

# Understanding and reducing stress in collaborative e-Learning

Naomi Lawless and John Allan

Open University Business School, Milton Keynes, UK

[n.lawless@open.ac.uk](mailto:n.lawless@open.ac.uk)

[j.s.allan@open.ac.uk](mailto:j.s.allan@open.ac.uk)

**Abstract:** On-line collaboration is becoming increasingly common in education and with organisations. It is believed that this can in itself cause stress for collaborators. We believe that in some ways stress can be designed out of on line collaborative exercises through management of the on-line working processes. This paper investigates methods of reducing stress on line and proposes some principles for constructing on-line collaborative events to ensure that stress is eliminated or at least minimised.

**Keywords:** On-line collaboration, stress, online learning, group roles, group cohesion, culture, reducing stress, barriers to online working, e-teams, e-Learning, cyber-stress, techno-stress, virtual teams.

## 1. Introduction

The Open University (OU) has some 220,000 students on-line using e-mail and web sites. Many OU courses now use students in small collaborative on-line teams (e-teams or virtual teams) to produce work that is assessed as part of their course work. In this collaborative work, students are dependent on each other and cannot work solely as individuals. As part of the OU, the Open University Business School (OUBS) uses collaborative on-line work extensively in their courses with more than 30,000 students per year in over 30 countries world wide. Collaboration on-line is increasingly a requisite of organisations sponsoring students with the OUBS. On-line collaboration is becoming part of normal organisational working practice – in particular in teleworking (working whilst on the telephone and/or connected to the Internet or an intranet).

Annual surveys of thousands of OU students by the Institute of Educational Technology show that on-line activity is one of the least popular elements of OU courses. This has also been the experience of the authors who have become increasingly aware, over the last five years, of the possible stressful effect for students undertaking on-line collaborative activities.

Stress is now the second greatest cause of absence from work in the EU (back pain is the greatest) with over 50% of absenteeism having its roots in work related stress – although this stress is lessened when teleworking from home (BT 2002). This is because home working means that the organisational environment is absent, and the worker has more control over their own work.

The stresses caused by teleworking and on-line collaboration are likely be similar in many areas, and this paper draws on experience in both teleworking and on-line collaborative activities. On-line collaborative activities are studied here in an educational context but are becoming increasingly common in organisational working methods. Virtual teams are becoming standard in education, training and work, Lipnack and Stamps (1997) define them as groups of people who interact through interdependent tasks guided by common purpose and work across space, time and organisational boundaries with links strengthened by webs of communication technologies.

Stress can be defined as ‘when the perceived pressure exceeds your perceived ability to cope’ (Palmer et al 2003). Stress is thus always perceived; a situation is only stressful for a given individual – not for all individuals. An external viewer cannot label an experience as stressful unless the subject displays physiological symptoms of stress, and there is a medical diagnosis concluding that stress is the cause, or the subject states that they have experienced stress. This means that one student may feel that a situation is ‘stressful’ whilst another student may perceive it as ‘enjoyable’. This may account for why some students in our study described particular activities as stressful, where others did not.

We believe that stress in a distance learning course, such as those dealt with in this paper, can be minimised through course design and by appropriate ‘acclimatisation’ of the student to situations such as collaboration at the start of the course. There is little, however, in the Distance Learning literature that deals with perceived stress in students. Simpson (2000) is one of the few writers to discuss stress in

relation to Distance Learning – but only does so in the general discussion of Stress Management, rather than the question of designing out stress from courses. Surveys of collaborative work in Australian Universities, such as that carried out by Scott et al (1997), have also indicated that collaborative work can cause stress, particularly when there are time constraints.

## 2. Earlier research

In 2000, drawing from experience of studying 2000 MBA students in on-line collaborative activities, two barriers to fully functional teleworking were proposed by Salmon et al (2000). The barriers were ‘technical aspects’ and ‘collaboration’ and it was found that both caused stress and had to be overcome for fully functional teleworking. These barriers are depicted in Figure 1.

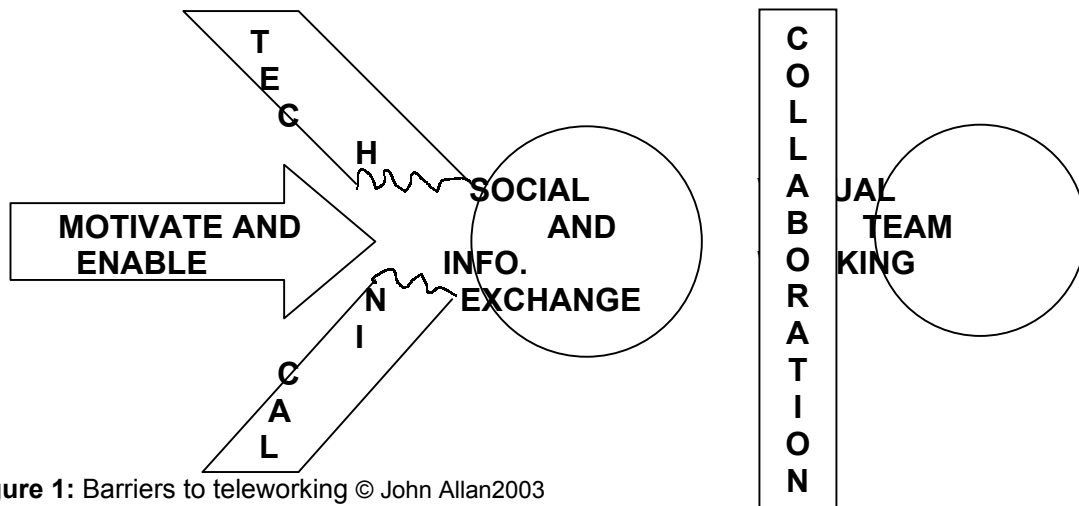


Figure 1: Barriers to teleworking © John Allan2003

A third, major barrier for virtual team working is lack of trust, (Walther 1992, Lipnack & Stamps 1997, Haywood, 1998, Jarvenpaa and Leidner 1999

<http://www.ascusc.org/jcmc/vol3/issue4/jarvenpaa.html>, Cohen and Gibson, 2003), where trust is ‘a confidence in someone’s competence and his or her commitment to a goal’ (Handy 1995). In fact Hall (1999) feels that trust is more of a problem on-line than face-to-face.

In the Open University we recognise the stresses that can be derived from technical difficulties and try to minimise them through the use of induction courses and helpdesks. These are, however, only aimed at the use of communication software and not collaborative methods

Traditionally stress caused directly through online collaboration has been considered less of an issue, so in order to ascertain to what degree it affects students a scoping study was carried out during the winter of 2002/2003. Students from two groups taking part in the one year long Diploma in Management course completed questionnaires to establish how they felt about their regular, course-based, online group activities. Students from the short, 18-day Online Management Challenge (OMC) course were also asked about their experiences whilst working online. The results, as well as showing that some students definitely do feel stressed when working online, revealed some other interesting findings. This has led to the development of the following proposed model to indicate the main factors in on-line collaboration stress.

TRUST	High	LOW STRESS	STRESS DEPENDENT ON PERFORMANCE
	Low	LOW STRESS	HIGH STRESS
		Low	High
		DEPENDENCY	

Figure 2: Stress caused by on-line collaboration ©John Allan 2003

### 3. Current research

In July 2003, over 120 students took part in the 18-day OMC online management course. They were asked to complete a brief web-based questionnaire beforehand, and those that did were then asked to complete a further questionnaire after the end of the course. There were 44 final responses and quotes from these are given in italics below.

All students were studying for the Certificate in Management, with over two thirds of the respondents being quite experienced at working online having studied the 'online' version, of the Certificate course, that is with online tutorials rather than the standard face to face tutorials.

#### 3.1 Technology and stress

The technology used may have a significant influence on online activity (Kayworth & Leidner, 2002) and it affects the way people interact in terms of the communications environment it provides and the ease with which people can use it (Yoo & Alavi, 2001, Walther, 1996).

##### 3.1.1 Technology provision

In the OUBS we use First Class as the conferencing medium and for the OMC it is accessed via a web interface. Although it offers very useful features and has a user-friendly interface, we occasionally experience problems with our technical provision that inevitably create stress for the students.

*'some days I missed [logging on] due to technical difficulties'*  
[student quote]

##### 3.1.2 User technology

Technical problems were, however, mainly at the user end:

*I 'experience[d] a few computer problems which restricted me a couple of days'*

##### 3.1.3 User technology skills

If the software is new to the student and is not very intuitive to use, the students' lack of skills can also create anxiety as the students struggle to 'make the technology work'.

### 3.2 The organisation

The organisation can be very influential with respect to the experience of the students, two of the main areas it can affect are culture and tutor support. (It is worth noting that at this stage we are only considering organisational culture; national and functional cultures are not explored here.)

#### 3.2.1 Culture

In this instance the organisation is the OUBS and the culture is that which pervades all our online courses in terms of tone, activities and support. The less experienced students taking part in the course had some familiarity with online support but little in the way of online OUBS courses; the more experienced students had a better understanding of what to expect. This is shown by the less experienced student expecting to log on about once a day, and the more experienced students anticipating between once and more than once per day; the higher figure being a more realistic expectation.

1	once every 2-3 days	Av. for inexperienced students = 2.08 Av for experienced students = 2.53
2	once a day	
3	more than once a day	

**Figure 3:** Student expectations for logging on

There are also differences between working on the OMC and in online tutorials in the Diploma course. In the OMC the students are far more self-directing and the lack of provided structure leads them to become rapidly aware of the different behavioural aspects of working online. To use a metaphor, in our normal face-to-face lives we understand expected behaviours such as the need to form a queue at the supermarket checkout, but online there are rules that many students are unaware of in which case there is a higher risk of unacceptable (or unexpected) behaviour. The organisation needs to acquaint the student with the rules for online working, in that specific context, if it is to avoid the stress caused by misunderstandings, for example how often they should expect to be posting messages:

*'I posted more than I thought I would as it was essential if I wanted to join in the debate and discussion'*

*I posted 'quite a lot more than expected but we communicated really well so that was great'*

*'I posted more than anticipated. This was clearly due to the enjoyment level'*

Or how often they should be logging in:

*'I had to log in several times a day in the important periods, I thought I would be able to log in just once a day!!'*

*Work pressures meant that 'I only had a chance to log on once each night....it did make the [OMC] more stressful'*

### 3.2.2 Tutor support

The organisation can also influence the students' experiences by ensuring that the tutors are well prepared and trained, so that they help to manage students' expectations:

*'Being in contact early by the tutor in response to my concern...alleviated a lot of stress.'*

### 3.3 The Individual

The individual brings their own working and behavioural preferences to any group activity, and although many of us are aware of how we work in a face-to-face environment, we may have had less opportunity to consider and reflect upon how we work in an online environment. On one level it is worth being pragmatic about these differences:

*'These are however problems faced in everyday working life'*

However it is also worth considering what factors can be mitigated against in advance, in order to reduce stress. The following were some of the main sources of frustration.

#### 3.3.1 Student expectations

These have already been referred to above, but it is not just the organisation that can influence these; the student themselves can prepare themselves for the online experience in order to ensure that their expectations are realistic. This can be done through reading any preparatory materials and talking to other students who have already gone through that experience, either in person or through online discussions.

#### 3.3.2 The pace of asynchronous working, including the time taken to build relationships

Walther (1996) notes that forming relationships online is slower than face-to-face, although the amount of information exchanged is the same, thus many students found it frustrating to be trying to build relations and work asynchronously.

*'I did get frustrated with the asynchronous nature of the communication'*

*'People dipped in and out according to their daily schedule, and only a couple of times met at once. This was one of the difficulties of my experience of working online'*

*I suffered 'Frustration with the initial slow pace of things'*

#### 3.3.3 Time pressure

The OMC is designed with a tight time-frame in order to motivate the groups to form and work together, any longer and the momentum starts to be lost. This can be seen to work:

*The time factor ... made me contribute earlier than I normally would.'*

However students do struggle with balancing home, work, revision for their exam and the OMC:

*'the time constraints of the challenge proved difficult.'*

Subsequent delays then affect the other group members:

*'I...found it very frustrating waiting for others in the group to make their contributions.'*

#### 3.3.4 Task participation

Group decision-making literature shows that groups work more positively if there is active task participation (Yoo and Alvai 2001), if this is absent it can lead to stress:

*'It was also quite frustrating at times if people didn't participate'*

#### 3.3.5 Group roles

As the students work together there needs to be a recognition of the differences between group members and the fact that these can be useful, not necessarily detrimental, to the

group (Shaw & Barret-Power 1998). Some students recognised this:

*'Allow room for all the styles and types as this provides the most efficient and effective methods of making decision and problem solving – as well as a wide varying range of personal views'*

### 3.3.6 Group cohesion

Group cohesion is a way of describing members' attraction to the group' (Hogg 1992 p30) and forms as a result of the group development process (Tuckman 1965). Groups are seen to work better when there is group cohesion (Yoo & Alavi 2001). Over 90% of the OMC students felt that a sense of group responsibility helps the group to work and many of their comments reflected their own commitment

*'Realising that someone had put a lot of effort on a particular activity ...I could not disappoint him'*

*'I didn't want to be responsible for letting the team down'.*

This commitment is built through supportive activities, such as responding or recognising the work of others:

*'A thank you for your contributions made a big difference'*

*'Feedback on ideas... encouraged further posting'.*

If this is not done this too can lead to stress:

*I felt 'Annoyed that people did not answer or acknowledge points input by me'.*

## 4. Discussion

Stress is not a medical condition but is based on the perception of an individual, thus what may appear stressful for one person may be viewed as a challenge by another. It is therefore important to understand what the individual's perceptions are and address these if we are to address the issue of stress with online working and learning.

Our earlier work showed that students certainly do experience stress when working online, but that this is not always for the reasons you would expect.

'Asynchronous Anxiety' is a term used to describe stress from on-line activities caused by a distrust of asynchronous activity. Students

are worried that their computer skills are not up to a long period of robust on line collaboration. (Crouch and Montecino 1997) [http://leahi.kcc.hawaii.edu/org/tcc\\_conf97/pres/crouch.html](http://leahi.kcc.hawaii.edu/org/tcc_conf97/pres/crouch.html) and 'Technostress' is a term used to describe the stress felt by employees when receiving demands from managers by e-mail without the buffering effects of face-to face-interaction (Gardner & Scheemerhom 1988) leading to significantly increased stress (Duxbury et al 1995) <http://hsb.baylor.edu/ramsower/acis/papers/staples.htm> . We found evidence of both Asynchronous Anxiety and Technostress amongst the students.

In our own research we discovered that students experience what we term *e-team stress*, which occurs when team members feel pressured not to let down the other members of their team.

Our current research shows that there are further factors that influence participants and that the factors influencing this are predominantly at the technological, organisational and individual levels. Through understanding the influences it may therefore be possible to address some of them in order to reduce or remove the factors that cause stress for some individuals.

### 4.1 Reducing stress caused by technology

In the first instance the technology used should be as user-friendly and as trouble-free as possible, providing a comfortable, accessible learning space.

Some elements of stress for students can be minimised through:

- Specifying the minimum technology standards required by the students
- Specifying the minimum prior knowledge level of the student, including their technical skills level.
- Running induction courses for students who have a skills shortage
- Maintaining a Help Desk to address technical problem that arise

### 4.2 How the organisation can reduce stress

The organisation needs to recognise its own working culture, and may need to adapt it if necessary to enable trouble free online working. This may involve creating a set of rules for online working to expedite students'

adaptation to working in the online environment, as well as providing accurate predictions for workload and working patterns. It may also involve briefing the tutors or facilitators on how to prepare the students.

#### 4.3 Reducing stress at the individual level

The students need to recognise and understand their own online group-working preferences, as well as being aware of other people's. They should ensure adequate preparation, recognising that as this is still a relatively new medium for learning they may need to consider additional factors. These include:

- The pace of asynchronous working, including the time taken to build relationships
- The time pressure
- Group roles
- Group cohesion

#### 5. Follow up research

Following on from this we identified two areas for follow up research. The first was carried out during the winter of 2003/4 where the implications of the findings were tested on a group of students starting the Diploma in Management. These students began their course in November 2003 and will be working together until October 2004, carrying out regular online collaborative activities as part of their course learning.

The students first made contact with the tutor and each other on-line and carried out a simple exercise to acquaint themselves with each other and to begin to become familiar with some of the issues they might be facing with their online working. This was followed by a face-to-face meeting where the problems of asynchronous working were discussed between students comprising the online work groups. Each group was asked to draw up its own protocols for collaboration and to identify online group roles that would be rotated throughout the year.

After the first collaborative assignment students were given the same questionnaire as in 2002 and the results are given below.

*13% of students felt 'stressed' other than through purely technical problems*

These students indicated that the perceived peer pressure from having to collaborate was a

major factor, what we have termed *e-team stress*.

Although this is only a small scale test, it can be seen that modifying the structure of the course to include a simple, non threatening, 'fun' on-line collaboration exercise, has the effect of significantly lowering the stress felt by students in subsequent on-line collaborations (compared to previous cohorts where the average was approximately 50% who felt stressed).

The second area for follow-up work involves further research into the students of the short, OMC course. The lessons learned have been applied to developing an introductory activity that is designed to alert the participants to a number of issues and required actions that affect online collaborative working. It is intended that by highlighting these factors at an early stage, and by using them as a trigger to aid the groups to develop working protocols, the groups will be able to form then perform (Tuckman, 1965) more quickly than those groups that have not been prepared in this way. It is also anticipated that this will make the online working experience less stressful.

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