Student Workload, Wellbeing and Academic Attainment

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Abstract. There has been extensive research on workload, often in the laboratory or workplace. Less research has been conducted in educational settings and there is very little examining workload, wellbeing and academic attainment of university students. The present study of 1294 students examined associations between perceptions of workload, hours spent at university, time pressure and attainment and wellbeing outcomes (measured using the Wellbeing Process Questionnaire). Established predictors (stressors; social support; negative coping; positive personality and conscientiousness) were controlled for, and the analyses showed that workload was significantly associated with all outcomes whereas time pressure was only related to course stress and negative wellbeing (life stress, fatigue and anxiety/depression). Hours spent at the university had no significant effects. The effects of workload were interpreted in terms of an initial challenge leading to increased efficiency and attainment. These results show the importance of including workload in future longitudinal research on student wellbeing and attainment.

Keywords: Workload · Wellbeing · Academic attainment · Time pressure

1 Introduction

Mental workload has been investigated using a variety of different approaches [1, 2], and it has a long history in Psychology and Ergonomics [3, 4]. It has been examined in both laboratory [5, 6] and occupational settings [7, 8], and a variety of measures have been proposed [9–14]. These include self-assessment, task measures and physiological measures.

Self-assessment measures or subjective measures have taken several forms such as the NASA Task Load Index [15], the Workload Profile [16] and the Subjective Workload Assessment Technique [1]. Recent research has shown that even single items about perceptions of workload are highly correlated with longer scales and can predict wellbeing of workers [7, 8]. Other approaches have examined specific aspects of workload, such as time pressure. This is a major feature of the Karasek Job Demands scale, which has been shown to predict health and safety outcomes of workers [17].

Student workload research has the potential to lead educators and key stakeholders to best practices in teaching, reduce academic stress, and decrease college student dropout rates. Identifying best practices regarding student workload issues has the

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potential for better outcomes in student learning. Despite the potential importance of studying student workload, there is little literature on students' workload, with a search of PsychInfo only revealing 16 articles. These were often concerned with the planning of the curriculum [18–22] or the relationship between assessment frequency and workload [23]. Other research has examined workload in distance learning [18, 24] and attempted to determine whether workload changes approaches to learning [20, 25] or how different teaching styles influence workload [26]. The present study is part of a programme of research examining factors which influence the wellbeing and academic attainment of students [27–34]. Again, the literature on these topics is very small with 3 articles on workload and attainment being identified [21, 26, 35], no articles on workload and wellbeing of students, and very few on related topics such workload and student performance [21] or workload and student stress [19, 22]. The aim of the present study was to provide information on workload, well-being and attainment using the Student Wellbeing Questionnaire [27].

Recent research has investigated well-being at work using occupational predictors (e.g. demands and resources) and individual effects (e.g. personality and coping). This research has been based on the Demands-Resources-Individual Effects model (DRIVE Model [36]), which allows for the inclusion of new predictors and outcomes. The model was initially designed to study occupational stress, and initial research [37, 38] focused on predictors of anxiety and depression. More recently, it has been adapted to study wellbeing, and recent studies [39–42] have also investigated predictors of positive well-being (happiness, positive affect and job satisfaction). When one studies both positive and negative aspects of wellbeing, then the number of predictors and outcomes grow, which can lead to a very long questionnaire. Our research has developed single or short item questions which have been shown to have the same predictive validity as multi-item scales. The original scale (the Well-being Process Questionnaire, WPQ) has been used with different occupational groups (e.g. nurses and university staff [41, 42]). This has led to the development of another questionnaire (the Smith Well-being Questionnaire – SWELL [7, 8]), which measures a wider range of predictors (e.g. the working environment and hours of work) and outcomes (e.g. absenteeism; presenteeism; sick leave; performance efficiency; work-life balance and illness caused or made worse by work).

The wellbeing of university students has been widely studied [43], and high levels of depression, anxiety, and stress have been reported by undergraduate students [44, 45]. These variables were, therefore, included in the Student WPQ. Positive and negative wellbeing are not just opposite ends of a single dimension, which meant that positive outcomes (happiness, life satisfaction and positive affect) were also included in the questionnaire. Student related stressors have been widely studied and include fear of failing and long hours of study [43], social demands [44–46] and lack of social support [47]. Questionnaires have been specifically developed to audit factors that influence well-being (e.g. the Inventory of College Students' Recent Life Experiences [ICSRLE] which measures time pressures, challenges to development, and social mistreatment [48]. The Student WPQ includes a short version of the ICSRLE and the most relevant question in this study was the one asking about time pressure. Research on students' well-being has also shown the importance of individual differences such as negative coping style and positive personality (high self-efficacy, high self-esteem and

high optimism) in the well-being process. Smith [28] demonstrated that fatigue was an important part of the wellbeing process and research with occupational samples has shown strong links between fatigue and workload. Williams et al. [27] also demonstrated that the WPQ could predict students' reports of cognitive function and Smith [28] showed that this also applies to objective measures of academic attainment.

The original WPQ also included questions related to both life in general and to specifically to academic issues. One of the academic questions related to the perception of workload. This was intended to be an indicator of habitual workload rather than reflecting acute peaks and troughs. Others were concerned with hours spent at the university, course stress and efficiency of working. The aim of the present study was to examine associations between workload, time pressure, hours at the university, and the general positive and negative wellbeing outcomes. Academic attainment and perception of work efficiency were also obtained, and consideration of course stress allowed for analysis of specific academic challenges. One of the most important feature of the study was that established predictors of wellbeing (student stressors; negative coping; positive personality and social support) and attainment (conscientiousness) were statistically adjusted for.

2 Method

2.1 Participants

The participants were 1299 first and second year undergraduate Psychology students at Cardiff University (89.4% female; mean age = 19.4 years, range = 18–46, 98% 18–22 years). The study was approved by the Ethics Committee, School of Psychology, Cardiff University, and carried out with the informed consent of the participants. At the end of the survey the participants were shown a debrief statement and awarded course credits for their participation.

2.2 The Survey

The survey was presented online using the *Qualtrics* software.

2.3 Questions

The full set of questions are shown in Appendix A.1. The majority were taken from the version of the WPQ used with workers. The additional questions measured student stressors, aspects of perceived social support and university workload, time pressure, hours in university, course stress and work efficiency.

2.4 Derived Variables from the Survey

Five control variables were derived:

- Stressors (sum of ICSRLE questions)
- Social support (sum of ISEL questions)

- Positive personality (optimism + self-esteem + self-efficacy)
- Negative coping (avoidance; self-blame; wishful thinking)
- Conscientiousness (single question)

These variables were used because previous research showed that they were established predictors of the wellbeing outcomes. Other variables (e.g. the Big 5 personality scores) were not used here due to their lack of sensitivity in our previous studies.

Three measures of workload were used:

- Hours in university for taught courses
- Perception of workload (rated on a 10 point scale)
- Time pressure (rated on a 10 point scale).

Four outcome variables were derived:

- Positive outcomes (happiness + positive affect + life satisfaction)
- Negative outcomes (anxiety + depression + stress)
- Stress due to academic issues
- Efficiency of working

2.5 Academic Attainment

Students gave permission for their academic attainment scores to be made available and combined with their survey data (after which the database was anonymised). The score used here, the Grade Point Average, reflected the combination of coursework and examination marks.

3 Results

The mean score for perceived workload was 7.3 (s.d. = 3.2; higher scores = greater workload; possible range = 1 to 10). Similarly, the mean score for time pressure was 7.74 (s.d. = 1.73; higher scores = greater workload; possible range = 1 to 10). The mean number of hours spent in university was 9.8 h a week (s.d. = 3.2).

Initial univariate correlations showed that workload and time pressure were significantly correlated ($r = 0.35$ $p < 0.001$) but the hours in university variable was not correlated with the other two indicators of workload. The correlations between the workload measures and the wellbeing and attainment outcomes are shown in Table 1.

Table 1. Correlations between workload measures and wellbeing and attainment outcomes.

	Time pressure	Hours in university	Workload
GPA	−0.02	−0.06	0.04
Work efficiency	-0.61^{*}	0.01	0.14^{*}
Course stress	0.48^{**}	0.08^{**}	0.60^{**}
Negative wellbeing	0.31^{**}	0.02	0.19^{**}
Positive wellbeing	-0.14^{**}	0.01	0.00

*p < 0.05, **p < 0.01

Time pressure was significantly correlated with all of the outcomes except the GPA score. Hours in university was only correlated with course stress, and workload was correlated with all of the variables except GPA and positive wellbeing. However, these univariate analyses do not take into account the impact of the established predictors of the outcomes, or the shared variance with the other measures of workload. The workload scores were dichotomised into high/low groups and entered as independent variables into a MANOVA. The dependent variables were GPA, work efficiency, course stress, negative wellbeing and positive wellbeing. The co-variates were the other stressors, social support, negative coping, positive personality and conscientiousness.

The MANOVA revealed significant overall effects of workload (Wilks' Lambda = 0.792 F = 65.3 df 5, 1243 $p < 0.001$) and time pressure (Wilks' Lambda = 0.932 F = 18.2 df = 5, 1243 $p < 0.001$) but not hours in university. There were no significant interactions between the independent variables. Examination of the individual dependent variables showed that workload had significant effects on all of them (see Table 2; work efficiency: F 1,1247 = 13.6 $p < 0.001$; course stress: F 1, 1247 = 294.9 $p < 0.001$; GPA F 1,1247 = 2.6 $p < 0.05$ 1-tail; negative wellbeing: F 1, 1247 = 10.4 $p < 0.001$; positive wellbeing: F 1, 1247 = 9.4 $p < 0.005$) whereas time pressure only had effects on course stress and negative wellbeing (life stress, anxiety and depression – see Table 3 – course stress: F 1,1247 = 82.8 $p < 0.001$; negative wellbeing: F 1,1247 = 14.67 $p < 0.001$). Those who reported a high workload had higher work efficiency scores, a higher GPA, more positive wellbeing but also greater course stress and negative wellbeing. Those with high time pressure scores reported greater course stress and higher negative wellbeing scores.

Table 2. Effects of workload on wellbeing and attainment outcomes (scores are the means, s.e.s in parentheses)

	Work efficiency	Course stress	GPA	Negative wellbeing	Positive wellbeing
Low workload	5.76 (0.70)	6.23 (0.053)	63.18 (0.28)	19.48 (0.19)	19.30 (0.10)
High workload	6.15 (0.08)	7.61 (0.06)	63.88 (0.32)	20.39 ((0.21)	19.74 (0.11)

Table 3. Effects of time pressure on course stress and negative wellbeing (scores are the means, s.e.s in parentheses)

	Course stress	Negative wellbeing
Low time pressure	6.54 (0.07)	19.37 (0.23)
High time pressure	7.30 (0.05)	20.50 (0.09)

4 Discussion

The main aim of the present study was to examine the associations between various single measures of workload and wellbeing and academic attainment of university students. The sample was very homogeneous in that it largely consisted of female Psychology students doing similar courses and of a similar age. A key feature of the

present study was that established predictors of wellbeing (stressors; negative coping; positive personality and social support) and academic attainment (conscientiousness) were statistically controlled. Smith [49] has also shown that workload load and time pressure are associated with established predictors, which means that one has to control for these other predictors when examining the association between workload and wellbeing.

The analyses showed that hours spent at university had little influence on wellbeing and attainment, which probably reflects the fact that students do a great deal of their university work at home. Indeed, lectures are now filmed and can be watched online away from the university, which means that it is not necessary to attend them. A better question would have been to ask how many hours students spent on their academic studies.

Time pressure had selective effects, with high time pressure being linked with greater course stress and higher negative well-being scores. Such results are in agreement with research on workers where high demands, often induced by time pressure, are associated with higher perceived stress and reduced wellbeing [7, 8]. In contrast, time pressure had no significant effect on academic attainment (GPA scores) or perceive work efficiency.

Perceived workload had a more global effect on the outcome measures, although it appeared to have both positive and negative effects. For example, high workload was associated with greater work efficiency, higher GPA scores and higher positive well-being. In contrast, high workload was also associated with greater course stress and higher negative wellbeing. It is possible that the positive and negative effects of workload occur at different time points. It is plausible that increased stress may have a motivating effect which then improves efficiency and academic marks, which suggests that high workload is a challenge rather than a threat and this increases achievement motivation.

4.1 Limitations

The present study has two main limitations. The first is that it is a cross-sectional study and the results could reflect reverse causality with the outcomes changing perceptions of workload and time pressure rather than effects occurring in the opposite direction. Longitudinal studies, preferably with interventions changing workload, are required to determine whether workload has direct effects on wellbeing and attainment. The second problem is that while a homogenous sample means that one need not control for factors such as age or culture, these variables may represent important influences that should be considered. For example, Omosehin and Smith (in press) examined the effects of time pressure on the wellbeing of students differing in ethnicity and culture. The results for the group as a whole largely confirmed the effects reported here, but there were also significant interactions between ethnic group and time pressure, which demonstrated the importance of conducting cross-cultural research. Finally, the study was not designed to address underlying mechanisms, and further research is required to address the microstructure of workload and time pressure. Also, the applicability of classic inverted-U models of workload and the notion of optimal state needs to be examined.

5 Conclusion

In summary, the present study investigated whether single-item measures of workload were predictors of wellbeing and attainment outcomes. Established predictors were also measured, as these have been shown to be associated with both the independent and dependent variables. The results showed that hours at university had little effect whereas both time pressure and ratings of workload had significant associations. Time pressure was associated with course stress and negative wellbeing (life stress, depression and anxiety). Workload had a more global effect, increasing course stress and negative wellbeing, but also being associated with higher positive wellbeing, work efficiency and GPA scores. The effects of workload may reflect a challenge rather than a threat. The workload may initially be perceived as stressful, but the associated increased motivation may then lead to greater efficiency and attainment. Further research with a longitudinal design is needed to test this view, but at the moment, one can conclude that workload is a variable that should be added to the Student WPQ.

A Appendix

A.1 Students' Well-Being Questionnaire

The following questions contain a number of single-item measures of aspects of your life as a student and feelings about yourself. Many of these questions will contain examples of what thoughts/behaviours the question is referring to which are important for understanding the focus of the question, but should be regarded as guidance rather than strict criteria. Please try to be as accurate as possible, but avoid thinking too much about your answers, your first instinct is usually the best.

1.	Overall, I feel that I have low self-esteem (For example: At times, I feel that I am no good at all, at times I feel useless, I am inclined to feel that I am a failure) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
2.	On a scale of one to ten, how depressed would you say you are in general? (e.g. feeling 'down', no longer looking forward to things or enjoying things that you used to) Not at all depressed 1 2 3 4 5 6 7 8 9 10 Extremely depressed
3.	I have been feeling good about my relationships with others (for example: Getting along well with friends/colleagues, feeling loved by those close to me) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
4.	I don't really get on well with people (For example: I tend to get jealous of others, I tend to get touchy, I often get moody) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
5.	Thinking about myself and how I normally feel, in general, I mostly experience positive feelings (For example: I feel alert, inspired, determined, attentive) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

(*continued*)

(*continued*)

6.	In general, I feel optimistic about the future (For example: I usually expect the best, I expect more good things to happen to me than bad, It's easy for me to relax) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
7.	I am confident in my ability to solve problems that I might face in life (For example: I can usually handle whatever comes my way, If I try hard enough I can overcome difficult problems, I can stick to my aims and accomplish my goals) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
8.	I feel that I am laid-back about things (For example: I do just enough to get by, I tend to not complete what I've started, I find it difficult to get down to work) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
9.	I am not interested in new ideas (For example: I tend to avoid philosophical discussions, I don't like to be creative, I don't try to come up with new perspectives on things) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
10.	Overall, I feel that I have positive self-esteem (For example: On the whole I am satisfied with myself, I am able to do things as well as most other people, I feel that I am a person of worth) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
11.	I feel that I have the social support I need (For example: There is someone who will listen to me when I need to talk, there is someone who will give me good advice, there is someone who shows me love and affection) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
12.	Thinking about myself and how I normally feel, in general, I mostly experience negative feelings (For example: I feel upset, hostile, ashamed, nervous) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
13.	I feel that I have a disagreeable nature (For example: I can be rude, harsh, unsympathetic) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
Negative Coping Style: Blame Self	
14.	When I find myself in stressful situations, I blame myself (e.g. I criticize or lecture myself, I realise I brought the problem on myself). Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
Wishful Thinking	
15.	When I find myself in stressful situations, I wish for things to improve (e.g. I hope a miracle will happen, I wish I could change things about myself or circumstances, I daydream about a better situation). Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
Avoidance	
16.	When I find myself in stressful situations, I try to avoid the problem (e.g. I keep things to myself, I go on as if nothing has happened, I try to make myself feel better by eating/drinking/smoking). Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly

(*continued*)

(*continued*)

Personality	
17.	I prefer to keep to myself (For example: I don't talk much to other people, I feel withdrawn, I prefer not to draw attention to myself) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
18.	I feel that I have an agreeable nature (For example: I feel sympathy toward people in need, I like being kind to people, I'm co-operative) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
19.	In general, I feel pessimistic about the future (For example: If something can go wrong for me it will, I hardly ever expect things to go my way, I rarely count on good things happening to me) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
20.	I feel that I am a conscientious person (For example: I am always prepared, I make plans and stick to them, I pay attention to details) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
21.	I feel that I can get on well with others (For example: I'm usually relaxed around others, I tend not to get jealous, I accept people as they are) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
22.	I feel that I am open to new ideas (For example: I enjoy philosophical discussion, I like to be imaginative, I like to be creative) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
23.	Overall, I feel that I am satisfied with my life (For example: In most ways my life is close to my ideal, so far I have gotten the important things I want in life) Disagree strongly 1 2 3 4 5 6 7 8 9 10 Agree strongly
24.	On a scale of one to ten, how happy would you say you are in general? Extremely unhappy 1 2 3 4 5 6 7 8 9 10 Extremely happy
25.	On a scale of one to ten, how anxious would you say you are in general? (e.g. feeling tense or 'wound up', unable to relax, feelings of worry or panic) Not at all anxious 1 2 3 4 5 6 7 8 9 10 Extremely anxious
26.	Overall, how stressful is your life? Not at all stressful 1 2 3 4 5 6 7 8 9 10 Very Stressful
Please consider the following elements of student life and indicate overall to what extent they have been a part of your life over the past 6 months. Remember to use the examples as guidance rather than trying to consider each of them specifically:	
27.	Challenges to your development (e.g. important decisions about your education and future career, dissatisfaction with your written or mathematical ability, struggling to meet your own or others' academic standards). Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life
28.	Time pressures (e.g. too many things to do at once, interruptions of your school work, a lot of responsibilities). Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life
29.	Academic Dissatisfaction (e.g. disliking your studies, finding courses uninteresting, dissatisfaction with school). Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life
30.	Romantic Problems (e.g. decisions about intimate relationships, conflicts with boyfriends'/girlfriends' family, conflicts with boyfriend/girlfriend). Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life

(*continued*)

(*continued*)

31.	Societal Annoyances (e.g. getting ripped off or cheated in the purchase of services, social conflicts over smoking, disliking fellow students). Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life
32.	Social Mistreatment (e.g. social rejection, loneliness, being taken advantage of). Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life
33.	Friendship problems (e.g. conflicts with friends, being let down or disappointed by friends, having your trust betrayed by friends). Not at all part of my life 1 2 3 4 5 6 7 8 9 10 Very much part of my life
Please state how much you agree or disagree with the following statements:	
34.	There is a person or people in my life who would provide tangible support for me when I need it (for example: money for tuition or books, use of their car, furniture for a new apartment). Strongly Disagree 1 2 3 4 5 6 7 8 9 10 Strongly Agree
35.	There is a person or people in my life who would provide me with a sense of belonging (for example: I could find someone to go to a movie with me, I often get invited to do things with other people, I regularly hang out with friends). Strongly Disagree 1 2 3 4 5 6 7 8 9 10 Strongly Agree
36.	There is a person or people in my life with whom I would feel perfectly comfortable discussing any problems I might have (for example: difficulties with my social life, getting along with my parents, sexual problems). Strongly Disagree 1 2 3 4 5 6 7 8 9 10 Strongly Agree

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