Cyberpsychology: Psychological Processes That May Affect Dropout Rates among Online IT Security Students

Tom Drange[1,2] and Joakim Kargaard[3]

[1]Noroff University College, Elvegt 2a, 4608 Kristiansand, Norway
[2]University of Sunderland, Faculty of Computing, Engineering and Technology,
David Goldman Building, St Peters Campus, Norway
[3]Noroff Education, Elvegt 2a, 4608 Kristiansand, Norway

Keywords: Online Education, Cyberpsychology, Social Anxiety, Drop out Rate.

Abstract   "Peter" is an online student in an IT Security program, and since the educational institution offers it online and he is a shy person, he thought that he would feel more comfortable at home, not having to face a lot of new people. As the number of online studies increases so does the dropout rate among these students. Research has shown that about 85% of people suffering from social anxiety have difficulties maintaining relationships as well as coping with academic challenges. Social anxiety could be the main contributor for young people to select studying online rather than in a physical classroom and therefore there may be a strong correlation between academic difficulties, social anxiety and the dropout rate for online students. This paper aims to enlighten educational institutions and staff that offers online study programs, by following "Peter" and his challenges, and at the same time discuss the different psychological processes he goes through and try to relate these to the rising dropout rate in higher online education. "Peter" is, of course, a fictive character, but with challenges, the authors experience from students on a frequent basis. The authors base the discussion on own experience and recent research.

1   INTRODUCTION

Peter is staring at the screen. He does not get it. He is trying to configure a router but does not seem to get his head around the subnetting of IP addresses, and he keeps getting an error message from the console. He has asked for help via the chat channel used by students in his class, and the last message there is shining brightly at him…" Don't you understand?" No. He does not understand. He feels stupid. Maybe this was not such a good idea after all. Maybe this study program is too complicated. Maybe he is just not cut out for it.

10-15% of us will during a lifetime experience social anxiety according to NHI.no (nhi.no, 2013) and after a student survey revealed a 49% completion rate from our online study programs (Figure 1) the authors conducted a short survey of online students undertaking a Network and IT-security program the academic year 2016-2017. The survey (Figure 2) showed that 17.6 percent of our online students lists psychological difficulties as one of the top reasons for
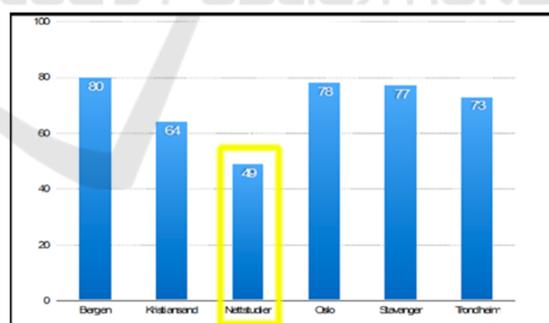

Figure 1: 49% completion rate in online studies.

choosing online studies over traditional classroom-based study programs (Drange and Kargaard, 2017).

The purpose of this paper is to discuss the different settings an online student might find him or herself in and the psychological processes that could result in the student dropping out. We will follow "Peter", a fictive student, through different scenarios and reflect on what in those scenarios could have an impact on the student's decision to either stay on the program or quit.

2 PERCIEVED WORKLOAD

Peter is struggling with social anxiety and has often chosen solutions based on that. So, when choosing his educational path, choosing the "easy way out" felt natural to him. Online studies seemed more comfortable since he would not have to face any fellow students, and he could avoid situations where he usually would feel anxious.

However, Peter did not consider the Cognitive load theory, that indicates that if an individual exceeds the working memory capacity of during learning, then the actual learning is inhibited (de Jong, 2010). De Jong (2010) also separates cognitive load into three main categories; intrinsic cognitive load that refers to taught topics, extraneous cognitive load that relates to how one presents a topic and germane cognitive load which is the learner's way of constructing the knowledge. Some criticise the cognitive load theory for conceptual limitations, such as cognitive resources spent versus maximum cognitive capacity and the fact that the level of difficulty will affect student motivation and therefore also the number of cognitive resources invested in the learning activities (Moreno, 2009). Regardless this will, of course, have an impact on the perceived workload by the student. The learning environment itself will often be new to students who will then have to spend time getting accustomed to this new environment. When fellow students are unfamiliar, and their behaviour is foreign to us, as the situation typically is during the start of a new class, then we often struggle with getting a reasoned impression (Suler, 2016) and this will also add to the perceived workload. Because of these elements, a high level of self-directed learning is needed to be successful in online education. Great flexibilities both regarding schedules and formal synchronous support and guidance from instructors and teachers also call for this. Self-directed learning is "a process in which individuals take the initiative, with or without the help from others" (Song and Bonk, 2016). According to Candy (1991), one can divide self-directed learning into four dimensions; self-direction as a personal attribute; as the motivation to conduct own education; as the willingness to organise instruction in formal settings and the individual pursuit of learning opportunities. Self-directed learning is more common amongst adult learners than young students. The reason for that may be related to the fact that adults see the world differently from younger learners and realise that to stay ahead in a career, they need to engage in self-directed learning (Ruvinsky, 1986).
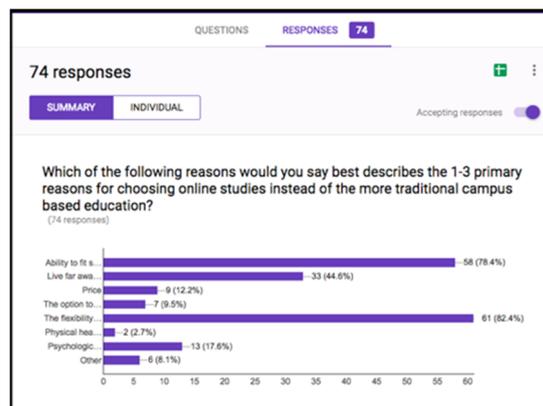

Figure 2: 17.6% list psychological difficulties as one of top four reasons for choosing online studies.

3 CYBERPSYCHOLOGY

Peter is communicating online with his peers and his tutors and teachers. He is mainly using text, communicating through forums and direct messaging. He put out an alternative solution on the forum related to an activity published by the teacher to get some responses from his fellow online students, but he is getting less than helpful feedback. Some of them are even indicating that he is stupid.

Dissociative anonymity provides people with the perception that they can be rude and disrespectful without anyone knowing who he or she is (Aiken, 2016) (Suler, 2016). If the educational institution is making use of text-based communication systems with no requirement of real usernames or identity indicators, then the dissociative anonymity might cause students to be blunt in their ways of communicating. People who have chosen the online environment to avoid having to face other students might have a lower threshold for feeling hurt and might, therefore, be offended more severe and quick compared to what perhaps would be considered normal among students in a brick and mortar university environment.

Another situation we often experience online is when we do something, such as clicking a button, sending an e-mail or a message and expect something to happen or receiving a response. If nothing happens by clicking the button, or one receives no response by sending an e-mail or a message through any of the overwhelming numbers of communication tools available, we experience what Suler (2016) calls a "black hole". The website http://truecenter publishing.com/psycyber/blackhole.html illustrates this feeling perfectly, providing visitors entering the

site with a black wall of nothing. The visitor then have to scroll a bit to find the actual text - but the first seconds after entering this website, one experiences that feeling of uncertainty "did I enter the correct URL?", "is my browser malfunctioning?", "is someone playing a joke on me?".

Transference is when earlier experiences have formed internal templates of what is normal feelings and reactions in different situations, and these templates affect how we unconsciously experience other people (Suler, 2016). Transference could along with black hole experiences, the feeling one experiences when one expects feedback and do not get it, create unfair and inappropriate reactions towards fellow students in a text-based chat.

In this environment that is new to Peter, he has made an effort to create a profile to reflect the person that he would like to be. A sort of better version of himself. "Why are they implying that I am stupid? Why do they not like me? My profile picture is cool, and I look good on it" he thinks to himself. "I even wrote that I work out on a regular basis and that I enjoy travelling, food and wine".

As we all do at some point or another, Peter thought that his "best version" of himself would be appreciated. We all do this in a more or less conscious way on social media – adding the profile picture we are most proud of, enhancing the interests and hobbies we think make us look more exciting and so on. However, what if our best self is not good enough? If our perfect self, does not get any likes, what then about our real self?

When humans communicate in real-life, we use visual cues to guide us along the communicative path. If the receiving party wrinkles his/her nose, we might think that the line of arguments is not appreciated, and therefore steer the conversation in other directions. We might even think before we speak, and restrain ourselves from saying things that we expect will create an adverse reaction. This inhibition is often not present in online communications, and the restraints one usually feels becomes blurry, and one might express things that one would not do in a face to face conversation. This situation is called the online disinhibition effect (Aiken, 2016)

The normalisation effect happens when we see or hear things on many enough occasions to make it seem reasonable. Our brain builds a model based on experiences and associations that connect actions and incidents and forms an idea of what is normal and expected. Kahneman (2013) states that surprise comes in two states; when an actively expected event does not occur, or when something happens that one does not expect. However, if something unexpected

occurs several times, one ceases to be surprised. For instance, if one suddenly and without warning hear an explosion, that will probably seem surprising because one does not expect it and one will, therefore, categorise it as "not normal". If then, a couple of minutes after, another explosion goes off, one will not be as surprised as with the first explosion. This situation has now become something that is considered normal under some circumstances but not probable enough to actively expect it to happen (Kahneman, 2013). For participants in a forum or an online learning environment, the normalisation effect can occur when people often use abusive and offensive expressions, and along with the online escalation effect described by Aiken (2016), the feedback can get more and more ugly, discouraging anyone from posting anything in a learning forum.

Because Peter is a timid person, he rarely speaks to other people, at least not in person. He has a lot on his mind, and sometimes, to take the load of things, he posts his innermost thoughts on an anonymous forum outside the school's learning environment. Feeling alone with his experiences, he reveals that someone abused him as a little boy.

Sometimes, the dissociation effect and the disinhibition effect causes people to act contradictory online, not revealing personal details such as name, address and date of birth but do reveal very intimate information about thoughts and actions, such as adultery or experiences of child molesting. Even if one confesses such things in anonymous forums and as such make one feel protected, they are still shared with strangers, investing in their opinion. The stranger(s) might then respond, and the anonymity provided by an anonymous user account will not shield the confessor from the feelings negative responses triggers (Turkle, 2012).

Suler (2017) identifies eight dimensions of cyberpsychology; Identity, Social, Interactive, Text, Sensory, Temporal, Reality and Physical. The Identity dimension is the dimension from which the rest feed (Suler, 2017). This dimension is the sense of self and allows people to determine who they are or are not within the cyber world. As users of cyberspace, it is possible to create identities which can be different depending on the application in use at a specific time. This possibility allows people to interact in a way very different from how people would interact in the physical world. If one uses the eight dimensions of cyberpsychology as a framework, it is possible to identify different online habitats, and each of these habitats provides a unique psychological experience (Suler, 2017).

Peter is panicking. His teacher just posted the assignment for the term paper, and it involves a presentation! Peter feels lost…"I can certainly do the poster requirement, and the justification paper...but presenting in front of the other students, even if it is not in person but through video conferencing? That is never going to happen. I need to address this with my teacher, and if I cannot do it in another way, I will quit!"

4 SOCIAL ANXIETY DISORDER

Social anxiety causes mild sufferers to experience social apprehension, and in more severe cases sufferers experience complete fear and avoidance (Russell and Topham, 2012). A common mental health problem, social anxiety, has been shown to affect social relationships and academic problems. Research indicates that 85% of people suffering from social anxiety have problems with academics (Villiers, 2009). In a study in 2004, Wetterberg (2004) found that 21% of seventeen-year-old school students in Sweden reported that social anxiety caused study problems. The Liebowitz Social Anxiety Scale (LSAS) is a tool that is very commonly used to measure social anxiety. The scale measures fear, and avoidance and the score indicate the level of social anxiety. One measures this by using twenty-four questions based on social situations, each measuring fear or avoidance, on a scale of 0-3. There is a total of 48 questions (Beard et al., 2011). The maximum score available is 144. Total scores between 60 and 90 indicate respondent is very probably suffering from Social Anxiety Disorder and scores above 90 indicate that respondents have a high probability of suffering from Social Anxiety Disorder. Using Google Forms, a survey was set up based on the LSAS social questions, for Noroff Vocational School students that started the academic year for the first time in August 2017 as well as for Noroff University College students. The survey included an option to indicate if the student was an on-campus student or an online student. The survey was anonymous, and therefore the assumption was that responses were honest. Based on research, people scoring high on the Liebowitz Social Anxiety Scale would be more likely to be online students, as they would want to avoid social situations with other students. This social anxiety could also affect dropout rates amongst online students as they would be more likely to give up when they perceive something as too demanding.
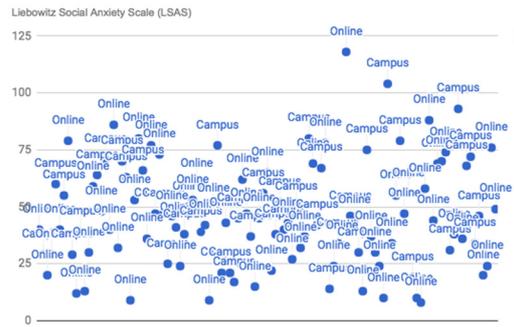

Figure 3: LSAS score for online and on-campus.

The study showed that the median score for the sample of 112 students was 44. This result indicates that 50% of the respondents are below that value and therefore are unlikely to suffer from Social Anxiety Disorder. However, 50% of the students might suffer from some level of Social Anxiety. Figure 3 shows that the respondent who scored the highest total, 118, is an online student.

Table 1 indicates that the number of respondents who scored within the various scale ranges. The scores show that many of the online students scored below 70, indicating that not all online students have a social anxiety disorder. Overall, the number of campus students scoring below 70 on the LSAS test was higher than the number above 70. As per Table 2, nine campus students scored 70 or more in the LSAS test versus twelve online students. The results do indicate that more online students suffer from

Table 1: The table shows the number of students, both Online and Campus, who scored within each value of the scale, from 10 to 130.

Scale	Below Scale Online	Above Scale Online	Below Scale Campus	Above Scale Campus
10	7	75	0	48
20	13	69	3	45
30	24	59	10	39
40	39	44	21	28
50	54	27	29	20
60	62	19	34	15
70	70	12	40	9
80	77	4	46	3
90	79	1	46	2
100	79	1	47	1
110	79	1	48	0
120	80	0	48	0
130	80	0	48	0

social anxiety. More online students than campus students took the test, hence the higher number of online students scoring below 70 versus the number of campus students. Although the percentage values indicate that 7.09% (Table 3) of the campus students survey suffer from social anxiety, compared to 9.45% of the surveyed online students, the sample size was not large enough to offer conclusive results.

Table 2: The table shows the number of students who scored above and below 70 in the LSAS test.

Campus (above and below 70)	Online (above and below 70)
9	12
39	68

Table 3: This table displays the percentage of Campus versus Online students scoring above and below 70 in the LSAS test.

% of Campus students above and below 70	% of Online students above and below 70
7.09%	9.45%
30.71%	53.54%

5 ISSUES

Grieve et al. (2017) set out to bridge the gap in the literature regarding the relationship between individual personality differences such as social anxiety and extraversion, and how these students perceive face-to-face and online learning activities. The result in this research shows no significant difference in how students with social anxiety and high level of extraversion perceive online learning activities. These findings contradict the indications from our study. The reason for this may be because the research was carried out on students that have already overcome their social anxiety enough to attend a traditional brick and mortar university. The authors also aimed to include those individuals that actively choose online studies to avoid situations that trigger their fear and social anxiety, since experience from a decade of online teaching indicates that the attitudes these students have towards face-to-face practical activities and online learning activities differ very much from existing research. As mentioned, the sample group was not large enough to present any conclusive results beyond the indications. According to Bandelow and Michaelis (2015) it is easier for people with panic attacks to acknowledge their

challenges, as the perception is that these attacks are more physical disorders than a psychological one. Psychological disorders, although frequently admitted by celebrities in the media these days, are still by many young adults considered a sign of failure. In anonymous, non-psychologist/psychiatrist lead surveys like the LSAS test published on our course pages, one would therefore still have responders refusing to acknowledge their challenges and therefore minimising their fear and avoidance levels. The test questions were also in English, while the responders are Norwegian, so language issues might also affect the outcome of the test.

6 CONCLUSIONS

Peter is typing frantically...he is communicating with his teacher through chat, regarding the poster presentation. "I really cannot do this...this was the very reason I quit my last college...is there any other way to do this?"

His teacher is understanding and grants him the privilege to present his poster in a one-to-one session through Skype. "Thank you so much; I appreciate this!" Peter is starting to calm down. He has managed to avoid another situation where his fear of making a fool out of himself would be overwhelming.

Social Anxiety Disorder affects many people. It impacts how sufferers interact with the world around them. The wave of new technological innovations has made it possible for severe sufferers to remain at home rather than needing to venture out. The advent of online education has undoubtedly aided sufferers in getting access to quality education without having to leave their homes, and educational institutions and personnel must bear this in mind. However, even if more caring and understanding is an essential tool, is it the right thing in every circumstance? What about Peter? He has an understanding teacher that grants him special privileges due to his condition, after all, we all want our students to succeed. However, what then when Peter has completed his degree and is going to apply for a job? He will be called into interviews and will have to "sell" himself as a knowledge worker that will fit into the social structure of a potential workplace. Will Peter manage this, after being granted ways around this all his life?

Although the results of the survey were not conclusive, there is indeed scope for more research. The indications are that people with social anxiety issues elect to study online rather than on-campus. With a larger sample size, it is probable that the

results would indicate more conclusively that online studies are the choice for more people with these challenges. This increase of students with social anxiety in online study programs then would affect the dropout rate as they would be more inclined towards the point of least resistance.

7 FUTURE RESEARCH

As this research is ongoing as a part of a PhD program, the next step will be to do a control test with another tool to measure the level of social anxiety within the same cohort of students. This test will then be compared to the previous test to see if there are correlations between them. The authors will then interview a volunteered selection of both campus-based and online based students with known social anxiety issues. Finally, the authors will create a new survey based on the interviews, to further support or refute the theory that students with social anxiety will, in fact, prefer online study programs over traditional brick and mortar educational programs - when given a choice.

REFERENCES

Aiken, M. (2016), The Cyber Effect. John Murray Publishers.

Bandelow, B. and Michaelis, S. (2015) Epidemiology of anxiety disorders in the 21st century. Dialogues in Clinical Neuroscience, 17(3), pp. 327–335.

Beard, C., Rodriguez, B.F., Moitra, E., Sibrava, N.J., Bjornsson, A., Weisberg, R.B. and Keller, M.B. (2011). Psychometric Properties of the Liebowitz Social Anxiety Scale (LSAS) in a Longitudinal Study of African Americans with Anxiety Disorders. Journal of Anxiety Disorder, Volume 25 Issue 5, pp 722-726.

Candy, P. C. (1991). Self-direction for lifelong learning: A comprehensive guide to theory and practice. San Francisco: Jossey-Bass.

De Jong, T. (2010), Cognitive load theory, educational research, and instructional design: some food for thought, Instructional Science, March 2010, Volume 38, Issue 2, pp 105-134.

Drange, T. and Kargaard, J. (2017). Increasing student/student and student/lecturer communication through available tools to create a virtual classroom feeling in online education, International Scientific Conference eLearning and Software for Education Conference, Bucharest, Romania on April 27-April 28, 2017.

Kahneman, D. (2013), Thinking, Fast and Slow. Farrar, Straus and Giroux.

Moreno, R. (2009). Cognitive load theory: more food for thought. Springer Science+Business Media B.V. 2009.

Nhi.no, (2013). Sosial Angst. [Internet] Available at https://nhi.no/sykdommer/psykisk-helse/angsttilstander/sosial-angst/ (Last accessed, November 30th, 2017).

Russell, G. and Topham, P. (2012). The impact of social anxiety on student learning and well-being in higher education. Journal of Mental Health, Volume 21 Issue 4, pp 375–385.

Ruvinsky, L I 1986 Activeness and self-education (J. Sayer, Trans.). Progress Publishers, Moscow.

Song, D. and Bonk, C.J. (2016) Motivational factors in self-directed informal learning from online learning resources, Cogent Education [Internet] Available at https://www.cogentoa.com/article/10.1080/2331186X.2016.1205838.pdf (Last accessed, November 30th, 2017).

Suler, J. (2016), Psychology of the digital age - Humans become electric. Cambridge University Press.

Suler, J. (2017), Psychoanalytic Cyberpsychology. International Journal of Applied Psychoanalytic Studies Volume 14 Issue 1, pp 97–102.

Turkle, S. (2012), Alone Together: Why We Expect More from Technology and Less from Each Other. Basic Books.

Villiers, D. (2009). Perfectionism and Social Anxiety Among College Students. 1st ed. [ebook] Boston: Northeastern University, p.3. Available at: https://repository.library.northeastern.edu/files/neu:976/fulltext.pdf (Last accessed, November 30th, 2017).

Wetterberg, L. (2004). Social anxiety in 17-year-olds in Stockholm, Sweden – A questionnaire survey. South African Psychiatry Review, Volume 7 Issue 2, pp 30–32.