload. *Journal of Higher Education Policy and Management*. 34(3):239–258.

Carbone, A. & Sheard, J. 2002. Developing a model of student learning in a studio-based teaching

environment. *Informing Science and IT Education*. (June):203–215.

Chambers, E. 1992. Work-load and the quality of student learning. *Studies in Higher Education*. 17(2):141–153.

CHE. 2013. *The Higher Education Qualifications Sub-Framework*. [Online], Available: http://www.sun.ac.za/afrikaans/policy/Documents/Leer en Onderrig/Institusionele Navorsing en Beplanning/Revised HEQSF Jan2013 FINAL.pdf [2015, July 08].

CHE. 2015. *What is the role of SAQA_ _ Council on Higher Education*. [Online], Available: http://www.che.ac.za/content/what-role-saqa [2015, July 12].

CQFW. 2009. *Credit and Qualifications Framework for Wales Delivering the Promise Implementation Plan and Handbook 2009 – 2014*. [Online], Available: www.wales.gov.uk/educationandskills [2015, July 06].

Dee, K.C. 2007. Student perceptions of high course workloads are not associated with poor student evaluations of instructor performance. *Journal of Engineering Education*. (January):69–78.

Deepwell, F. & Malik, S. 2008. On campus, but out of class: an investigation into students' experiences of learning technologies in their self-directed study. *Research in Learning Technology*. 16(1):5–14.

Department of Education. 2007. The Higher Education Qualifications Framework. *Government Gazette*. 928(30353):3–29.

Department of Education. 2008. *Classification of Educational Subject Matter*. Pretoria. [Online], Available: http://www.che.ac.za/media_and_publications/accreditation-and-national-reviews/cesm-classification-educational-subject [2015, July 01].

Department of Labour. 2014. The basics conditions of employment amendment act - 2013. *Government Gazette*. 654(37955):1–132. [Online], Available: http://www.greengazette.co.za/pages/national-gazette-37230-of-17-january-2014-vol-583_20140117-GGN-37230-003.

Dochy, F.J.R.C., Wagemans, L.J.J.. & De Wolf, H.C. 1989. *Modularisation and student learning in modular instruction in relation with prior knowledge*. Heerlen: Open University: Centre for Educational Technological Innovation.

Dubberly, H. 2004. *How Do You Design*. San Francisco: Dubberly Design Office.

Duggan, F. 2004. The changing nature of the studio as an educationalsetting. *CEBE Transactions*. 1(2):70–76.

Dutton, T. 2011. Design and Sudio Pedagogy. *Journal of Architectural Education*. 41(1):16–25.

Ercan, T., Karaağaç, F. & Emekli, A.E. 2009. A desktop application to learn the actual workload of the students. *Procedia - Social and Behavioral Sciences*. 1(1):136–140.

European Commision. 2009. *ECTS users' guide*. Luxembourgh: European Communities.

Garg, S., Vijayshre, P. & Panda, S. 1992. A prelimanary study of student workload for IGNOU Physics Elective Courses. *Indian Journal of Open Learning*. 1(2):19–25.

Garmendia, M., Guisasola, J., Barragués, J.I. & Zuza, K. 2008. Estimate of students' workload and the impact of the evaluation system on students' dedication to studying a subject in first-year engineering courses. *European Journal of Engineering Education*. 33(4):463–470.

Garrouste, C. 2010. *100 years of educational reforms in Europe: a contextual database*. Luxembourgh: European Union.

GfK Finance. 2011. *NUS/HSBC Student Experience Full Report*. [Online], Available: http://www.nus.org.uk/PageFiles/12238/NUS-HSBC-Experience-report-web.pdf [2015, July 05].

Gijselaers, W.H. & Schmidt, H.G. 1995. Effects of quantity of instruction on time spent on learning and achievement. *Educational Research and Evaluation*. 1(2):183–201.

Gillard, D. 2011. *Education in England: a Brief History*. [Online], Available: http://www.educationengland.org.uk/history/chapter02.html [2015, February 28].

Ginns, P., Prosser, M. & Barrie, S. 2007. Students ' perceptions of teaching quality in higher education : the perspective of currently enrolled. *Studies in Higher Education*. 32(5):603 – 615.

Goldschmidt, G., Hochman, H. & Dafni, I. 2010. The design studio "crit": Teacher–student communication. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing*. 24(03):285–302.

Gonzalez, J. & Wagenaar, R. 2006. "Student workload, teaching methods and learning outcomes: The Tuning Approach". In *Tuning Educational Structures in Europe. Universities' contribution to the Bologna Process. An Introduction (re-print 2008)*. R. Wagenaar & J. Gonzalez, Eds. Bilbao and Groningen: University of Deusto Press. 82–89.

Green, J. 2007. *Death in the Haymarket: A Story of Chicago, the First Labour Movement and the Bombing that Divided Gilded Age America*. Knof Doubleday Publishing Group.

Greenwald, A.G. & Gillmore, G.M. 1997. No pain, no gain? The importance of measuring course workload in student ratings of instruction. *Journal of Educational Psychology*. 89:743–751.

Hanson, T.L., Drumheller, K., Mallard, J., McKee, C. & Schlegel, P. 2011. Cell phones, text messaging, and Facebook: competing time demands of today's college students. *College Teaching*. 59(1):23–30.

HEA & HEPI. 2015. *The HEPI-HEA 2015 Student Academic Experience survey: Summary and recommendations*. [Online], Available: http://www.hepi.ac.uk/.../2015/.../AS-PRINTED-HEA_Student-Academic-Exp [2015, January 11].

Hellsten, L.M. 2012. What do we know about time management? A review of the literature and a psychometric critique of instruments assessing time management. In *Time Management*. T. Stoilov, Ed. Intech. 3–29.

History. 2015. *May 1, 1926: Ford factory workers get 40-hour week*. [Online], Available: http://www.history.com/this-day-in-history/ford-factory-workers-get-40-hour-week [2015, July 29].

Hoadley, C. & Cox, C. 2008. What is design knowledge and how do we teach it ? *Educating Learning Technology Designers*. (2000):19–35.

Howell, G.F. & Buck, J.M. 2012. The Adult Student and Course Satisfaction : What Matters Most ? *Innovative Higher Education*. 37(3):215–226.

Van den Hurk, M.M., Wolfhagen, H.A.P., Dolmans, D.H.J.M. & Van der Vleuten, C.P.M. 1998. The relation between time spent on individual study and academic achievement in a Problem-Based Curriculum. *Advances in Health Sciences Education : Theory and Practice*. 3(1):43–49.

Iida, M., Shrout, P.E., Laurenceau, J.P. & Bolger, N. 2012. Using diary methods in psycological research. In *APA Handbook of Research Methods in Psychology*. Volume 1 ed. H. Cooper, Ed. The American Psychological Association. 277–305.

Innis, K. & Shaw, M. 1997. How do students spend their time? *Quality Assurance in Education*. 5(2):85–89.

Jacobs, S.R. & Dodd, D. 2003. Student burnout as a function of personality, social support, and workload. *Journal of College Student Development*. 44(3):291–303.

Jenkins, A. & Unwin, D. 1996. *Writting Learning Outcomes for the Core Curriculum*. [Online], Available: http://www.ncgia.ucsb.edu/giscc/units/format/outcomes.html#top [2015, September 11].

Karjalainen, A., Alha, K. & Jutila, S. 2006. *Give me time to think - Determining student workload in higher education*. Finland: University of Oulo, Teaching Development Unit.

Kelly, W.E. & Johnson, J.L. 2005. Time use efficiency and the five-facto model of personality. *Education*. 125(3):511–515.

Kember, D. 2004. Interpreting student workload and the factors which shape students' perceptions of their workload. *Studies in Higher Education*. 29(2):165–184.

Kember, D. & Leung, D.Y.P. 1998. Influences upon students' perceptions of workload. *Educational Psychology*. 18(3):293 – 307.

Kember, D. & Leung, D.Y.P. 2006. Characterising a teaching and learning environment conducive to making demands on students while not making their workload excessive. *Studies in Higher Education*. 31(2):185–198.

Kember, D., Charlesworth, M., Davies, H., McKay, J. & Stott, V. 1994. Evaluating the effectiveness of educational innovations: Using the study process questionnaire to show that meaningful learning occurs. *Studies in Educational Evaluation*. 23(2):141–157.

Kember, D., Biggs, J. & Leung, D.Y.P. 2004. Examining the multidimensionality of approaches to learning through the development of a revised version of the Learning Process Questionnaire. *British Journal of Educational Psycology*. 74(6):261 – 279.

Kilfoil, W. 2015. *Credits notional hours and workload*. [Online], Available: http://www.unisa.ac.za/contents/faculties/service_dept/bld/docs/Creditsnotionalhoursandworkload.doc [2015, July 22].

Kingsland, A.J. 1996. Time expenditure, workload, and student satisfaction in problem-based learning. *New Directions for Teaching and Learning*. 1996(68):73–81.

Koch, A., Schwennsen, K., Dutton, T.A. & Smith, D. 2002. *The redesign of studio culture: a report of the AIAS studio culture task force*. New York: The American Institute of Architecture Students. [Online], Available: http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:The+Redesign+of+Studio+Culture:+A+Report+of+the+AIAS+Studio+Culture+Task+Force#0.

Kolari, S., Savander-Ranne, C. & Viskari, E.L. 2006. Do our engineering students spend enough time studying? *European Journal of Engineering Education*. 31(5):499–508.

Kolari, S., Savander-Ranne, C. & Viskari, E.L. 2008. Learning needs time and effort: a time-use study of engineering students. *European Journal of Engineering Education*. 33(5):483–498.

Kyndt, E., Dochy, F., Struyven, K. & Cascallar, E. 2011. The perception of workload and task complexity and its influence on students' approaches to learning: A study in higher education. *European Journal of Psychology of Education*. 26(3):393–415.

Kyndt, E., Berghmans, I., Dochy, F. & Bulkens, L. 2014. "Time is not enough."Workload in higher education: a student perspective. *Higher Education Research & Development*. 33(4):684–698.

Lam, P., McNaught, C., Lee, J. & Chan, M. 2012. *The impact of student workload on learning experiences*. (Working Paper no. 12). Hong Kong: The Chinese University of Hong Kong.

Lawless, C. 2000. Using learning activites in mathematics: workload and study time. *Studies in Higher Education*. 25(1):97 – 111.

Lee, N. 2009. Project methods as the vehicle for learning in undergraduate design education: a typology. *Design Studies*. 30(5):541–560.

Leedy, P.D. & Ormrod, J.E. 2005. *Practical research - Planning and design*. 8th ed. New Jersey: Merrill Prentice Hall.

Lindsay, E.D. & Rogers, H. 2010. The relationship between reported workload, stress and employment levels in first-year engineering students. *Australasian Journal of Engineering Education*. 16(2):167–180.

Lizzio, A., Wilson, K. & Simons, R. 2002. University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher Education*. 27(1):27–52.

Lockwood, F. 2005. *Estimating student workload, readability and implications for student learning and progression*. [Online], Available: http://wikieducator.org/images/5/5a/Odlaa2005Lockwoodestimating_student_workload.pdf [2015, November 02].

Malisa, V. & Komenda, T. 2011. More efficient studying in complex studies due to elementary control of workload on an example in the degree program mechatronics/robotics. In *Annals & proceedings of DAAAM International*. Vol. 22. B. Katalinic, Ed. Vienna, Austria: DAAAM International. 573–574.

Marsh, H.W. 1980. The influence of student , course, and in evaluations of instructor characteristics university teaching. *American Educational Research Journal*. 17(2):219–237.

Marsh, H.W. 2001. Distinguishing between good (useful) and bad workloads on students' evaluations of teaching. *American Educational Research Journal*. 38(1):183–212.

Massey University. 2015. *Student_Workload_Calculator*. [Online], Available: http://www.massey.ac.nz/massey/fms/.../Student_Workload_Calculator.doc [2015, August 23].

Matthews, D. 2013. *Student workloads compared and contrasted*. [Online], Available: http://www.timeshighereducation.co.uk/news/student-workloads-compared-and-contrasted/2006151.article [2015, November 02].

McCormick, A.C. 2011. It's about time: what to make of reported declines in how much college students study. *Liberal Education*. 97(1):30–39.

Meeuwisse, M., Born, M.P. & Severiens, S.E. 2013. Academic performance differences among ethnic groups: Do the daily use and management of time offer explanations? *Social Psychology of Education*. 16(4):599–615.

Meng, C. & Heijke, H. 2005. Student time allocation, the learning environment and the acquisition of competencies. In *Research centre for Education and the Labour Market*. Maastricht: Maastricht University Library.

Miliband, R. 1954. The politics of Robert Owen. *Journal of the History of Ideas*. 15(2):233–245.

Miller, S. 2001. Workload measures. The University of Iowa. [Online], Available: http://www.nads-sc.uiowa.edu/publicationStorage/200501251347060.N01-006.pdf [2015, November 02].

Monaghan, P. 2001. The "insane little bubble of nonreality" that is life for architecture students. *Chronicle of Higher Education*. 47(2):A34–A36.

Nijhuis, J., Segers, M. & Gijselaers, W. 2008. The extent of variability in learning strategies and students' perceptions of the learning environment. *Learning and Instruction*. 18(2):121–134.

Nonis, S.A. & Hudson, G.I. 2006. Academic performance of college students: influence of time spent studying and working. *Journal of Education for Business*. (January/February):151–160.

Nonis, S.A., Philhours, M.J. & Hudson, G.I. 2006. Where does the time go ? A diary approach to business and marketing students' time use. *Journal of Marketing Education*. 28(2):121–134.

NSSE Institute. 2000. *Validity focus groups*. [Online], Available: http://nsse.indiana.edu/pdf/psychometric_portfolio/Validity_FocusGroups.pdf [2015, July 13].

NSSE Institute. 2012. *The NSSE survey instrument*. [Online], Available: http://nsse.indiana.edu/html/survey_instruments.cfm [2015, July 13].

NSSE Institute. 2014. *Bringing the institution into focus: Annual results 2014*. Bloomington, IN. [Online], Available: http://nsse.indiana.edu/NSSE_2014_Results/pdf/NSSE_2014_Annual_Results.pdf#page=20.

Nulty, D.D. 2008. The adequacy of response rates to online and paper surveys: what can be done? *Assessment & Evaluation in Higher Education*. 33(3):301–314.

NUS. 2008. *NUS Student Experience Report*. London. [Online], Available: http://www.nus.org.uk/PageFiles/4017/NUS_StudentExperienceReport.pdf.

Orr, S., Blythman, M. & Blair, B. 2007. *Critiquing the crit: Staff guide*. [Online], Available: http://www.adm.heacademy.ac.uk/library/files/adm-hea-projects/learning-and-teaching-projects/crit-staff-guide.pdf [2015, February 12].

Piotrowski, C. 2011. *Problem solving and critical thinking for designers*. New Jersey: John Wiley & Sons Inc.

Pogacnik, M., Juznic, P., Pogacnik, A., Cestnik, V., Kogovsek, J., Pestevsek, U. & Fernandes, T. 2004. An attempt to estimate students' workload. *Journal of Veterinary Medical Education*. 31:255–260.

Pouyioutas, P., Gjermundrod, H. & Dionysiou, I. 2012. ReProTool Version 2.0: Re-engineering academic curriculum using learning outcomes, ECTS and Bologna process concepts. *Interactive Technology and Smart Education*. 9(3):136–152.

Du Pré, R. 2010. Universities of technology in the context of the South African higher education landscape. In *Universities of Technology – Deepening the Debate*. R. Townsend, Ed. Pretoria, South Africa: Council on Higher Ecudation (CHE). 1–41.

Quyen, D.T.N. 2008. Contact hours in Dutch and Vietnamese higher education: a comparison. *Higher Education*. 57(6):757–767.

Ramsden, P. 1991. A performance indicator of teaching quality in higher education: The Course Experience Questionnaire. *Studies in Higher Education*. 16(2):129–150.

Richardson, J.T.E. 2005. Instruments for obtaining student feedback: a review of the literature. *Assessment & Evaluation in Higher Education*. 30(4):387–415.

Rosenzweig, R. 1983. *Eight hours for what we will - Workers and leisure in an industrial city, 1870-1920*. Cambridge: Cambridge University Press. [Online], Available: http://assets.cambridge.org/97805212/39165/sample/9780521239165ws.pdf.

Rossouw, P.L. & Abrahamse, C. 2011. One size fits all? Student workload in a higher education faculty. In *Design, Development and Research Conference 2011*. E. Appiah, Ed. Cape Town, South Africa. 1–23.

Rožman, L. & Leser, V.J. 2014. Assessing student workload - tough nut to crack. In *MakeLearn Conference - Human Capital without borders: Management Knowledge and Learning for Quality of Life, Knowledge and Learning*. V. Dermol, N. Širca, & G. Dakovic, Eds. Portorož, Slovenia: ToKnowPress. 1411–1416.

Ruiz-Gallardo, J.R., Castaño, S., Gómez-Alday, J.J. & Valdés, A. 2011. Assessing student workload in problem-based learning: relationships among teaching method, student workload and achievement. A case study in Natural Sciences. *Teaching and Teacher Education*. 27(3):619–627.

Rust, A.A.B. 2012. The utilisation of “off time” by the modern South African business student: An exploratory study. *African Journal of Business Management*. 6(37):10212–10221.

Salama, A.M. & Wilkinsan, N. 2007. Theoretical perspectives and positions. In *Design Studio Pedagogy: Horizons for the Future*.

Salmon, M. 2011. Liberal arts in the studio classroom: a survey of art faculty. *Visual Arts Research*. 16(2):59–78.

SAQA. 2000. *The National Qualifications Framework and Curriculum Development*. South African Qualifications Authority. [Online], Available: http://www.saqa.org.za/structure/nqf/docs/curriculum_dev.pdf.

SCQF. 2015. *Scottish Credit and Qualifications Framework - About*. [Online], Available: http://scqf.org.uk/the-framework/scqf-credit-points/ [2015, July 01].

Shaw, J., Quigg, S., Murch, R. & Wunsch, D. 2014. *Students matter - The UNITE students student experience survey 2014 full report*. Bristol. [Online], Available: http://www.unite-group.co.uk/binaries/877/895/students-matter-2014_summary-report-_final.pdf.

Shedd, J.M. 2003. The history of the student credit hour. *New Directions for Higher Education*. Summer(122):5–12.

Smith, K. & Smith, C. 2012. Non-career teachers in the Design studio: economics, pedagogy and teacher development. *International Journal of Art & Design Education*. 31(1):90–104.

Stinebrickner, R. & Stinebrickner, T.R. 2004. Time-use and college outcomes. *Journal of Econometrics*. 121(1-2):243–269.

Stott, R. 2015. *For and against all-nighter culture:ArchDaily readers respond*. [Online], Available: http://www.archdaily.com/616567/for-and-against-all-nighter-culture-archdaily-readers-respond/ [2015, April 07].

Strydom, J.F. & Mentz, M. 2010. *Focusing the student experience on success through student engagement*. Pretoria, South Africa: Council on Higher Education (CHE).

Swann, C. 2002. Nellie is Dead. *Art, Design and Communication in Higher Education*. 1(1):50–58.

Tampakis, A. & Vitoratos, E. 2009. Estimation of students workload: correlation of teaching and learning methods with examination results. A case study. In *Internationalisation and the Role of University Networks Proceedings of the 2009 EMUNI Conference on Higher Education and Research*. D. Čurčić & T. Jazbec, Eds. Portorož, Slovenia,: EMUNI University. 1–20.

Tanner, J.R., Stewart, G., Maples, G.M. & Totaro, M.W. 2008. How business students spend their time — do they really know ? *Proceedings of the Academy of Educational Leadership*. 13(2):81–85.

Trowler, V. 2010. *Student engagement literature review*. Heslington. [Online], Available: http://americandemocracy.illinoisstate.edu/documents/democratic-engagement-white-paper-2_13_09.pdf.

Wade, B.K. 1991. A profile of the real world of undergraduate students and how they spend their discretionary time. In *Paper presented at the Annual meeting of the American Educational Research Association*. Chicago. 39.

Wagenaar, R. 2015. *Educational structures, learning outcomes, workload and the calculation of ECTS credits*. [Online], Available: http://www.unideusto.org/tuningeu/workload-a-ects/177-educational-structures-learning-outcomes-workload-and-the-calculation-of-ects-credits.html [2015, July 01].

Wellman, J. 2005. The student credit hour: counting what counts. *Change*. (July/August):19–23.

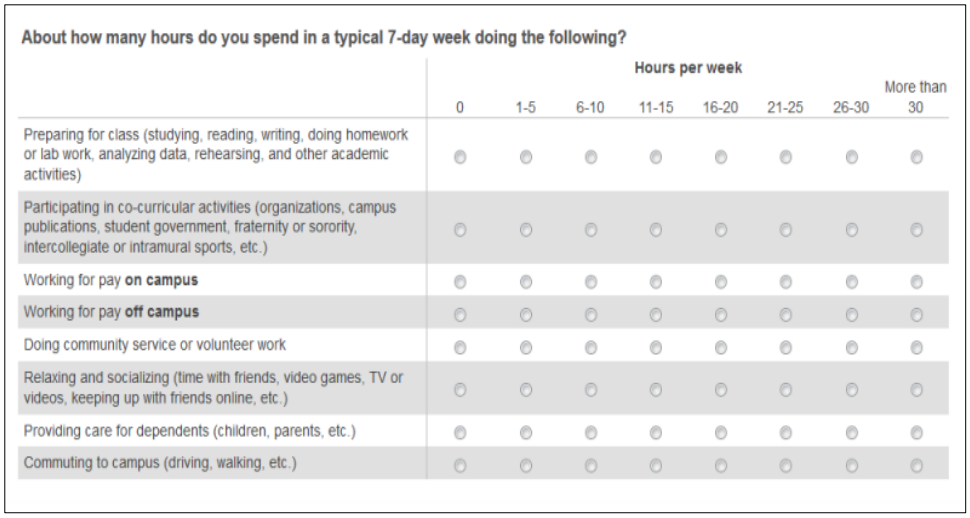
Van der Wende, M.C. 2000. The Bologna Declaration: enhancing the transparency and competitiveness of European higher education. *Higher Education in Europe*. 25(3):305–310.

Wilson, K.L., Lizzio, A. & Ramsden, P. 1997. The development, validation and application of the Course Experience Questionnaire. *Studies in Higher Education*. 22(1):33–53.

YourDictionary. 2015. *Crit dictionary definition _ crit defined*. [Online], Available: http://www.yourdictionary.com/crit [2015, November 01].

Zuriff, G.E. 2003. A method for measuring student study time and preliminary results. *College Student Journal*. 37(1):72–78.

Appendix A – 2015 NSSE questionnaire segment on workload



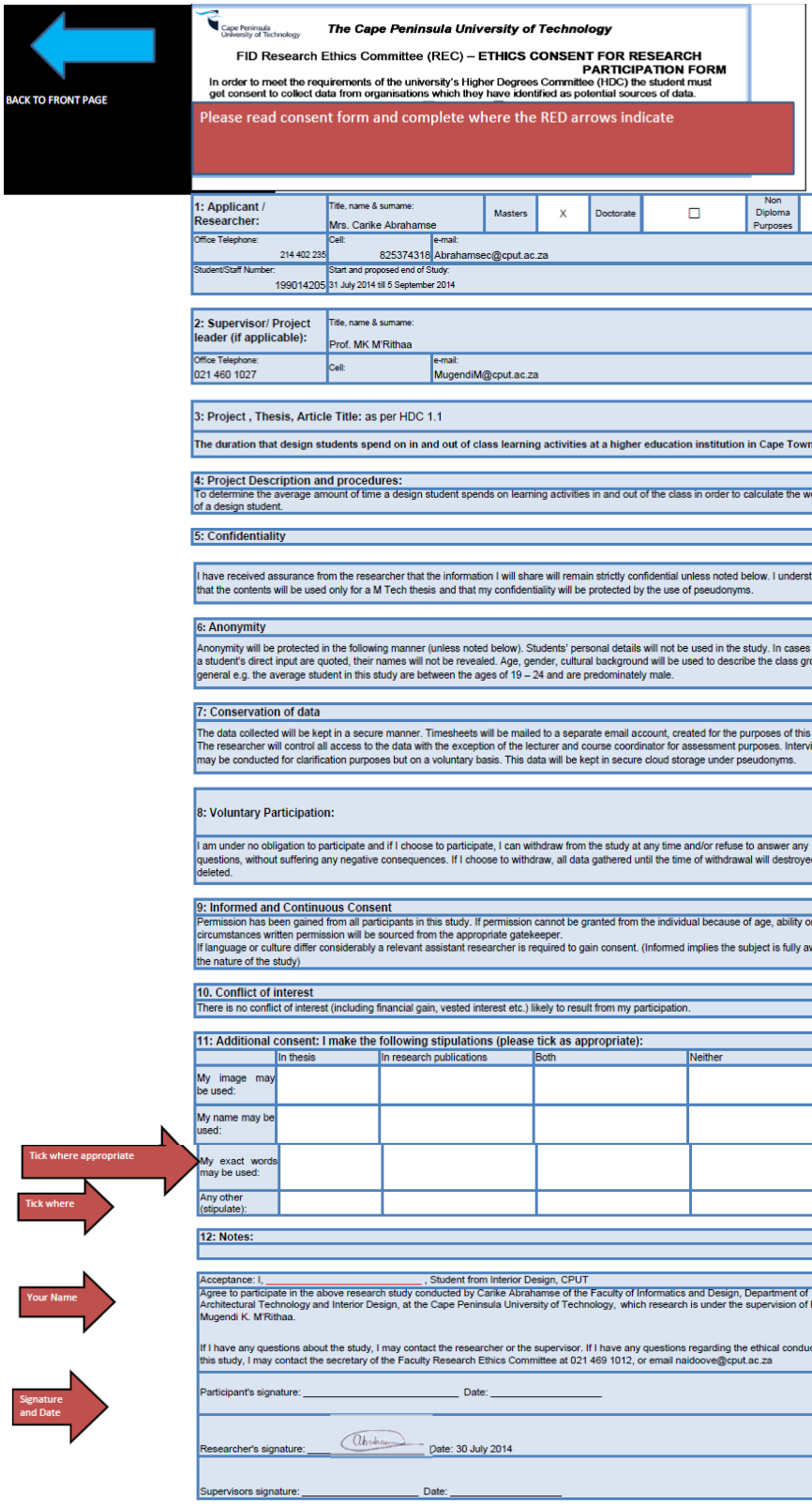
About how many hours do you spend in a typical 7-day week doing the following?

	Hours per week							
	0	1-5	6-10	11-15	16-20	21-25	26-30	More than 30
Preparing for class (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, and other academic activities)	○	○	○	○	○	○	○	○
Participating in co-curricular activities (organizations, campus publications, student government, fraternity or sorority, intercollegiate or intramural sports, etc.)	○	○	○	○	○	○	○	○
Working for pay **on campus**	○	○	○	○	○	○	○	○
Working for pay **off campus**	○	○	○	○	○	○	○	○
Doing community service or volunteer work	○	○	○	○	○	○	○	○
Relaxing and socializing (time with friends, video games, TV or videos, keeping up with friends online, etc.)	○	○	○	○	○	○	○	○
Providing care for dependents (children, parents, etc.)	○	○	○	○	○	○	○	○
Commuting to campus (driving, walking, etc.)	○	○	○	○	○	○	○	○

Appendix B – Example of a workload calculator (Kilfoil, 2015)

Activities	Estimated student time in minutes
Reading and comprehending of seventeen pages at 7.5 pages in 60 minutes	136
Vocabulary study: 24 new words – writing own word list	24
Activity 1: writing	30
Activity 2: answering three questions	10
Activity 3: ticking a checklist	2
Activity 4: answering twenty multiple-choice comprehension questions	20
Reading checklist	2
Writing checklist	2
Studying an annotated text	5
Activity 5: Letter to the press	60
Consulting grammar reference book	30
Activity 6: grammar exercise	10
Reflection on unit	10
TOTAL	341 (5.68 hours)

Appendix C – Consent form as it appears in the timesheet diary



BACK TO FRONT PAGE

Please read consent form and complete where the RED arrows indicate

Cape Peninsula University of Technology

The Cape Peninsula University of Technology

FID Research Ethics Committee (REC) – **ETHICS CONSENT FOR RESEARCH PARTICIPATION FORM**

In order to meet the requirements of the university's Higher Degrees Committee (HDC) the student must get consent to collect data from organisations which they have identified as potential sources of data.

1: Applicant / Researcher:	Title, name & surname: Mrs. Carike Abrahamse	Masters	X	Doctorate	☐	Non Diploma Purposes	☐
Office Telephone: 214 402 235	Cell: 825374318	e-mail: Abrahamsec@cput.ac.za					
Student/Staff Number: 199014205	Start and proposed end of Study: 31 July 2014 till 5 September 2014						

2: Supervisor/ Project leader (if applicable):	Title, name & surname: Prof. MK M'Rithaa	
Office Telephone: 021 460 1027	Cell:	e-mail: MugendiM@cput.ac.za

3: Project , Thesis, Article Title: as per HDC 1.1

The duration that design students spend on in and out of class learning activities at a higher education institution in Cape Town

4: Project Description and procedures:

To determine the average amount of time a design student spends on learning activities in and out of the class in order to calculate the workload of a design student.

5: Confidentiality

I have received assurance from the researcher that the information I will share will remain strictly confidential unless noted below. I understand that the contents will be used only for a M Tech thesis and that my confidentiality will be protected by the use of pseudonyms.

6: Anonymity

Anonymity will be protected in the following manner (unless noted below). Students' personal details will not be used in the study. In cases where a student's direct input are quoted, their names will not be revealed. Age, gender, cultural background will be used to describe the class group in general e.g. the average student in this study are between the ages of 19 – 24 and are predominately male.

7: Conservation of data

The data collected will be kept in a secure manner. Timesheets will be mailed to a separate email account, created for the purposes of this study. The researcher will control all access to the data with the exception of the lecturer and course coordinator for assessment purposes. Interviews may be conducted for clarification purposes but on a voluntary basis. This data will be kept in secure cloud storage under pseudonyms.

8: Voluntary Participation:

I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, all data gathered until the time of withdrawal will destroyed and deleted.

9: Informed and Continuous Consent

Permission has been gained from all participants in this study. If permission cannot be granted from the individual because of age, ability or other circumstances written permission will be sourced from the appropriate gatekeeper.
If language or culture differ considerably a relevant assistant researcher is required to gain consent. (Informed implies the subject is fully aware of the nature of the study)

10. Conflict of interest

There is no conflict of interest (including financial gain, vested interest etc.) likely to result from my participation.

11: Additional consent: I make the following stipulations (please tick as appropriate):

	In thesis	In research publications	Both	Neither
My image may be used:				
My name may be used:				
My exact words may be used:				
Any other (stipulate):				

Tick where appropriate

Tick where

12: Notes:

Acceptance: I, _____, Student from Interior Design, CPUT

Agree to participate in the above research study conducted by Carike Abrahamse of the Faculty of Informatics and Design, Department of Architectural Technology and Interior Design, at the Cape Peninsula University of Technology, which research is under the supervision of Prof. Mugendi K. M'Rithaa.

If I have any questions about the study, I may contact the researcher or the supervisor. If I have any questions regarding the ethical conduct of this study, I may contact the secretary of the Faculty Research Ethics Committee at 021 469 1012, or email naidoove@cput.ac.za

Your Name

Participant's signature: _____ Date: _____

Signature and Date

Researcher's signature: _____ Date: 30 July 2014

Supervisors signature: _____ Date: _____

Appendix D – DATA: Student timetables

2014 Second-year timetable

Timetable: Interior Design 2						
	08:30		10:30	11:00	13:00	14:00 16:00
	1	2	tea		lunch	
Mon	Services			Pres Methods Autocad	Talk or Staff meeting	Des Th Des TH
Tue	Design			Design		Design
wed	Materials			Pres methods		Pres methods
thu	Prof Prac			Design		Design
Fri	Construction			Construction	12:30 Mosque	Student support

[24]

2015 Second-year timetable

ID _2ND year	1	2	3	TEA BREAK	4	5	6	LUNCH	7	8	9
	08h30 - 10h30			10h30 - 11h00	11h00 - 13H00			13h00 - 14h00	14h00 - 16H00		
MON	Consults				DET200S (Construction) ID STUDIO 2			12h45 - 14h00 school talk / staff meeting	DET200S (Construction) ID STUDIO 2 JdW		
TUE	ITD200S ID STUDIO 2				ITD200S ID STUDIO 2				PDP ID STUDIO 2		
WED	PSM200S ID STUDIO 2 & Computer Lab				PSM200S ID STUDIO 2 & Computer Lab				DET200S (Materials) ID STUDIO 2		
THU	DEY200S ID STUDIO 2				ITD200S ID STUDIO 2				ITD200S ID STUDIO 2		
FRI	DET200S (Services) ID STUDIO 2				PSM200S (Autocad) ID STUDIO 2 & Computer Lab			12h30 - 14h00 MOSQUE Moslem stds only	SUPPORT		

[24] The timetable makes provision for students to consult with an additional lecturer on a Friday. This is part of the programme's provision for student support. Several of the participants noted time spent in consultation on a Friday afternoon.

2014 Third year student timetable

Interior Design Timetable: Third Year											
	8:00 - 9:00	08:30	10:30	10:30	11:00	13:00	13:00	14:00	16:00		
		1	2	tea	3	4	lunch	5	6		
Mon		Design theory DEY300S			ITD300S Interior Design		Talk or Staff meeting	ITD300S Interior Design			
Tue		PSM300S Pres methods			PSM300S Pres methods			PSM300S Pres methods			
wed	IDP 300S Int Des Practice	DET300S Construction			DET300S Construction			DET300S Construction			
thu		PDP300S Prof Prac			ITD300S Interior Design			ITD300S Interior Design			
Fri		DET300S Materials			DET300S Services		12:30-14:00 Mosque	Student Consults			

2015 Third year student timetable

	8:30-9:30	9:30 - 10-:30	Tea	11:00 - 12:00	12:00-13:00	Lunch	14:00-15:00	15:00 - 16:00
Monday	**DET300S** Services 3			**ITD300S** Interior Design 3			**ITD300S** Interior Design 3	
Tuesday	**PSM300S** Pres Methods 3			**PSM300S** Pres Methods 3			**DEY300S** Design Theory 3	
Wednesday	**DET300S** Construction 3			**DET300S** Construction 3			**DET300S**	**IDP 300S**
Thursday	**PDP300S** Prof Practice 3			**ITD300S** Interior Design			**ITD300S** Interior Design	
Friday	**DET300S** Materials 3			**PSM300S** REVIT TRAINING			SUPPORT SUPPORT	

[25]

[25] The timetable makes provision for students to consult with an additional lecturer on a Friday. This is part of the programme's provision for student support. Several of the participants noted time spent in consultation on a Friday afternoon.

Appendix E – DATA: Results for term 3 for Second- year participants

This breakdown of the term marks compared to the reported time shows in bold instances where the results indicate a fail or where the time spent is less than the 40 notional hours.

	SUBJECT CODES/ RESULTS					RESULTS	REPORTED TIME		
PARTICIPANTS	ITD 200S	DET 200S	PSM 200S	PDP 200S	DEY 200S	Average	IN - CLASS	OUT-OF-CLASS	TOTAL WORKLOAD
INT20212	47	14	35	66	49	**42**	**7:40**	28:17	**35:57**
INV05206	56	53	43	41	50	**49**	12:38	21:01	**33:40**
INV15215	57	44	59	56	30	**49**	14:42	41:07	55:50
INV27209	65	53	54	44	47	53	11:44	35:12	46:56
INT20206	55	51	58	61	42	53	23:52	28:07	52:00
INV12201	61	63	58	69	44	59	10:33	55:57	63:52
INT06204	52	62	59	59	63	59	20:22	41:31	61:54
INV02214	58	50	62	64	62	59	27:43	49:21	77:04
INV29204	68	56	66	54	55	60	19:02	36:30	55:32
INT23209	58	60	64	53	66	60	14:13	28:27	42:41
INV12216	66	61	62	63	56	62	**9:45**	33:37	43:22
INV22211	55	64	63	49	78	62	16:48	65:23	82:12
INV31210	55	69	57	70	64	63	12:05	62:14	74:19
INT17207	55	61	66	67	69	64	13:22	37:44	51:07
INT28208	61	63	63	72	62	64	10:36	24:55	**35:31**
INV19212	59	67	62	64	69	64	**29:00**	71:40	**100:40**
INT23216	63	61	71	52	75	64	16:57	20:11	**37:08**
INT27214	58	54	61	81	70	65	20:26	14:22	**34:48**
INV24205	65	67	65	74	56	65	10:03	21:36	**31:40**
INT16211	62	67	65	69	64	65	15:26	29:37	45:03
INT27213	65	66	70	61	65	65	17:01	37:03	54:05
INV13208	75	62	70	53	68	66	11:02	44:16	55:18
INT23202	57	60	65	93	56	66	14:58	31:39	46:38
INV13203	70	55	71	72	67	67	11:47	39:44	51:32
INV12202	70	69	67	60	71	67	13:27	45:34	59:01
INT15203	75	53	71	76	67	68	17:52	58:07	76:00
INV28207	69	66	69	75	68	69	14:57	15:07	**30:05**
INT20210	78	63	73	68	69	70	12:50	29:30	42:20
INT20215	73	73	73	61	71	70	14:17	25:23	**39:41**
INV15213	70	68	71	73	73	71	10:00	52:44	62:44

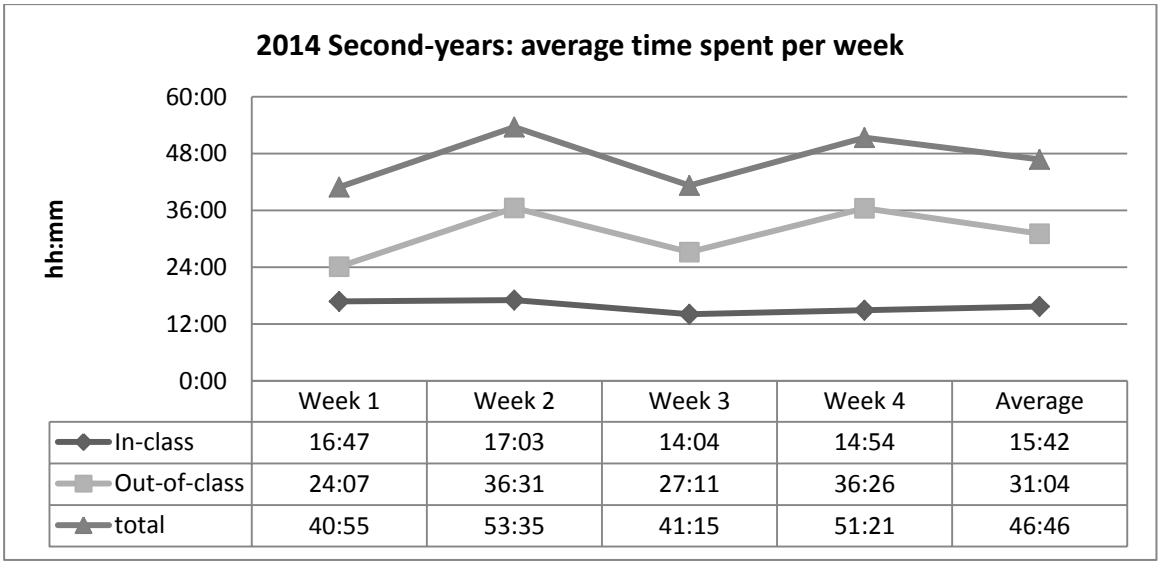
Appendix F – DATA: Results for term 3 for Third year participants

This breakdown of the term marks compared to the reported time shows in bold instances where the results indicate a fail or where the time spent is less than the 40 notional hours.

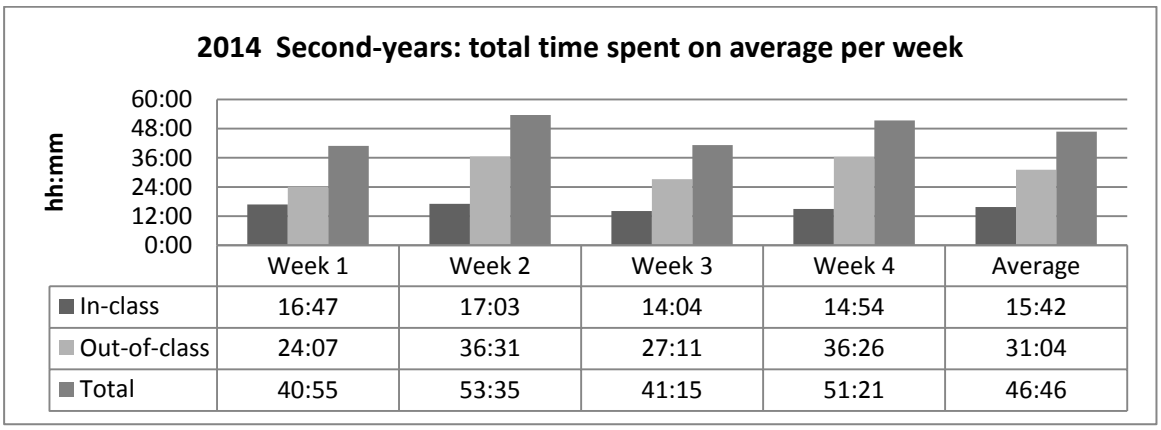
	SUBJECT CODES/ RESUTLS					RESULTS	REPORTED TIME		
PARTICIPANTS	ITD 300S	DET 300S	PSM 300S	PDP 300S	DEY 300S	Average	IN - CLASS	OUT - of - CLASS	WORKLOAD
INV20322	50	56	55	60	71	**58**	**11:26**	15:00	**26:26**
INV04321	47	64	56	74	56	59	**12:31**	50:10	62:41
INT17306	58	54	55	78	59	61	**11:52**	28:52	40:44
INV15323	56	58	57	72	65	62	**11:07**	43:44	54:52
INV16324	60	68	55	70	66	64	**7:30**	30:49	**38:19**
INT17302	62	56	70	85	62	67	15:41	61:41	77:22
INV26325	65	72	60	72	70	68	17:45	31:04	48:49
INT20305	75	61	70	75	64	69	16:37	38:08	54:45
INV19326	71	71	75	70	61	70	**11:08**	39:21	50:30
INV01327	73	68	70	68	70	70	16:41	33:25	50:06
INV23328	75	73	77	67	76	74	**12:45**	38:07	50:52
INT20301	76	68	75	84	82	**77**	20:52	48:22	69:14
INT22304	75	79	73	92	74	**79**	14:10	31:53	46:03
INT22303	76	74	77	90	86	**81**	20:00	51:07	71:07

Appendix G – 2014 Second-year DATA from the timesheet diary per subject

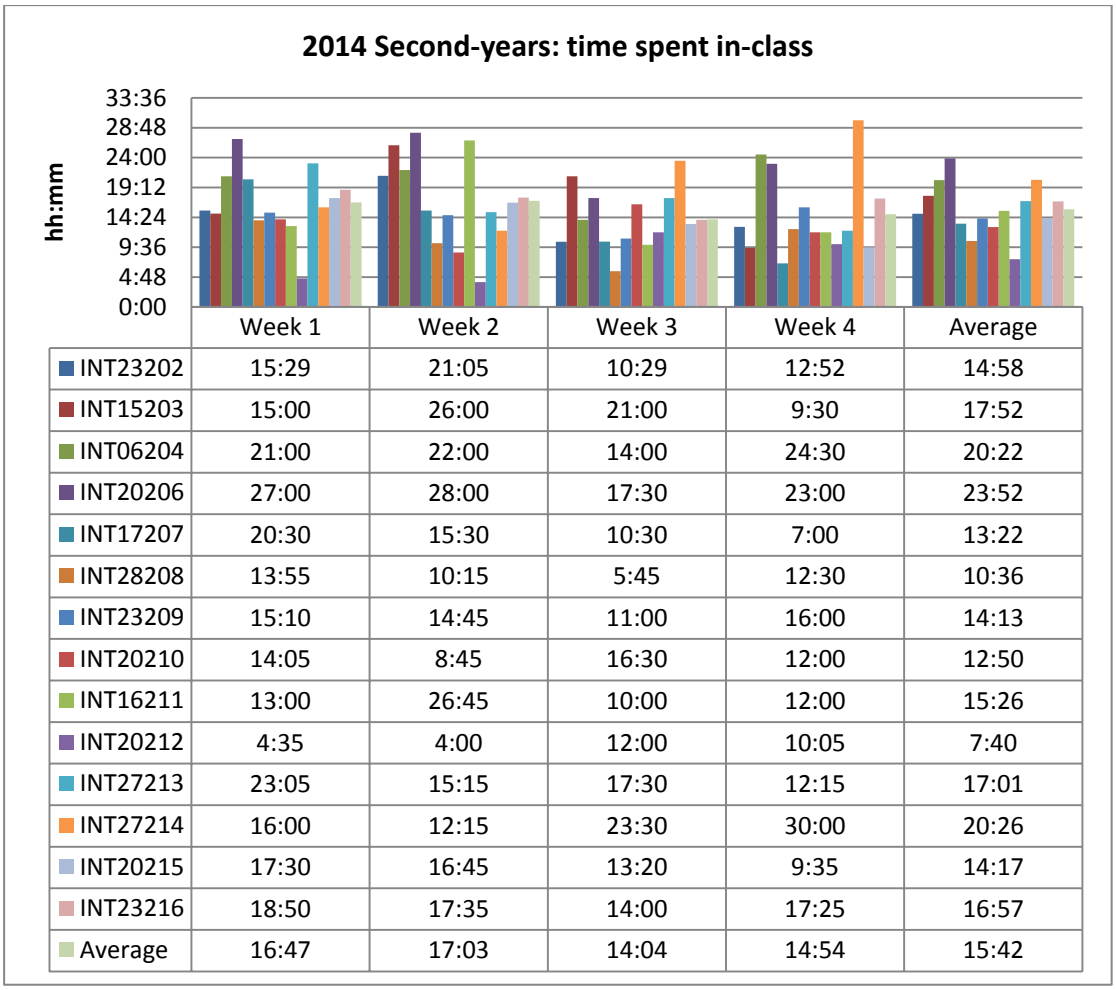
G.1. 2014 Second-years: Time spent per week



	Week 1	Week 2	Week 3	Week 4	Average
In-class	16:47	17:03	14:04	14:54	15:42
Out-of-class	24:07	36:31	27:11	36:26	31:04
total	40:55	53:35	41:15	51:21	46:46

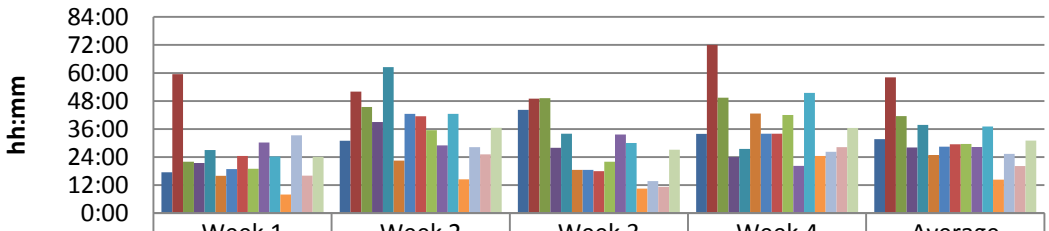


	Week 1	Week 2	Week 3	Week 4	Average
In-class	16:47	17:03	14:04	14:54	15:42
Out-of-class	24:07	36:31	27:11	36:26	31:04
Total	40:55	53:35	41:15	51:21	46:46

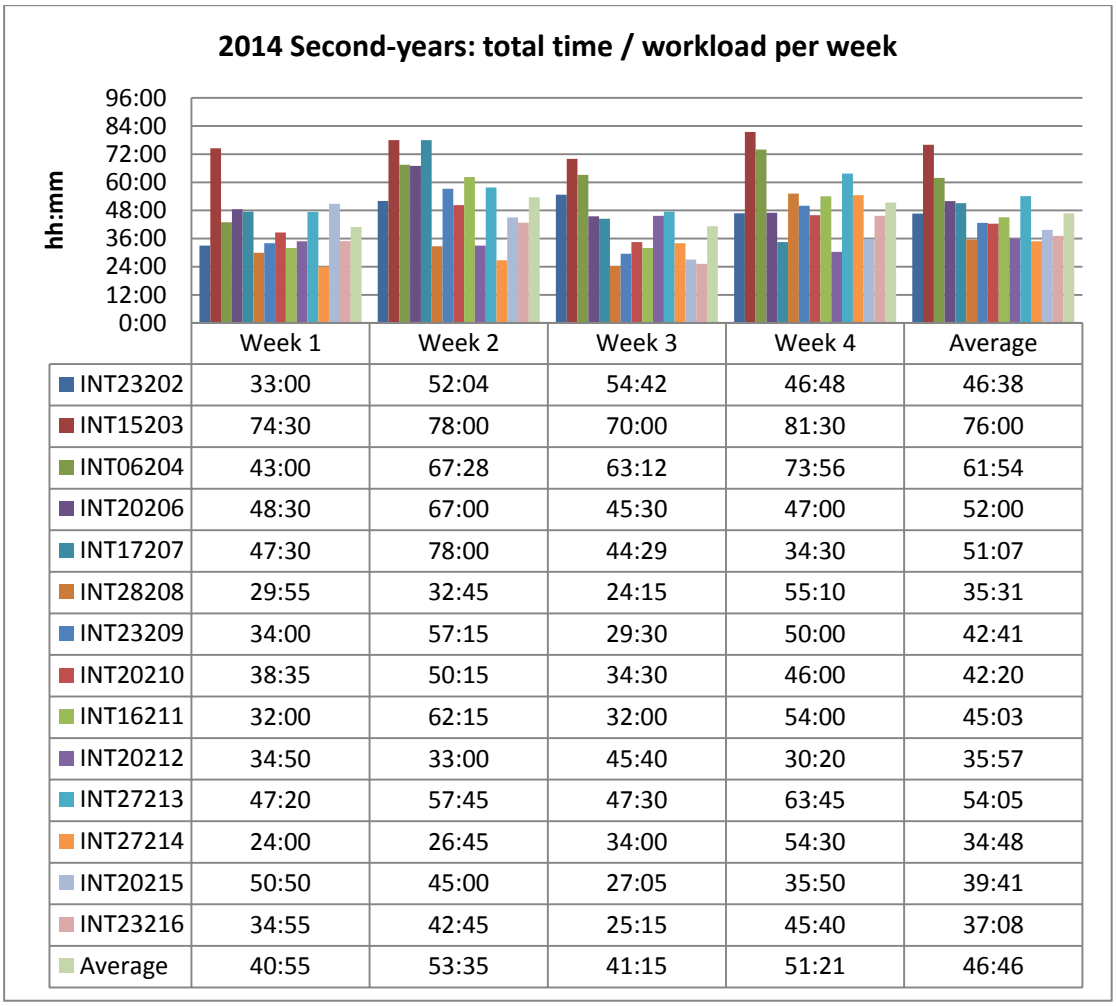


	Week 1	Week 2	Week 3	Week 4	Average
INT23202	15:29	21:05	10:29	12:52	14:58
INT15203	15:00	26:00	21:00	9:30	17:52
INT06204	21:00	22:00	14:00	24:30	20:22
INT20206	27:00	28:00	17:30	23:00	23:52
INT17207	20:30	15:30	10:30	7:00	13:22
INT28208	13:55	10:15	5:45	12:30	10:36
INT23209	15:10	14:45	11:00	16:00	14:13
INT20210	14:05	8:45	16:30	12:00	12:50
INT16211	13:00	26:45	10:00	12:00	15:26
INT20212	4:35	4:00	12:00	10:05	7:40
INT27213	23:05	15:15	17:30	12:15	17:01
INT27214	16:00	12:15	23:30	30:00	20:26
INT20215	17:30	16:45	13:20	9:35	14:17
INT23216	18:50	17:35	14:00	17:25	16:57
Average	16:47	17:03	14:04	14:54	15:42

2014 Second-years : time spent out-of-class

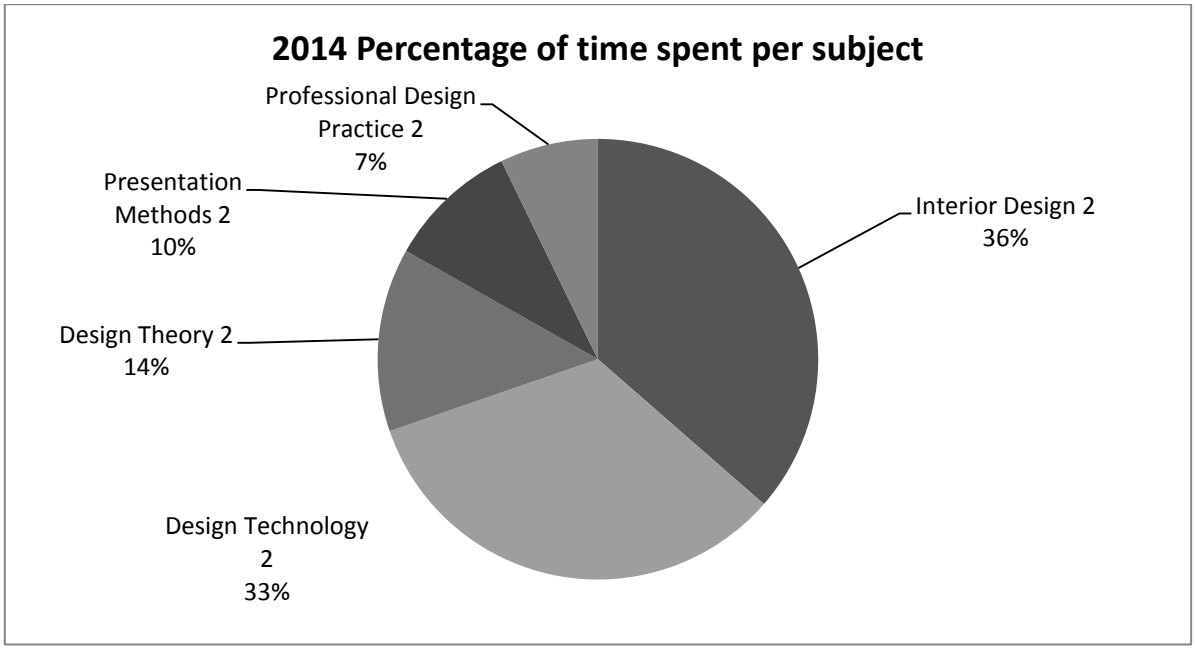


	Week 1	Week 2	Week 3	Week 4	Average
INT23202	17:31	30:59	44:13	33:56	31:39
INT15203	59:30	52:00	49:00	72:00	58:07
INT06204	22:00	45:28	49:12	49:26	41:31
INT20206	21:30	39:00	28:00	24:00	28:07
INT17207	27:00	62:30	33:59	27:30	37:44
INT28208	16:00	22:30	18:30	42:40	24:55
INT23209	18:50	42:30	18:30	34:00	28:27
INT20210	24:30	41:30	18:00	34:00	29:30
INT16211	19:00	35:30	22:00	42:00	29:37
INT20212	30:15	29:00	33:40	20:15	28:17
INT27213	24:15	42:30	30:00	51:30	37:03
INT27214	8:00	14:30	10:30	24:30	14:22
INT20215	33:20	28:15	13:45	26:15	25:23
INT23216	16:05	25:10	11:15	28:15	20:11
Average	24:07	36:31	27:11	36:26	31:04



	Week 1	Week 2	Week 3	Week 4	Average
INT23202	33:00	52:04	54:42	46:48	46:38
INT15203	74:30	78:00	70:00	81:30	76:00
INT06204	43:00	67:28	63:12	73:56	61:54
INT20206	48:30	67:00	45:30	47:00	52:00
INT17207	47:30	78:00	44:29	34:30	51:07
INT28208	29:55	32:45	24:15	55:10	35:31
INT23209	34:00	57:15	29:30	50:00	42:41
INT20210	38:35	50:15	34:30	46:00	42:20
INT16211	32:00	62:15	32:00	54:00	45:03
INT20212	34:50	33:00	45:40	30:20	35:57
INT27213	47:20	57:45	47:30	63:45	54:05
INT27214	24:00	26:45	34:00	54:30	34:48
INT20215	50:50	45:00	27:05	35:50	39:41
INT23216	34:55	42:45	25:15	45:40	37:08
Average	40:55	53:35	41:15	51:21	46:46

G.2. 2014 Second-years: Time spent per subject



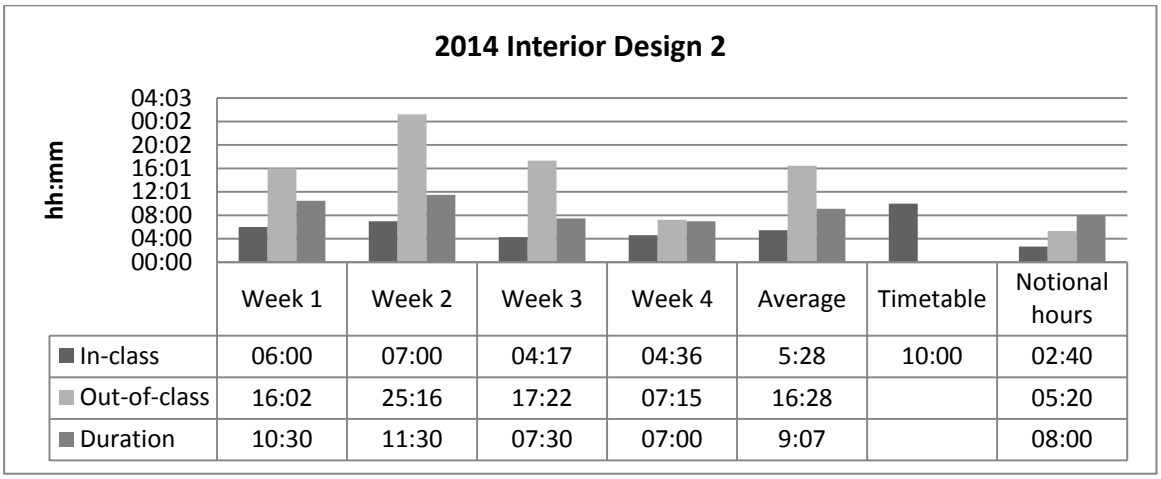
G.3. 2014 Second-years: Learning Activities

2014 Second-year Interior Design 2 Learning activities:	
In-class	Out-of-class
Formal Lecture	Individual work
Individual crit	Construction drawings (CAD/freehand /other)
Individual work	Working on presentation of project
Group crit	Design drawings (CAD/SketchUp/freehand)
Presentation of project	Written reports/assignments
Design drawings (CAD/SketchUp/freehand)	Study for test
Write a test	Research (Internet/Library/books/magazines)
Group discussion	Development of concepts or ideas
Guest lecture	Consulting with industry
Construction drawings (CAD/freehand /other)	Group discussion
Group work	Group work
Research (Internet/Library/books/magazines)	Group crit
Feedback	Site visit
Study for test	
Hand-in	
Working on presentation of project	
Written reports/assignments	

G.4. 2014 Interior Design 2

2014 Interior Design 2 Learning activities:	
In-class	Out-of-class
Individual work	Individual work
Individual crit	Working on presentation of project
Presentation of project	Design drawings (CAD/SketchUp/freehand)
Group crit	Research
Design drawings (CAD/SketchUp/freehand)	Development of concepts or ideas
Group discussion	Consulting with industry
Working on presentation of project	Group crit

Time spent in-class and out-of-class:



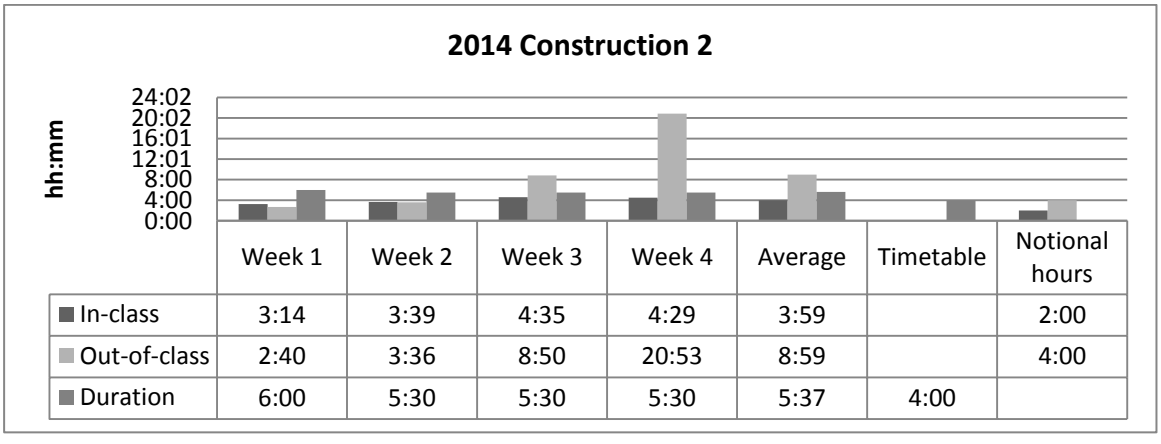
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	06:00	07:00	04:17	04:36	5:28	10:00	02:40
Out-of-class	16:02	25:16	17:22	07:15	16:28		05:20
Duration	10:30	11:30	07:30	07:00	9:07		08:00

G.5. 2014 Design Technology 2

2014 Construction

2014 Construction 2 Learning activities:	
In-class	Out-of-class
Formal lecture	Construction drawings (CAD/freehand/other)
Individual crit	Individual work
Group crit	Research
Construction drawings (CAD/freehand/other)	
Individual work	
Group discussion	

Time spent in-class and out-of-class:

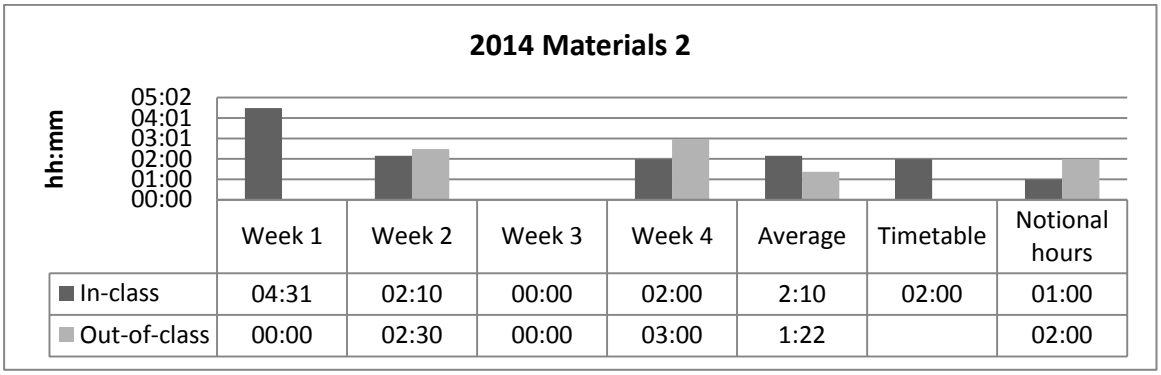


	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	3:14	3:39	4:35	4:29	3:59		2:00
Out-of-class	2:40	3:36	8:50	20:53	8:59		4:00
Duration	6:00	5:30	5:30	5:30	5:37	4:00	

2014 Materials 2

2014 Materials 2 Learning activities:	
In-class	Out-of-class
Formal lecture	Working on presentation of project
Research	Individual work
Presentation of project	
Individual crit	

Time spent in-class and out-of-class:

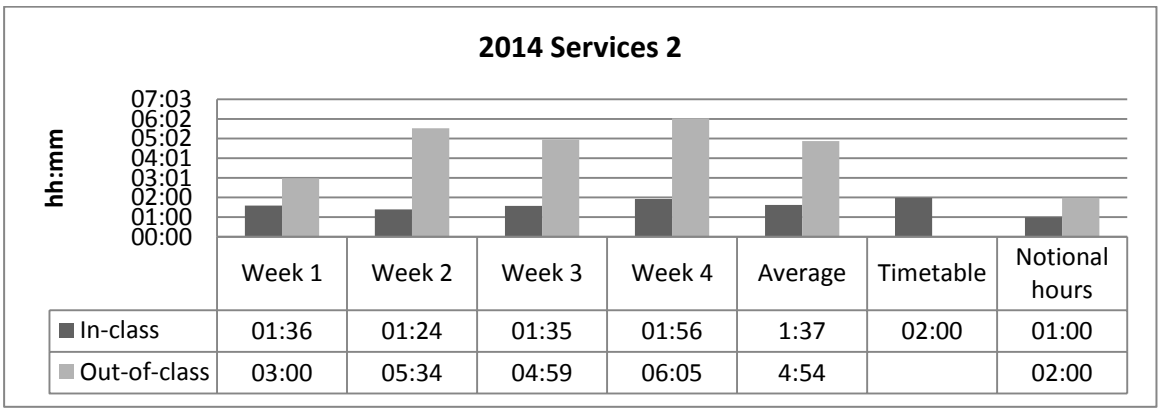


	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	04:31	02:10	00:00	02:00	2:10	02:00	01:00
Out-of-class	00:00	02:30	00:00	03:00	1:22		02:00

2014 Services 2

2014 Services 2 Learning activities:	
In-class	Out-of-class
Formal lecture	Study for test
Write a test	Individual work
Individual work	Drawings (CAD/Freehand/other)
Study for test	Group work
Group discussion	Research

Time spent in-class and out-of-class:



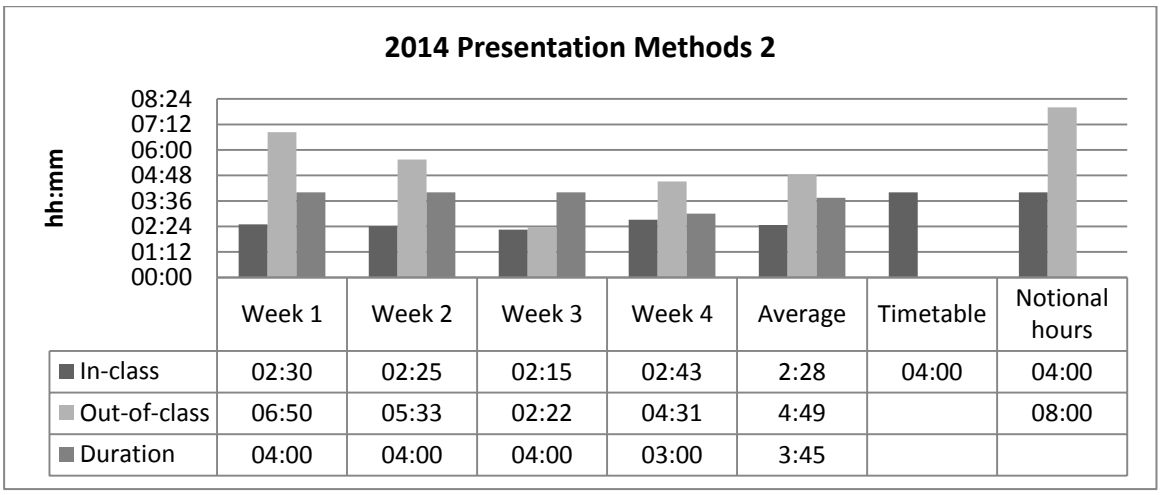
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	01:36	01:24	01:35	01:56	1:37	02:00	01:00
Out-of-class	03:00	05:34	04:59	06:05	4:54		02:00

G.6. 2014 Presentation Methods 2

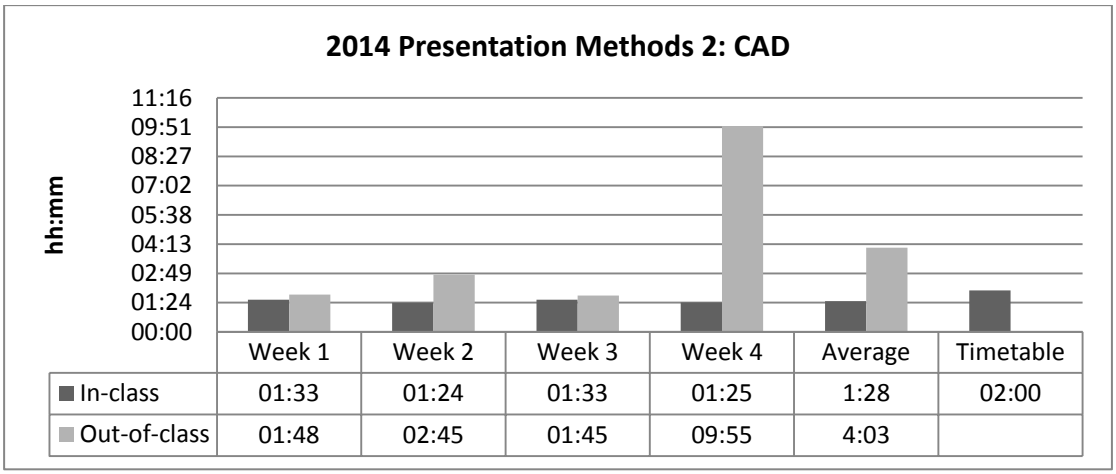
2014 Presentation Methods 2 Learning activities:	
In-class	Out-of-class
Formal lecture	Working on presentation of project
Individual crit	Drawings (CAD/Freehand/other)
Presentation of project	Research
Group crit	
Feedback	
Hand-in	
Individual work	
Group discussion	

2014 Presentation Methods 2: CAD Learning activities:	
In-class	Out-of-class
Formal lecture	Construction drawings (CAD/Freehand)
Construction drawings (CAD/Freehand)	Individual work
Write test	Study for test
Individual work	
Written reports/assignments	

Time spent in-class and out-of-class:



	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	02:30	02:25	02:15	02:43	2:28	04:00	04:00
Out-of-class	06:50	05:33	02:22	04:31	4:49		08:00
Duration	04:00	04:00	04:00	03:00	3:45		

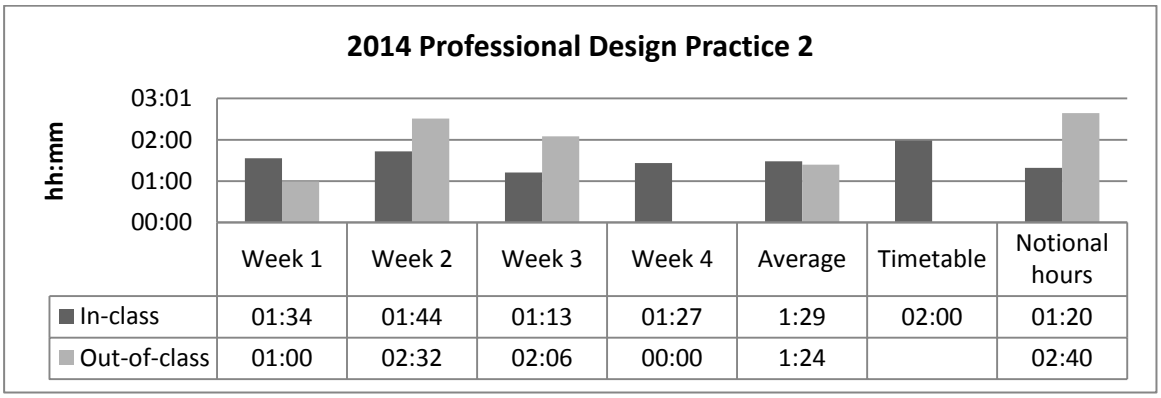


	Week 1	Week 2	Week 3	Week 4	Average	Timetable
In-class	01:33	01:24	01:33	01:25	1:28	02:00
Out-of-class	01:48	02:45	01:45	09:55	4:03	

G.7. 2014 Professional Design Practice 2

2014 Professional Design Practice 2 Learning activities:	
In-class	Out-of-class
Formal lecture	Study for test
Write a test	Individual work
Study for test	

Time spent in-class and out-of-class:



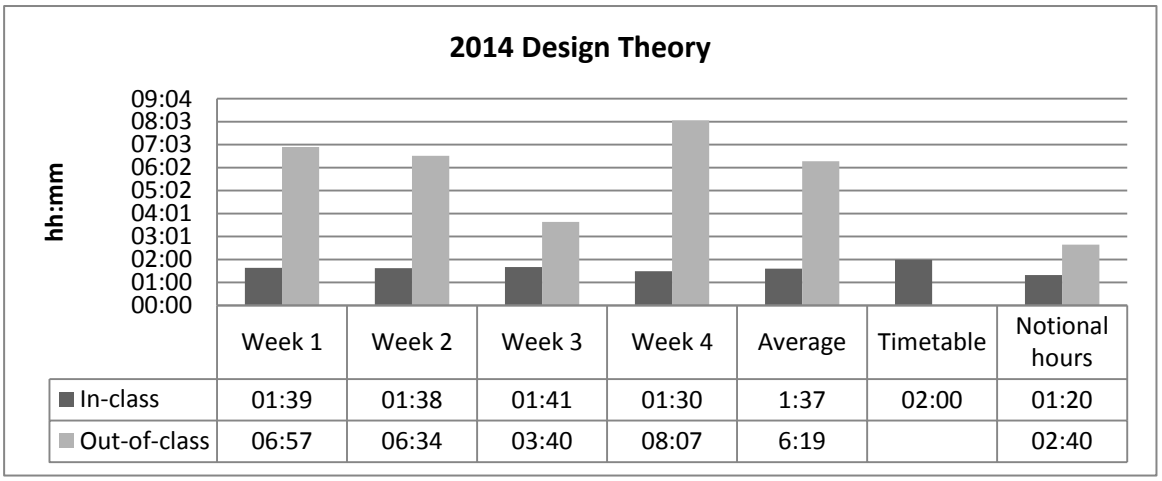
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	01:34	01:44	01:13	01:27	1:29	02:00	01:20
Out-of-class	01:00	02:32	02:06	00:00	1:24		02:40

G.8. 2014 Design Theory 2

2014 Design Theory 2 Learning activities:	
In-class	Out-of-class
Formal lecture	Written reports/assignments
Guest lecture	Individual work
Group work	Research
Research	Working on presentation of project
	Group discussion
	Site Visit

An interesting event that lecturer B commented on was the poor concentration of the students during a guest lecture. In the students' timesheets, it was revealed that prior to the Design Theory lecture, they studied the night before for a Services test in the morning and were given a surprise CAD test in the class following the Services test and then went to the afternoon guest lecture. The full picture of a student's workload reveals that timing of tests, submissions and lecturers are crucial to encourage student engagement.

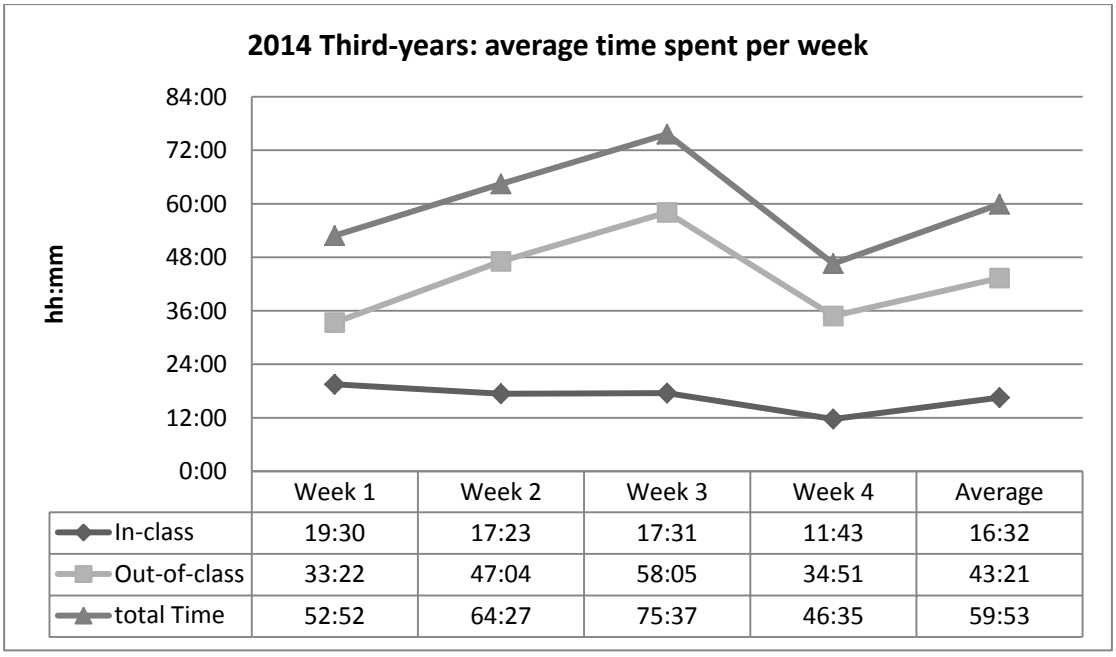
Time spent in-class and out-of-class:



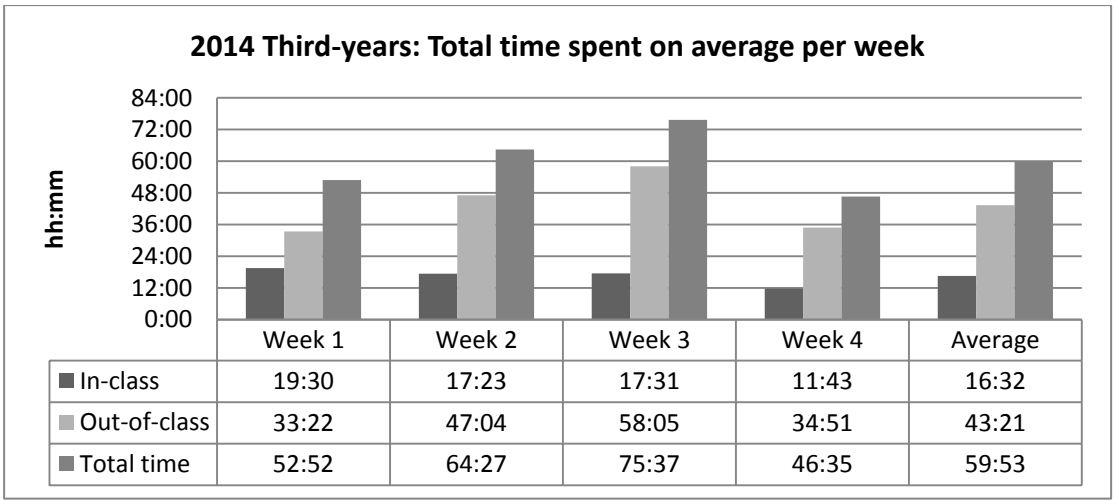
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	01:39	01:38	01:41	01:30	1:37	02:00	01:20
Out-of-class	06:57	06:34	03:40	08:07	6:19		02:40

Appendix H – 2014 Third-year DATA from the timesheet diary per subject

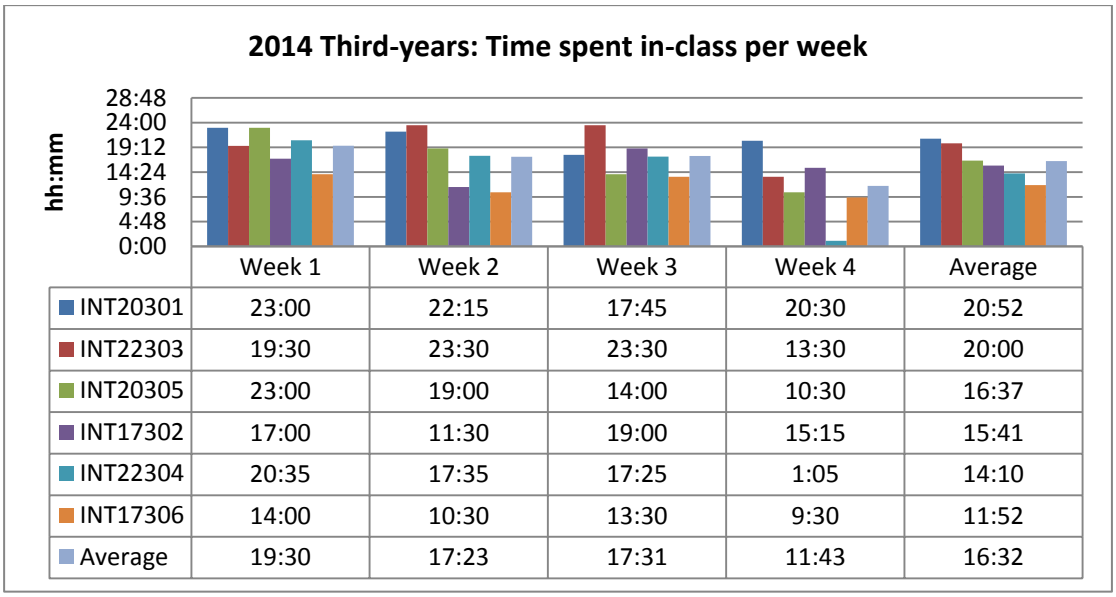
H.1. 2014 Third-years: Time spent per week



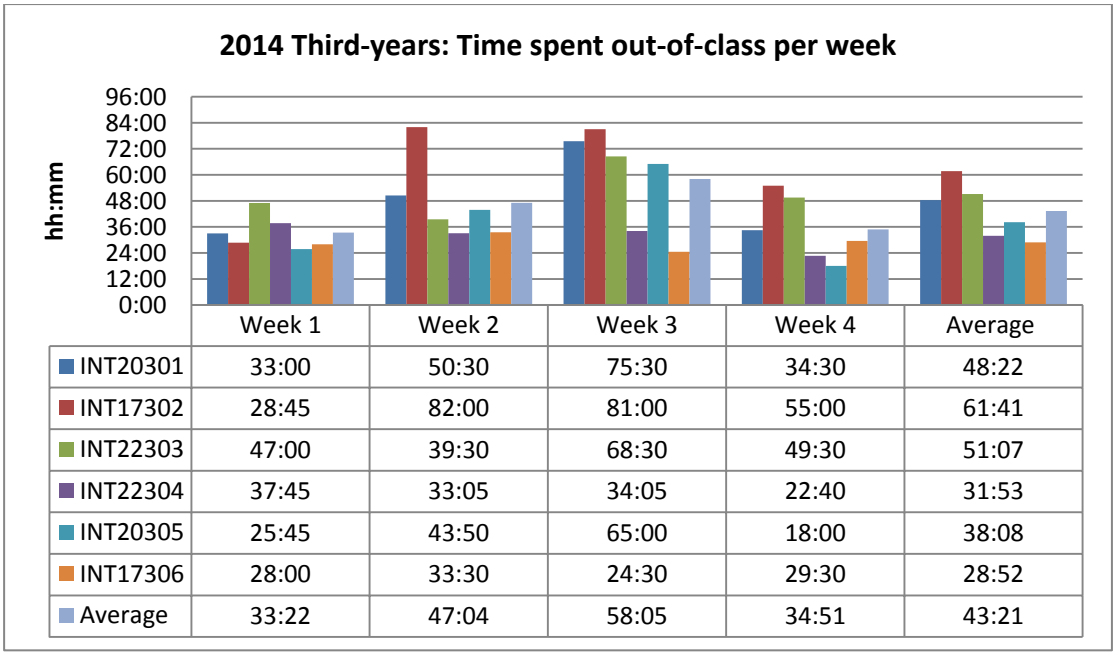
	Week 1	Week 2	Week 3	Week 4	Average
In-class	19:30	17:23	17:31	11:43	16:32
Out-of-class	33:22	47:04	58:05	34:51	43:21
total Time	52:52	64:27	75:37	46:35	59:53



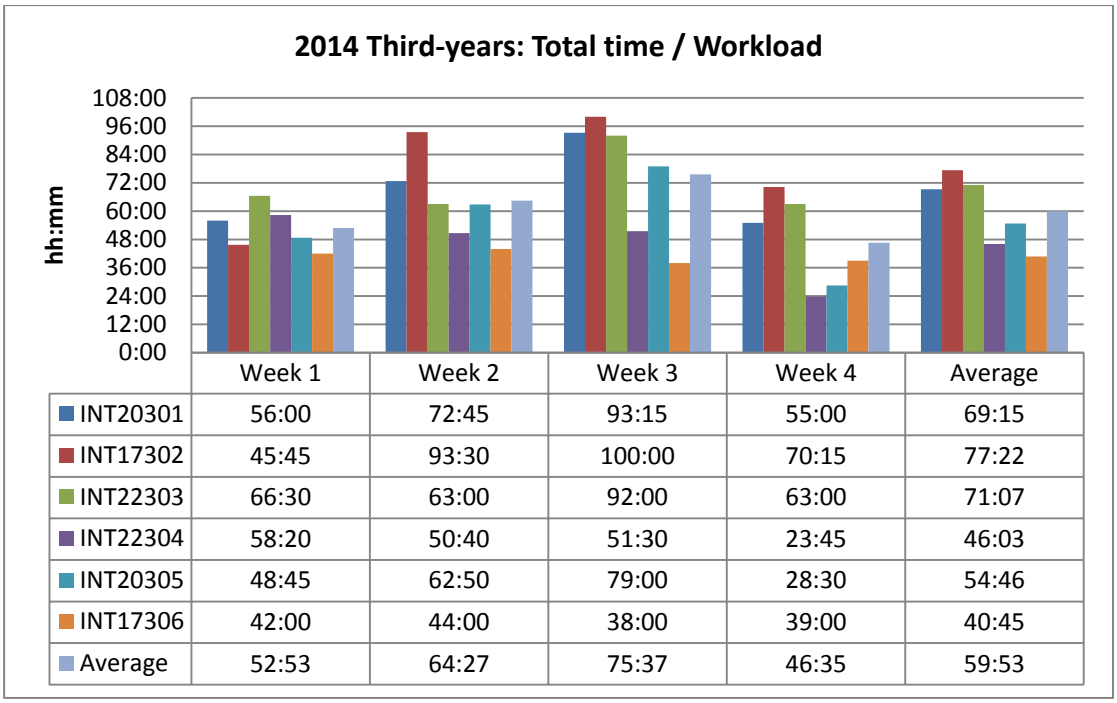
	Week 1	Week 2	Week 3	Week 4	Average
In-class	19:30	17:23	17:31	11:43	16:32
Out-of-class	33:22	47:04	58:05	34:51	43:21
Total time	52:52	64:27	75:37	46:35	59:53



	Week 1	Week 2	Week 3	Week 4	Average
INT20301	23:00	22:15	17:45	20:30	20:52
INT22303	19:30	23:30	23:30	13:30	20:00
INT20305	23:00	19:00	14:00	10:30	16:37
INT17302	17:00	11:30	19:00	15:15	15:41
INT22304	20:35	17:35	17:25	1:05	14:10
INT17306	14:00	10:30	13:30	9:30	11:52
Average	19:30	17:23	17:31	11:43	16:32

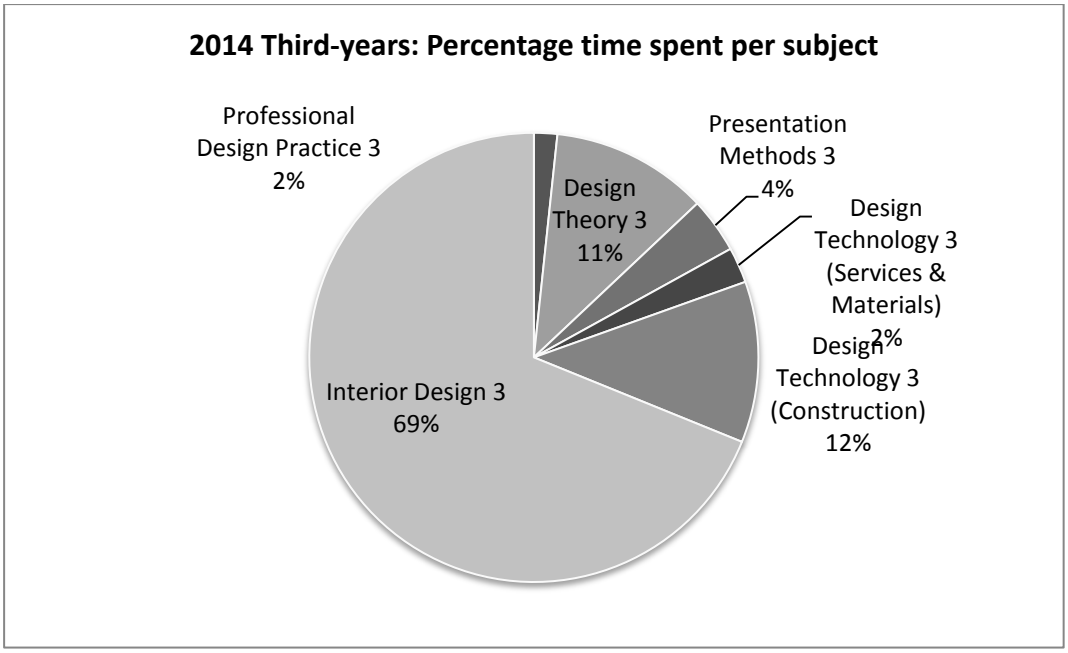


	Week 1	Week 2	Week 3	Week 4	Average
INT20301	33:00	50:30	75:30	34:30	48:22
INT17302	28:45	82:00	81:00	55:00	61:41
INT22303	47:00	39:30	68:30	49:30	51:07
INT22304	37:45	33:05	34:05	22:40	31:53
INT20305	25:45	43:50	65:00	18:00	38:08
INT17306	28:00	33:30	24:30	29:30	28:52
Average	33:22	47:04	58:05	34:51	43:21



	Week 1	Week 2	Week 3	Week 4	Average
INT20301	56:00	72:45	93:15	55:00	69:15
INT17302	45:45	93:30	100:00	70:15	77:22
INT22303	66:30	63:00	92:00	63:00	71:07
INT22304	58:20	50:40	51:30	23:45	46:03
INT20305	48:45	62:50	79:00	28:30	54:46
INT17306	42:00	44:00	38:00	39:00	40:45
Average	52:53	64:27	75:37	46:35	59:53

H.2. 2014 Third-years: Time spent per subject



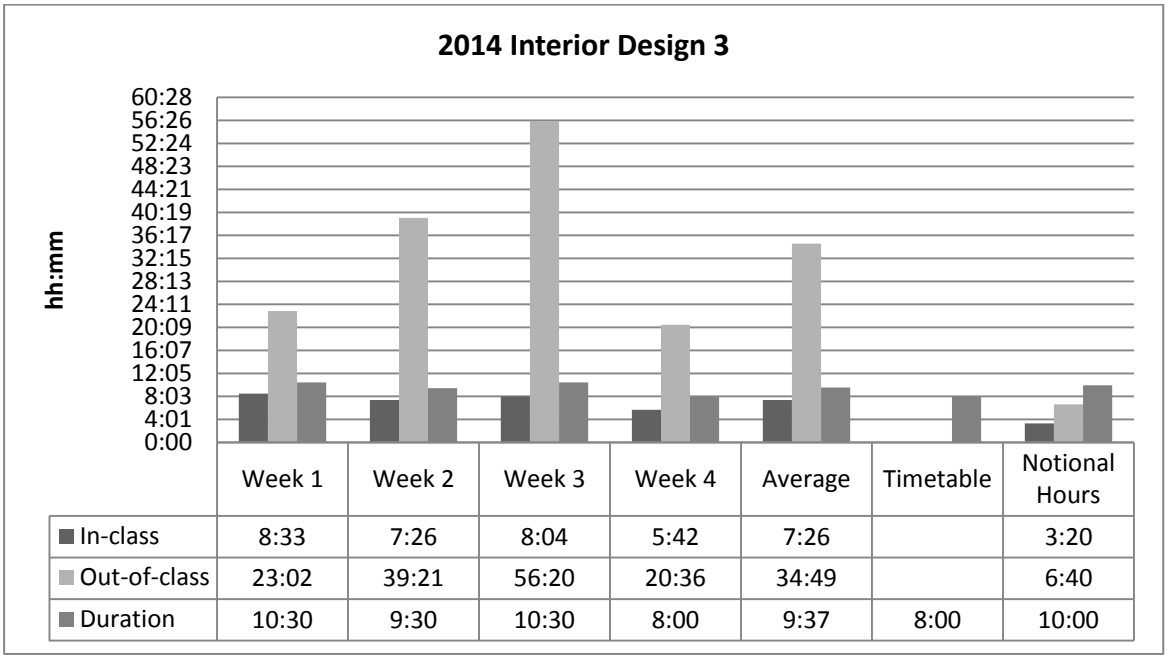
H.3. 2014 Third-years: All learning activities

2014 Third-year Interior Design learning activities:	
In-class	Out-of-class
Individual crit	Individual work
Formal Lecture	Working on presentation of project
Individual work	Design drawings (CAD/SketchUp/freehand)
Verbal presentation of project	Development of concepts or ideas
Working on presentation of project	Written reports/assignments
Group crit	Research (Internet/Library/books/magazines)
Design drawings (CAD/SketchUp/freehand)	Construction drawings (CAD/freehand /other)
Site visit	Study for test
Group discussion	Consulting with other students
Hand in work	
Write test	
Development of concepts or ideas	
Informal lecture	
Written reports/assignments	
Construction drawings (CAD/freehand /other)	
Consulting with other students	
Feedback	

H.4. 2014 Interior Design 3

2014 Interior Design 3 learning activities:	
In-class	Out-of-class
Individual crit	Individual work
Individual work	Working on presentation of project
Working on presentation of project	Design drawings (CAD/Sketchup/freehand)
Verbal presentation of project	Development of concept or ideas
Group crit	Research (Internet/library/books/magazines)
Design drawings (CAD/Sketchup/freehand)	Written reports/assignments
Site visit	Other
Formal lecture	Consulting with other students
Development of concept or ideas	
Group discussion	
Consulting with other students	

Time spent in–class and out-of-class:



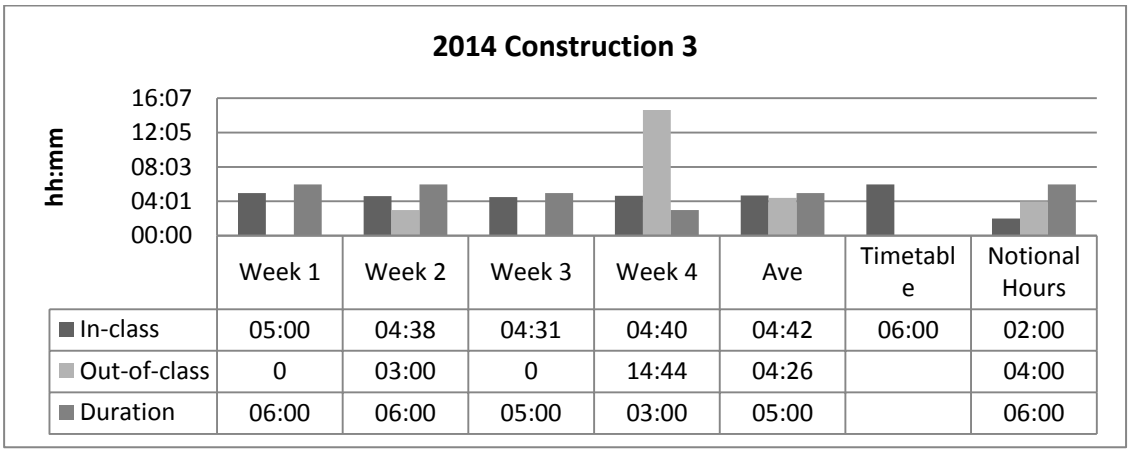
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	8:33	7:26	8:04	5:42	7:26		3:20
Out-of-class	23:02	39:21	56:20	20:36	34:49		6:40
Duration	10:30	9:30	10:30	8:00	9:37	8:00	10:00

H.5. 2014 Design Technology 3

2014 Construction 3

2014 Construction 3 learning activities:	
In-class	Out-of-class
Formal lecture	Working on presentation of project
Individual crit	
Verbal Presentation of Project	
Working on presentation of project	

Time spent in–class and out-of-class:



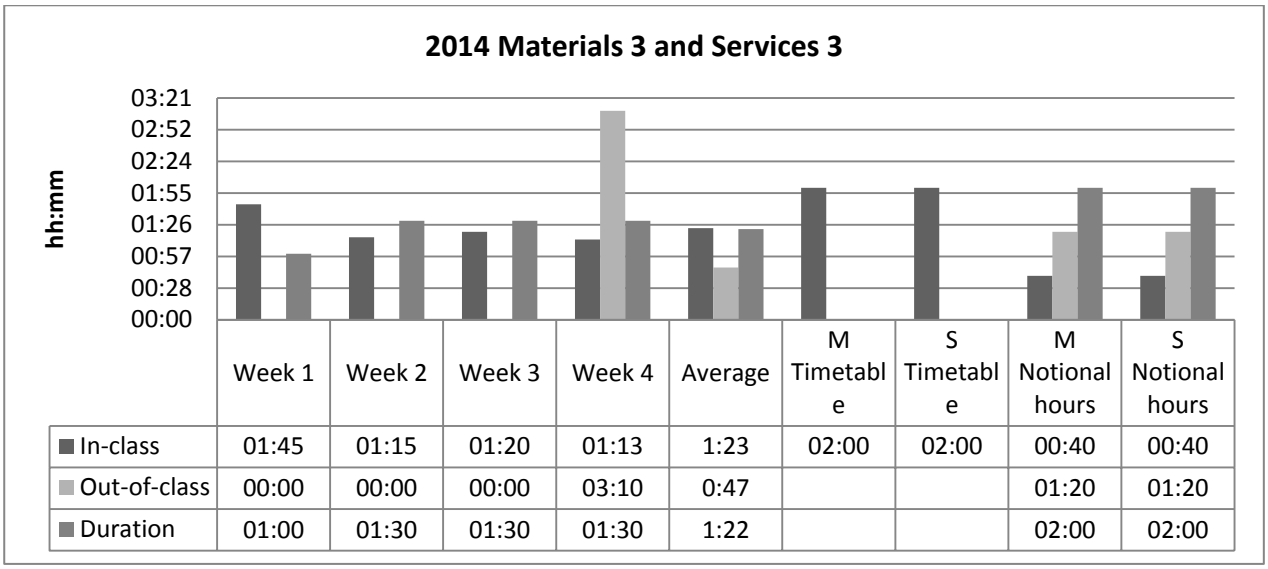
	Week 1	Week 2	Week 3	Week 4	Ave	Timetable	Notional Hours
In-class	05:00	04:38	04:31	04:40	04:42	06:00	02:00
Out-of-class	0	03:00	0	14:44	04:26		04:00
Duration	06:00	06:00	05:00	03:00	05:00		06:00

2014 Materials 3 and Services 3

Usually there are three components to Design Technology 3 but in the timesheet diaries participants reported Materials and Services occurring at the same time and taught by the same person. Thus it is reflected as one.

2014 Materials 3 and Services 3 learning activities:	
In-class	Out-of-class
Write test	Study for test
Individual work	
Formal lecture	
Informal Lecture (Services 3)	
Group discussion	
Individual crit	

Time spent in–class and out-of-class:

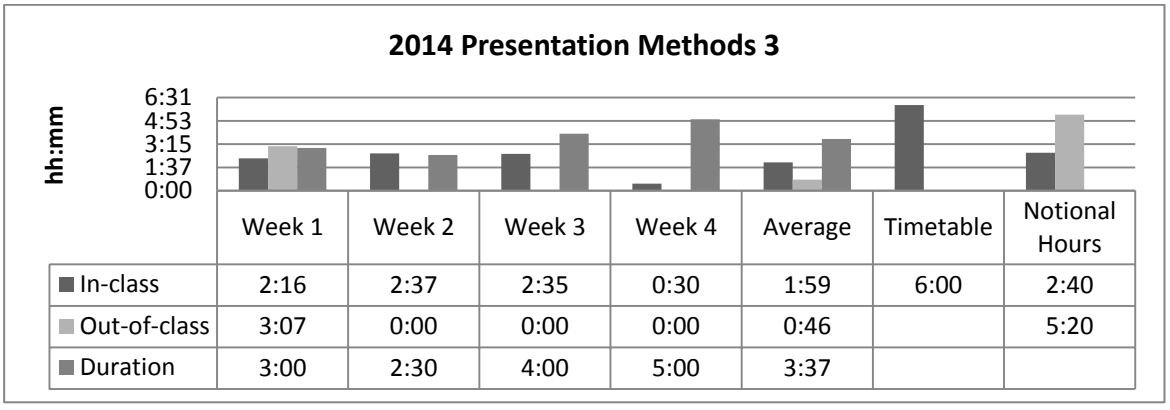


	Week 1	Week 2	Week 3	Week 4	Average	M Timetable	S Timetable	M Notional hours	S Notional hours
In-class	01:45	01:15	01:20	01:13	1:23	02:00	02:00	00:40	00:40
Out-of-class	00:00	00:00	00:00	03:10	0:47			01:20	01:20
Duration	01:00	01:30	01:30	01:30	1:22			02:00	02:00

H.6. 2014 Presentation Methods 3

2014 Presentation Methods 3 learning activities:	
In-class	Out-of-class
Formal lecture	Working on presentation of project
Individual crit	
Verbal Presentation of Project	
Working on presentation of project	

Time spent in–class and out-of-class:



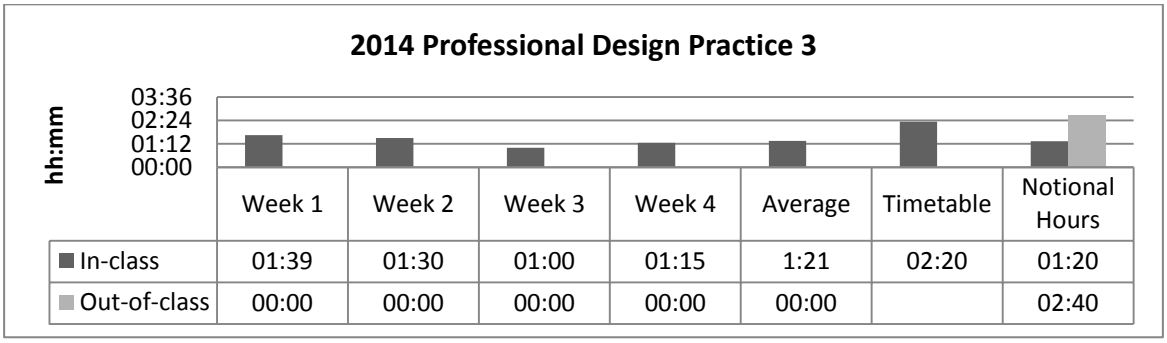
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	2:16	2:37	2:35	0:30	1:59	6:00	2:40
Out-of-class	3:07	0:00	0:00	0:00	0:46		5:20
Duration	3:00	2:30	4:00	5:00	3:37		

H.7. 2014 Professional Design Practice 3

Learning activities:

Formal lecture and individual work. Both occurred during the timetabled slot. No out-of-class learning activities were reported.

Time spent in–class and out-of-class:

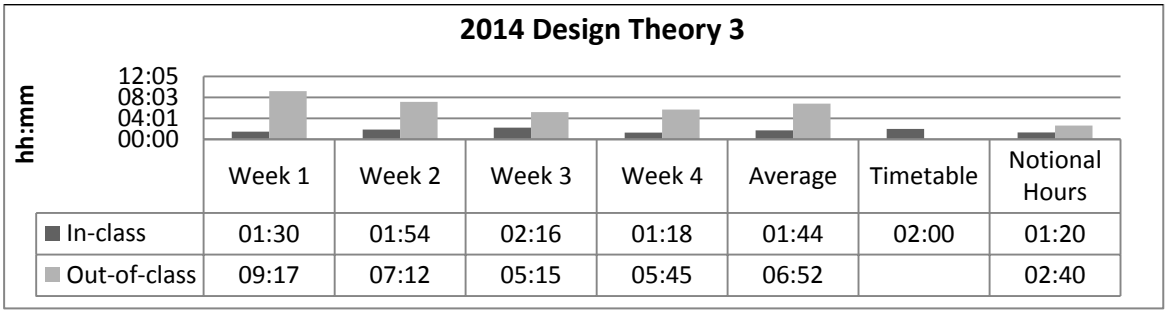


	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	01:39	01:30	01:00	01:15	1:21	02:20	01:20
Out-of-class	00:00	00:00	00:00	00:00	00:00		02:40

H.8. 2014 Design Theory 3

2014 Design Theory 3 learning activities:	
In-class	Out-of-class
Hand in work	Written report / assignments
Group discussion	Individual work
Written report / assignments	Research
Formal lecture	
Research	
Individual crit	
Group crit	
Individual work	
Feedback	

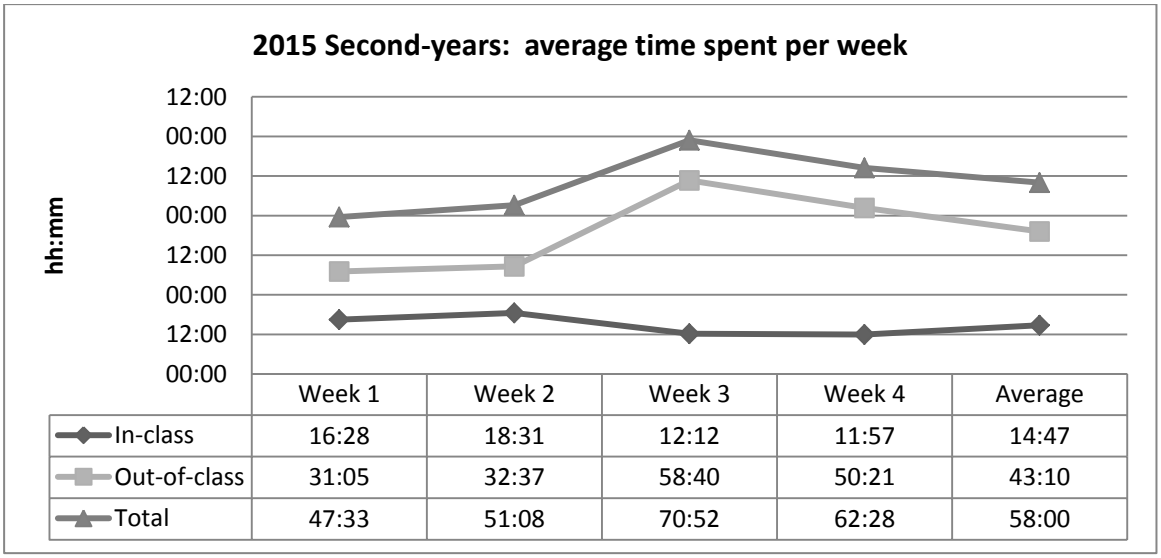
Time spent in-class and out-of-class:



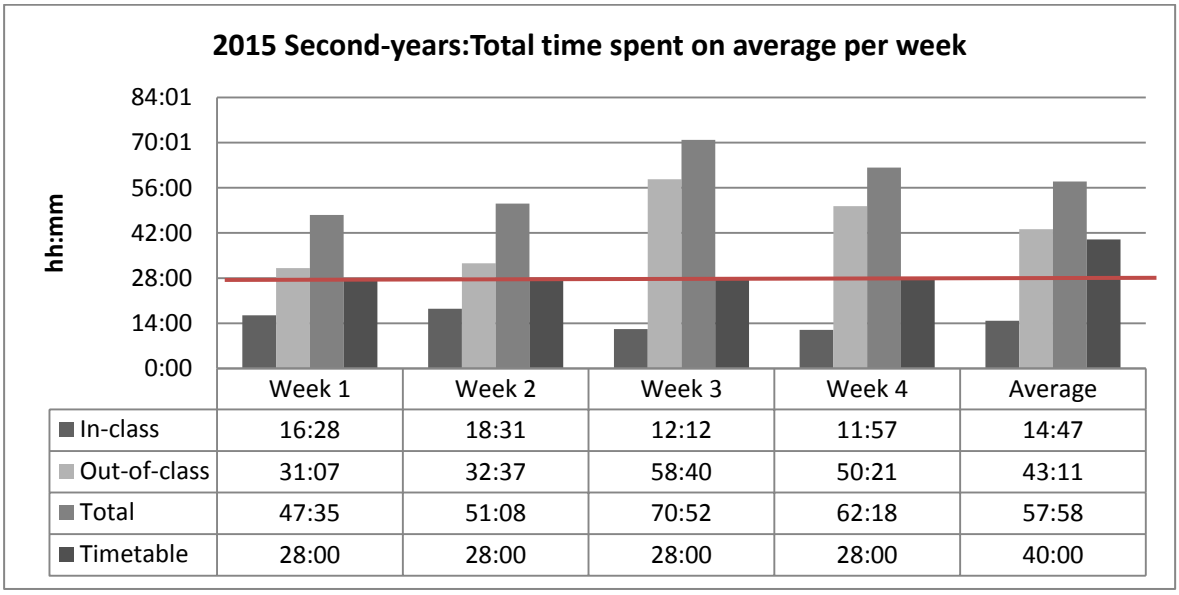
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	01:30	01:54	02:16	01:18	01:44	02:00	01:20
Out-of-class	09:17	07:12	05:15	05:45	06:52		02:40

Appendix I – 2015 Second-year DATA from the timesheet diary per subject

I.1.2015 Second-years: Time spent per week

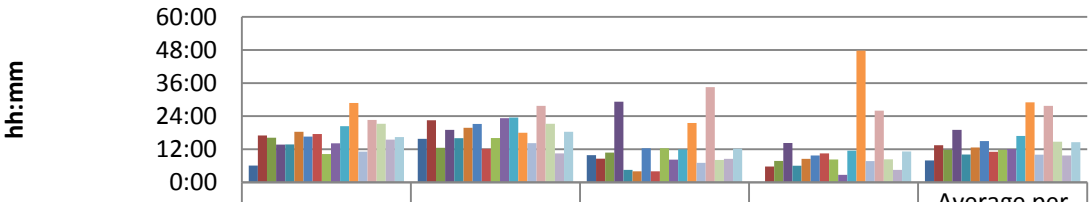


	Week 1	Week 2	Week 3	Week 4	Average
In-class	16:28	18:31	12:12	11:57	14:47
Out-of-class	31:05	32:37	58:40	50:21	43:10
Total	47:33	51:08	70:52	62:28	58:00



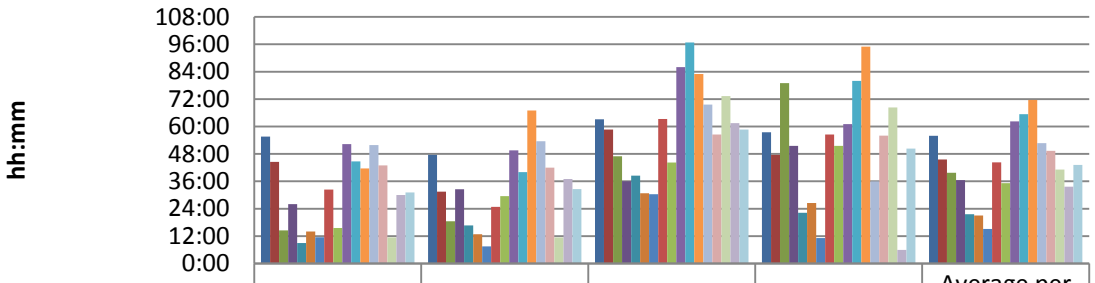
	Week 1	Week 2	Week 3	Week 4	Average
In-class	16:28	18:31	12:12	11:57	14:47
Out-of-class	31:07	32:37	58:40	50:21	43:11
Total	47:35	51:08	70:52	62:18	57:58
Timetable	28:00	28:00	28:00	28:00	40:00

2015 Second-years: Time spent in-class per week



	Week 1	Week 2	Week 3	Week 4	Average per student
INV12201	6:05	15:45	9:50	0:00	7:55
INV12202	16:58	22:32	8:35	5:45	13:27
INV13203	16:10	12:30	10:45	7:45	11:47
INV29204	13:40	19:00	29:15	14:15	19:02
INV24205	13:45	16:00	4:30	6:00	10:03
INV05206	18:20	19:45	4:00	8:30	12:38
INV28207	16:35	21:10	12:20	9:45	14:57
INV13208	17:30	12:10	4:00	10:30	11:02
INV27209	10:15	16:05	12:20	8:18	11:44
INV31210	14:10	23:14	8:12	2:44	12:05
INV22211	20:20	23:30	11:55	11:30	16:48
INV19212	28:45	18:00	21:30	47:45	29:00
INV15213	11:06	14:12	7:03	7:41	10:00
INV02214	22:37	27:45	34:30	26:00	27:43
INV15215	21:13	21:13	8:05	8:20	14:42
INV12216	15:30	10:30	8:30	4:30	9:45
Average per week	16:26	18:20	12:12	11:12	14:32

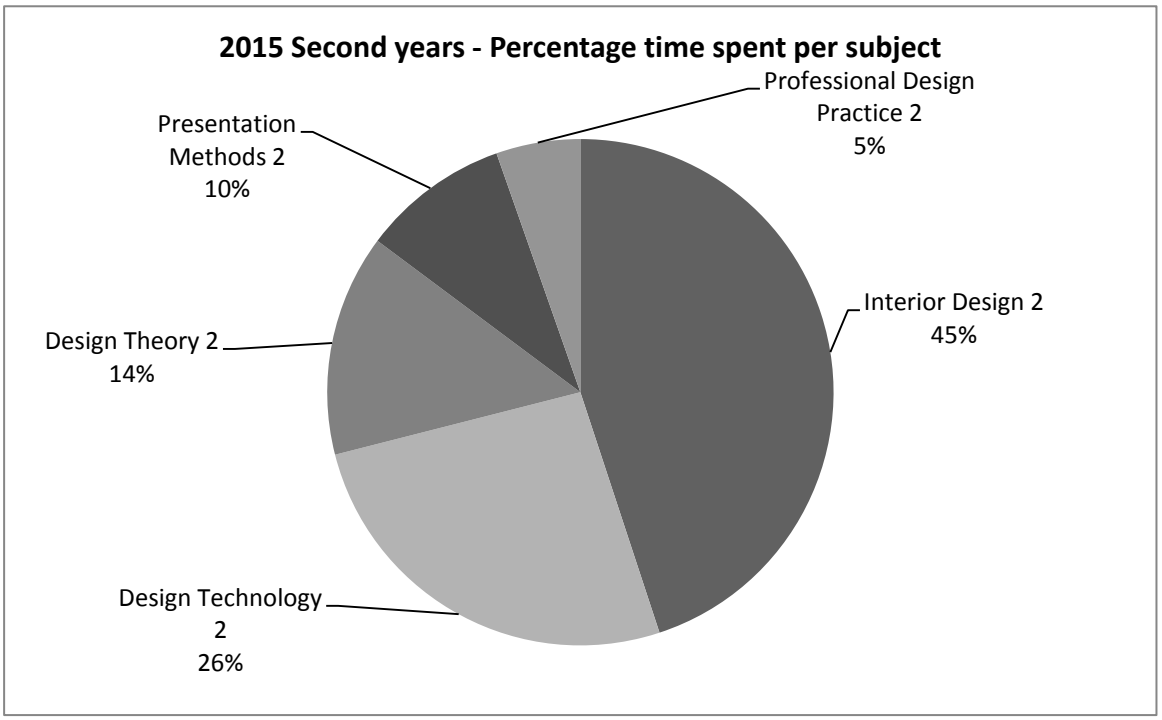
2015 Second-years: Time spent out-of-class per week



	Week 1	Week 2	Week 3	Week 4	Average per student
INV12201	55:34	47:35	63:10	57:30	55:57
INV12202	44:30	31:30	58:42	47:35	45:34
INV13203	14:30	18:30	47:00	78:58	39:44
INV29204	26:00	32:30	36:00	51:30	36:30
INV24205	9:00	16:40	38:30	22:15	21:36
INV05206	14:00	12:50	30:45	26:30	21:01
INV28207	11:30	7:30	30:20	11:10	15:07
INV13208	32:25	24:50	63:20	56:30	44:16
INV27209	15:35	29:29	44:13	51:32	35:12
INV31210	52:16	49:34	86:01	61:05	62:14
INV22211	44:45	40:00	96:50	80:00	65:23
INV19212	41:40	67:00	83:00	95:00	71:40
INV15213	51:52	53:32	69:36	35:57	52:44
INV02214	42:57	42:00	56:30	56:00	49:21
INV15215	11:26	11:26	73:20	68:19	41:07
INV12216	30:00	37:00	61:30	6:00	33:37
Averages per week	31:07	32:37	58:40	50:21	43:11

	Week 1	Week 2	Week 3	Week 4	Average per student
INV12201	61:39	63:20	73:00	57:30	63:52
INV12202	61:28	54:02	67:17	53:20	59:01
INV13203	30:40	31:00	57:45	86:43	51:32
INV29204	39:40	51:30	65:15	65:45	55:32
INV24205	22:45	32:40	43:00	28:15	31:40
INV05206	32:20	32:35	34:45	35:00	33:40
INV28207	28:05	28:40	42:40	20:55	30:05
INV13208	49:55	37:00	67:20	67:00	55:18
INV27209	25:50	45:34	56:33	59:50	46:56
INV31210	66:26	72:48	94:13	63:49	74:19
INV22211	65:05	63:30	108:45	91:30	82:12
INV19212	70:25	85:00	104:30	142:45	100:40
INV15213	62:58	67:44	76:39	43:38	62:44
INV02214	65:34	69:45	91:00	82:00	77:04
INV15215	32:39	32:39	81:25	76:39	55:50
INV15216	45:30	47:30	70:00	10:30	43:22
Average per week	47:33	50:57	70:52	61:34	57:44

I.2.2015 Second-years: Time spent per subject



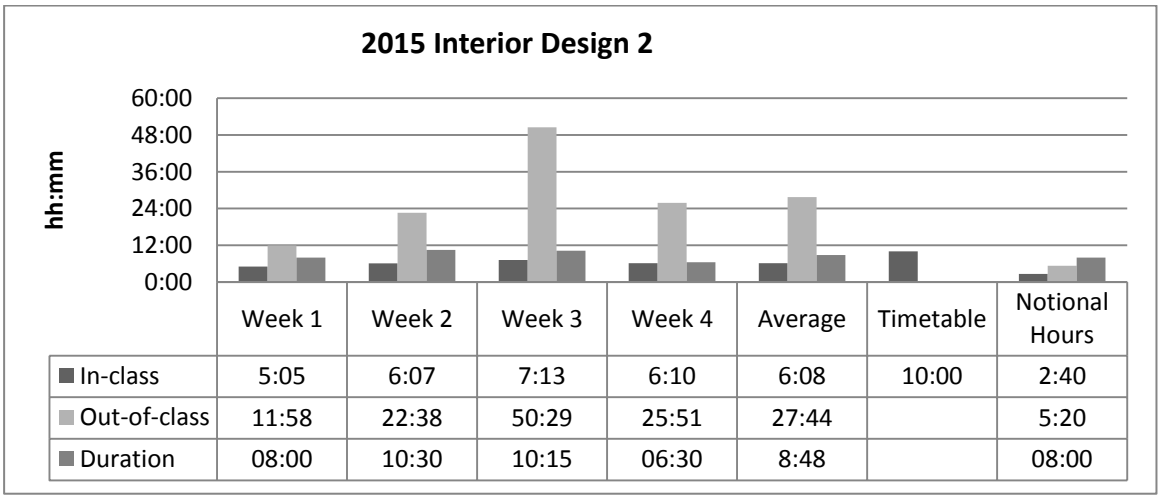
I.3.2015 Second years: All learning activities

2015 Second-year Interior Design learning activities:	
In-class	**Out-of-class**
Formal Lecture	Design drawings (CAD/SketchUp/freehand)
Design drawings (CAD/SketchUp/freehand)	Individual work
Individual crit	Written reports/assignments
Verbal presentation of project	Presentation (Photoshop/rendering/other)
Presentation (Photoshop/rendering/other)	Construction drawings (CAD/freehand /other)
Group crit	Research (Internet/Library/books/magazines)
Individual work	Study for test
Working in studio	Development of concepts or ideas
Write Test	Working on presentation of project
Group discussion	Consulting with industry
Site visit	Group work
Development of concepts or ideas	Working in studio
Construction drawings (CAD/freehand /other)	Site visit
Hand in work	Verbal presentation of project
Working on presentation of project	Hand in work
Written reports/assignments	Group crit
Research (Internet/Library/books/magazines)	
Group work	

I.4.2015 Interior Design 2

2015 Interior Design 2 learning activities:	
In-class	Out-of-class
Design drawings (CAD/SketchUp/freehand)	Design drawings (CAD/SketchUp/freehand)
Group crit	Individual work
Individual work	Presentation (Photoshop/rendering/other)
Presentation (Photoshop/rendering/other)	Development of concepts or ideas
Individual crit	Research
Verbal presentation of project	Consulting with industry
Working in the studio	Working in the studio
Development of concepts or ideas	Group crit
Working on presentation of project	
Hand-in work	

Time spent in-class and out-of-class:



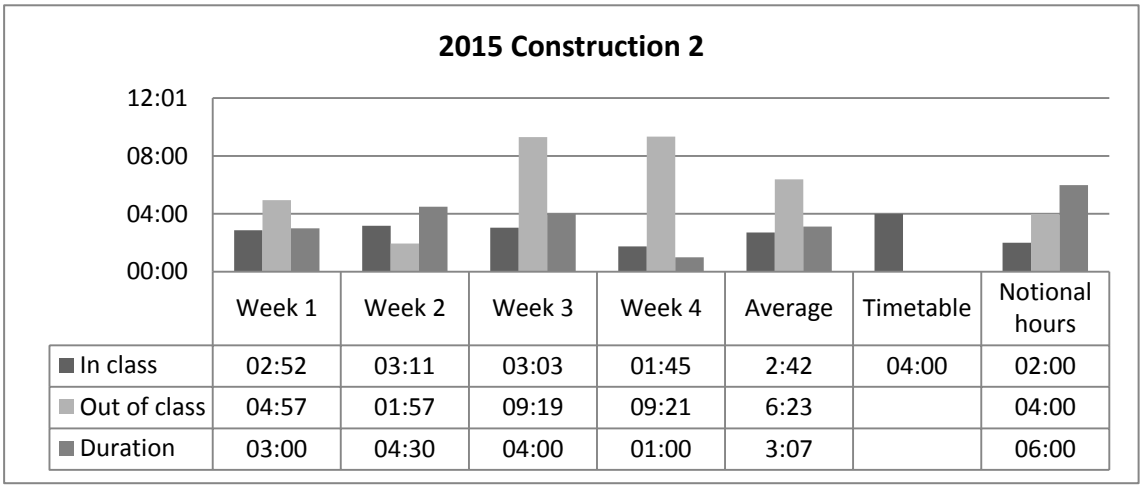
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	5:05	6:07	7:13	6:10	6:08	10:00	2:40
Out-of-class	11:58	22:38	50:29	25:51	27:44		5:20
Duration	08:00	10:30	10:15	06:30	8:48		08:00

I.5.2015 Design Technology 2

2015 Construction 2

2015 Construction 2 learning activities:	
In-class	Out-of-class
Formal lecture	Construction drawings (CAD/freehand)
Individual crit	Research
Individual work	Written reports/assignments
Construction drawings (CAD/freehand)	Individual work
Research	Working in the studio
Working in the studio	
Written reports/assignments	
Group crit	
Hand-in work	

Time spent in-class and out-of-class:

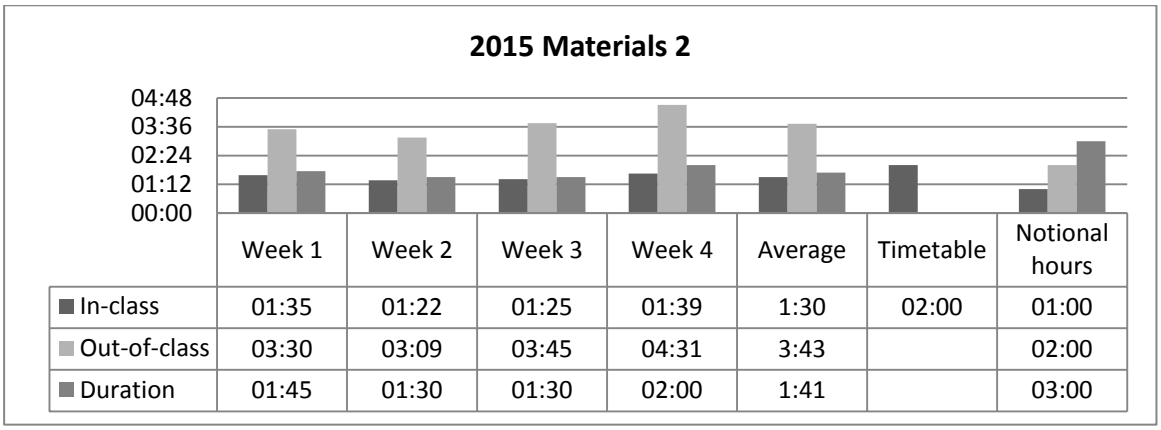


	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In class	02:52	03:11	03:03	01:45	2:42	04:00	02:00
Out of class	04:57	01:57	09:19	09:21	6:23		04:00
Duration	03:00	04:30	04:00	01:00	3:07		06:00

2015 Materials 2

2015 Materials 2 learning activities:	
In-class	**Out-of-class**
Formal lecture	Written reports/assignments
Site visit	Research
Hand in work	Individual work
Group work	Study for test
Written reports/assignments	Consulting with industry
Group discussion	Site visit
	Working in the studio
	Hand in work

Time spent in-class and out-of-class:

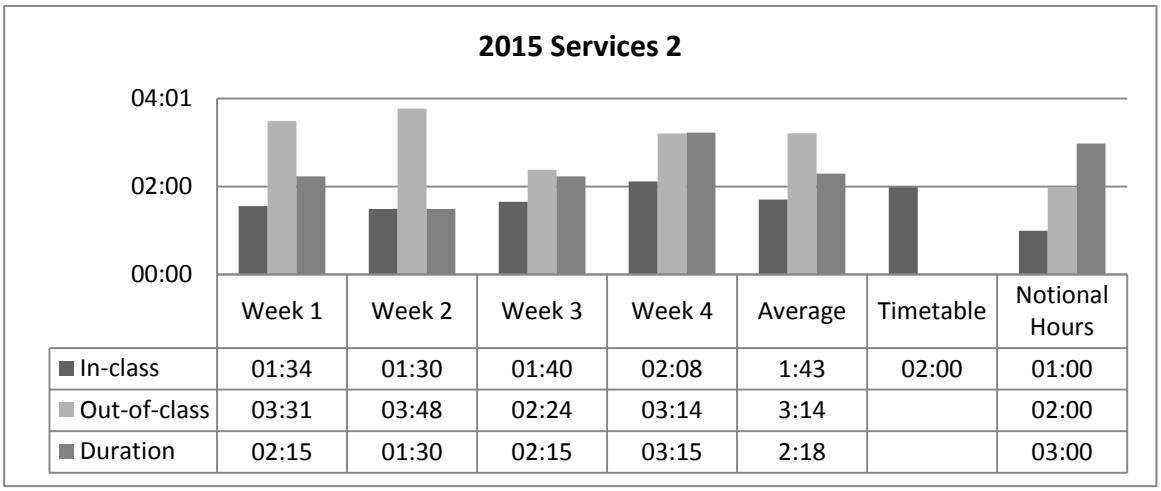


	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	01:35	01:22	01:25	01:39	1:30	02:00	01:00
Out-of-class	03:30	03:09	03:45	04:31	3:43		02:00
Duration	01:45	01:30	01:30	02:00	1:41		03:00

2015 Services 2

2015 Services 2 learning activities:	
In-class	**Out-of-class**
Formal lecture	Study for test
Write test	Individual work
	Research
	Construction drawings (CAD/Freehand)

Time spent in-class and out-of-class:



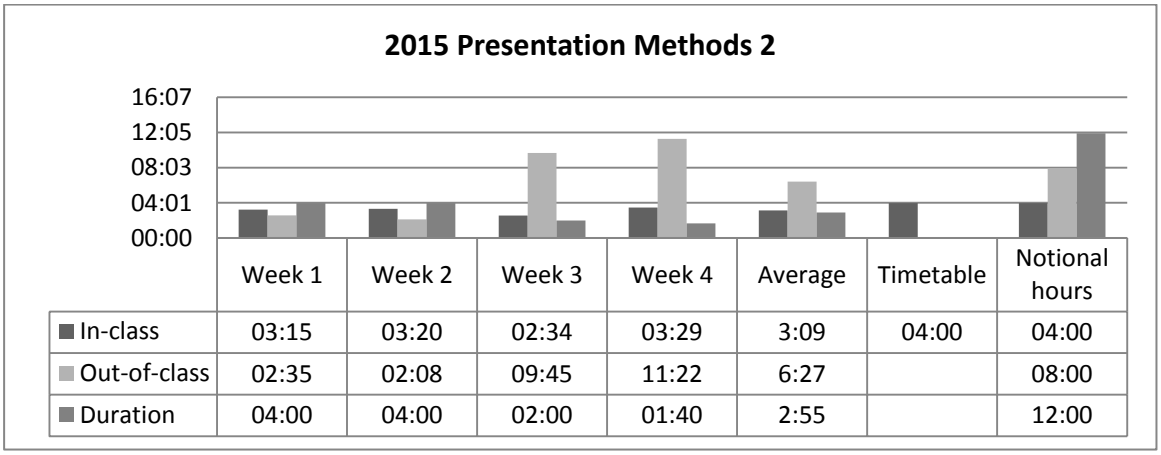
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	01:34	01:30	01:40	02:08	1:43	02:00	01:00
Out-of-class	03:31	03:48	02:24	03:14	3:14		02:00
Duration	02:15	01:30	02:15	03:15	2:18		03:00

I.6.2015 Presentation Methods 2

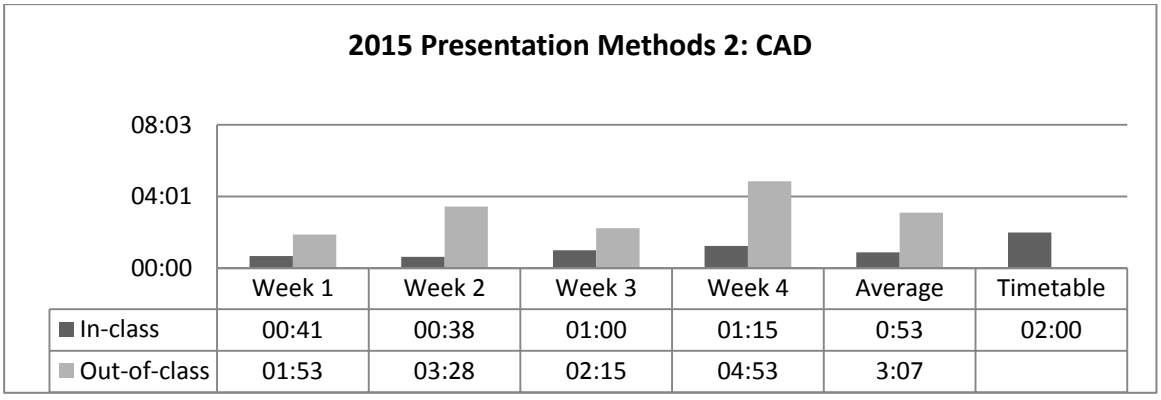
2015 Presentation Methods learning activities:	
In-class	**Out-of-class**
Individual crit	Presentation (Photoshop/rendering/other)
Design drawings (CAD/Sketchup/freehand)	Individual work
Presentation (Photoshop/rendering/other)	Design drawings (CAD/Sketchup/freehand)
Working in studio	Development of concept or ideas
Formal lecture	Working on presentation of project
Individual work	Research (Internet/library/books/magazines)
Working on presentation of project	Construction drawings (CAD/freehand)
Development of concept or ideas	

2015 Presentation Methods: CAD learning activities:	
In-class	**Out-of-class**
Construction drawings (CAD/freehand)	Individual work
Design drawings (CAD/Sketchup/freehand)	Construction drawings (CAD/freehand)
Individual crit	Design drawings (CAD/Sketchup/freehand)

Time spent in-class and out-of-class:



	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	03:15	03:20	02:34	03:29	3:09	04:00	04:00
Out-of-class	02:35	02:08	09:45	11:22	6:27		08:00
Duration	04:00	04:00	02:00	01:40	2:55		12:00

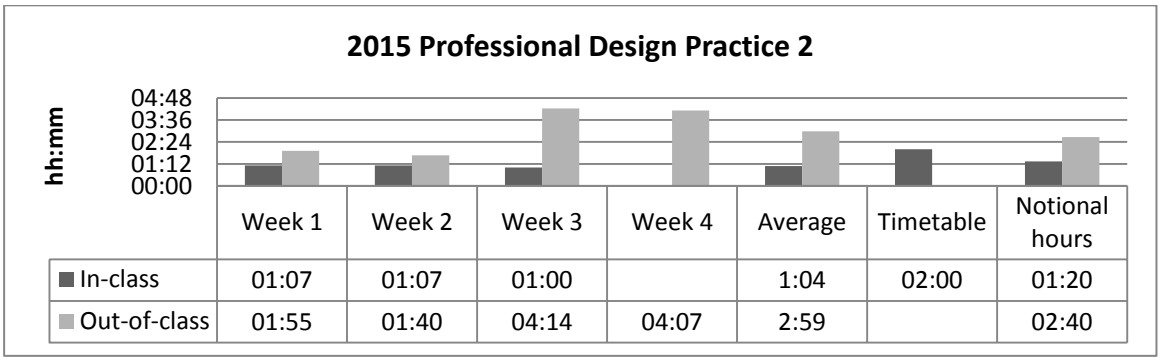


	Week 1	Week 2	Week 3	Week 4	Average	Timetable
In-class	00:41	00:38	01:00	01:15	0:53	02:00
Out-of-class	01:53	03:28	02:15	04:53	3:07	

I.7.2015 Professional Design Practice 2

2015 Professional Design Practice 2 learning activities:	
In-class	**Out-of-class**
Formal lecture	Individual work
Group discussion	Written reports/assignments
Individual work	Research
Hand in work	Consulting with industry

Time spent in-class and out-of-class:

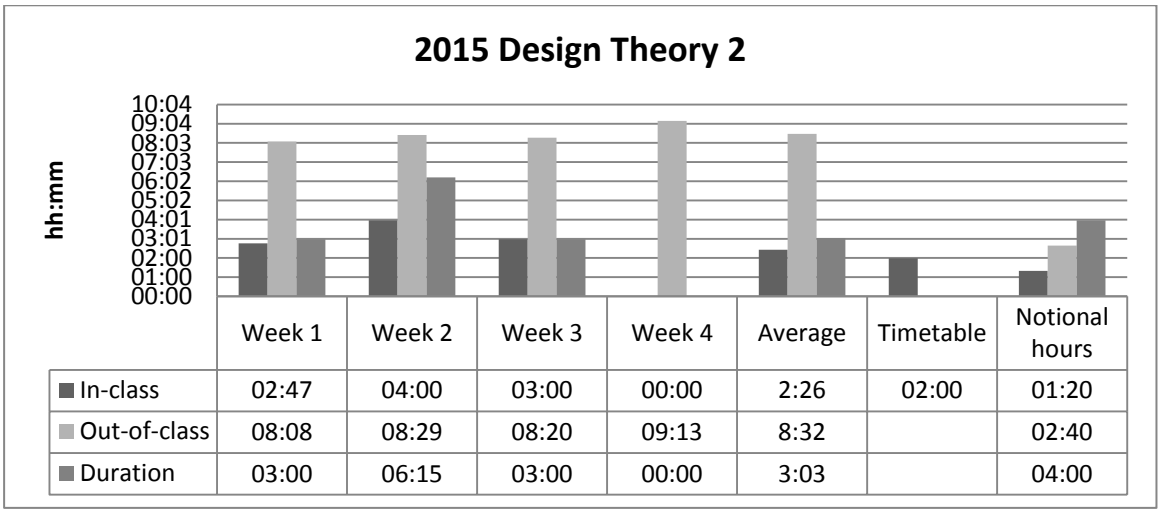


	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	01:07	01:07	01:00		1:04	02:00	01:20
Out-of-class	01:55	01:40	04:14	04:07	2:59		02:40

I.8.2015 Design Theory 2

2015 Design Theory 2 learning activities:	
In-class	**Out-of-class**
Verbal Presentation of project	Written reports/assignments
Formal lecture	Individual work
Group discussion	Research
Written reports/assignments	Presentation (Photoshop/rendering/ other)
Hand in work	Group work
Group crit	Verbal presentation of project
Presentation (Photoshop/rendering/ other)	Site Visit
Group work	

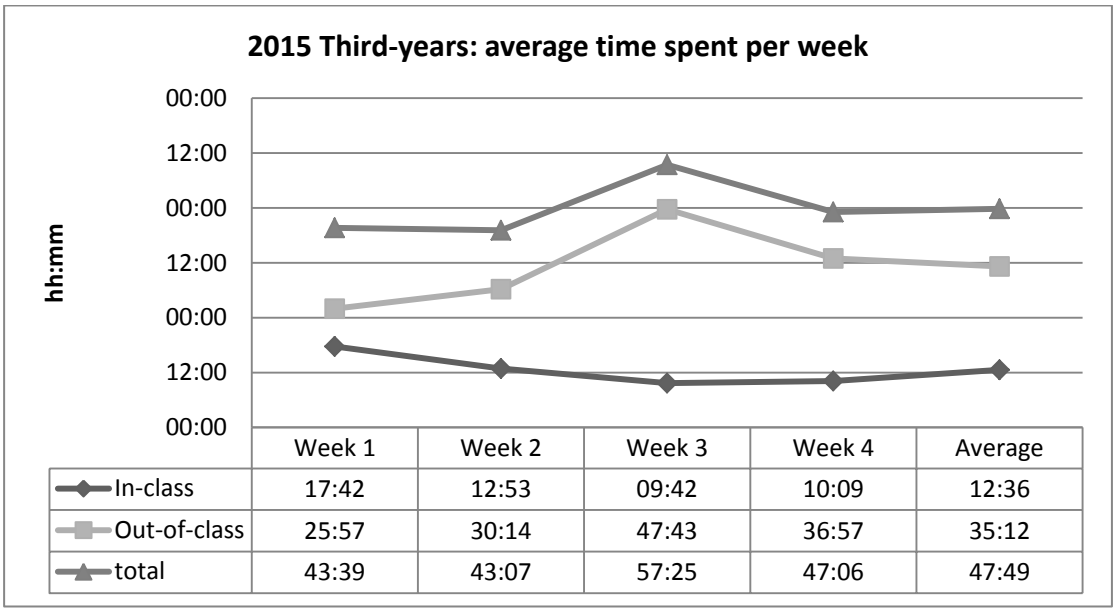
Time spent in-class and out-of-class:



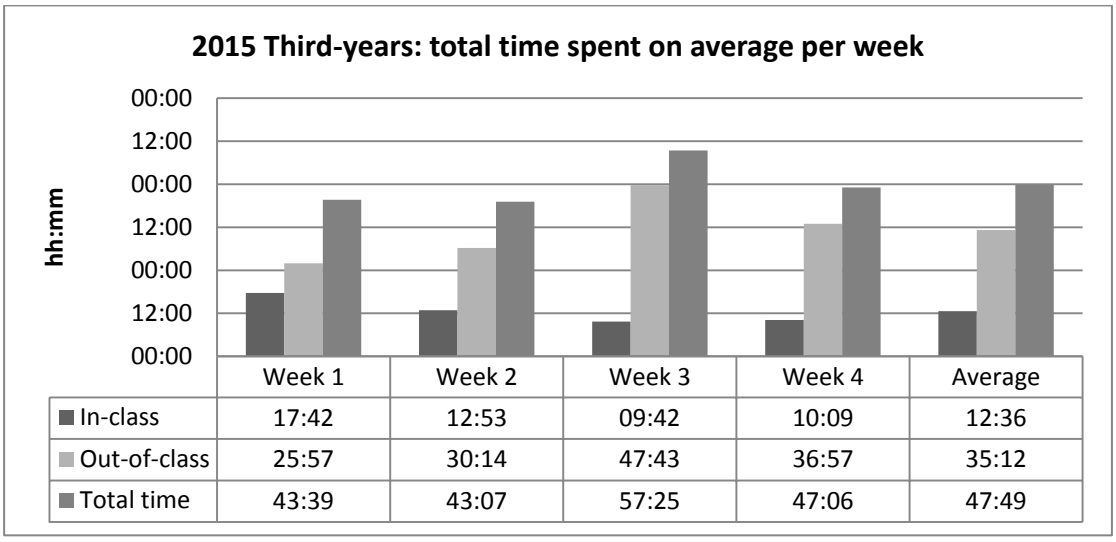
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	02:47	04:00	03:00	00:00	2:26	02:00	01:20
Out-of-class	08:08	08:29	08:20	09:13	8:32		02:40
Duration	03:00	06:15	03:00	00:00	3:03		04:00

Appendix J – 2015 Third-year DATA from the timesheet diary per subject

J.1.2015 Third-years: Time spent per week

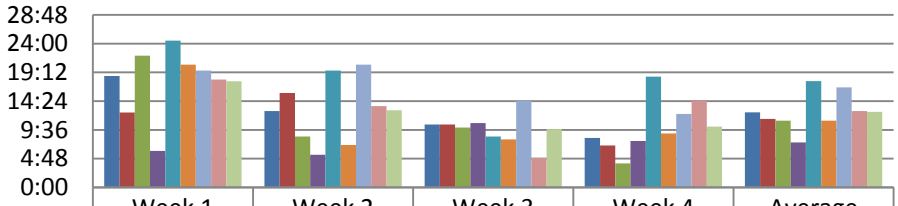


	Week 1	Week 2	Week 3	Week 4	Average
In-class	17:42	12:53	09:42	10:09	12:36
Out-of-class	25:57	30:14	47:43	36:57	35:12
total	43:39	43:07	57:25	47:06	47:49



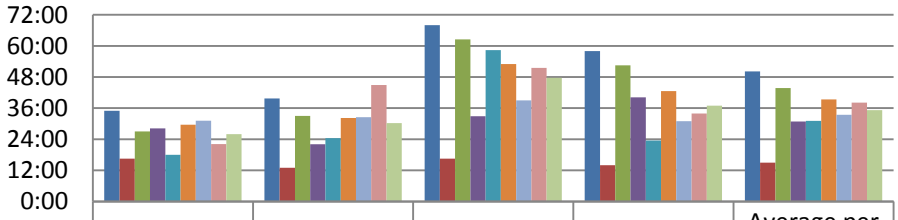
	Week 1	Week 2	Week 3	Week 4	Average
In-class	17:42	12:53	09:42	10:09	12:36
Out-of-class	25:57	30:14	47:43	36:57	35:12
Total time	43:39	43:07	57:25	47:06	47:49

2015 Third-years: Time spent in-class per week

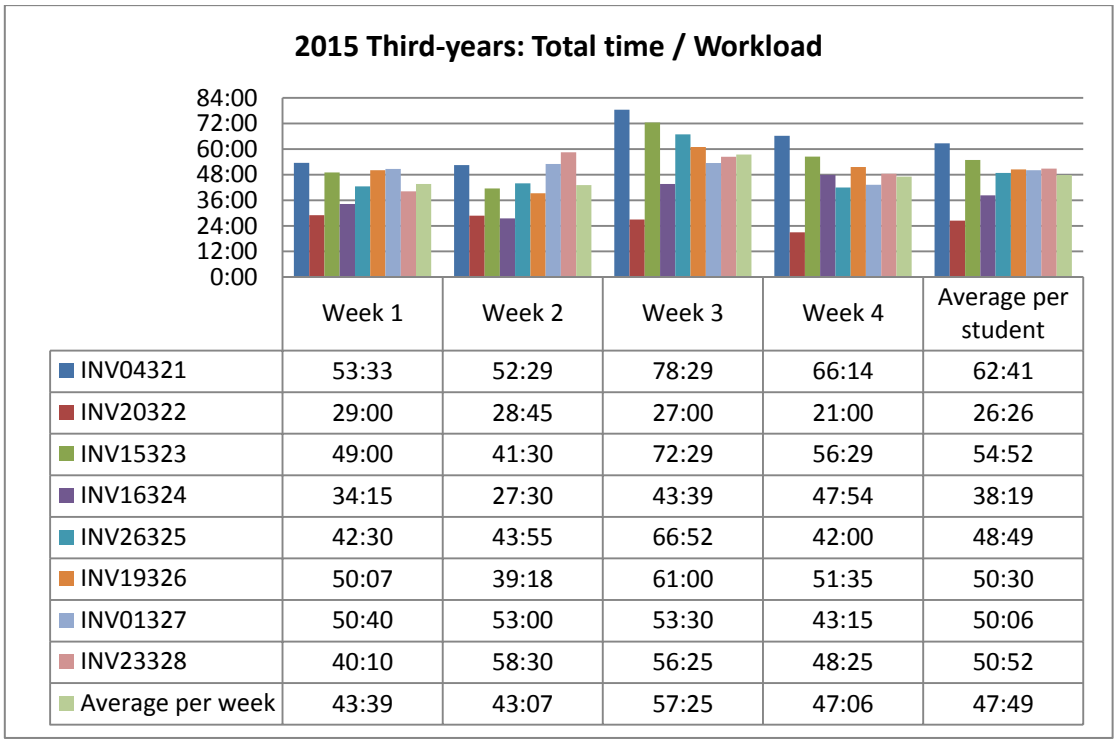


	Week 1	Week 2	Week 3	Week 4	Average
INV04321	18:35	12:45	10:30	8:15	12:31
INV20322	12:30	15:45	10:30	7:00	11:26
INV15323	22:00	8:30	10:00	4:00	11:07
INV16324	6:05	5:26	10:45	7:45	7:30
INV26325	24:30	19:30	8:30	18:30	17:45
INV19326	20:30	7:04	8:00	9:00	11:08
INV01327	19:30	20:30	14:30	12:15	16:41
INV23328	18:00	13:35	4:55	14:30	12:45
Average per week	17:42	12:53	9:42	10:09	12:36

2015 Third-years: Time spent out-of-class per week

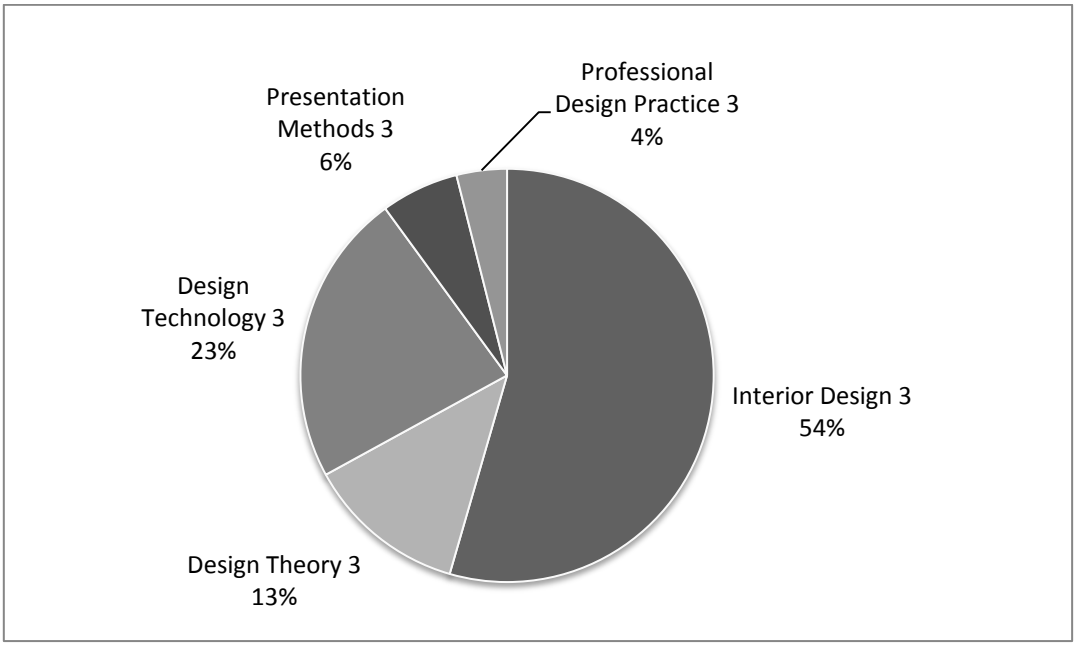


	Week 1	Week 2	Week 3	Week 4	Average per student
INV04321	34:58	39:44	67:59	57:59	50:10
INV20322	16:30	13:00	16:30	14:00	15:00
INV15323	27:00	33:00	62:29	52:29	43:44
INV16324	28:10	22:04	32:54	40:09	30:49
INV26325	18:00	24:25	58:22	23:30	31:04
INV19326	29:37	32:14	53:00	42:35	39:21
INV01327	31:10	32:30	39:00	31:00	33:25
INV23328	22:10	44:55	51:30	33:55	38:07
Average per week	25:57	30:14	47:43	36:57	35:12



	Week 1	Week 2	Week 3	Week 4	Average per student
INV04321	53:33	52:29	78:29	66:14	62:41
INV20322	29:00	28:45	27:00	21:00	26:26
INV15323	49:00	41:30	72:29	56:29	54:52
INV16324	34:15	27:30	43:39	47:54	38:19
INV26325	42:30	43:55	66:52	42:00	48:49
INV19326	50:07	39:18	61:00	51:35	50:30
INV01327	50:40	53:00	53:30	43:15	50:06
INV23328	40:10	58:30	56:25	48:25	50:52
Average per week	43:39	43:07	57:25	47:06	47:49

J.2.2015 Third-years: Time spent per subject



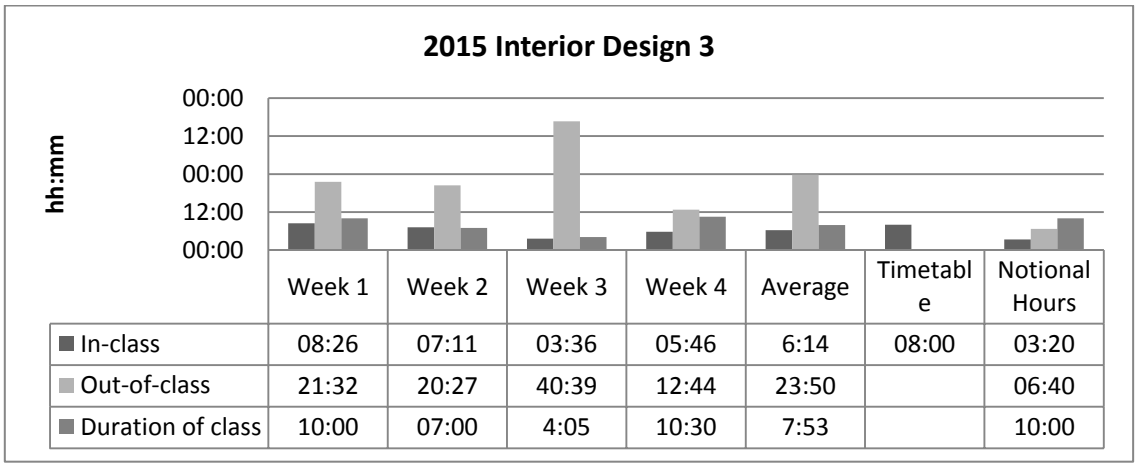
J.3.2015 Third-years: All learning activities:

2015 Third-year Interior Design learning activities:	
In-class	Out-of-class
Individual crit	Design drawings (CAD/SketchUp/freehand)
Verbal presentation of project	Individual work
Formal Lecture	Presentation (Photoshop/rendering/other)
Individual work	Written reports/assignments
Design drawings (CAD/SketchUp/freehand)	Construction drawings (CAD/freehand /other)
Working in studio	Group work
Guest lecture	Development of concepts or ideas
Development of concepts or ideas	Working in studio
Feedback	Research (Internet/Library/books/magazines)
Group crit	Consulting with industry
Construction drawings (CAD/freehand /other)	Write in journal
Group discussion	Working on presentation of project
Written reports/assignments	Site visit
Other (please specify)	Individual crit
Presentation (Photoshop/rendering/other)	Other (please specify)
Group work	Verbal presentation of project
Hand in work	

J.4.2015 Interior Design 3

2015 Interior Design 3 learning activities:	
In-class	Out-of-class
Verbal presentation of project	Design drawings (CAD/Sketchup/freehand)
Individual work	Individual work
Individual crit	Presentation (Photoshop/rendering/other)
Design drawings (CAD/Sketchup/freehand)	Development of concept or ideas
Working in studio	Working in studio
Development of concept or ideas	Research (Internet/library/books/magazines)
Group crit	Construction drawings (CAD/freehand)
Construction drawings (CAD/freehand)	Write in journal
Presentation (Photoshop/rendering/other)	Individual crit
	Site visit
	Verbal presentation of project

Time spent in–class and out-of-class:



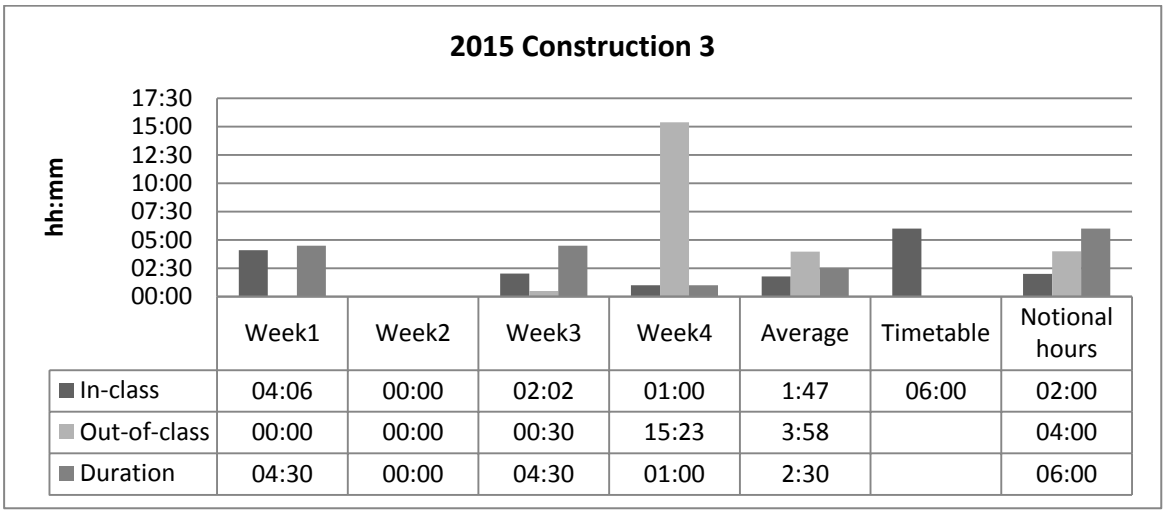
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	08:26	07:11	03:36	05:46	6:14	08:00	03:20
Out-of-class	21:32	20:27	40:39	12:44	23:50		06:40
Duration of class	10:00	07:00	4:05	10:30	7:53		10:00

J.5.2015 Design Technology 3

2015 Construction 3:

2015 Construction 3 learning activities:	
In-class	Out-of-class
Individual crit	Construction drawings (CAD/freehand)
Group discussion	Design drawings (CAD/Sketchup/freehand)
Construction drawings (CAD/freehand)	Individual work
Design drawings (CAD/Sketchup/freehand)	

Time spent in–class and out-of-class:



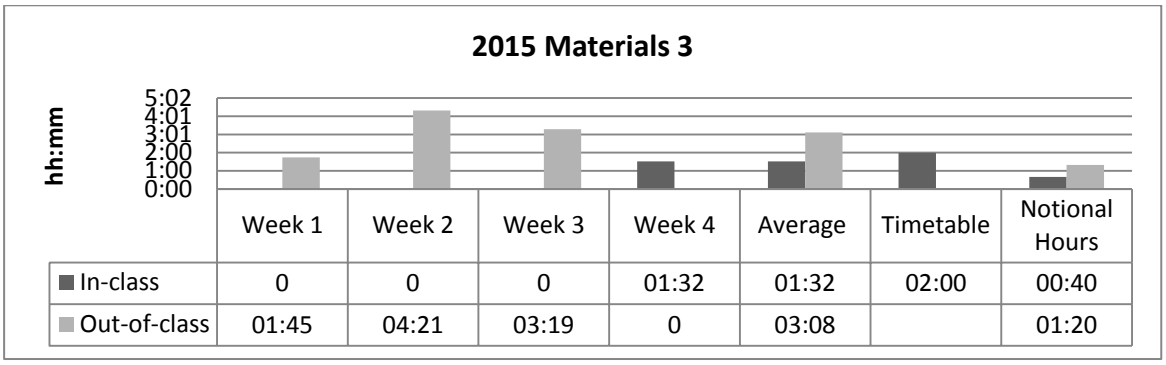
	Week1	Week2	Week3	Week4	Average	Timetable	Notional hours
In-class	04:06	00:00	02:02	01:00	1:47	06:00	02:00
Out-of-class	00:00	00:00	00:30	15:23	3:58		04:00
Duration	04:30	00:00	04:30	01:00	2:30		06:00

From the data it appears that no work were conducted either in class or out of class during week two of data collection. Since the assessment for construction is directly link to construction drawings of the design project, students work on their design project until the design has been resolved before commencing with construction drawings. Students consult the construction lecture regarding their design drawings as is evident in their listed activities.

2015 Materials 3

2015 Materials 3 learning activities:	
In-class	Out-of-class
Formal lecture	Written reports / assignments
	Research (internet/library/books)
	Consulting with industry
	Individual work

Time spent in–class and out-of-class:

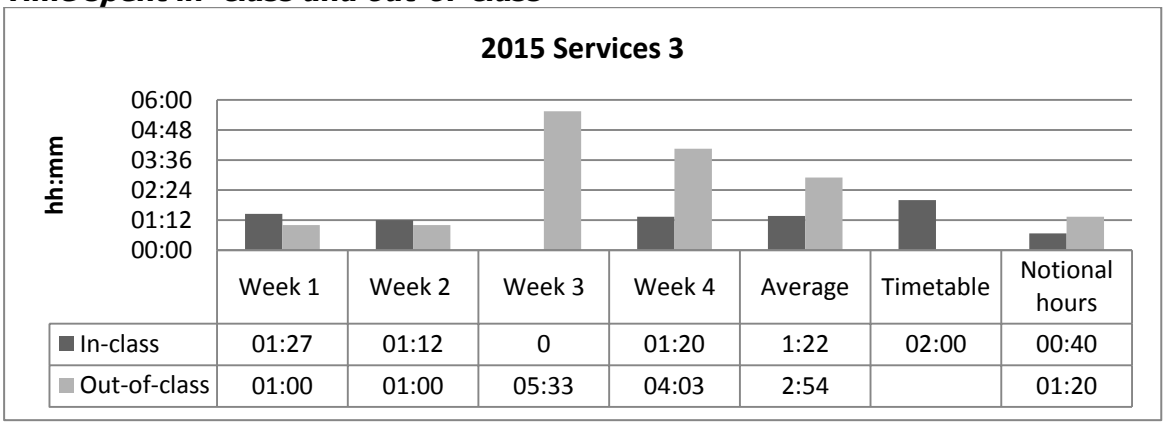


	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	0	0	0	01:32	01:32	02:00	00:40
Out-of-class	01:45	04:21	03:19	0	03:08		01:20

2015 Services 3:

2015 Services 3 learning activities:	
In-class	Out-of-class
Guest lecture	Group work
Feedback	Research
Verbal presentation of project	Site visit
Group work	Consulting with industry

Time spent in–class and out-of-class



	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	01:27	01:12	0	01:20	1:22	02:00	00:40
Out-of-class	01:00	01:00	05:33	04:03	2:54		01:20

J.6.2015 Presentation Methods 3

Learning activities:

The first week participants reported having individual crits with the lecturer while working in the class developing of concepts and ideas. These reported crits were as short as 20 minutes. During the second week, only one participant reported having an individual crit. The presentation of the project can only happen once the design problem is resolved. As can be seen from the total hours spent the third week is characterized with lots of activity: participants report attending a formal lecture on rendering, individual crit sessions and working on design drawings while waiting for a crit. And in the

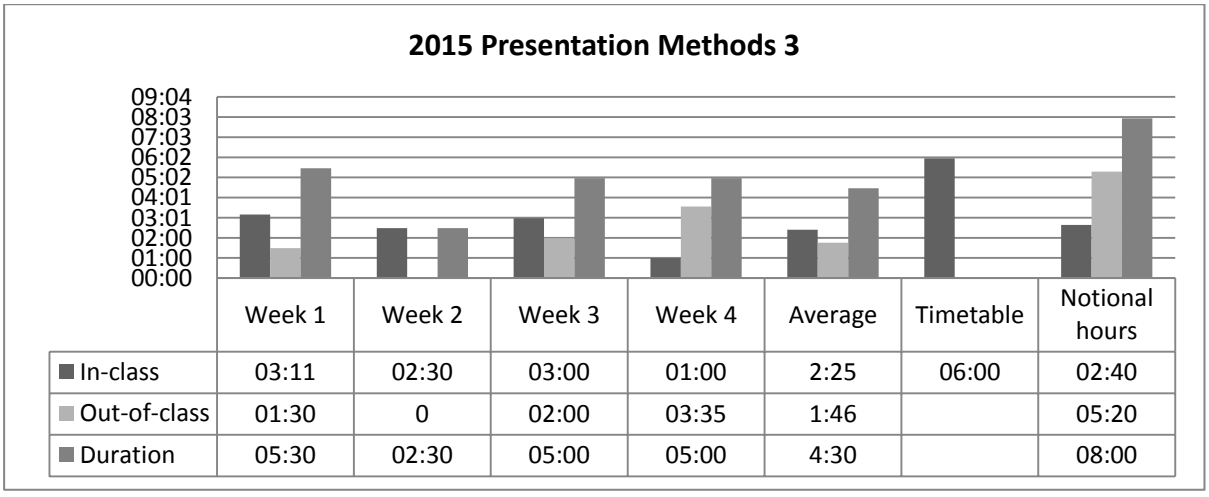
fourth week, after the design hand-in, only one participant report spending time on presentation of project.

The out of class learning activities for Presentation Methods 3 are reported as "Design drawings" and "Presentation".

2015 Presentation Methods 3 learning activities:	
In-class	**Out-of-class**
Individual crit	Presentation (Photoshop/rendering/other)
Formal lecture	Design drawing (CAD/Sketchup/freehand)
Individual work	
Development of concepts or ideas	
Design drawing (CAD/Sketchup/freehand)	
Presentation (Photoshop/rendering/other)	

The same project is assessed for both Interior Design 3 and Presentation Methods. Therefor students reported most of the time for presentation under the subject Interior Design 3. It is the third highest reported learning activity in Interior Design 3. It is very difficult to make the distinction in term of time between these two subjects. Is the same problem for Construction 3? This is a very difficult subject for workload assessment. The credits are high as the expected outcomes for this subject are based on student's ability to communicate their design solutions in a visually effective manner using computer programme. There is a perceived link between the presentation of a project and the design solution being represented.

Time spent in–class and out-of-class:



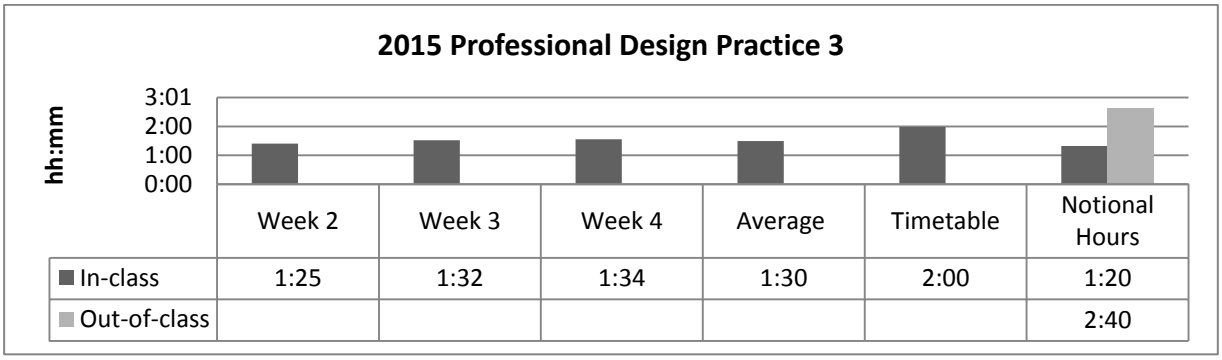
	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional hours
In-class	03:11	02:30	03:00	01:00	2:25	06:00	02:40
Out-of-class	01:30	0	02:00	03:35	1:46		05:20
Duration	05:30	02:30	05:00	05:00	4:30		08:00

J.7.2015 Professional Design Practice 3

Learning Activity:

The only activity reported for the period of data collection was "Formal Lecture".

Time spent in-class and out-of-class:



	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	1:25	1:32	1:34	1:30	2:00	1:20
Out-of-class						2:40

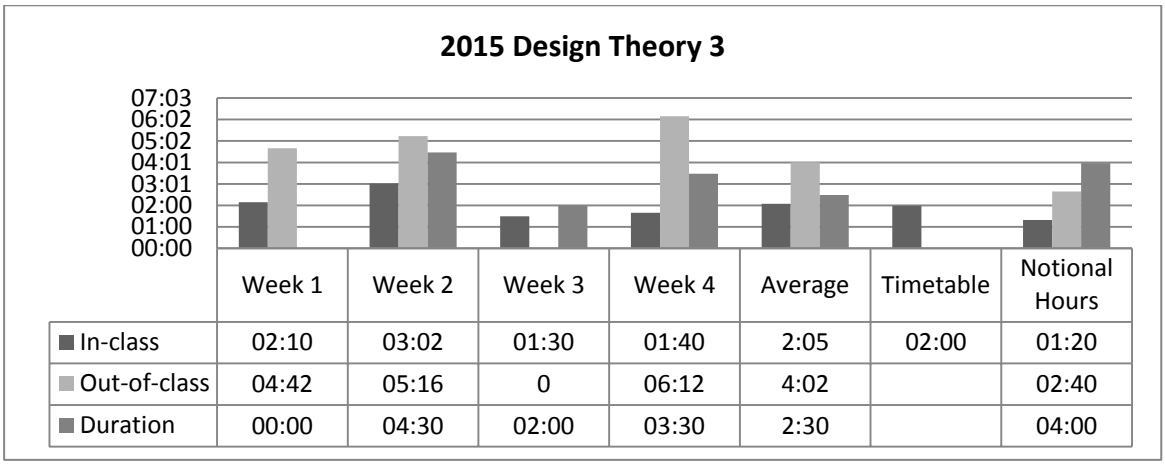
No time was reported for week 1.

J.8.2015 Design Theory 3

2015 Design Theory 3 learning activities:	
In-class	Out-of-class
Verbal presentation of project	Written report / assignments
Written report / assignments	Individual work
Feedback	Research
Guest lecture*	Working on the presentation of project
Group crit	Group work
Formal lecture*	
Group discussion	
Hand in work	

**A guest lecturer gave a formal lecture on heritage for 1 hr. This could be another sub learning activity within formal lectures.*

Time spent in-class and out-of-class

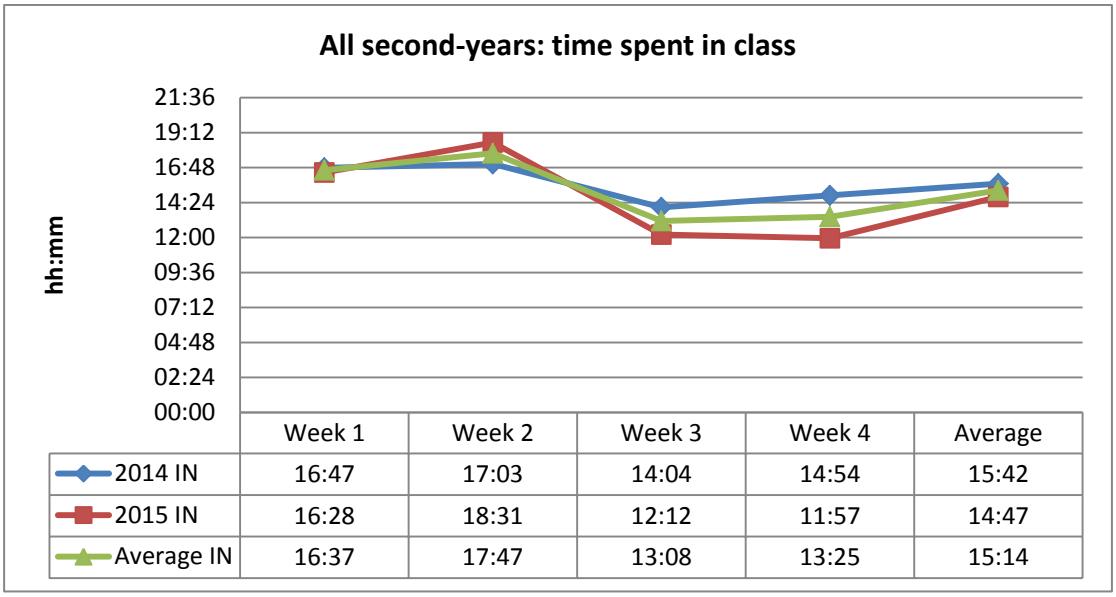


	Week 1	Week 2	Week 3	Week 4	Average	Timetable	Notional Hours
In-class	02:10	03:02	01:30	01:40	2:05	02:00	01:20
Out-of-class	04:42	05:16	0	06:12	4:02		02:40
Duration	00:00	04:30	02:00	03:30	2:30		04:00

Although set times are given for theory and studio times, in this case, Design Theory 3 and Interior Design 3 are taught consecutively, and by the same lecturer. In the case of the heritage project, the line between history and design solution are blurred completely: Student require an understanding of the implications when working within heritage buildings, this understanding comes from the Design Theory learning outcomes.

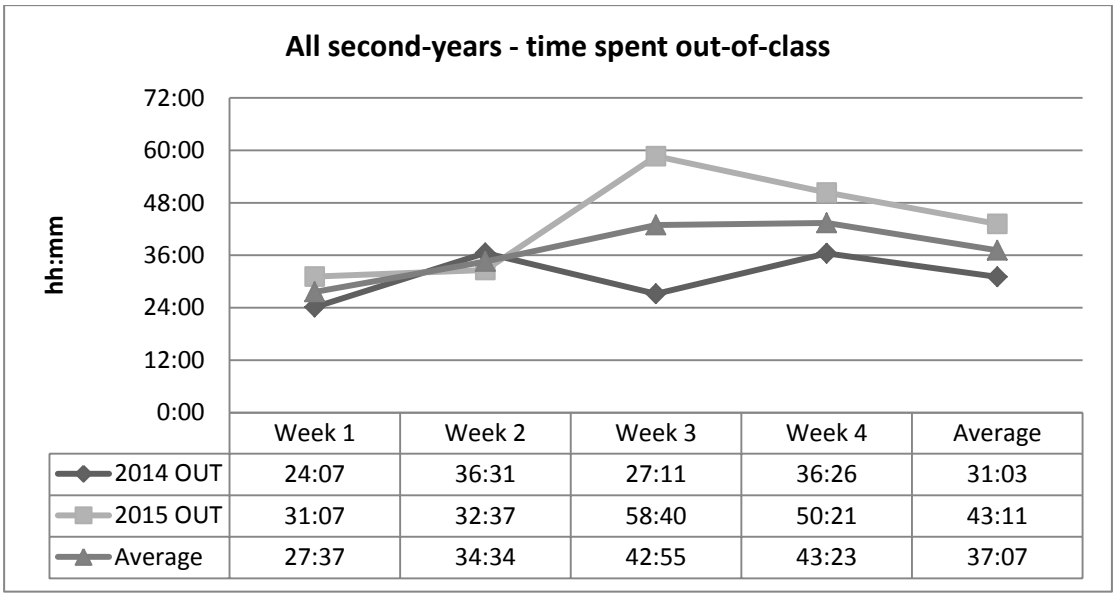
Appendix K – Combined data from 2014 and 2015 timesheet diaries

K.1. Second-year 2014 and 2015 – workload

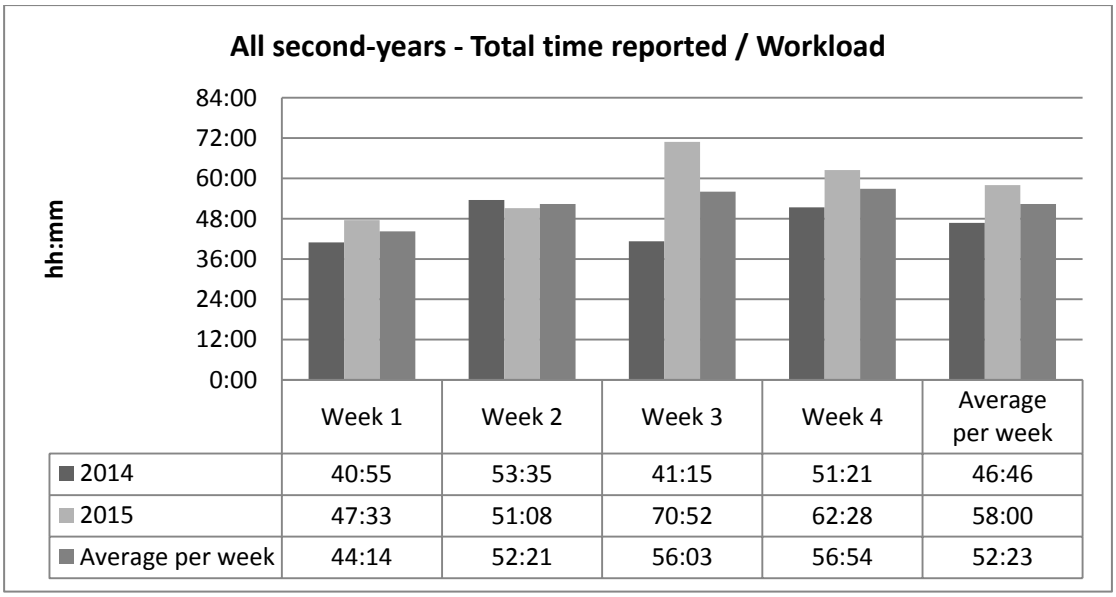


	Week 1	Week 2	Week 3	Week 4	Average
2014 IN	16:47	17:03	14:04	14:54	15:42
2015 IN	16:28	18:31	12:12	11:57	14:47
Average IN	16:37	17:47	13:08	13:25	15:14

In the first week students are spending an equal amount of time on in class and out of class activities. In the second week the time spent in class starts to drop and the time spent out of the class increases and peaks in the third week before the design project hand in. Students spent fewer hours attending classes while producing work for their design presentation. In the fourth week there is a steady drop but the hours spent out of class are still above that of the first two weeks.

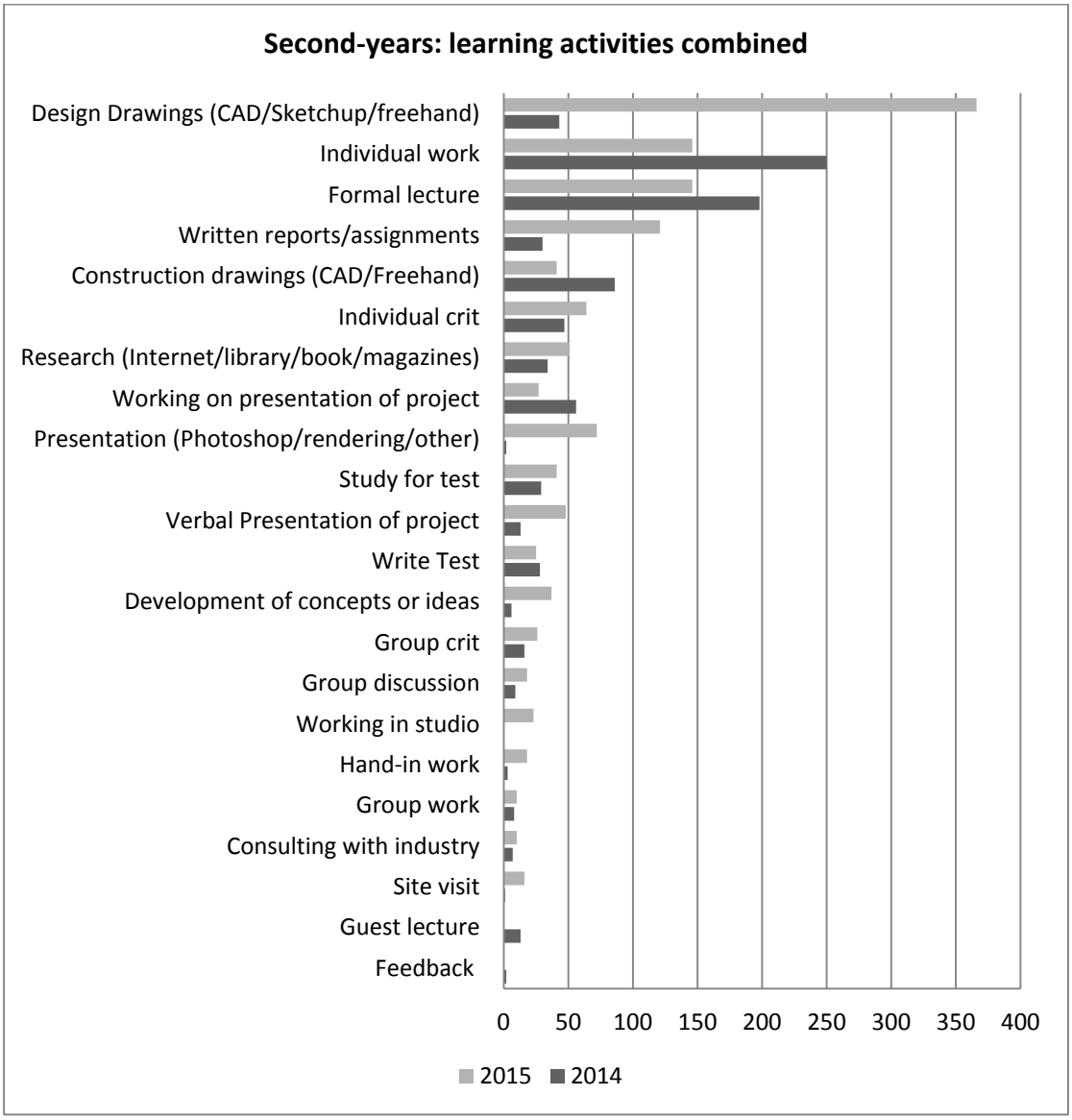


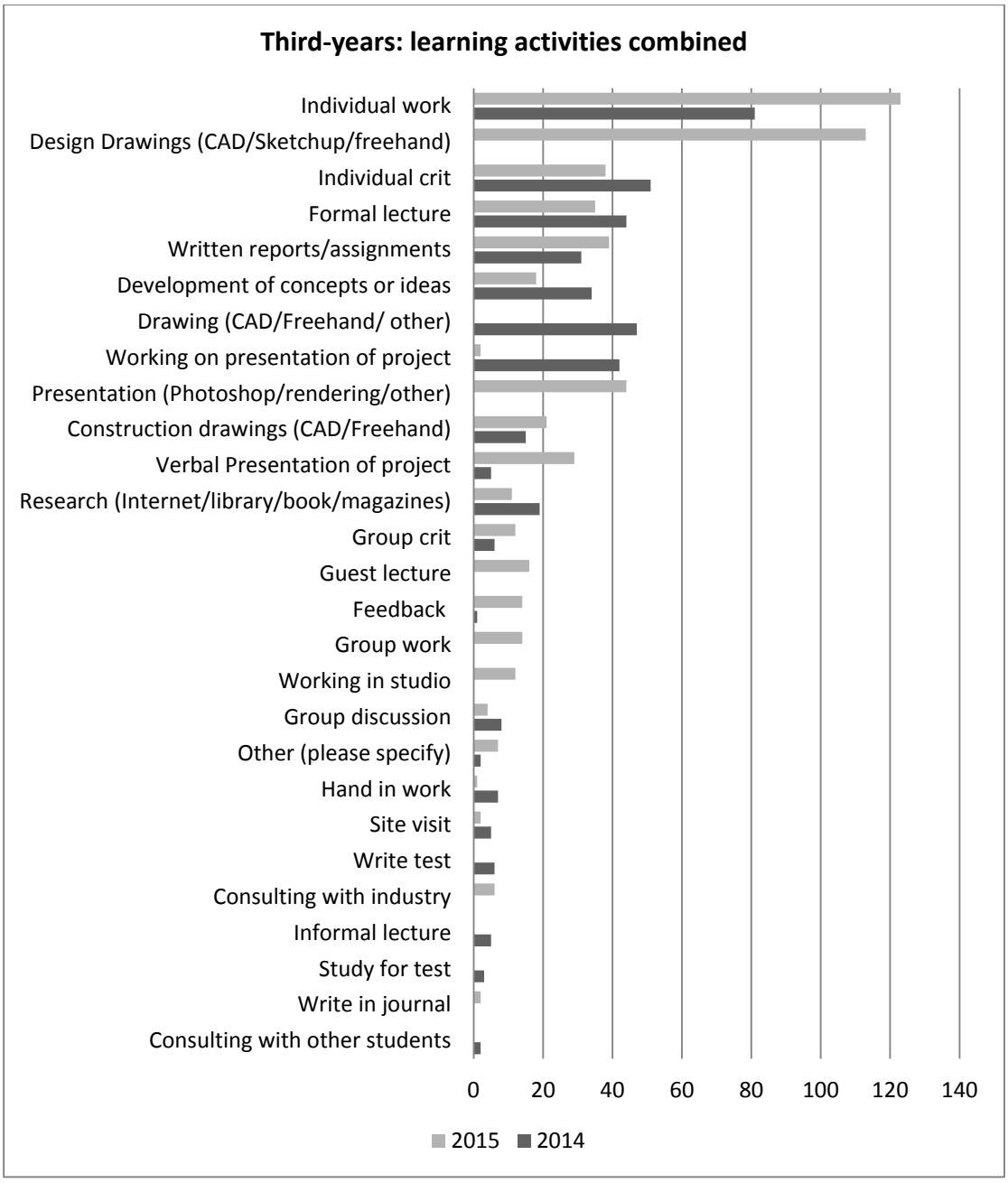
	Week 1	Week 2	Week 3	Week 4	Average
2014 OUT	24:07	36:31	27:11	36:26	31:03
2015 OUT	31:07	32:37	58:40	50:21	43:11
Average	27:37	34:34	42:55	43:23	37:07

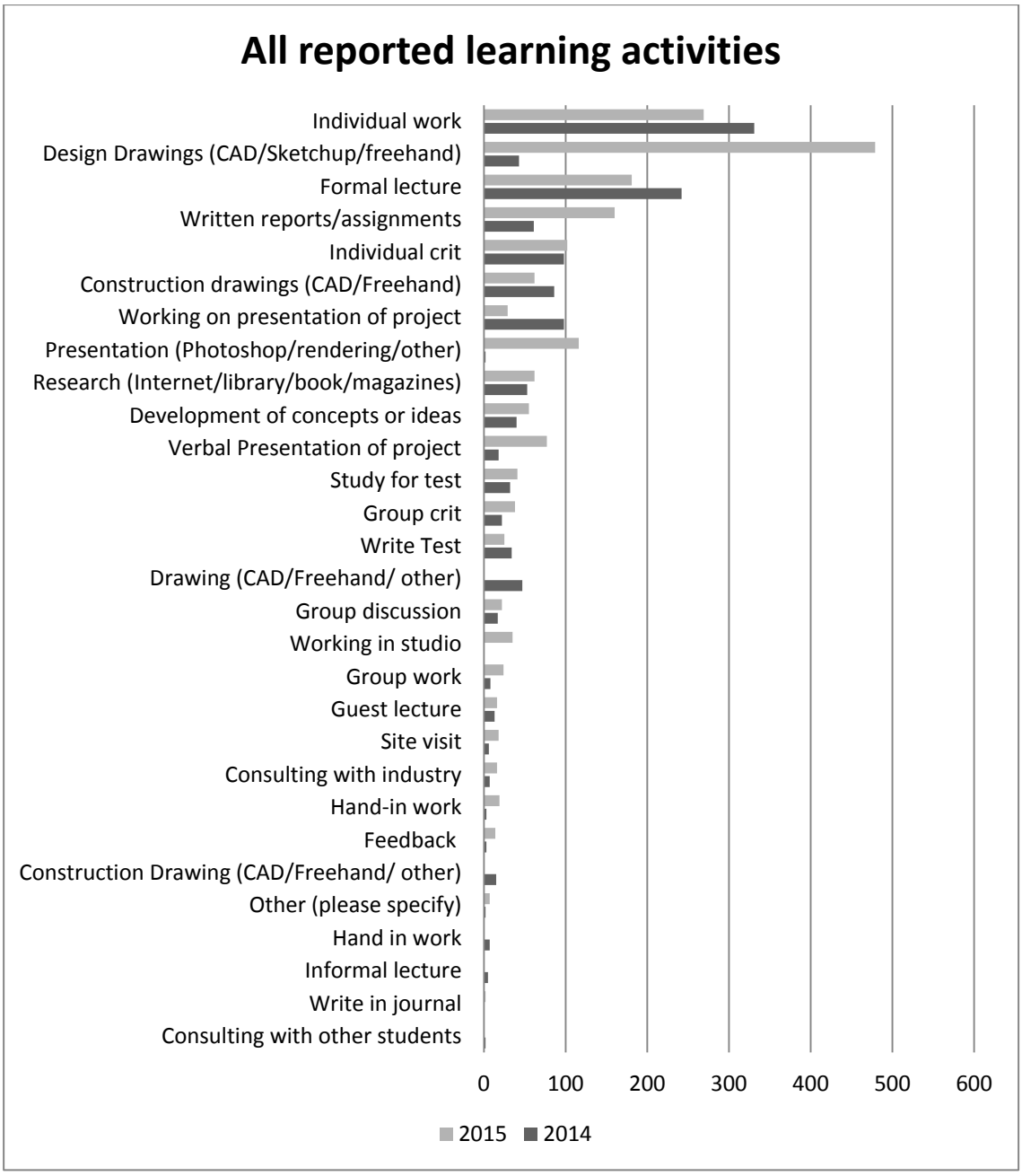


	Week 1	Week 2	Week 3	Week 4	Average per week
2014	40:55	53:35	41:15	51:21	46:46
2015	47:33	51:08	70:52	62:28	58:00
Average per week	44:14	52:21	56:03	56:54	52:23

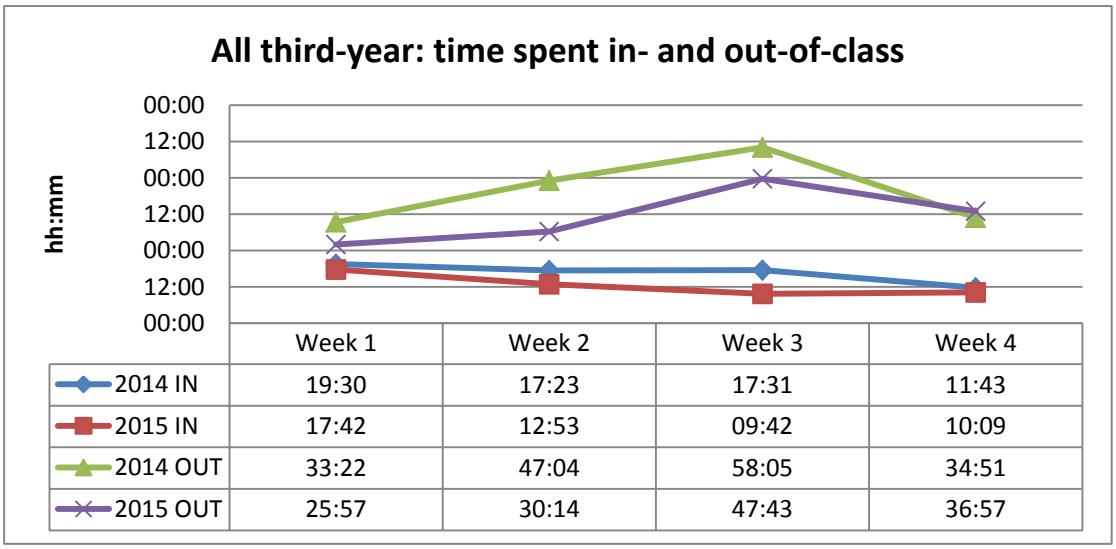
K.2. Summary of learning activities



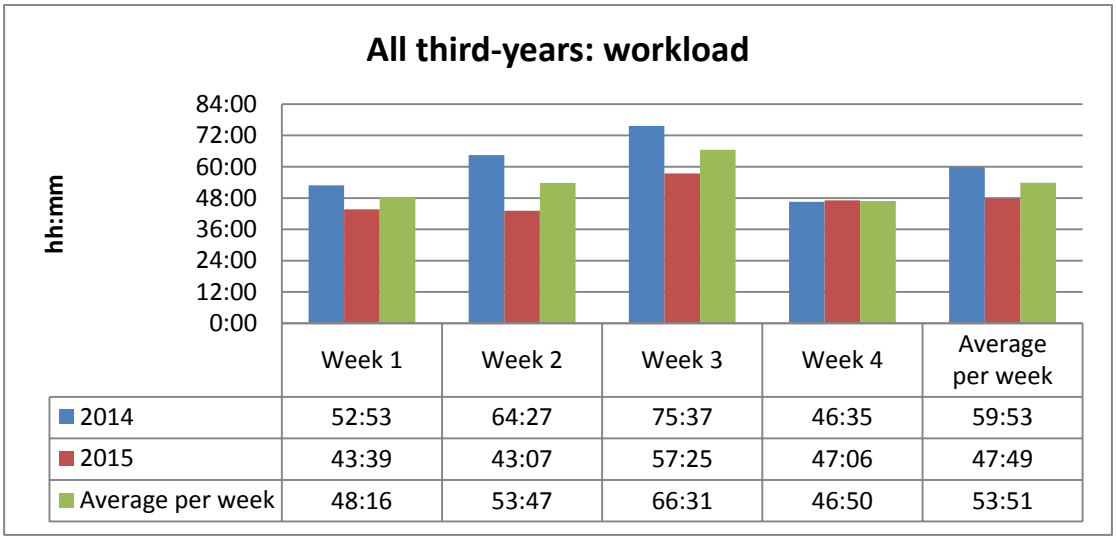

Third-years: learning activities combined
Individual work
Design Drawings (CAD/Sketchup/freehand)
Individual crit
Formal lecture
Written reports/assignments
Development of concepts or ideas
Drawing (CAD/Freehand/ other)
Working on presentation of project
Presentation (Photoshop/rendering/other)
Construction drawings (CAD/Freehand)
Verbal Presentation of project
Research (Internet/library/book/magazines)
Group crit
Guest lecture
Feedback
Group work
Working in studio
Group discussion
Other (please specify)
Hand in work
Site visit
Write test
Consulting with industry
Informal lecture
Study for test
Write in journal
Consulting with other students
0
20
40
60
80
100
120
140
2015
2014


All reported learning activities
Individual work
Design Drawings (CAD/Sketchup/freehand)
Formal lecture
Written reports/assignments
Individual crit
Construction drawings (CAD/Freehand)
Working on presentation of project
Presentation (Photoshop/rendering/other)
Research (Internet/library/book/magazines)
Development of concepts or ideas
Verbal Presentation of project
Study for test
Group crit
Write Test
Drawing (CAD/Freehand/ other)
Group discussion
Working in studio
Group work
Guest lecture
Site visit
Consulting with industry
Hand-in work
Feedback
Construction Drawing (CAD/Freehand/ other)
Other (please specify)
Hand in work
Informal lecture
Write in journal
Consulting with other students
0
100
200
300
400
500
600
2015
2014

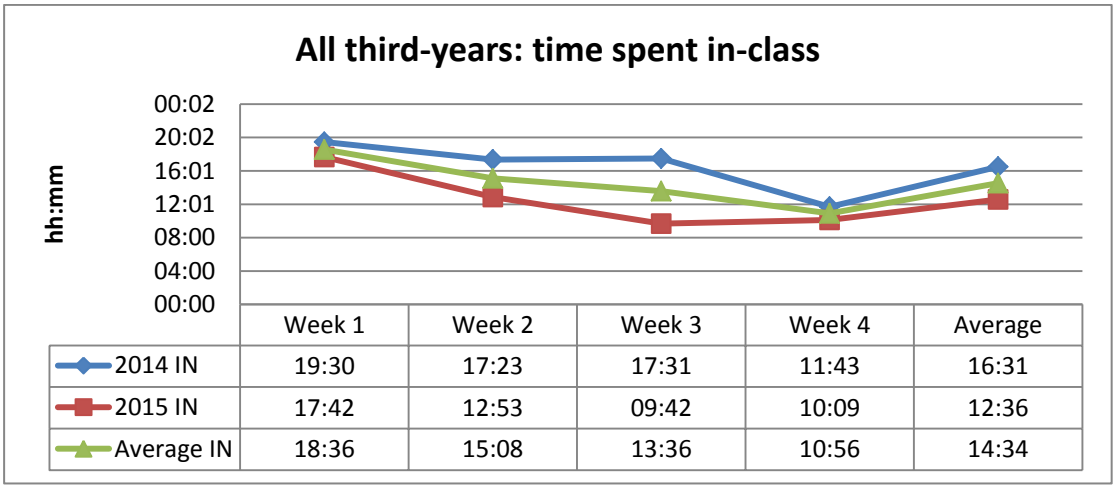
K.3. Third-year combined 2014 and 2015 – workload



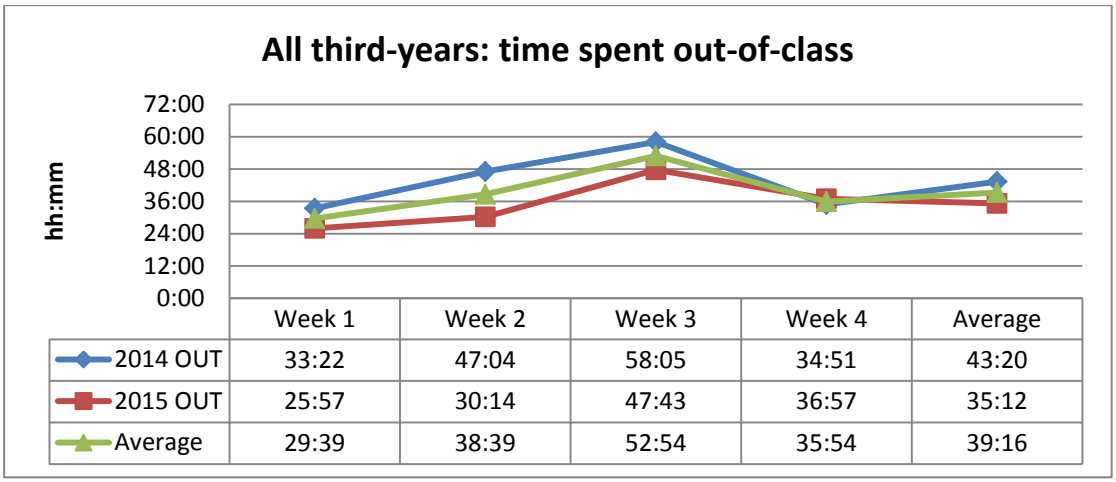
	Week 1	Week 2	Week 3	Week 4
2014 IN	19:30	17:23	17:31	11:43
2015 IN	17:42	12:53	09:42	10:09
2014 OUT	33:22	47:04	58:05	34:51
2015 OUT	25:57	30:14	47:43	36:57



	Week 1	Week 2	Week 3	Week 4	Average per week
2014	52:53	64:27	75:37	46:35	59:53
2015	43:39	43:07	57:25	47:06	47:49
Average per week	48:16	53:47	66:31	46:50	53:51



	Week 1	Week 2	Week 3	Week 4	Average
2014 IN	19:30	17:23	17:31	11:43	16:31
2015 IN	17:42	12:53	09:42	10:09	12:36
Average IN	18:36	15:08	13:36	10:56	14:34



	Week 1	Week 2	Week 3	Week 4	Average
2014 OUT	33:22	47:04	58:05	34:51	43:20
2015 OUT	25:57	30:14	47:43	36:57	35:12
Average	29:39	38:39	52:54	35:54	39:16

K.4. Interior Design 2 & 3

Interior Design 2 (2014 & 2015) *N*=14 +16 =30	Average in-class		Average out- of -class
Week 1 (*n*=27)	5:32	Week 1 (*n*=28)	13:51
Week 2 (*n*=29)	6:31	Week 2 (*n*=29)	23:54
Week 3 (*n*=27)	5:42	Week 3 (*n*=27)	36:59
Week 4 (*n*=25)	5:26	Week 4 (*n*=25)	17:53
Average	5:48		23:09

Interior Design 3 (2014 & 2015) *N*=6 +8 =14	Average in-class		Average out- of -class
Week 1 (*n*=14)	8:26	Week 1 (*n*=14)	22:10
Week 2 (*n*=14)	7:17	Week 2 (*n*=14)	28:33
Week 3 (*n*=10)	6:17	Week 3 (*n*=14)	47:23
Week 4 (*n*=13)	5:44	Week 4 (*n*=13)	14:46
Average	6:57		28:28

K.5. Design Technology 2 & 3

Construction

Construction 2 (2014 & 2015) *N*=14 +16 =30	Average in-class		Average out- of -class
Week 1 (*n*=28)	3:02	Week 1 (*n*=16)	4:40
Week 2 (*n*=28)	3:24	Week 2 (*n*=9)	2:52
Week 3 (*n*=16)	4:12	Week 3 (*n*=15)	8:54
Week 4 (*n*=13)	4:16	Week 4 (*n*=22)	16:10
Average	3:44		8:09

Construction 3 (2014 & 2015) *N*=6 +8 =14	Average in-class		Average out- of -class
Week 1 (*n*=12)	4:32	Week 1 (*n*=0)	none
Week 2 (*n*=5)	4:38	Week 2 (*n*=1)	3:00
Week 3 (*n*=11)	3:10	Week 3 (*n*=1)	0:30
Week 4 (*n*=4)	3:45	Week 4 (*n*=13)	15:08
Average	4:01		6:12

Materials 2

Materials 2 (2014 & 2015) *N*=14 +16 =30	Average in-class		Average out- of -class
Week 1 (*n*=15)	2:10	Week 1 (*n*=11)	3:30
Week 2 (*n*=17)	1:28	Week 2 (*n*=8)	3:04
Week 3 (*n*=14)	1:25	Week 3 (*n*=8)	3:45
Week 4 (*n*=10)	1:39	Week 4 (*n*=6)	4:15
Average	1:40		3:39

Services 2

Services 2 (2014 & 2015) *N*=14 +16 =30	Average in-class		Average out- of -class
Week 1 (*n*=27)	1:35	Week 1 (*n*=16)	3:27
Week 2 (*n*=13)	1:25	Week 2 (*n*=6)	5:16
Week 3 (*n*=26)	1:37	Week 3 (*n*=9)	4:42
Week 4 (*n*=29)	2:02	Week 4 (*n*=16)	3:46
Average	1:40		4:18

Materials and Service 3

Materials and Services 3 (2014[26] & 2015) *N*=6 +8 =14	Average in-class		Average out- of -class
Week 1 (*n*=13)	1:35	Week 1 (*n*=3)	2:05
Week 2 (*n*=11)	1:39	Week 2 (*n*=8)	4:29
Week 3 (*n*=3)	1:20	Week 3 (*n*=6)	8:19
Week 4 (*n*=14)	1:53	Week 4 (*n*=6)	4:17
Average	1:37		4:47

[26] Combined reports were received from students as the same lecturer taught it consecutively on the same day and thus time was inseparable.

K.6. Presentation Methods 2 & 3

Presentation Methods 2 (including CAD) (2014 & 2015) *N*=14 +16 =30	Average in-class		Average out- of -class
Week 1 (*n*=27)	3:14	Week 1 (*n*=15)	4:09
Week 2 (*n*=27)	3:10	Week 2 (*n*=16)	4:42
Week 3 (*n*=25)	3:04	Week 3 (*n*=10)	7:07
Week 4 (*n*=24)	3:27	Week 4 (*n*=10)	12:49
Average	3:14		7:12

Presentation Methods 3 (2014 & 2015) *N*=6 +8 =14	Average in-class		Average out- of -class
Week 1 (*n*=13)	2:46	Week 1 (*n*=3)	2:35
Week 2 (*n*=6)	2:15	Week 2 (*n*=0)	none
Week 3 (*n*=14)	2:49	Week 3 (*n*=3)	2:00
Week 4 (*n*=4)	3:00	Week 4 (*n*=3)	3:35
Average	2:42		2:43

K.7. Professional Design Practice 2 & 3

Professional Design Practice 2 (2014 & 2015) *N*=14 +16 =30	Average in-class		Average out- of -class
Week 1 (*n*=25)	1:19	Week 1 (*n*=6)	1:55
Week 2 (*n*=24)	1:26	Week 2 (*n*=7)	1:34
Week 3 (*n*=22)	1:04	Week 3 (*n*=8)	2:58
Week 4 (*n*=12)	1:27	Week 4 (*n*=11)	3:12
Average	1:19		2:25

Professional Design Practice 3 (2014 & 2015) *N*=6 +8 =14	Average in-class		Average out-of-class[27]
Week 1 (*n*=6)	1:55	Week 1 (*n*=0)	none
Week 2 (*n*=12)	1:27	Week 2 (*n*=0)	none
Week 3 (*n*=9)	1:39	Week 3 (*n*=0)	none
Week 4 (*n*=8)	1:41	Week 4 (*n*=0)	none
Average	1:41		none

[27] No out of class activities were reported

K.8. Design Theory 2 & 3

Design Theory 2 (2014 & 2015) *N*=14 +16 =30	Average in-class		Average out- of -class
Week 1 (*n*=28)	2:16	Week 1 (*n*=27)	7:06
Week 2 (*n*=28)	2:59	Week 2 (*n*=24)	7:08
Week 3 (*n*=4)	2:01	Week 3 (*n*=4)	4:50
Week 4 (*n*=13)	1:30	Week 4 (*n*=24)	8:45
Average	2:11		6:57

Design Theory 3 (2014 & 2015) *N*=6 +8 =14	Average in-class		Average out- of -class
Week 1 (*n*=6)	2:10	Week 1 (*n*=12)	6:50
Week 2 (*n*=12)	2:34	Week 2 (*n*=14)	6:06
Week 3 (*n*=14)	1:50	Week 3 (*n*=2)	5:15
Week 4 (*n*=7)	1:24	Week 4 (*n*=11)	6:02
Average	1:59		6:03