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**FACULTY OF LAW, ARTS & SOCIAL SCIENCES**

**SCHOOL OF EDUCATION**

**A small-scale study of feelings about dyslexia in relation to the uptake of specific learning support amongst students with an identified dyslexic learning difference in an HE institution**

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of the degree of MSc (SpLD)

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**"I'm just as good at things as other people, but I think about and do them in a different way"<sup>1</sup>**

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<sup>1</sup> Humphrey, N., Mullins, P.M., (2002)

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## **Abstract**

This small scale research project explores attitudes towards dyslexia and the interrelation of these with the uptake of a differentiated learning and study support provision for students in a higher education institution. The study focuses on exploring why a significant proportion of students who are entitled to use this differentiated resource appear either not to do so at all, or use it very infrequently.

A group of 86 students were identified who shared similar characteristics such that they were all due to graduate at the same time-point, were all registered with the support service before an earlier established time-point, and were all identified as dyslexic. This group was then divided according to their use of the support service as determined by their respective frequency of access to the computer facilities over a specific date-to-date interval so that two distinct subgroups of users could be identified: those who access the support on a regular basis (Users) as opposed to those who are rarely, if ever seen (Non-Users).

The research has been specifically interested in exploring the differences between students' attitudes and feelings about their own dyslexic learning differences and their perceptions of the impact that the syndrome has on their study regimes to try to understand if this was a factor in determining this disparity of use of the support facility. The psychological construct of Locus of Control (LoC) has been used as a quantifier of attitudes and feelings for each individual, which was deconstructed into five psychological sub-constructs to enable a 'profile' for each student to be established so that similarities and/or significant differences might be more easily identified. The hypothesis being tested is that students with a higher Internal Locus of Control will be the students who use the learning support service more rarely (or in terms of a null hypothesis: choice of uptake of learning support is independent of level of Internal Locus of Control).

Both quantitative and qualitative analysis of the data collected has been applied, and although overall no statistically significant differences were identified between the two sub-groups using the parameters defined, interesting similarities and differences between Locus of Control characteristics were exposed, and some statistically significant differences between the two groups did emerge when exploring the sub-components of the psychological constructs used to establish the overall LoC profiles. An innovative, graphical presentation of the profile for each individual was developed which enabled more qualitative analysis to be undertaken and when taken together with personal comments from individuals who completed the research questionnaire, this analysis did then reveal some clear differences between the profiles of those who use the support service and those who do not.

## **Section 1: Theoretical perspectives and practical settings**

### **Introduction:**

Why do some students use a learning support services designed for them and others do not?

Searching for evidence to address this fundamental question is the rationale that underpins the research for this dissertation.

The researcher's position as a staff-member in an academic and technology support service at this University has provided a good opportunity to engage in a small-scale research project that attempts to contextualize generalized observations of student behaviour and anecdotal evidence about their feelings towards disability, and dyslexia in particular, into a more scientific framework.

Over the five year period that the researcher has been working in this learning support environment, it had been noticed that there appeared to be a marked distinction between outwardly similar students when looking at their uptake of the support provided for them. It was evident that many students who were entitled to use the support were keen to access a good deal of the resources provided from the earliest stage of their entitlement to do so, whilst others would arrive to register with the service and then seldom be seen again.

So the rationale that has driven this project is an attempt to explain this disparity in behaviour, not the least because it is an important criterion to take account of for strategic planning and development for the future of this support provision in the university, but also because it may illuminate attitudes to support services provided in tertiary education settings particularly in the context of attitudes and feelings towards individual disability and in relation to the uptake of these support services from amongst those to whom they are clearly directed.

This is all the more interesting and relevant in the light of the dearth of research into participation in specific student support in universities. Avramidis and Skidmore (2004) usefully summarize the situation that existed in the earlier part of this decade indicating that most research into the experiences of disabled students in higher education appears to have been focused on aspects of access and entitlement to services. Generally this seems to have been in response to the requirements for institutions to comply much more rigorously with the stipulations embodied into the original Disability Discrimination Act (Office of Public Sector Information, 1995), and more latterly as a result of the subsequent amendments and additions which negated the original exemption of education from the

Act. Particularly these have been through the introduction of the Special Educational Needs and Disability Act (SENDA) (Department for Education and Skills, 2001), and most recently in order to comply with the stipulations set out in the Disability Equality Duty (Disability Rights Commission, 2005) which now requires educational institutions including universities to be *proactive and anticipatory* of the requirements of those with unconventional needs, rather than reactive and thus merely responsible for providing minimal 'reasonable' adjustments when these are requested.

In this respect, and given the interest from other institutions, this Service at this university appears to be in the vanguard of providing focused learning support in a higher education context. The lessons learned in the field are increasingly commensurate with the growing groundswell of research advocating the rising demand of both learning support more generally across the higher education sector, and particularly how the provision experiences being noted by those working in differentiated services such as that operating at this institution can provide valuable markers of 'good practice', clearly useful for addressing the issues of how to make learning and teaching more inclusive across the board at universities through the actions of meeting the needs of those who have particularly learning requirements that may be defined by disability.

We might reflect on this in the light of earlier signposting by Nunan et. al. (2000) that the politically driven evolution of a market-oriented higher education environment that was antipathetic to the development of inclusive learning and teaching has now been dragged almost kicking and screaming into the latter years of the first decade of this century through the stipulations of legislation rather than through a more honourable rationale based on fairness and accessibility to ensure that everyone has equal access to the learning and teaching curriculum. It is only with some irony therefore, that we might also reflect that this legislation, together with the increasingly voluble vox populi of the steadily rising numbers of disabled people entering higher education, appears to be fostering the establishment of differentiated provisions rather than inclusive ones. The gist of Barnes (2007) is important here: His reflections on the 'politicization of disability' (ibid, p135) and observations that the social model of disability may actually be responsible for the somewhat protracted discourse between disabled activists and the academy because it continues to lack focus in the direction of access to *learning* for disabled students is significant, and although we might interpret his discussion as quite relevant it is ironic due to its very exclusion of the single most numerous group of disabled students in higher education when it comes to issues of accessibility - those with a dyslexic learning difference. In the wider disability context, this group remains somewhat marginalized because their disability is hidden. Significantly, Madriaga (2007) more generally claims that there continues to be a low proportion of disabled people in higher education suggesting that this may be due to 'disablism instutionalized within many sectors of education' (ibid,

p399) but may also be because those with dyslexia are frequently not considered as significantly disabled and therefore not part of the head-count.

However, on a more positive note let us be encouraged none the less by Boxall et.al. (2004) and also by Fuller et.al (2004) amongst others, who take similar views that a significant factor in ensuring that provision for accommodating disability in all its forms in the higher education sector should be part of a proactive cycle of identification of need and consequent improvement in accessibility in all areas, which can be more easily facilitated when it includes the observations, feelings, aspirations and concerns of disabled people themselves (Goode, 2007), which of course lends a useful legitimacy to this small scale research project.

## **Background: the Assistive Technology Service (ATS) at the University of Southampton**

The ATS is a support service for students with disabilities.

It is an exclusive service located under the umbrella of the Library Service in the University. Students are eligible to register to use the ATS (hereafter generally referred to as the Service) on the basis that they have previously registered with one or another of the other student support services in the University, these being:

the Learning Differences Centre, for students with a dyslexic learning difference or dyspraxia,

the Disability Service, for students with a physical disability,

the Mentor Service for anyone with a current mental health issue or longer term mental health condition that affects their personal well-being.

For all of these services their existence is underpinned by the desire to provide enabling and empowering functions that permit students who are challenged in ways that set them aside from their more conventionally-abled colleagues to properly access their learning curriculum, engage with it effectively, and participate in university life more generally in ways that strives to put them on a more equal footing with everyone else.

The ATS was established in 2000 largely in response to an increasing awareness from a few enlightened library staff of a demand from a sizeable minority of the student population for accessible (that is, assistive) technologies that might ameliorate the generally non-accessible technology environments that existed in the University at that time and still do to a certain extent. The intention was to enable a more equal access to a learning curriculum that was becoming increasingly driven by the integration of technology-based learning.

It is clear that this small group of dedicated staff were also well-versed with the broad base of requirements incorporated into national legislation designed to combat discrimination against disability, but they were also highly aware of the deficiencies of the DDA (1995) when it came to stipulating adjustments to *learning* provision for disabled people within higher education. As we know, education was an exclusion from the original DDA when it was written to the statute book in 1995, only to become incorporated into the revised Act a decade later and subsequently strengthened by the implementation of the Disability Equality Duty which came into effect in December 2007. This duty now requires educational establishments to be proactive and anticipatory in making reasonable adjustments for those whose needs fall outside the standard provision as a result of a disability.

Deficiencies in this area were increasingly evident following the introduction and rapidly permeating new regime of curriculum delivery in the form of a virtual learning environment (VLE) which is now established throughout all University Faculties and Schools. This relatively recently introduced web-based (that is, internet) application has been steadily relocating learning and teaching into a delivery framework that has come to rely even more heavily on the students' ability to not only self-manage their learning and organize and engage in effective collaborative initiatives with their peers, but to use technology as the first base tool to do this.

These highly observant members of the library staff were instrumental in realizing that in addition to 'reasonable adjustments' being applied to the physical access to buildings and doorways for example, there was just as much an obligation to pay attention to access to technology. Otherwise, those who were disabled, in whatever form or for whatever reason, marginalization from the majority of the student body would be likely and hence the subject of discrimination through not being able to access and properly engage with this new learning regime equally due to their disability.

VLEs are now common in HEs across the country, and government policy cites the need for e-learning to "meet the greater diversity of student needs, to increase flexibility of provision ... [and] develop approaches to individualized support for planning and recording achievements" (HEFCE, 2005, p4) but ironically, has little to say about the impact of these initiatives on students whose learning needs fall outside the more general envelope of learning skills and attributes within which the majority of students operate<sup>2</sup>. Possibly this is indeed due to the lack of evidence-based research into the attitudes and feelings of these students into the suitability of new provision directed at them and certainly points yet again to a lack of involvement of disabled people into the design and implementation of such provisions - a point also made by Goode (2007), and Fuller et. al. (2004), for example, who strongly argue that input from disabled people at the design stage of systems intended to more properly provide for them is key in ensuring that the provision is appropriate.

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<sup>2</sup> see particularly BROWNE, T., JENKINS, M. & WALKER, R. (2006) A Longitudinal Perspective Regarding the Use of VLEs by Higher Education Institutions in the United Kingdom. *Interactive Learning Environments*, 14, 177-192. for a report on the uptake of virtual learning environments during the time period that is con-incident with the existence of the Assistive Technology Service at this University, which notes as one of the findings of the research that 'specialized support such as that required ... for students with special needs are identified as significant factors but have as yet had little impact on the character or resourcing of provision' (p14)

The Assistive Technology Service continues to expand and for the academic year 2006/7 over 900 students were registered out of a student population of approximately 20000. The demography of these students is significantly biased towards those with dyslexia, this group representing approximately 75% of the registration, whilst those with a physical disability or a mental health issue share the remaining 25% in almost equal proportions.

The ATS is staffed by two full-time learning technologists (the researcher being one of them) whose role is to provide a broad portfolio of assistance, support and guidance to students registered with the Service on the basis of their individual requests. This activity takes place within a large computer workstation room providing enhanced computer facilities which is located in the main library of the University and has been carefully designed in ways that differentiate it environmentally from the more conventional computer workstation facilities in the University. This differentiation is a response to the need to provide an effective study environment that is more suited to the particular requirements of students with disabilities or learning differences where these are otherwise unavailable in the mainstream of computer and technology provision in the University, and also to equip the workstations with a much wider range of assistive software and hardware than is available elsewhere on the campus so that some degree of amelioration for the specific difficulties that learning differences and other disabilities have on learning regimes can be provided. The workstation room can be used at any time during the normal opening hours of the library and is staffed during normal weekday office hours. Only students who are registered with the Service are entitled to access the workstations and this is controlled through a log-in procedure that denies entry to anyone who is not registered. Typically students access the technology provided on an individual, self-managed basis to support their studies, but are able to request help from the staff either 'on-demand' or through arranged appointments, these being more generally used for software tutorials, often as a complementary service to the Disabled Students' Allowance provision, or for other academic, study skills, or at times mentoring or counselling support.

Ironically, it is realised that whilst a truly inclusive learning environment remains an aspiration rather than a reality, the differentiated provision that this Service offers to those who are deemed 'in need' is an essential half-way house. Indeed, 'conventionally-abled' students are frequently heard to say they wish they were dyslexic, such is the provision so far in advance of that which is available for everyone else in the university in terms of study-skills support.

## The Primary Research Question

Why do some students use the ATS and others don't?

Could the reasons for this be external to the student, or internal to the student, or some combination of both?

'External' in this context means due to factors that will be unrelated to the student's self but due to more practical circumstances such as the geographical location of the ATS facility relative to their principle learning environments or social and peer-group related learning habits for instance. Also considered as external factors, are issues concerning the perception of the ATS. That is, what it is, who it is for, what it provides or doesn't, and how these factors might impact or not on the individual's perception of how they might wish to engage with their learning whilst at University, and particularly what the Service offers in relation to the specific demands of their actual disability.

'Internal' to the student means due to feelings, attitudes and self-perceptions about their own disability and how this may then have an effect on their engagement with their learning and how they access the curriculum. This ranges from none, as results from this survey will allude to later, to an impact that is so significant in terms of its interference with the learning process that it seems remarkable that such students are able to gain much by way of academic achievement at all. In this latter group one student who responded to the research questionnaire writes:

"I never feel good enough in my course...people don't want me in there group projects because they think there grades will drop and i become depressed. I really try and never seem to get anywhere always told that my work is not academic enough. But i never been shown how write the way they want because my teachers at school left me out and put me in the bottom classes. I often wonder is it worth continuing uni because I dont want to fail asnd embaress my self" (questionnaire respondent #10)

whilst another remarks:

"going for help with studies takes up more of my time when I'm already struggaling with too much work and not enough time, and it rarely helps as I can't explain why i'm struggaling otherwise I would have just done it *in the first place*" (questionnaire respondent #20).

(The comments are reproduced here exactly as they appeared in the questionnaire)

This small-scale research project has also been dynamic. That is, throughout the research period the researcher's position, and hence the fundamental research questions, have evolved as a result of the preliminary findings and literature reviewed that has more comprehensively informed the early stages of the enquiry. As a result, this has prompted

the focus to be sharpened more closely onto the *internal* aspects of how the dyslexic student engages with their learning and the learning environment at the University, rather than focus on external factors. The determining process for exploring these internal factors has been to try to find out more about each individual's locus of control, a well-researched and utilized theory in psychology originally formulated by Rotter<sup>3</sup>, and which is the degree to which the outcome of a course of action or of a behaviour is as a result of an individual's own determination or intention - which demonstrates an internal locus of control - or is more so due to luck, chance or fate, that is, as a result of what the individual perceives as external circumstances over which no control can be exercised. This is discussed more fully later, but the working hypothesis for this research project is that students with a high internal locus of control are less likely to be Users of the support service than those with low internal locus of control, and it is this that the enquiry is attempting to inform.

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<sup>3</sup> for a useful summary see ROTTER, J. B. (1990) Internal Versus External Control of Reinforcement: A Case History of a Variable. *American Psychologist*, 45, 489-493., in which Rotter himself reflects on the extraordinary impact that his original thesis has had on the more general discourse of personality theory in the field of psychology (ROTTER, J. (1966) Generalized expectancies for internal versus external control of reinforcements. *Psychological Monographs*, 80, (Whole No. 609).).

## **Literature review and some theoretical perspectives**

At its core, this small scale research project is mostly interested in exploring aspects of the relationship between a particular study behaviours and habits that dyslexic students display and their interrelated feelings about these and their dyslexia. Feelings are about emotions, or, to use an expression more in the context of this project at least, affective processes, that is, how emotions and feelings may be thought to have a regulatory effect on motivation and behaviour (Bandura, 1997). Particularly here we are looking at affective process in conjunction with other closely related constructs to try to examine the relationships between characteristics of dyslexia and some aspects of self-identity or self-concept, so that we might be more informed about how these are enmeshed into the learning process in higher education with the particular group of disabled students that have responded to this research enquiry.

A brief summary of the main psychological theories that have informed this project is presented here as a discussion about the interrelationships between emotion, learning and dyslexia. This is presented against the backdrop of the wide-ranging and comprehensive body of research that exists about the learning difference of dyslexia in children, which is at last migrating into exploration of the subsequent impact of dyslexia in adults, largely due to the need to inform remedial basic skills education but equally, and particularly in terms of this study, in recognition of the more diverse learning needs of the increasing numbers of dyslexic adults who are studying in higher education.

### **Theoretical background connecting to the psycho-social perspectives according to Kelly, Rogers and Bandura**

Theories in the field of identity development and the psychological components that are thought to be the determining factors of the concept of 'the self' might be said to be largely underpinned by the work of Kelly (eg, 1955). Kelly's personal construct theory asserts that an individual's behaviour is expressed psychologically by the ways in which they might regard a future event as probable or likely, or not, and more so, in terms of the ways in which they construct their world around them in order to navigate a path through it. This idea places his 'personal construct theory' in sharp contrast with the psycho-analytical school of thinking largely attributed to Freud, and the conditioned behaviourist paradigms, advocated mainly by Skinner (Fig 1).

The person-centred approach of Rogers (eg, 1959) can be seen as an extension of Kelly's ideas and in our context is sharper, because Rogers' approach particularly focuses not on some objective concept of reality but much more so on how the individual perceives

reality, that is, the individual's subjective awareness of themselves and the world in which they exist (Thorne, 1992).

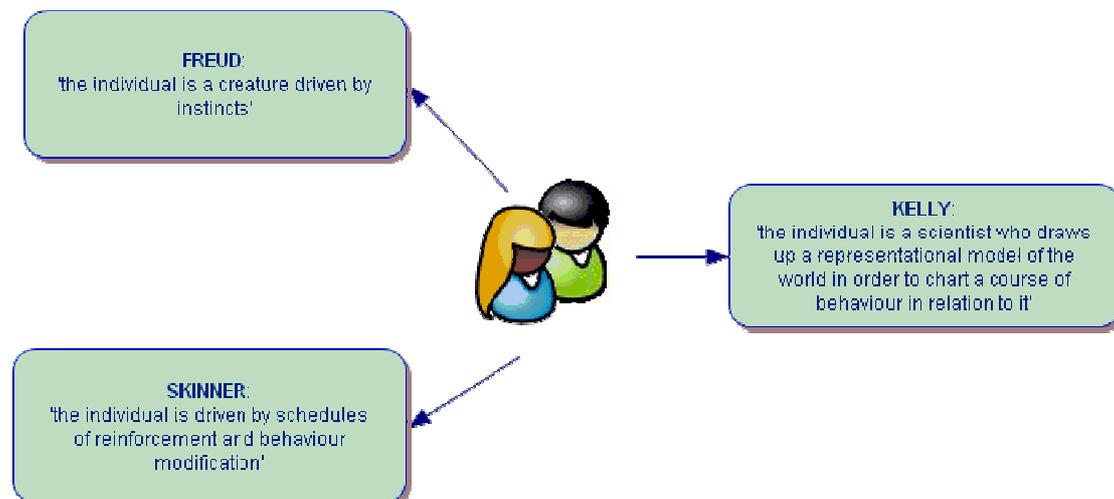


Figure 1: Contrasting psychological perspectives of the individual according to three widely known theories, interpreted from Humphrey and Mullins (2002).

So this research is interested in applying the concept of the actualizing tendency, Rogers' term for the 'basic human function that moves us towards the constructive accomplishment or our potential' (ibid, p26), to the behaviour of the individuals in the research groups, and particularly the extent to which their Rogersian 'positive self-regard' is developed in ways that can be related to their uptake or not of the learning support that the Assistive Technology Service provides. In order to arrive at some kind of evaluation of their positive self-regard, the research tool was designed to attempt to determine an evaluation of each individual's locus of control, use this as the indicator of the development of their positive self-regard and then relate it to their uptake of the Service.

Now in order to deconstruct these theories somewhat into ways in which practical mechanisms can be devised and incorporated into a research tool, an attempt has been made to take the theoretical constructs of Kelly and Rogers, together with the original thesis from Rotter, and intermesh these with the relatively recent work by Bandura and others on self-concept and self-efficacy (Bandura, 1986, Bandura, 1997, Bandura and Locke, 2003) to try to give the enquiry a broad-ranging degree of practical, scientific legitimacy. Specifically, the intention was to draw on aspects of Bandura's theory of mediating processes to try to help in categorizing aspects of individuals' feelings about their dyslexic self that might be influential in their choice about engaging or not with the specialized learning support designed for them.

The mediating processes that Bandura speaks of appear to be derived through his inspection, summary, synthesis and extrapolation of the substantial research material

supporting the argument that 'efficacy beliefs regulate human functioning' (ibid, 1997, p116) and these are distilled into four components:

*cognitive processes*, where efficacy, that is, the capacity or power to produce a desired effect and personal beliefs in them, are significant in enhancing or undermining performance;

*motivational processes*, where in particular by integrating these with attribution theory such that the focus of concern is with explanations and causality so that it is possible to construct a theoretical framework that is expeditious in finding reasons, for example, that set apart otherwise similarly positioned individuals but where the one attributes success to their personal skills, expertise and capabilities and failure principally to a lack of effort and as a result are then more likely to accept the challenges of more difficult tasks and persist in them, even in the face of failure, as opposed to the other, who may be convinced that because their success or failure is mainly due to circumstances outside their control or influence, there is little point in pursuing difficult tasks where they perceive little chance of success;

*affective processes*, which are mainly concerned with the effects that emotions and feelings have in regulating behaviour, and in the particular context of this enquiry, how these may impact on their perception of the value of support for their learning processes and their attitudes towards it where affective states such as anxiety, depression and stress are controlled or not by efficacy beliefs;

*selective processes* where the interest is with how personal efficacy beliefs influence the types of activities individuals choose to engage in and, particularly in the context of this enquiry, the environments in which they choose to locate themselves whilst undertaking these activities.

Now the Assistive Technology Service has been established to specifically provide a safe haven for those who may feel threatened or otherwise disenfranchised with aspects of the conventional learning environment at university because they feel, consciously or not, that its lack of suitability for their specific learning needs may adversely affect their aspirations towards academic success. Therefore it follows conversely, that those who 'have a high sense of coping efficacy [are likely to] adopt strategies and courses of action designed to change hazardous situations into benign ones' (ibid, p141), that is, *these* individuals are likely to present a high internal locus of control, and consequently we would expect them to be unlikely to use the support service because their internal mechanisms of behaviour regulation can enable them to adapt..., make best use of..., not be bewildered by..., be largely unaffected by... their dyslexic learning differences when it comes to choosing where and how to study. Thus it is this hypothesis that forms the core of this enquiry.

The legitimacy for the theoretical underpinnings of this small-scale project is further strengthened when taking into account work by Judge et. al. (2002) who, in more generally

seeking to determine whether the three most widely studied traits in psychology: self-esteem, neuroticism (also known as emotional stability or emotional adjustment), and locus of control, together with a fourth, closely related trait, self-efficacy, were indeed closely related, but particularly that when taken together they were indicators of a higher order construct, that is, were markers of the *same* higher order concept. Their significantly rigorous statistical analysis concluded that this was likely. Also mentioned is that 'relatively few investigations have explicitly considered these interrelationships, thus in the majority of cases, these measures are studied in isolation' (ibid, p694). An attempt to, if not clarify, then at least illustrate this interrelation between emotional stability and locus of control is presented in Figure 2 (see p22) where this is discussed in more detail.

### **Emotion and learning:**

There is not the scope in the account of this research project for a full discussion on the impact of emotion on learning, or more accurately perhaps, the interrelationship between emotion and learning, as a good deal has been written about this, particularly in recent years as the idea of social and emotional learning being useful in schools at least, has been gathering momentum. This has been partly as a means to explain dysfunctional or disruptive behaviours in the classroom context but also to try to understand more completely how the emotional development of young people needs to be considered as a factor in their academic development too (eg: Weare, 2004, Zins et al., 2004a, Greenhalgh, 1994)

But suffice it to say, for those who are engaged in learning situations as adults and who carry a whole raft of emotional baggage which might be due to personal feelings and perceptions of 'being different' when it comes to learning at least, which often stems from experiences in formative years when minds are very tender (Riddick, 1996), it is clear that embracing the impact that emotion has on learning for this group of people in ways that can help us to understand more fully their learning processes so as to actively engage with them more effectively, particularly in terms of how this learning may have differing needs from the mainstream, is very important indeed. For to fail to provide latitude and flexibility within a learning and teaching environment that can accommodate difference, or worse, that ignores or even denies learning difference would be shameful, and we might hope that informed, considerate and empathic educators would ensure that their professional integration with the learners within their domain of influence is always considerate and accommodating of the diversity of needs that treating *all* learners as individuals demands.

But let us consider just a few of the issues and review a sample of the research where it is relevant to this study based on the argument that a significant contributory factor that could account for the disparity between performance and ability may be due to the

learner's emotional integration with their learning processes being compromised through learning difference and an education environment that fails to respond constructively and supportively to it (Dykes, 2007). So particularly we should be concerned about exploring how emotion *interferes* with the learning process. Zins et.al. (2004b) for example, usefully summarized research arguing that emotional literacy, for want of a better phrase that can be easily understood, can have a significant impact on academic success. Rosslyn (2007) explored the behavioural and emotional difficulties faced by university students and is one among many other researchers in this area who observe that universities are well behind in the discourse surrounding emotional aspects to learning and suggests that this is largely as a result of '[notions of] emotional needs, developmental stages and support systems' (ibid, p70) that are not integrated into the more general culture of university learning and teaching. We should consider how this impacts on those for whom specialist learning support is key to keeping our more learning-fragile students away from what Rosslyn describes as 'academic despondency' such that, for example an English degree is just too many old books, and where getting a degree is much akin to pushing boulders uphill and 'even one's best efforts are unremarkable in the peer-group context' (ibid, p74).

To return to a more constructive research perspective, further legitimacy is added to the research project being reported in this paper when considering work by Op't Eynde and Turner (2006) who have adopted innovative research techniques to look at the complexity of emotion issues in learning by applying what they term as a 'dynamical component systems' approach as a means to try to gain an understanding of students' learning behaviours in a not too dissimilar fashion to the approach developed in the research methodology and research methods described below for this project.

It also seems clear however, that much of the work on the linkage between emotions and learning in the context of adult education tends to focus on either more practical aspects of widening participation and the diversity of the student body that this embraces insofar as the balance between social (and by implication, emotional) and academic integration is explored as a means to explain retention rates (Cartney and Rouse, 2006), or the relationship is deconstructed into the context of learning *disabilities* which more generally refers to much more severe and debilitating conditions than the learning difference of dyslexia (eg: Arthur, 2003).

### **Dyslexia and learning - a brief background**

We should note with some relief that the research discussion surrounding the syndrome of dyslexia has progressed positively in the last decade, particularly from the perspective of its location within the wider discourse on the nature and impact of disability to learning at an adult level. As recently as the mid-nineties, the writings of highly respected researchers and protagonists were still clearly entrenched in the medical and deficit models of

disability such that dyslexia was being 'diagnosed' rather than 'identified'. Diagnosis implies that something is wrong and can be fixed. Heavily loaded statements such as

"The conventional diagnostic procedure that is used for identifying learning disability [dyslexia] is based on the extent of the discrepancy found between a child's potential for reading and his or her actual reading achievement"

(Aaron, 1994, p5)

were the norm at the time and it is not without some sadness that we reflect upon the fact that in some less-informed educational settings this thesis about the nature of dyslexia and how it is the individual sufferer's fault rather than anything to do with society or in our case, the learning environment that they may be trying their best to engage with, remains difficult to shift, despite the overwhelming body of research evidence that now exists to suggest that we should be regarding dyslexia as a learning difference rather than a learning difficulty, and the social model of disability which has attempted to move the agenda away from the individual and onto society as being the agent responsible for change.

Somewhat optimistically, the more recent working texts designed to provide a useful theoretical background to the syndrome in addition to offering practical guidance for the practitioner are more wide-ranging in their descriptions of the learning difference and the consequences of it being identified as a characteristic of an individual's learning profile. Reid (2003) for example, lists key aspects of dyslexia that are helpful, and with the opening phrase of his definition 'dyslexia is a processing difference experienced by people of all ages...' (ibid, p4) argues that the condition, although often characterized by difficulties in literacy, can also affect many other cognitive areas including short-term memory, speed of processing, time management, co-ordination, comprehension of mathematical abstracts, to name but some of the most widely recognized. It is also probably generally accepted as one main school of thought that Frith's (1999) very useful analysis of the syndrome as a neuro-developmental disorder with a biological origin which exhibits behavioural signs extending well beyond problems with writing and reading have provided a sound, scientific underpinning to current thinking about dyslexia. However an alternative viewpoint purports that the difficulties attributed to dyslexia are largely as a result of a vision difference - the magno-cellular theory - and there is a plethora of research which seeks to connect dyslexia with vision (eg, Kriss and Evans, 2005) and indeed Evans' (2003) work is significant because it proposes that

'dyslexia is a complex condition and there are probably a range of factors that can cause or contribute to [it]...[which] may explain the countless theories that have been proposed ...[and that] if one of them is correct it does not necessarily mean that all the others are wrong' (ibid, p5),

As an optometrist, Evans' interest is in corroborating the effects that known visual aberrations have on reading with those that are observed as a result of dyslexia and works

from the premise that since reading must start with vision, it is possible that difficulties with reading may equally be attributable to a vision difference as to a dyslexic one<sup>4</sup>. What is certainly clear, is that many of those who are trying their best to deal with their dyslexia are also affected by vision differences, the commonest of which is the scotopic sensitivity more generally referred to as Meares-Irlen syndrome, where sensitivity to the interrelationship between the colours of the background of a page of printed text and the text itself has a significant effect on the readability of the text for many individuals (eg: Kriss and Evans, 2005)

It is nevertheless true and widely researched and reported that most dyslexic learners become aware at an early age that their 'thinking and doing' processes are different and the single most significant feature of this self-perception is that they begin to consider themselves inferior or weak mostly because their situation engenders the need for support, and that this learning self-perception often becomes a self-reinforcing cycle from which it becomes difficult to break free. Riddick (1996) reports that amongst both primary and secondary-aged children, feelings of disappointment, frustration, shame, anger, embarrassment and depression were widely attributed to their dyslexia with many of them also reporting that 'other children noticed the difficulties they had with their work [and that they] were not willing to explain their difficulties for fear of teasing' (ibid, p162). The extent to which these negative feelings about self-worth and a sense of marginalization through difference are carried forward to higher education is, after all, one of the features of the impact that dyslexia has on learning in tertiary education that this research is attempting to explore, and given that others working with students in HE are beginning to evaluate perceptions of social support and stress to discover that, for example, those with learning differences consider themselves to be less well supported and had higher levels of academic stress than their non-dyslexic peers (Heiman, 2006) then the hypothesis that the uptake of learning support may be related to self-perception begins to show promise.

But it has taken time to fully appreciate that dyslexic children grow up to be dyslexic adults and in situations where literacy skills are not a significant part of employment it is highly likely that many unidentified dyslexic adults will have found themselves in manual trades where reading and writing could be avoided (Morgan and Klein, 2000), rather than in places where their more academic and intellectual abilities and capacities that their dyslexia shrouds could be more efficaciously employed.

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<sup>4</sup> and a further, useful summary can be found in Stein (2001) *The Magnocellular Theory of Developmental Dyslexia*, *Dyslexia*, 7, 12-36

Significantly, it is only with relatively recent initiatives to address widespread recognition that national weaknesses in levels of adult literacy and numeracy are so significant that they cannot be ignored, (eg, Rice and Brooks, 2004, Atkin et al., 2005) and, more so from the context of this enquiry, that with widening participation in tertiary education being advocated as desirable for the general economic good of the country as a whole, the significance of the impact of dyslexia in a higher education context is only now becoming more fully realized. So it is with some encouragement that research into adult dyslexia is also beginning to explore how these adults, who have higher intellectual aspirations than merely redressing the imbalances in their fundamental learning due to poor support in their formative years, are increasingly attempting to engage with the demands of higher education.

But as this enquiry is seeking to illuminate further, with this greater awareness of the existence of dyslexic students in higher education, the impact of the need for 'reasonable adjustments' in all areas of their engagement with the learning curriculum has become increasingly apparent. We know that dyslexia has a significant impact on learning from the huge body of research that exists on dyslexia in children, but as intelligent, intellectual adults who are trying their best to make headway in a highly challenging academic learning environment it is only in very recent years that learning support for dyslexic students has begun to materialize. Indeed, given that close to half of first year students in England declaring a disability in 2003-04 identified this to be dyslexia this figure is still widely regarded as an underestimate of the true prevalence of dyslexia in higher education, as students who have difficulties similar to dyslexia are not included, as are not those who either choose not to disclose their learning difference, or even those who are unaware that that they have one since it has never been formally identified (Mortimore and Ray Crozier, 2006).

Ironically, the nature of the learning support at this university, being such that it generally exists in the form of differentiated provision, is perhaps surprising when taken from the perspective of the contemporary inclusivity agendas. The ATS, the support service that this project is relating to, is just such a differentiated provision, but until such time as the level of resources and facilities that the ATS provides for dyslexic students can be made available across the entire university in ways that are accessible for everyone, it will remain so. But perhaps this is no bad thing? There is much to be said for bringing people together who share differences so that they may gain mutual benefit through peer group support, and not feel that they are battling in isolation against unrecognized difficulties or ones that they would prefer to keep to themselves (Dale and Taylor, 2001). *Exclusive provision* indeed, but one that appears to be a necessary condition in order that these learners who may otherwise be unfairly disadvantaged may feel supported by each other in a particular environment that fosters and encourages a climate of mutuality (Dale and Green, 1998).

Additionally, in the most recent climate of commodifying learning provision in universities to the extent where students come to be regarded as 'customers', the spin-off from this in terms of student support has seen the widespread appearance of 'bolt-on' support structures where depersonalized, proprietary support products, by their very nature, are not integrated into the more general teaching and learning provision. As such, frequently they may be ineffective in meeting true student need by not addressing them as individuals, instead focussing on identification and categorization of difficulties into perceived need-models. The upshot of this is that individuals aren't treated as such, the support is depersonalized and doesn't clearly differentiate between individual learning and other needs, preferring instead to 'train students and manipulate them into 'preferred' models of identity' (Smith, 2007, p688).

So the defence for the exclusive provision being described and explored in this small-scale enquiry is that although it is differentiated, it is nevertheless guided by the ideals of providing holistic support for those who are entitled to access it that engenders the ethos that education should contain consistent elements of nurturing (ibid, p689) which can only be provided from a position of respect for the individual concerned rather than the support-need-category that he may fall into.

#### **Dyslexia and self-concept:**

Much of the work by Burden and colleagues has provided a highly informative backdrop to this project (Burden, 2005, Burden and Burdett, 2005, Burden, 2000) and the data-gathering questionnaire constructed for this research has been inspired by Burden's Dyslexia Identity Scale (DIS) (Burden, 2005, p34), his earlier 'Myself as a Learner' Scale (MALS) (Burden, 2000) and the introductions and rationales in both texts concerning the complexity of the interrelations between learning and how the learner perceives himself as a learner. Even so, within the broader discourse of self-concept, self-image, self-esteem and other related psychological constructs, it still appears difficult to use these terms in their most appropriate fashion in ways that enable them to be pinned to a charted path through a research project exploring what people think about themselves. Nevertheless, given that the MALS is a standardized tool specifically developed to explore young people's perceptions about themselves as learners within the academic context, and the DIS was subsequently developed to look at individuals' sense of identity following an identification of dyslexia as a learning difference, it was felt that by drawing on these, the research tool designed for this project was provided with added validity.

But also the recent work from Humphrey and Mullins (eg 2002) which explores the relationships between dyslexia and the way pupils view themselves as learners has connected usefully with Burden's work and has enabled a visual framework to be constructed to place their shared ideas into the context of this project which further

connects to ideas of emotional stability referred to earlier. The diagram (Fig 2, below) has been constructed to try illustrate these relationships and attempts to thread together the idea of attributional style into a learning context, where attribution theory is locating the cause for a particular type of behaviour or action (described in the blue boxes in the diagram) to either internal or external factors and in turn, also attributes the action as reflecting emotional adjustment as stable or unstable. For example: a student who

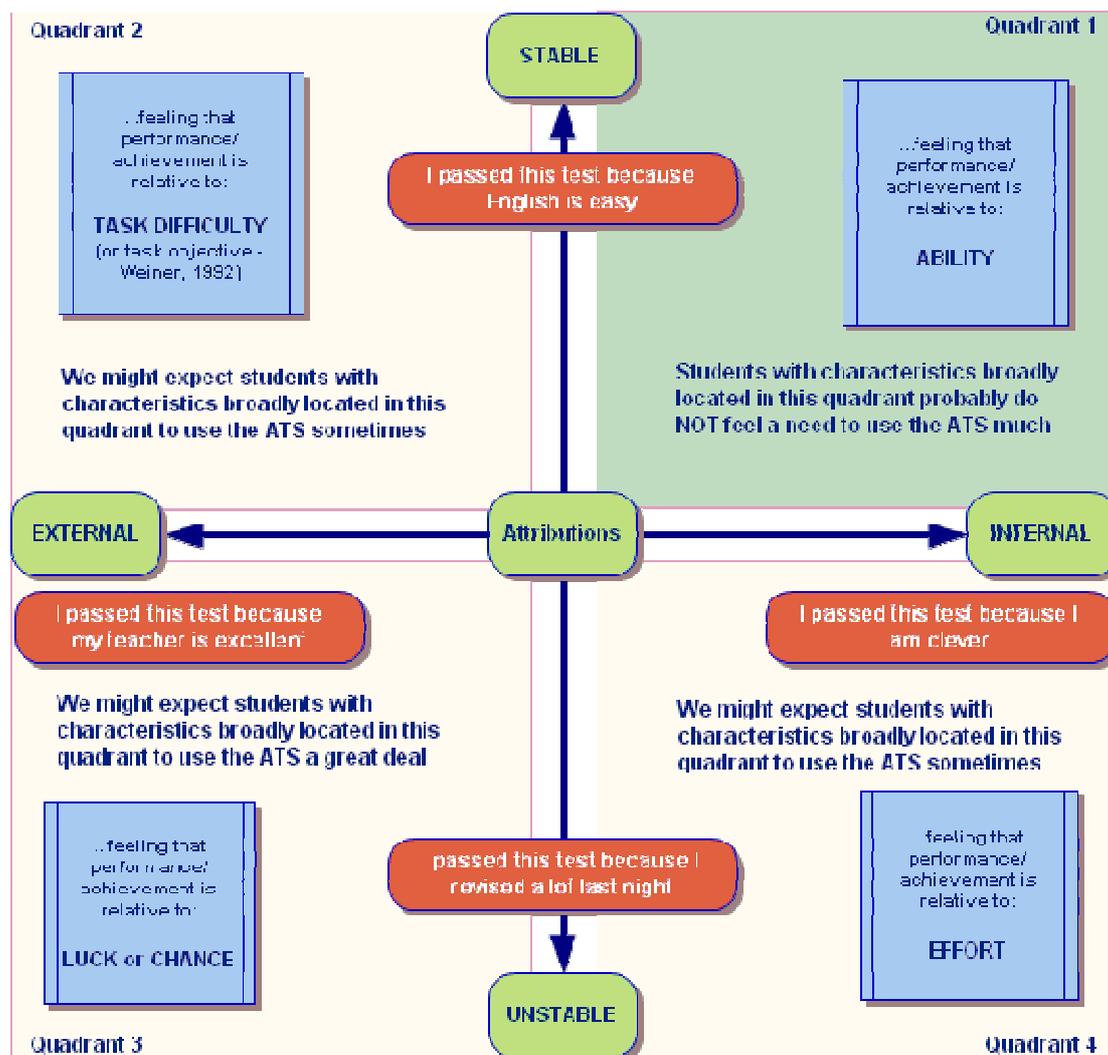


Figure 2: Showing the relationship between emotional stability and locus of control in terms of the most significant attribute we might expect a typical student to identify as the most significant one for academic success (in the blue boxes); Developed from Humphrey and Mullins, 2002 and 1992

attributes success in an English test to being clever, or it being an easy test or a combination of these factors is indicating the success attribute to be their ABILITY, that is, an 'internal' factor, whereas another student who thinks that they might pass the test if they revise diligently, that the teaching was of good quality or a combination of both, is exhibiting 'external' locus of control and/or 'unstable' emotional adjustment characteristics, and this is an indicator of a success attribute being down to little more than chance. Humphrey and Mullins cite work by Kutze-Costes and Schneider (1994) as an example to

support of the use of attribution theory to explore the links between self-concept and academic achievement, and although Kurtze-Costes and Schneider's work was with primary-aged children, it seems valid to extrapolate this linkage to students in higher education because this research is amongst a wider body of knowledge that has shown that such positive relationships do exist. So in the context of the enquiry that this dissertation is reporting, we might expect students who do *not* take up the resources and facilities of the Service to be broadly located in the 1st quadrant of this diagram, with those who do use the ATS as a learning support service forming a much larger subset of individuals who are likely to display a mixture of the characteristics presented in the diagram in the other three quadrants.

At this point we should now refocus the discussion onto the psychological constructs that this research is trying to understand in respect of the dyslexic adult learner, and briefly reflect on relevant research in these areas:

### **Dyslexia and self-esteem**

If we could identify the single most significant aspect of the 'self' that is impacted upon by dyslexia, surely this would be self-esteem as this construct appears to be the most fragile and easily dented by the experience of difficulty, especially in the learning context and in formative years. All the major practitioner and more common theoretical texts refer to self-esteem in particular as being depressed in those with a dyslexic learning difference (eg: Reid and Wearmouth, 2002, Hunter-Carsch and Herrington, 2001, Kay and Yeo, 2005, McLoughlin et al., 1994, Goodwin and Thomson, 2004, Morgan and Klein, 2000, Reid and Kirk, 2005). The effects are well reported as extending into adulthood, particularly so for those with a disability which of course dyslexia is considered to be (in legal terminology at least) although amongst the survey group in this research the overwhelming majority considered themselves not to be disabled <sup>5</sup>.

Modest correlations between self-esteem and school performance do not necessarily indicate that high self-esteem results in good performance, indeed, viewing this statement from the reverse direction is often true, that is, good performance raises self-esteem (Baumeister et al., 2003) so it seems likely that for those who find learning challenging at the best of times, and where good marks are what the other kids get, the constant knock to self-esteem and self-confidence will have lasting effects. At university level, more recent

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<sup>5</sup> 34 out of the 41 questionnaire respondents in this enquiry agreed with the statement: 'I don't consider myself to be disabled', indeed 12 out of the 41 respondents agreed with the partially related statement: "I feel guilty about being dyslexic" perhaps suggesting an element of self-denial about being identified with the syndrome;

research evaluating perceptions of social support and stress amongst students showed that those with learning differences perceived themselves as being less well supported and had higher levels of academic stress than their non-dyslexic peers. These students were also found to more likely attribute their academic success to study skills and their academic characteristics, compared with their dyslexic peers who attributed their academic success, or lack of it, to external factors (Heiman, 2006). Alexander-Passe (2006) looked at the coping strategies of dyslexic teenagers with a particular focus on self-esteem, coping and depression and by using standardized tests for measuring these found the effects of dyslexia in this context to be widespread and with significant gender differences, particularly so where females used more emotional and avoidance-based coping strategies than males which nevertheless resulted in lower scores in general and academic self-esteem and even moderate depression (ibid, p256). Riddick (1999) investigated self-esteem and anxiety of 16 dyslexic and 16 non-dyslexic university students where it emerged that despite the highly negative recollections of school by many of the dyslexic students in the study their impression about their learning environment in university was much more sympathetic. Nevertheless, the dyslexic group was found to have significantly lower self-esteem than the (non-dyslexic) control group. Trautwein and Ludkte (2006) explored the 'directionality of effects between global self-esteem, domain-specific academic self-concepts, and academic achievements' (ibid, p334) and found that 'bottom-up' effects, that is, where self-esteem is influenced by academic self-concept, are more pronounced in meritocratic learning environments than in ego-protective ones. In terms of the support service that this dissertation is reporting on, it is of some comfort that the learning environment created by the Assistive Technology Service in the University Library would certainly count as an ego-protective one, and hence once again lends legitimacy to the vision of the Service: to provide a study and support environment that tries to have an ameliorating effect on the impacts of learning difference when engaged in academic study. Burton (2004) described work with secondary pupils where an intervention was developed in response to an identified need in a resourced provision for improving the self-esteem of dyslexic pupils. Pupils reported that they found participating in activities in groups enjoyable and that it had been useful to work with others who had similar difficulties and that anecdotally at least these interventions did appear to positively effect the pupils' self-esteem. It was unfortunate that the original intention in the research to apply a standardized tool for pre- and post-evaluating self-esteem<sup>6</sup> could not be applied. As an aside, it was particularly interesting that the course that was developed was extended beyond those with learning differences and into the mainstream provision as the benefits

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<sup>6</sup> MAINES, B. & ROBINSON, G. (1988) B/G-STEEM: A self-esteem scale (with locus of control items), Bristol, Lucky Duck Publishing.

were felt to be so worthwhile, which again lends legitimacy to the differentiated provision that the ATS provides as a learning support environment at this university in terms of peer groups support as identified by Burton, and also the implication that 'good practice' developed in differentiated learning regimes can have beneficial applications across the wider learning landscape and thus adds weight to the cry for proper inclusivity.

#### **Other fundamental themes: self-efficacy, anxiety and learned helplessness**

There has been work in important related areas which emphasizes how complex the interrelations between the sub-componental psychological constructs that may or may not be as such, in terms of their contribution to the more overall 'self-concept' of any individual. Lackaye et.al. (2006) compared self-perceptions of self-efficacy<sup>7</sup>, mood, effort and hope between two groups of 123 adolescents, one group with learning disabilities and the other not, and reported that those with learning disabilities reported lower academic, and social self-efficacy, rated their mood as more negative and reported lower levels of hope and investment or effort in their academic work, although no significant differences were found between emotional self-efficacy between the groups. Indeed, amongst the non-learning-disabled group there appeared to be a subgroup who equally reported low levels of hope which further exemplifies the less-than-straightforward interrelationship between these little-understood variables. Humphrey (2003) looked at how the educational environment could be changed in ways that could help students develop a positive sense of self. In applying the consistent themes that appear to have emerged from much research, the most important of which is that self-perceptions are largely acquired in social contexts and that, especially amongst the young, the development of the self is deeply affected by the influence of 'significant others' who are generally adults but sometimes peers with whom the individual deeply identifies with, it was perhaps not unsurprising therefore that tackling the issues of raising self-esteem, self-efficacy and other interrelated factors may be achieved by careful focus on aspects of the learning environment that indirectly enhanced these characteristics. Significantly, it was reported that 'peer group support systems seem to be an appropriate means of intervention in relation to [students] with dyslexia' (ibid, p124), which once again, suggests that the intentions at least that underpin the ATS support service in this university are entirely honourable.

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<sup>7</sup> where we will apply a definition of self-efficacy here, and more broadly throughout this enquiry, to be an individual's judgment of their capabilities to organize and execute courses of action required to attain a desired outcome or achievement; BANDURA, A. (1986) *Social Foundations of Thought and Action*, Englewood Cliffs, New Jersey, Prentice Hall.

Let us also not forget that one of the single most significant outward manifestations of psychological stress is anxiety. There is much research about the vulnerability of learning-disabled children to emotional consequences such as anxiety but only recently has research begun to encompass older learners. Significantly, work by Carroll and Iles (2006) for example, reports that anxiety levels amongst dyslexic students in higher education were well above those shown for non-dyslexic peers and discovered that this condition extended beyond the learning environment into social situations too as for the majority of students their academic peer-group overlaps significantly with their social network. Specifically in terms of learning, findings were that 'those that choose to enter higher education ... may still report a number of negative feelings due to the competitive environment and the demand for high literacy skills' (ibid, p653) and conclude that a highly desirable element in assessment of need procedures should include a component that scrutinizes emotional well-being in addition to academic support requirements. In this enquiry we are trying to get a feel for how anxiety affects and regulates motivation and as one of the five psychological constructs used in our componentalization of locus of control the research tool attempts to explore the impact that dyslexia has on individuals' levels of anxiety, either directly, or more subtly by enquiring about 'how things are' in terms of approaches to study.

Finally, the concept of learned helplessness is an important factor in our deconstruction of locus of control because it elucidates probably the most negative approaches to study that we might expect to witness from learners, particularly amongst those who are disabled. Burden (2005) drew heavily on the concept of learned helplessness in the construction of the Dyslexia Identity Scale (mentioned above) and in keeping with the often very strong negative feelings of 'worth' experienced both by dyslexia children and adults, describes learned helplessness as a characteristic that in extreme cases leads to attendant feelings of depression because it

'reflects the ingrained sense of failure and inability to succeed...as a result of negative experiences in academic or more general aspects of their lives'  
(ibid, p34)

From our perspective therefore, and as a direct mechanism for exploring the hypothesis that this project is seeking to address, learned helplessness, as a psychological construct that exposes *external* levels of locus of control, may be a key factor in helping to determine whether a relationship exists between the uptake of the ATS learning support service and internal locus of control of the students in the research group.

## **Section 2: The research**

### **Research Methodology:**

Given that all students surveyed in this investigation are identified as having a dyslexic learning difference, one underpinning assumption that drives this research is that there may be some differences in perceptions of and feelings towards their own disability between the students who use the support service and those who don't. This in itself seems to be an unusual standpoint to take as most research into dyslexia focuses on looking for reasons to explain either behaviour of dyslexics or aspect of their learning differences that set them apart from the mainstream by comparing these groups with those who are not identified as having dyslexia.

But as we have said earlier, this disparity in the uptake of a support provision that is almost exclusively designed for the benefit of those with a dyslexic learning difference may be nothing to do with self-perceptions and be more connected with knowledge about the service: where it is located, how it operates, what facilities and resources are available, how it is staffed, when it is accessible; which all may be as a result of the publicity (or lack of it) that advertises the service, or the interrelation between this service and the other support services in the University in terms of how effective the one is in drawing students' attention to the other; or is related to the awareness of not only the service from amongst the academic teaching staff in the University but more so their professional expertise at recognizing when any particular student might be performing academically under-par and suspecting that this may be more to do with a learning difference such as dyslexia, than any other reason.

It may be however, that neither of these assumptions is behind the differences in uptake because the reasons are entirely unrelated to disability and more directly due to other factors, referred to earlier as 'external' factors. So one further assumption may be that use of the service or not, is more related to its geographical location in relation to the parts of the University that these students mostly use, either due to the proximity to their principal learning and teaching locations and/or other factors related to social aspects such as the study behaviour of peer groups.

So a starting point for devising a research methodology has been to consider how this possibly quite complex set of inter-relations concerning human behaviour in this context may be investigated and unscrambled in some way that gives some insight into why students choose to do what they do.

It was felt that trying to explore these three identified, distinct but possibly related areas in a single data gathering exercise would be too complex at this level, both from the practical point of attempting to design an effective data collecting instrument that could interrogate these data fields and which at the same time would be sufficiently concise to encourage people to engage with it, and equally from the task that this would then present in analysing data without experience of sophisticated data analysis tools such as might be provided through the use of factor analysis for example. Exploring the interrelations between these seemingly diverse angles of enquiry, together with an attempt at designing a more sophisticated research methodology to do this, may, however, suggest a route for research at a higher level.

So driven by a literature review that has identified a dearth of research on attitudes to and self-perceptions of dyslexia as a disability or a learning difference amongst *adults* generally, and in particular within the sub-group of adults engaged in higher education, it was decided that the research would exclude those factors connected with knowledge of the service, and instead focus on a simple investigation of geographical factors and more substantially try to find out more about perceptions and attitudes related to dyslexia itself.

We can observe and record human behaviour multifariously, but one of the best ways to find out why people do what they do is to ask them. With this in mind, the intention was to try to design a data collecting tool that was as unobtrusive as possible, easy to implement whilst at the same sufficiently robust in design so that the data generated would be both valid and reliable, and in a format that that was easy to apply and administrate. A simple questionnaire created using an internet web-authoring tool that could be deployed as an e-mail link to individuals in the data groups fitted this design criteria and it was felt would provide a good balance between the need to generate usable data and equally be quick to complete. The questionnaire is available to view at:

[http://soton.ac.uk/~ad6/QNR/msc\\_qnr\\_v1.htm](http://soton.ac.uk/~ad6/QNR/msc_qnr_v1.htm) (March 2008) and a printed copy is presented in Appendix 1.

## **Research Methods:**

The two principle methods of obtaining information will be by analysing data which records student 'log-ins' to ATS (student) computer workstations, and by asking students who are identified as having a dyslexic learning difference about their attitudes towards, and perceptions of their interaction with their learning in ways that seek to quantify the impact of their dyslexia on their studies.

Computer log-in data enables students who fall into the research data group criteria to be easily identified - these criteria are detailed below - following which each was contacted personally by e-mail with an invitation to participate in the research by completing an on-line questionnaire, developed as the data gathering tool, and also detailed below.

Data collected was value-coded and both quantitative and qualitative analysis was applied to try to make sense of it in order to apply results to an evaluation of the research hypothesis - that those students exhibiting a high internal locus of control are also those who choose not to take advantage of the ATS support service that they are entitled to use.

An attempt was made to provide a very visual interpretation of the complex interrelations between the five psychological constructs used as componental functions of Locus of Control by developing a 5-co-ordinate-axis graphical presentation of these constructs for each respondent to the questionnaire, effectively generating a Locus of Control Profile for each individual. By comparing these graphs, the intention was to look for similarities between the profiles which might enable them to be collated into groups of students who appeared to be exhibiting similar characteristics, and also to identify significant differences either between the groups, or between isolated individuals and the groups if this should occur.

### **Defining the data group**

It is important to understand that the intention at this stage of the enquiry was to establish a specific group of students who were sufficiently identifiable so that they could be the recipients of the questionnaire by e-mail. The group would not be randomly chosen. The procedure used for this purpose employed computer log-in behaviour that could be specifically attached to known individuals.

### **Setting the defining criteria**

In order to try to eliminate as many extraneous factors as possible from this demographically diverse group of students it was essential to peel away as many differences between individuals within the complete group of students registered as dyslexic with the ATS (the background population) so as to leave a dataset of people who

had as much in common with each other as possible aside from the fundamental variable being explored: whether each one used the ATS resources regularly or not - subsequently defined as a 'User' or a 'Non-User'.

At the time that the preliminary stages of the research were being planned (January 2007) there were  $N_0=689$  students registered with the Assistive Technology Service.

So the two basic criteria that were set in order to determine a suitable sub-group from the background population were students who:

would be in the early stages of their third year of their course at University at the time that their views were to be sought - that is, due to graduate in the summer of 2008;

had been registered with the ATS since at least 1st February 2006 - that is, at or before the end of their first semester at university;

and this was based on the rationale that in the first instance, students at this point in their studies are likely to have become established in effective study routines based on personal preferences and knowledge of what works best and therefore able to respond to the questionnaire in such a way that their consistency of behaviour would lead to responses being reliable, and secondly that they needed to have been able to log in to ATS computer workstations for the entire data-to-date research period for which computer log-in data was available.

#### **Establishing the research group and splitting it into two sub-groups**

This was achieved through the utilization of computer data statistics that records each individual student's access to computer workstations across the university network.

This data is supplied regularly to ATS staff and is used to monitor use of computer resources for administrative and planning purposes only. It should be noted that the data merely records the dates and times of a student's log-in and log-out to any particular computer workstation and attaches this information to the identity of the student. It is not possible to monitor or record the nature of the computer activity that takes place during each log-in period.

At the time that the enquiry commenced, complete and reliable log-in data had been obtained which covered a 15 month period from 1st February 2006 to 30th April 2007, which was a contributing factor in setting the defining criteria above for establishing the background population for the data group. Hence students in the research group needed to have been able to log in at any time during this period - that is, they needed to have been at the University and registered with the ATS prior to 1st February 2006, to still be attending their courses on 30th April 2007 and subsequently that they were available during the Autumn term of 2007 which was planned as the deployment time for the questionnaire.

The log-in data was stripped of non-essential information and loaded into MS Excel. The data was then sorted according to username (that is, the log-in name of the student) and a simple pivot table analysis applied to determine the number of times each username logged in to any ATS computer workstation. It should be emphasized here that the number of log-in times would be the defining criteria for assigning any particular individual to either the Users or the Non-Users subgroups and the procedure for this is detailed below.

At this point, the number of students,  $n$ , in the sample was  $n_1=256$  defined according to the criteria set out above where  $N_0=689$ , this being the total number of students registered with the ATS in January 2007.

Subsequently, students were stripped out of this sample  $n_1=256$  who were not registered with the ATS prior to the start of the analysis period, that is, before 1st February 2006 which further reduced the number of students in the sample to  $n_2=138$ .

Further, and since this enquiry has dyslexia as its specific focus, students were stripped out of the remaining dataset  $n_2=138$  who were not registered with the ATS through self-identifying as dyslexic, which left a sample size of  $n_3=96$ .

From this remaining group of  $n_3=96$  it was now necessary to examine the computer log-in data for the survey period to decide on a dividing point for the number of computer 'log-ins' with those on the one side forming the group identified as Users and those on the other side as Non-Users.

Preliminary analysis of this group of students' log-in behaviour identified the following:  
29 students (30%) registered 0 log-ins to an ATS computer workstation during the period 1st February 2006 to 30th April 2007;  
42 students (44%) logged in less than 5 times during this period;  
48 students (50%) logged in 10 times or less during this period, this therefore representing the median number of log-ins;  
18 students (19%) logged in 50 times or more during this period;  
the total number of log-ins during this period = 2649

On the basis of this distribution it seemed not unreasonable to use the median point as the division for establishing the two sub-groups.

So students who had logged in 10 times or more during the survey period were categorized as Users and those who logged in less than 10 times categorized as Non-Users.

Following the deployment of the questionnaire by e-mail, those returned as undeliverable, that is, indicating students who although still registered with the ATS were no longer at the

university, removed a further 10 from the sample leaving a final data sample of both groups combined of  $n_4=86$ . Of this, the Users subgroup contained 46 students leaving the remainder of 40 students forming the 'NonUsers' subgroup.

### **Designing the research tools**

To explore aspects of human behaviour it would seem that the most sensible, practical and ethical method of collecting data is to ask people about the activities that they are engaged in.

As such and as described above, in the case of this small-scale research project it was felt that the simplest way to collect data in the most unobtrusive way would be through the use of a questionnaire because given a carefully considered design with clear goals presented in a format that is easy to access and complete, a reasonable response rate might be anticipated. With these factors in mind, and more so because the individuals forming the two research sub-groups had been identified and could be contacted personally by e-mail, it was decided to devise the questionnaire as a web-based form and publish it to the internet<sup>8</sup>, the link to which would be incorporated into a short e-mail inviting each of the students in the subgroups to access and complete it. It was further hoped that both the interest factor and an anticipation that completing the questionnaire on-line through a few clicks of a mouse rather than completing a paper-based form and submitting it by hand or by post might further encourage a higher response rate.

Particular attention was paid to the design and layout of the questionnaire to ensure that it incorporated dyslexia-friendly accessibility features - essential in any case, but particularly so given the researcher's position as a staff member supporting dyslexic learning differences at this institution. Essential features that attempted to maximize accessibility of the design were:

short introductory sentences explaining the purpose of the research;

a design that used a dark colour text on a pale-coloured background to reduce the black-on-white glare that makes more usual text presentation difficult for those with visual sensitivities;

in Question 4 in the long list of statements to agree or disagree with, the 'radio-button' headings ('generally agree' and 'generally disagree') were repeated throughout the list to ensure that these never went out of view on the screen as the respondent scrolled down the page;

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<sup>8</sup> available to view at [www.soton.ac.uk/~ad6/QNR/msc\\_qnr\\_v1.htm](http://www.soton.ac.uk/~ad6/QNR/msc_qnr_v1.htm)

instructions for answering each question given in plain text (i.e. simple english);  
The design was piloted with 6 dyslexic students chosen on an opportunity basis as Users of the ATS workstation room who were willing to try it out and provide feedback. All reported it as easy to access with explanations and questions that were clearly written, and all reported it to have been completed within 10 minutes.

**The QNR design rationale:**

The questionnaire needed to incorporate several features yet remain both as short and as easy to use as possible in order to maximize the response rate.

Working within the overall design of the enquiry, the intention was to use the questionnaire to acquire information about two fundamental areas:

where students used computers in connection with their studies;  
their attitudes towards dyslexia and how they felt that this might impact on their study regimes;

Although replies to the questionnaire could be anonymous, it was also felt that in order to provide an avenue for further enquiry with individuals in particular, the questionnaire would include an invitation to leave an e-mail address for this purpose should the respondent choose to do so.

It was also felt that it in order to identify whether there may be any secondary links between the main research questions that the questionnaire was to address and either gender and/or whether the respondent was an undergraduate or a post-graduate, questions on these would also be included so that this could be analysed if appropriate.

Additionally, it was anticipated that students may be interested in revealing more about their feelings and attitudes towards both their own dyslexic learning differences and also how this affected their study through the sense of self-reflection that the attitudinal statements in Question 4 may encourage if invited to do so, so space was included on the questionnaire as an open text field where a respondent could write as much as they wished about their thoughts and feelings about their dyslexia and studying. Should it be that a respondent both filled in this text field *and* felt comfortable to identify themselves through leaving an e-mail address then this would indeed be a bonus.

Since the rationale for the enquiry was to investigate differences between two otherwise similar groups of students it was necessary to devise a means to distinguish between the questionnaire responses returned from individuals from each group given that the questionnaire was common to both groups. Although individuals had been identified specifically from the ATS database and details of the link to the questionnaire sent to them by e-mail, given that there was no compulsion to self-identify on response, a mechanism had to be devised that would enable the researcher to determine which of the two research

sub-groups the response had come from given that it may be returned anonymously. This was achieved by altering very slightly the order of the questions to create two versions of the questionnaires that were in all other respects identical, with a link to the one sent to the Users sub-group and the link to the other sent to the Non-Users sub-group. Given that the questionnaire was a simple internet form, submitting the form when the respondent had completed it generated a copy of the responses in e-mail format which sent itself to the researcher as a list of the responses to the questions in the order in which they appeared on the form. Thus it was possible to determine from which sub-group the reply had been received by inspecting the order of the questions in the e-mail response. Questions in the questionnaire that were used for this purpose were Questions 7 and 8, enquiring about gender and about under/post graduate status which were in the opposite order on each version of the questionnaire.

### **Questionnaire construction**

The main focus of the enquiry was in two sections: computer use and study locations; and attitudes to dyslexia:

#### **Computer use and study locations**

The first section was enquiring about computer use in connection with studies and the intention was to acquire a broad overview of this from amongst the two groups.

The first question asks about general computer use for studying as it was felt that knowledge of this may be important for validating the subsequent questions in this section.

1. "Would you say that you use computers in connection with your studies ... Often/Sometimes/Rarely/Never"

We would expect a student who selected 'rarely' or 'never' to be unlikely to provide much useful information in the subsequent questions about use of computers in specific locations but may still provide very interesting feedback about their feelings and attitudes to their dyslexia.

The second question was a 'check' question intended to confirm the placement of the student in their respective sub-group as determined by their number of log-ins to the computer workstations:

2. "Would you say that you use ATS computer workstations ... Often/Sometimes/Rarely/Never"

It was therefore expected that a student from the Non-Users group would select 'Rarely' or 'Never' whilst a student from the Users group would select 'Sometimes' or 'Often';

The third question completed this section and enquired about locations of computer use in connection with studying, attempting to address the issue concerning geographical location preference as an indicator of use/non-use of ATS workstations. It was felt that this may

provide useful data if upon scrutiny it seemed likely that it might co-relate this as a factor with the attitudinal questions to follow in some way. It would be expected that if geographical preference for computer use was not correlated with any factors extracted from the attitudinal part of the enquiry then this would indicate that this alone may be the significant factor in explaining why some students use the ATS and others do not. On the other hand, if some correlation existed, then this may be indicating that attitudes and feelings towards their dyslexic self is indeed a indicator in determining uptake of the ATS provision.

### **Attitudes to dyslexia**

Question 4 contained the substantial part of the questionnaire and comprised 30 statements against which the respondent was given a choice of selecting that they 'generally agreed' with the statement or 'generally disagreed' with it. The statements were constructed to explore attitudes and beliefs about dyslexia in relation to study and to perceptions of the impact of the syndrome on academic achievement and progress, which is attempting to explore the feelings of each individual about the affect that their dyslexia has on their studies at university. The intention was that information established from responses to these statements could be used as a sensible indicator of each respondent's Locus of Control, specifically biased towards factors that pointed to an *internal* locus of control as it was with this bias that the working hypothesis of the enquiry had been set. With this in mind, the five psychological constructs used to attempt to obtain an evaluation of each individual's locus of control were:

Affective Process

Anxiety, Motivation and Regulation

Self-Efficacy

Self Esteem

Learned Helplessness

The statements were in five groups of six statements with each group trying to find out something about how dyslexia impacts on these five distinct but clearly overlapping and inter-related psychological constructs with statements setting out to interrogate these constructs thus:

### **Affective Process**

Broadly speaking, the first group is exploring aspects of emotions and attitudes, considered as affective processes (abbreviated in the analysis to AF):

- I am able to settle down to my work anytime, anyplace
- I feel too embarrassed to ask for help with my studies
- I feel guilty about being dyslexic
- I will always be held back by my dyslexic difficulties

- I use strengths related to my dyslexia to help me with study strategies
- I don't think about my dyslexia much

### **Anxiety, Motivation and Regulation**

Secondly, statements were 'about how things are' for the respondent, which is concerned with anxiety levels, how they feel their study behaviour is regulated, and also exploring levels of motivation (ARM);

- However hard I try, I'll never be as good as someone without dyslexia
- I find it quite difficult to concentrate on my work most of the time
- I don't think my dyslexia makes me any more anxious than anyone else
- I approach my written work with enthusiasm
- I need to work much harder than my friends to get similar grades
- I often feel frustrated when trying to study<sup>9</sup>

### **Self-efficacy**

The next group of statements enquires about strategies used in study and perceptions of how successful these can be in terms of setting targets and achieving them - that is, self-efficacy (EF);

- I believe that my dyslexia impacts a great deal on my academic progress
- I am usually surprised if I get good marks
- I don't think my dyslexia makes any difference to the way I tackle my work
- I approach my written work with a high expectation of success
- I believe my dyslexia helps me to be more creative
- I can manage my studies quite adequately without any help

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<sup>9</sup> Unfortunately this statement in this group was omitted in error in the final version of the questionnaire which was published on-line, and therefore data has not been collected for it. Adjustments were made in coding the data and for the quantitative analysis to attempt to compensate for this omission which is reported below.

### **Self-esteem**

The fourth group is also exploring feelings but in ways that seek to shed light on how dyslexia has an effect on self-esteem (ES);

- I often felt pretty stupid at school
- If I try hard I can achieve as much as anyone else
- I don't consider myself to be disabled
- I keep knowledge about my dyslexia to myself
- I don't use any of the support services because it makes me feel different
- My contributions in class discussions is usually rubbish, so generally I don't bother

### **Learned helplessness**

Lastly, statements were interrogating how the respondents felt that dyslexia leads them to assume that events outside their control and which they perceive to be locked into a self-reinforcing and generally non-constructive cycle have more effect on their study than anything else - best described as learned helplessness (LH);

- The learning environment at University is considerate of the needs of dyslexic students
- I've had help with strategies for dealing with my dyslexia but it hasn't made any difference
- I believe that my grades are as much to do with luck as any effort on my part
- My friends know I'm dyslexic
- Teachers' help at school made little difference to my progress so I didn't ask much
- It would make no difference to my progress if my tutors knew about my dyslexia

As described earlier, the research methodology has drawn heavily on work by Burden (2005) with the construction of the statements in the questionnaire for this enquiry using many of the features incorporated into Burden's Dyslexia Identity Scale (DIS). But because the DIS was developed for use with school-aged students it was felt that much of the wording of the statements should be adapted to suit a higher education environment and the particular context of this enquiry. However, the general flavour of the statements that Burden found to be successful in revealing not only perceptions about how the dyslexic learner feels that their learning difference impacts on their study but also on the level of

understanding that the dyslexic student's perception of the understanding of other people have about their condition (ibid, p34) has been retained.

#### **Randomizing questionnaire Question 4 statements**

At the design stage of the questionnaire the statements were contained within each of their respective groups, the groups initially listed in alphabetical order: AF, ARM, EF, ES, LH, with the complete list of statements then numbered from statement 1 to statement 30. A random number generator (Haahr, 2007) was then used to derive a new order for the list of statements so that it would be harder for the respondent to spot a 'correct' answer or sequence of answers based on getting a 'feel' for which aspect of their behaviour or feelings that section of the questionnaire was interrogating, and hence how they might want themselves to be portrayed, either consciously or not. Appendix 2 shows the statements in their original order and also in the randomized order which was then published into the questionnaire.

#### **Internal validity**

Insofar as this would be possible without lengthening this data gathering tool unduly, statements that complemented each other in a positive-negative sense were included amongst the list of statements in Question 4 to try to accomplish a simple check on the validity of the responses. Each section comprised just six key statements so it was felt that including additional ones for checks for validity would be burdensome. However it was possible to word some statements in such a way that their meanings were similar but different enough so that they appeared in different sections, but where it would be expected that an 'AGREE' response on one ought to be complemented by a 'DISAGREE' response on the other, thus providing at least a basic check on validity. For example:

- *I believe that my grades are as much to do with luck as with any effort on my part*
- *If I try hard I can achieve just as much as anyone else*

where we would expect that a respondent who agreed with the first statement would probably disagree with the second, or vice versa, as otherwise their responses would be contradictory.

#### **Locus of Control assignment**

Given that Question 4 is attempting to interrogate the respondent to explore the relationship between their study behaviour and their locus of control, each of the statements was designed so that either an 'AGREE' response or a 'DISAGREE' response might be an indicator of either a degree of internal or of external locus of control. Care was taken with the wording of the statements so that it did not appear, for example, that all the negatively worded questions corresponded to, say, an external locus of control. For

example, in the section exploring anxiety, regulation and motivation, we might expect the statement:

- *However hard I try, I'll never be as good as someone without dyslexia*

to provoke a 'DISAGREE' response from an individual who considers that their perceived lack of academic achievement isn't as a result of the external factor of their dyslexia, that is, through a part of their personal make-up, part of their 'self' over which they have no control, but that by being proactive in striving to be successful in the face of adversity to compensate for their dyslexia, the ultimate result will be greater rewards and a higher level of academic achievement - which is clearly an indicator of *internalized* behavioural characteristics. So the response 'DISAGREE' was counted as a marker for a strong INTERNAL locus of control for this respondent. Whereas for the statement:

- *I need to work much harder than my friends to get similar grades*

a respondent who selected 'AGREE' as their response would also be indicating an INTERNAL locus of control because their response equally suggests that with determined and sustained effort a higher level of success will be achieved. The table in Appendix 3 provides the full list of statements with their AGREE/DISAGREE assignment with indicators of INTERNAL/EXTRNAL locus of control highlighted. (Note also that the two statements used here are also examples of a pair used for assessing the internal validity of the questionnaire such that we might expect a respondent who was providing 'valid' responses should select opposite ones for each of these two statements).

#### **Further information collected**

Question 5 on the questionnaire provided an empty text field where the respondent was invited to comment further on any aspect of their dyslexia that they wanted to share, or to provide their views on the Assistive Technology Service more generally or disclose more about how they studied in university.

It was felt that any information collected here may also be useful in itself, but further that it could strengthen the validity of an individual's responses as it may be possible to compare anything written here with the responses in the previous question so that the one supports the other. Interestingly, respondents seemed keen to talk about their dyslexia with well over 50% of the replies containing information in this field.

Question 6 provided an option for the respondent to leave an e-mail address as contact details on the premise that should it be decided to follow up their questionnaire responses with a short interview this would be possible. In fact, the questionnaire provided as much information as required and no respondents were subsequently contacted although this could be a development of the enquiry for the future.

Questions 7 and 8 asked the respondent to state their gender and whether they are of undergraduate or a post-graduate status as it was felt that information provided here may also be useful for looking at differences between the uptake of the support service under scrutiny in this enquiry.

These two questions were also used as a means to differentiate between the two research subgroups as although individual students had been identified in the original analysis of log-in data as those who would form the overall research group, it was not possible to know which of them would complete the questionnaire and submit it and even if they did, whether they would choose to identify themselves through providing contact details in question 6. Thus without a means of differentiating from which subgroup a reply had been received it would be impossible to use the data provided to address the fundamental research rationale of looking for differences between the subgroups on the basis of data collected from individual respondents in each of those subgroups.. This differentiation was achieved by modifying the questionnaire to create two almost identical versions switching the question order in which information about gender and student status was interrogated in each. For students in the subgroup Non-Users question 7 asked about gender, question 8 asked about student status, and for students in the subgroup Users the order of these questions were reversed. Both versions of the questionnaire were published to the internet and in the initial e-mail contact with individual students as identified and in each of the subgroups which invited them to take part in the research, those in each of the two subgroups were supplied with the link to their respective versions of the questionnaire. When responses were received following submission of the questionnaire on-line, the e-mail generated by the browser-based form-script listed the questions in the order in which they had appeared on each respective version, thus it was possible to identify from which subgroup the reply had been received by noting the order in which the questions relating to gender and to student status appeared in the e-mail without it being necessary for the respondent to identify themselves (See Appendix 4 for an example of the e-mail-form generated by submission of the questionnaire);

### **Preliminary data analysis procedure:**

86 students were identified from original workstation log-in data to form the overall research group and each was contacted by e-mail with an invitation to take part in the research. Two follow-up e-mails were sent out, the first a week or so after the initial invitation and the second, a week or so after that, both further requesting these students to participate in the enquiry. In total 41 replies were received of which 15 were from students in the Non-Users subgroup and 26 were from the Users subgroup.

On completion of the on-line questionnaire by a respondent, the 'submit' feature generated an e-mail form containing the full set of responses which was posted to the researcher. The data collected was transferred from the e-mail forms directly into an Excel spreadsheet and the data from the statements in Question 4 re-ordered into its original grouping according to psychological constructs to facilitate easier analysis.

A simple system of coding the data in order that quantitative analysis may be possible was determined and applied (see Appendix 5 for more specific details) with the software application SPSS subsequently used to interrogate the data with the principle focus on the analysis of responses for the statements in Question 4 of the questionnaire, exploring locus of control.

### **5-co-ordinate axes graphical representation of a profile for Locus of Control**

It was also felt that developing a method to represent the data gathered in Question 4, on the five psychological constructs that contribute to each respondent's locus of control, would be valuable in aiding a more qualitative approach to the analysis. Given that the data had been coded according to the methods set out in Appendix 5 for each of the five psychological constructs of Affective Process; Anxiety, Regulation and Motivation; Self-Efficacy; Self-Esteem; and Learned Helplessness, the responses given by each individual against each of the statements in Question 4 enabled a Locus of Control 'score' to be determined for each of the constructs which was unique to each individual (see Tables 5 and 6 below). In order to illustrate these scores together, a 5-co-ordinate-axis graph was developed so that each score could then be transferred to the respective axis on the graph as a co-ordinate. By joining up each of the 5 co-ordinates a polygon could be created which was further enhanced by infilling the area contained with different colours to represent each of the five constructs as shown in Figure 3 below. The result is a profile of Locus of Control that is unique to each individual and provides a very visual interpretation of quite complex results. It quite clearly indicates the levels of the five, Internal Loci of Control scores because the data was coded with this in mind (i.e. biased towards internal, neutral towards external) but when taken together, the overall area of the polygon

established provides a 'feel' for not only the total score for Internal Locus of Control but also generates an interesting indication of skew which is discussed further in the results analysis below. The magnitude of the area of the polygon is an indication of the overall level of INTERNAL locus of control (ILoC) for the individual, that is, the larger the area of the polygon, the greater the total ILoC score for that respondent. Hence to explore the underlying hypothesis of this enquiry - that those students with a relatively high internal locus of control are less likely to use the Assistive Technology Service support facilities and resources - we would expect respondents in the Non-Users subgroup to display large overall areas on this graphical representation of their ILoC profiles than respondents in the Users subgroup if the data collected, together with this analysis, supports the working hypothesis.

**QNR #28;**  
**USER**

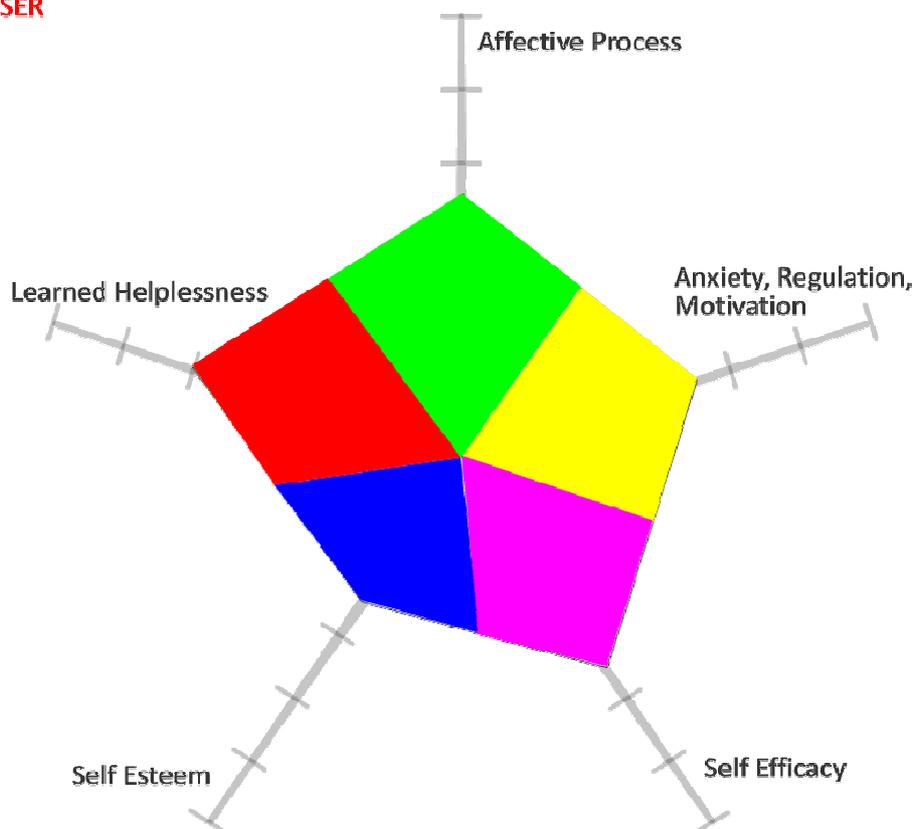


Figure 3: The overall Internal Locus of Control profile for questionnaire respondent #28

Not only did this provide an astonishingly visual representation of the data collected on Question 4 for each individual, but when all the graphs were inspected together, it was possible to spot both remarkable similarities and significant differences between profiles which enabled most to be sorted into distinct groups. The full set of profiles is presented in Appendix 6 where additional to each profile is added the contents of the questionnaire

question 5 text field in which respondents were invited to record anything that they felt was appropriate concerning their feelings about their dyslexia, how they perceived it to impact on their studies, or any other comments that they felt would be useful feedback about the quality of the Assistive Technology Service or studying at University more generally. An evaluation of these Locus of Control profiles and the contribution that this makes to the enquiry is detailed in the next section.

## Research Results:

### Descriptive statistics and commentary

#### Response rate; gender distribution;

86 e-mail questionnaire invitations were sent out and 41 on-line questionnaires were completed and submitted. Table 1 shows the frequency distribution between the two subgroups: Users and Non-Users also according to gender, and the respective response rates:

	e-mail invitations			questionnaire returns			response rate		
	male	female	both	male	female	both	male	female	both
USERS	19	27	46	10	16	26	52.6%	59.3%	56.5%
NON-USERS	20	20	40	7	8	15	35.0%	40%	37.5%

Table 1: Questionnaire response rates

The lower response rate from students in the Non-Users groups is as we might expect given that these students are not using the ATS much or at all and so may be less likely to be interested in offering their views about it. Nevertheless, the overall response rate of 47.7% is encouraging for a small-scale research project and provided enough data to explore in more detail. In both groups the response rate for females was slightly higher than for males which may be an indication of a more general interest amongst females for sharing their feelings and experiences, or may also be related to research reported earlier concerning gender bias towards females (Alexander-Passe, 2006).

#### Graduate status

No differentiation was made in the selection of the research group between post- and undergraduates as other parameters were applied and as such the target subgroup Users was comprised entirely of undergraduates, with the subgroup Non-Users comprising just 4 post-graduates out of the 40 invitations to complete the questionnaire. A questionnaire response was received from just one of these post-graduates.

#### Workstation log-in data

Table 2 shows a summary of the data for workstation log-ins for each subgroup over the research date-to-date time period February 2006 to April 2007.

	Users	Non-Users
least number of log-ins	12	0
most number of log-ins	255	6
median log-ins	51	2
mean log-ins	57.7	2.04

Table 2 Workstation log-in data for the date-to-date research period February 2006 to April 2007

### Using computers in connection with studies

Tables 3 and 4 shows data collected from questions 1 and 2 of the questionnaire: the respondents perception of their frequency of use of computers generally in connection with their studies, and more specifically of ATS computer workstations.

These questions were exploring general computer workstation use and also were intended as a check that see if the boundary that was determined to discriminate between a User and a Non-User by looking at the median number of log-ins in total for the complete research group, (median = 10) placed students in a subgroup that correlated with the respondents own perception of how often they used computers in connection with their studies. A student who logged-in to ATS workstations less than 10 times would be considered as a 'Non-User' of the Service.

Respondent number:	Would you say that you use computers in connection with your studies...	Would you say that you use ATS computer workstations ...	Number of Log-ins to ATS workstations:	I use University computers in areas that are close to where I receive my teaching	I use University computers in the Hartley Library public workstation rooms	I use University computers in the ATS workstations rooms	I don't use University computers much	I use my own laptop computer in places on the campus that are convenient to me	I use my own computer at home	I use a computer somewhere else	I don't use computers much
#2	RARELY	NEVER	2	no	no	no	no	no	YES	no	no
#3	OFTEN	SOMETIMES	6	no	no	YES	no	YES	YES	no	no
#7	OFTEN	RARELY	0	YES	no	no	no	YES	YES	no	no
#12	OFTEN	NEVER	0	YES	no	no	no	YES	YES	no	no
#13	OFTEN	NEVER	0	no	no	no	no	no	YES	no	no
#15	OFTEN	NEVER	2	YES	YES	no	no	YES	YES	no	no
#16	OFTEN	RARELY	2	no	no	no	YES	no	YES	no	no
#20	OFTEN	OFTEN	10	no	no	YES	no	no	YES	no	no
#26	OFTEN	OFTEN	2	no	no	YES	no	no	YES	no	no
#27	OFTEN	RARELY	0	YES	YES	no	YES	YES	YES	YES	no
#30	OFTEN	OFTEN	2	YES	YES	YES	no	YES	YES	no	no
#31	OFTEN	RARELY	1	YES	no	no	no	no	no	no	no
#34	OFTEN	NEVER	0	no	no	no	no	no	YES	no	no
#38	OFTEN	RARELY	2	YES	no	no	no	no	YES	no	no
#39	OFTEN	NEVER	2	no	no	no	YES	no	YES	no	no

Table 3: Distribution of computer workstation use for respondents in the Non-Users subgroup

Respondent number:	Would you say that you use computers in connection with your studies...	Would you say that you use ATS computer workstations ...	Number of Log-ins to ATS workstations:	I use University computers in areas that are close to where I receive my teaching	I use University computers in the Hartley Library public workstation rooms	I use University computers in the ATS workstations rooms	I don't use University computers much	I use my own laptop computer in places on the campus that are convenient to me	I use my own computer at home	I use a computer somewhere else	I don't use computers much
#1	OFTEN	OFTEN	225	YES	YES	no	no	no	YES	no	no
#4	OFTEN	SOMETIMES	58	no	no	YES	no	no	YES	no	no
#5	OFTEN	OFTEN	14	no	no	YES	no	no	YES	no	no
#6	OFTEN	OFTEN	52	no	YES	no	no	no	no	YES	no
#8	OFTEN	OFTEN	31	no	YES	no	no	no	YES	no	no
#9	OFTEN	SOMETIMES	70	no	YES	YES	no	no	no	YES	no
#1no	OFTEN	SOMETIMES	18	YES	no	no	no	no	YES	no	no
#11	OFTEN	OFTEN	61	no	no	YES	no	no	YES	no	no
#14	OFTEN	OFTEN	58	no	no	YES	no	no	no	no	no
#17	OFTEN	OFTEN	40	no	YES	YES	no	YES	YES	no	no
#18	OFTEN	SOMETIMES	14	YES	YES	no	no	no	YES	no	no
#19	SOMETIMES	SOMETIMES	78	no	no	YES	no	no	no	no	no
#21	OFTEN	OFTEN	15	no	no	YES	no	no	YES	no	no
#22	OFTEN	SOMETIMES	81	no	no	YES	no	YES	YES	no	no
#23	OFTEN	OFTEN	99	no	no	YES	no	no	no	no	no
#24	OFTEN	OFTEN	181	no	no	YES	no	no	no	no	no
#25	OFTEN	OFTEN	58	no	no	YES	no	no	no	no	no
#28	OFTEN	RARELY	19	YES	no	no	no	YES	YES	no	no
#29	OFTEN	SOMETIMES	76	YES	no	YES	no	YES	YES	no	no
#32	OFTEN	SOMETIMES	18	YES	no	no	no	no	no	no	no
#33	OFTEN	RARELY	32	YES	no	YES	no	no	YES	no	no
#35	OFTEN	SOMETIMES	22	YES	YES	no	no	no	no	no	no
#36	OFTEN	SOMETIMES	97	YES	no	no	no	no	no	no	no
#37	OFTEN	SOMETIMES	21	YES	no	YES	no	no	YES	no	no
#40	OFTEN	OFTEN	50	no	no	YES	no	no	no	no	no
#41	OFTEN	SOMETIMES	12	YES	YES	YES	no	no	no	no	no

Table 4: Distribution of computer workstation use for respondents in the Users subgroup

## Commentary

Although all but one of the respondents in the Non-Users subgroup (Table 3) said that they used computers OFTEN in connection with their studies there was general consistency between the subgroup that they had been placed into by the researcher according to their actual number of log-ins to ATS computer workstations over the 15-month research period and their own perception of how frequently they used the Service. One respondent, #3, reporting that they used ATS computer workstations 'SOMETIMES' although this respondent logged-in just 6 times during the research period, and two other inconsistent results: for respondent #20 who felt that they logged-in 'OFTEN' but actually had just 10 log-ins, and for respondent #30 who also reported logging-in 'OFTEN' but had just 2 log-ins. Perhaps these relatively isolated cases identify a weakness in the scale choices in this question as it was left to the respondents' common sense to determine for themselves in what ways 'SOMETIMES' was different from 'RARELY' for example. Additionally it is possible that respondents in this subgroup (Non-Users) are muddled about the differentiation between public (ISS) workstations and ATS workstations, particularly for respondent #30.

For respondents in the Users subgroup, all respondents reported using computers in connection with their studies 'OFTEN' aside from one who recorded 'SOMETIMES', and all but two said that they used ATS workstations 'OFTEN' or 'SOMETIMES', showing general consistency with the researcher's definition of these students as Users and their own perception as Users of the Service. But there were still notable inconsistencies recorded here. For example respondent #1 actually logged-in to ATS workstations more than anyone else (225 log-ins) but nevertheless indicated that they didn't use ATS workstations, and there was a marked difference in the number of respondents indicating that they used their own computer at home for the Users subgroup in comparison to respondents in the Non-Users subgroup (14/26 and 14/15 respectively). It is quite possible that this feature of access to a computer at home is the single most determining factor in uptake of the ATS support service although it is likely that if not all, then certainly the substantial majority of students in total are in receipt of the Disabled Students' Allowance which almost always provides a computer workstation for use at home. However if this is true, it is puzzling that 12/26 respondents in the Users subgroup reported that they didn't use a computer at home, whereas in the Non-Users subgroup all but one of the respondents said that they used a computer at home. One explanation for this could be that by chance, the respondents in the Users subgroup either did not receive computer equipment as part of their DSA for some reason, or had chosen not to apply for the DSA in the first place. With hindsight, it would have been useful to have included a question in the questionnaire that asked whether the respondent was in receipt of the DSA.

A similar proportion of respondents in each subgroup said that they used computers in areas that were close to their leaching locations (47% (7/15) of the Non-Users against 42% (11/26)

of the Users) which suggests that this feature of computer use is independent of uptake of the ATS computer workstation facility.

A higher proportion of respondents in the Non-Users subgroup appeared to have access to a laptop computer (6/15) that they used in areas on the campus that were convenient against just 3 out of 15 Users reporting this. Of the Non-Users who did use a laptop, all also indicated that they used University computers in areas that were close to their teaching which suggests that laptop use for this group is regarded as not necessarily preferential over University workstation use.

So on the basis of this relatively un-quantitative analysis it nevertheless seems unlikely that an exploration of alternative computer usage is going to indicate reasons why the Non-Users don't use ATS resources and facilities.

### **Quantitative analysis**

It was felt that although the data collected in the questionnaire was largely categorical being only semi-continuous once coded with discrete coding values, it was nevertheless worth exploring it at a quantitative level to try to expose relationships between the categories that might be difficult to spot through a more qualitative approach. Specifically we are looking for significant differences between the two subgroups Users and Non-Users. Parametric tests in the form of the Independent Samples Test (T-test) and its non-parametric equivalents, the Mann-Whitney U and Kolmogorov-Smirnoff Z tests were employed to search for significant differences between the data collected for students in each of the two subgroups that might be used to address the working hypothesis for the enquiry.

### **Parametric tests - T-test (independent samples test)**

The independent samples test, or T-test, inspects the data to search for a significant difference between the means of two independent variables which share a common attribute, that is, a dependent variable.

Data provided in the questionnaire about the statements of belief (Question 4) were used both collectively in accordance with each of the 5 psychological constructs that grouped them together and also on a statement by statement basis to examine for significant differences between the Users and the Non-Users subgroups. The response for each individual statement in Question 4 was assigned a code value of either 1, 0 or 0.5 depending on whether the response was an indicator of internal locus of control, or not, or there was no response, respectively, as detailed in Appendix 5.

**Using the T-test to search for significant differences between Users and Non-Users for each construct:**

Using the coding system described above it was possible to sum scores to provide a total for each psychological construct for respondents according to their responses for each of the statements in each construct group. (See Appendix 2 for the statements listed in their groups). Hence 6 separate T-tests can be computed for the two independent variables of Users and Non-Users being tested against each other sharing the dependent variables:

- Internal Locus of Control score for Affective Process
- Internal Locus of Control score for Anxiety, Regulation and Motivation
- Internal Locus of Control score for Self-Efficacy
- Internal Locus of Control score for Self-Esteem
- Internal Locus of Control score for Learned Helplessness
- Internal Locus of Control score for the sum of all 5 sub-constructs

Table 5 lists the total Internal Loci of Control for each construct for each questionnaire respondent in the Non-Users subgroup and Table 6 lists the same for the Users subgroup. It is worth noting that Tables 5 and 6 also set out the co-ordinate axes values for each construct that have been used to create the Internal Locus of Control Profiles using a 5-axes-co-ordinate graphing system. As reported earlier, all 41 profiles are available in Appendix 6 and a commentary on what they may be indicating is given below.

Respondent number:	Internal LOCUS of CONTROL score for AFFECTIVE PROCESS:	Internal LOCUS of CONTROL score for Anxiety, Regulation, Motivation	Internal LOCUS of CONTROL score for Self-Esteem	Internal LOCUS of CONTROL score for Self-Efficacy	Internal LOCUS of CONTROL score for Learned Helplessness	Internal LOCUS of CONTROL TOTAL SCORE
#2	1	2.4 <sup>10</sup>	1	4	3	11.4
#3	2	0	3	4	4	13
#7	3	2.4	2	3	3	13.4
#12	5	3.6	2	6	4	20.6
#13	3	1.2	1	4	4	13.2
#15	3	1.2	3	5	3	15.2
#16	4	4.8	5	5	3	21.8
#20	3	1.2	1	4	2	11.2
#26	2	2.4	1	3.5	3.5	12.4
#27	3	2.4	2	4	2.5	13.9
#30	3	2.4	1	2	5	13.4
#31	1	6	4	5	4	20
#34	5	3.6	3	3	4	18.6
#38	4	4.8	3	4	5	20.8
#39	4	3.6	3	6	5	21.6

Table 5: Summary of Locus of Control totals for respondents in the Non-Users subgroup

<sup>10</sup> As reported earlier, after the final questionnaire was published to the internet it was noticed that one of the statements in the Anxiety, Regulation and Motivation group had been omitted in error during the final edit, leaving only 5 statements in this group rather than 6. The statement omitted was: 'I often feel frustrated when trying to study'. In an attempt to re-scale these scores to compensate for this and to equate them in a way such that comparison with the other groups was possible, a scaling factor of x1.2 was used. That is for example, a raw score of 3 was scaled x1.2 to generate a new score of 3.6. It was felt that this was a reasonable adjustment to apply under the circumstances and went some way to covering for the omission of the original statement in the final questionnaire.

Respondent number:	Internal LOCUS of CONTROL score for AFFECTIVE PROCESS:	Internal LOCUS of CONTROL score for Anxiety, Regulation, Motivation	Internal LOCUS of CONTROL score for Self-Efficacy:	Internal LOCUS of CONTROL score for Self-Esteem:	Internal LOCUS of CONTROL score for Learned Helplessness:	Internal LOCUS of CONTROL TOTAL SCORE
#1	1	1.2	1	3	3	9.2
#4	2	3.6	1	4	5	15.6
#5	3	2.4	1	4	4	14.4
#6	3	2.4	1	4	3	13.4
#8	2	6	3	3	1	15
#9	1	1.2	1	3	2	8.2
#10	0	1.2	1	0	3	5.2
#11	4	4.8	5	5	2	20.8
#14	2	1.2	1	4	4	12.2
#17	1	1.2	2	3	3	10.2
#18	4	1.2	2	4	5	16.2
#19	4	1.2	1	3	1	10.2
#21	2	1.2	2	4	4	13.2
#22	3	2.4	1	3	4	13.4
#23	2.5	1.2	2.5	4	2	12.2
#24	3	3.6	3	4	5	18.6
#25	2	1.2	1	2	4	10.2
#28	3.5	3.5	2.5	4	2.5	16
#29	4	4.8	5	6	5	24.8
#32	5	3.6	2	4	5	19.6
#33	4	3.6	3	6	4	20.6
#35	3	1.2	1	5	4	14.2
#36	3	2.4	1	4	6	16.4
#37	3	3.6	4	5	4	19.6
#40	5	3.6	3	3	4	18.6
#41	4	2.4	-4	4	3	9.4

Table 6: summary of Locus of Control totals for respondents in the Users subgroup

## Results:

For all 6 T-tests, Levene's Test for Equality of Variances showed no significant differences between the variances of the subgroups Users and Non-Users. Subsequently, T-test results for Internal Locus of Control for the 5 psychological constructs and for the Internal Locus of Control Total Score showed no significant differences between the subgroups Users and Non-Users:

- For the independent-samples T-test to compare the Internal Locus of Control Scores (Affective Process) for the subgroups Users and Non-Users there was no significant difference in scores for Users (mean = 2.75, SD = 1.259) and Non-Users (mean = 3.10, SD = 1.20). The magnitude of the difference in the means was small ( $\eta^2 = 0.0191$ )<sup>11</sup>
- For the independent-samples T-test to compare the Internal Locus of Control Scores (Anxiety, Regulation and Motivation) for the subgroups Users and Non-Users there was no significant difference in scores for Users (mean = 2.585, SD = 1.418) and Non-Users (mean = 2.800, SD = 1.6142). The magnitude of the difference in the means was very small ( $\eta^2 = 0.0051$ )
- For the independent-samples T-test to compare the Internal Locus of Control Scores (Self-Efficacy) for the subgroups Users and Non-Users there was no significant difference in scores for Users (mean = 1.962, SD = 1.3033) and Non-Users (mean = 2.333, SD = 1.2344). The magnitude of the difference in the means was small ( $\eta^2 = 0.0202$ )
- For the independent-samples T-test to compare the Internal Locus of Control Scores (Self-Esteem) for the subgroups Users and Non-Users there was no significant difference in scores for Users (mean = 3.75, SD = 1.210) and Non-Users (mean = 3.87, SD = 1.343). The magnitude of the difference in the means was very small ( $\eta^2 = 0.0021$ )
- For the independent-samples T-test to compare the Internal Locus of Control Scores (Learned Helplessness) for the subgroups Users and Non-Users there was no significant difference in scores for Users (mean = 3.481, SD = 1.2528) and Non-Users (mean = 3.667, SD = 0.9194). The magnitude of the difference in the means was very small ( $\eta^2 = 0.0064$ )
- For the independent-samples T-test to compare the Internal Locus of Control Scores (TOTAL SCORE) for the subgroups Users and Non-Users there was no significant

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<sup>11</sup>  $\eta^2$  gives an indication of the effect size, this being the magnitude of the differences between the groups being tested and as such is in addition to just testing whether the difference could have occurred by chance (that is, is not significant). Guidelines followed are:  $<0.01$  = very small effect;  $<0.06$  = small effect;  $<0.14$  = moderate effect;  $\geq 0.14$  = large effect; PALLANT, J. (2005) *SPSS Survivors Manual*, Maidenhead, Open University Press.

difference in scores for Users (mean = 14.53, SD = 4.323) and Non-Users (mean = 15.77, SD = 4.234). The magnitude of the difference in the means was very small ( $\eta^2 = 0.0199$ )

With no significant differences between the mean scores in each of the 5 psychological construct totals for Internal Locus of Control and for the Internal Locus of Control Total Score between the subgroups Users and Non-Users, it was decided to use the T-test to further explore each separate statement in Question 4 of the questionnaire to see if there were any effects to be exposed that were shrouded by taking statements in groups:

#### **Using the T-test to search for significant differences between Users and Non-Users for each statement:**

It would not be expeditious to present the results for each of the 29 statements, especially since in almost all cases no significant differences were exposed. Exceptions were:

- For the independent-samples T-test to compare the statement: "I need to work much harder than my friends to get similar grades" for the subgroups Users and Non-Users there was a **significant difference at the 5% level** in scores for Users (mean = 0.885, SD = 0.3258) and Non-Users (mean = 0.600, SD = 0.5071). The magnitude of the difference in the means was moderate to large ( $\eta^2 = 0.11$ )
- For the independent-samples T-test to compare the statement: "The learning environment at University is considerate of the needs of dyslexic students" for the subgroups Users and Non-Users there was a significant difference in scores at the 5% level for Users (mean = 0.192, SD = 0.4019) and Non-Users (mean = 0.533, SD = 0.4806). The magnitude of the difference in the means was moderate to large ( $\eta^2 = 0.1321$ )

#### **Non-parametric tests: Mann-Whitney U and Kolmogorov-Smirnoff Z**

It may be reasonable to surmise that using non-parametric tests is more valid in these circumstances and the two listed here are the non-parametric equivalents of the parametric T-test for independent means. Mann-Whitney U and its slightly more robust partner when used for small data, Kolmogorov-Smirnoff Z, both use a comparison of the medians of the data groups rather than the means and are still useful. Required are two variables, one categorical variable with two groups - in our case this will be our two subgroups, Users and Non Users - and one continuous variable, for example, Internal Locus of Control Scores for each of the 5 psychological constructs and also for the Internal Locus of Control total of the 5 constructs.

**Using the Mann-Whitney U and Kolmogorov-Smirnoff Z tests to search for significant differences between Users and Non-Users for each construct:**

The same testing procedures were applied in their non-parametric sense to the Internal Locus of Control scores for each of the 5 psychological construct groups of statements and also to the total scores for all 5 groups to test for any significant differences between the Users and the Non-Users subgroups and in all cases no significant differences were exposed between the two subgroups Users and Non-Users.

**Using the Mann-Whitney U and Kolmogorov-Smirnov Z tests to search for significant differences between Users and Non-Users for each statement:**

In the same way, the data was further tested using these non-parametric tests on a statement by statement basis to try to expose any otherwise hidden significant differences that had been insufficient to affect the group tests. Using the Mann-Whitney U, in almost all cases, no significant differences were detected but with the same two exceptions discovered as with the T-test reported above:

- Using the Mann-Whitney U non-parametric test to compare the statement: "I need to work much harder than my friends to get similar grades" for the subgroups Users and Non-Users there was a **significant difference in scores at the 5% level** for Users and Non-Users (Asymptotic significance, 2-tailed,  $Z = 0.036$ )
- Using the Mann-Whitney U non-parametric test to compare the statement: "The learning environment at University is considerate of the needs of dyslexic students" for the subgroups Users and Non-Users there was a **significant difference in scores at the 5% level** for Users and Non-Users (Asymptotic significance, 2-tailed,  $Z = 0.036$ )

Using the Kolmogorov-Smirnov Z test, other significant results were detected:

- Using the Kolmogorov-Smirnov Z non-parametric test to compare the statement: "I approach my written work with enthusiasm" for the subgroups Users and Non-Users there was a **significant difference in scores at the 5% level** for Users and Non-Users ( $Z = 0.024$ )
- Using the Kolmogorov-Smirnov Z non-parametric test to compare the statement: "I keep knowledge of my dyslexia to myself" for the subgroups Users and Non-Users there was a **significant difference in scores at the 5% level** for Users and Non-Users ( $Z = 0.016$ )

- Using the Kolmogorov-Smirnov Z non-parametric test to compare the statement: "I am usually surprised if I get good marks" for the subgroups Users and Non-Users **there was a significant difference in scores at the 5% level for Users and Non-Users (Z = 0.024)**

### Commentary

On the basis of the quantitative analysis generally, the working hypothesis for this small-scale research project would have to be rejected. That is, there is no significant difference in values of Internal Locus of Control between students in the Users subgroup compared with the Non-Users subgroup according to the parameters developed to measure it, that could be said to account for why the respondents in the one subgroup choose to use the ATS support service and respondents in the other do not.

However, it must be remembered that with the two subgroups of Users and Non-Users comprising just 26 respondents in the former and only 15 in the latter, it may have been very surprising indeed had a statistically significant result have been determined as data computed from small groups can be notoriously unreliable for drawing valid conclusions inferring reasons for behaviour more generally amongst the background population.

Some interesting results did occur when statements were analysed individually and indicated significant differences between the two subgroups for these statements alone but given that these were spread across the 5 psychological constructs rather than being confined to any one area we might surmise that it is unlikely that these are an explanation for why some students use the ATS and others do not.

Also possible is that the statements are incorrectly attributed to their respective psychological construct sub-group, or worded in such a way that their meaning is misconstrued by some respondents, or not testing effectively the psychological construct that they are attributed to. So it is also possible that a re-evaluation of the location of statements in their respective groupings may unearth fresh differences that might be significant, indeed alternative quantitative analysis such as factor analysis may also be appropriate and might discover differences that remain hidden.

Of course the entire concept of deconstructing Locus of Control into sub-constructs to use as an evaluation of human behaviour remains largely untested with a dearth of research in this area providing the researcher for this small-scale enquiry with little guidance.

## Qualitative Analysis

### Internal Locus of Control Profiles

The complete set of Internal Locus of Control Profiles is presented in Appendix 6 and the rationale that underpins these as a mechanism for viewing complex data is described above.

The profiles have been ordered into groups that show similarities within each group and differences between groups and this analysis was completed on an entirely visual basis by spreading out all 41 profiles and looking for similarities with this exercise being repeated three times by asking two other people aside from the researcher to sift the profiles into groups. It was interesting to note that although this process was bound to introduce a degree of difference between who chose which profiles to group together, these differences were marginal with the majority of profiles being grouped in similar ways each time.

4 relatively clear groups of profiles exhibiting similar characteristics were identified together with a further group of profiles that were all different both to each other and to the profiles in the other 4 groups. In Appendix 6 the profiles are ordered into these 5 groups. The questionnaire respondents are listed here in profile groups where QNR ## indicates a respondent in the Users subgroup and QNR ## indicates a respondent in the Non-Users subgroup:

Group A: #7, #11, #16, #24, #28, #29, #32 #34, #37, #38, #40

- profiles in Group A showed the most even balance between the 5 psychological constructs with none showing a particular strength or weakness;

Group B: #6, #9, #12, #13, #15, #20, #23, #27, #33, #35, #39

- profiles in Group B showed a more pronounced bias towards Self-Efficacy, and also Affective Process, and to a lesser extent Learned Helplessness although these three constructs were generally stronger than the other two;

Group C: #1, #5, #14, #17, #18, #21, #22, #26

- profiles in Group C showed a bias towards strong Internal Locus of Control in areas of Learned Helplessness and less so, Self-Efficacy with a significantly less pronounced representation for Anxiety, Regulation and Motivation;

Group D: #2, #4, #25, #30, #36

- profiles in Group D were strongly biased towards Learned Helplessness ;

Group E: #3, #8, #10, #19, #31, #41

- profiles in Group E did not fit into any of the other four groups and comprised a mixture of balances for the 5 constructs. In the case of respondents #3, #41 these profiles showed zero scores in one construct and respondent #10 showed zero scores in two constructs.

## Commentary

It was difficult to determine in which group to place many of the profile with the exception of Group A, where profiles showed a more general equivalence in the Internal Locus of Control scores between the five constructs and it is interesting to note that the composition of respondents in this profile group from each of the enquiry subgroups of Users and Non-Users was in an equal proportion (that is, this group contained profiles from 4 out of the 15 Non-Users and 7 out of the 26 Users both representing just over one quarter of the total number of respondents in each of the enquiry data subgroups). This may further add weight to the rejection of the enquiry hypothesis: that a measure of Internal Locus of Control goes some way towards explaining the uptake of support provided by the ATS at this university - at least for students for whom this measure of their Internal Locus of Control shows no particularly strong markers for one psychological construct as opposed to another, nor any weaknesses either. That is, for those with a 'well-rounded' Internal Locus of Control that is quite high overall in any case (all respondents scored relatively highly in all 5 of the constructs), Internal Locus of Control is independent of choice of uptake of learning support. This means that there will be some other reason to account for students' choice of behaviour in taking up learning support or not, from amongst this small group at least. Possibly this is locational, as for the 4 respondents in this group who were from the Non-Users subgroup, 2 indicated that they used computers in areas close to where their teaching took place and one other said declared not to use university computers much at all, with all four indicating that they used their own computer at home. 2 of the respondents in this LoC group who came from the Non-Users subgroup wrote comments in the text-field area of the questionnaire which are interesting in that both appear to indicate a degree of negativity, perhaps from a more practical perspective that may account for a reluctance to use learning support:

"Extra support is not given in the right way. How does extra time in exams help? It doesn't reflect what would happen in the real world. More focused tuition concentrating on different skill areas...would be of a lot more benefit, or changing the assessment techniques" respondent #7 (Non-User)

"...I am unable to use support study sessions as I am already finding it hard to keep up with my coursework and don't have time....

...I avoid computers at university because they are not set up the same as mine at home and I find it confusing..." respondent #34 (Non-User)

For the other groups the picture may be equally unclear:

In Group B, adjusted for the proportionality of the relative numbers in the enquiry subgroups of Users and Non-Users, the Non-Users outnumbered the Users by a factor of 2:1 (6/15 Non-Users = 40% : 5/26 Users = 19%). Profiles in this group were generally strongest

in areas of Self-Efficacy and Affective Process, and to a lesser extent to Learned Helplessness indicating that these respondents may perceive themselves as clearly in control of their engagement with their learning and have probably developed mature and effective study skills and strategies that 'enable' their learning processes effectively without feeling the need for learning support. We might expect these students to be secure and have a good understanding of their meta-learning processes perhaps. So here we are seeing evidence that strengths in some sub-components of Internal Locus of Control as defined by this enquiry at least, may well be an indicator of a predisposition to study without learning support despite having a dyslexic learning difference. All respondents in this LoC group added comments in the text-field area of the questionnaire and although there doesn't appear to be any common theme that runs through these comments, they are nevertheless very interesting and reveal some really quite personal insights in some cases into the individuals' own self-concept and self-analysis of their learning differences and the real difficulties that these present in attempting to engage effectively with the demands of their learning:

"...I also find occasionally i will be thinking one work and write a completely differnt work but that is related. for example i will be thinking force but right power. power never came into my head yet u find myself writing it im obviously cross wired some where" respondent #33 (User)

"...going for help with studies takes up more of my time when i'm already struggaling with too much work and not enough time, and it rarely helps as i can't explain why i'm struggaling otherwise i would have just done in in the first place." respondent #20 (Non-User)

For the respondents in Group C the situation is reversed compared with those in Group B, in that taking nto account a proportionality adjustment as described above, the Users in this group outnumber the Non-Users by a factor of nearly 4:1 (7/26 Users = 27% : 1/15 Non-Users = 7%). This suggests that students with low Internal Locus of Control in areas of Anxiety, Regulation and Motivation, and in Self-Esteem may be particularly disposed to seek the need of learning support. This is certainly consistent with much of the research findings reviewed earlier in this report concerning self-esteem and anxiety as being particularly heightened amongst dyslexic learners and may also support the findings of Carroll and Iles (2006) referred to previously who calls for an appraisal of emotional needs and how this disposes an individual towards their learning, to be part of an overall assessment of needs when disclosing a dyslexic learning difference to the university support services. Having said this, respondents in this group do indicate relatively strong scores in Internal Locus of Control for the constructs of Learned Helplessness and Self-Efficacy but this may be suggesting that given their engagement with the facilities and resources of the ATS support service, their feelings for being more in control of their own learning is

scaffolded by their uptake of the service, which goes some way towards vindicating its usefulness!

"I think the ATS room is great as i cannot go into the normal workstations it makes me anxious and really stresses me out" respondent #1

"ATS is a great service, it has helped me a great deal over the last 3 years. I often feel it is the only place I can focus on my work" respondent #17

With only 5 respondents in Group D it is perhaps hard to draw any real meaningful conclusions and given that all of the profiles of respondents in this group were not too dissimilar to those in Group C, that these two groups could be combined. The Group D profiles also showed a markedly low Internal Locus of Control score for the construct Self-Esteem when compared with the other constructs and if combined with the respondents in Group C the balance of Non-Users to Users proportionally adjusted is 2:1 ( $10/26 = 38\%$  Users :  $3/15 = 20\%$  Non-Users) which still reflects a strong bias in favour of respondents in the Users subgroup, further adding weight to the argument that this Internal Locus of Control profile tends to be a characteristic of those students who choose to take advantage of the learning and study support offered by the ATS.

For the respondents in Group E the position is quite confusing as there existed no similarities between the profiles of the six respondents in this group aside from the significant differences between all of them! But it is interesting to note that of all the respondents who wrote comments in the text-field area of the questionnaire, some of the most extensive and revealing were from those who now find themselves in Group E for their Locus of Control Profile. For example, respondent #19 (User) revealed a good deal about his ambivalence to engaging in studies 'the right way' at university, and clearly indicated his feelings about attributing his perception of perhaps just moderate success to his learning being not under his control. This usefully correlated with his low score for the sub-construct 'Learned Helplessness' which in his case at least, indicated that the evaluation parameters for this construct was effective.

Respondent #3 (Non-User) showed a zero score for Internal Locus of Control in the construct Anxiety, Regulation and Motivation suggesting really quite an anxious and worried individual who might be finding it hard to engage with learning and as such it is a pity that they choose not to take advantage of all of the benefits that the ATS might be able to offer. Whereas respondent #8 (User) showed a high score for Internal Locus of Control for Anxiety, Regulation and Motivation and a very low score for Learned Helplessness which might be indicated that although she may find the sanctuary of the ATS workstation room a considerable comfort in reducing her levels of anxiety and the stress it may lead to, she still tends to view her progress in learning as largely haphazard and outside her domain of control. But at least these two examples may go some way to providing further evidence

that the ATS as a learning support service has much to offer. As for the other respondents in this group, the profile for respondent #10 (User) exhibits the most bizarre characteristics out of all 41 profiles. With zero or close to zero scores for all constructs apart from Learned Helplessness, coupled with the comments that this student recorded for questionnaire question 5 (see p117), we might observe an individual who is possibly quite troubled, totally lacking in self-esteem, highly anxious, deeply affected by her feelings towards her learning and only partially in control of her learning regime in terms of how much she feels her achievement is as a result of her efforts rather than through luck. Looking at the comments she wrote about how she feels, it seems clear that this is a learner who has found the learning process from an early age fraught with disappointment, difficulty and feelings of being misunderstood. Needless to say, in individual statement responses this student 'felt guilty about being dyslexic', 'felt too embarrassed to ask for help with [her] studies', 'felt that [she] would always be held back by her dyslexic difficulties', 'is usually surprised when [she] gets good marks', and 'often felt pretty stupid at school'. The fact that she has made it into higher education is a triumph of perseverance over adversity but it seems as though no-one has reminded her about this and given her the encouragement and support she deserves perhaps.

Of the two remaining respondents in this group, respondent #19 (User) wrote more in the 'comments' question (5) in the questionnaire than any other student and taken with a Internal Locus of Control profile showing a relatively high level of ILC for the construct Affective Process compared with very low scores for Learned Helplessness and Self-Esteem, we may be looking at a student who is exhibiting some signs of academic insecurity, possibly because he may have come from a much more directed previous learning background and as such finds the freedom at university combined with the need to be much more a manager of his own learning quite challenging and as a result perhaps feels that he is performing beneath his own perceptions of his academic capability. As a student who logged in to ATS workstations 78 times over the date-to-date research interval he is a regular user of the Service although perhaps has not utilized the personal support that is available from the staff to best advantage in terms of counselling his learning insecurity. Respondent #31 (Non-User) has high ILoC scores in all areas apart from Affective Process, which, taken together with the comments she recorded in the text field for question 5 of the questionnaire it seems she is angry about the quality of teaching she is receiving, particularly in terms of the degree to which her lectures are made relatively inaccessible: *'...During school I never felt let down, and do not understand how a University that prides itself on dealing with disabilities as managed to allow this kind of behaviour within schools'* - she is referring to refusal to hand out lecture notes and difficulties that she encounters in copying from OHP presentations, which are classic difficulties that many dyslexic students face due to sometimes quite severe difficulties in multi-tasking. The final respondent in this group #41 (User) is perhaps exhibiting the classic symptoms of insecurity associated with returning to study as a mature student after a period of absence, finding

that the processes required in order to engage effectively with learning are different to memories of earlier learning, and that to be identified as a disabled student as part of her infrastructure of learning all serves to reduce her self-esteem to an ILoC score of zero.

## **Concluding discussion and directions for further research:**

This small-scale enquiry found that statistically at least, there appeared to be no significant differences between dyslexic students who chose to use the learning support service (ATS) provided as a means to support their learning difference of dyslexia and those who chose not to, when using an evaluation of each individual's Internal Locus of Control as the measurement parameter. There may be many reasons for this, not the least of which could be that with two such small sample groups (15 Non-Users and 26 Users) it would have been quite surprising to have unearthed significant differences between the two groups, simply on the basis of the unreliability of small-sample research. We must also consider that the basic premise is flawed, that is, that to assume that there might be any connection between Internal Locus of Control and the uptake of a support service is invalid, although it is felt that there is a strength in the rationale behind applying the idea of componentalizing Locus of Control into 5 psychological sub-constructs on the basis of previous research and application of these broad principles as used by Burden (Burden, 2005) to explore aspects of 'the self' as a learner. Given this, the results from this enquiry for this group of students at least, goes some way towards eliminating Internal Locus of Control as a determining factor in the choice of uptake of learning support or not in this case.

However, the development of the 5-co-ordinate axes graphical representation of Internal Locus of Control provided some useful insights into both the complexity of factors that contribute to the notion of the 'self' and also how this might impact on learning and on study behaviour. It seems clear that as a mechanism for revealing the nuances embedded in the complex data that this enquiry appears to have collected, this observational and relational analysis of Internal Locus of Control Profiles has been the most revealing aspect of the project in terms of trying to understand how the 41 individuals in the research group address their engagement with the academic demands of higher education. Taken together with many of comments that respondents submitted it seems likely that as an investigative procedure it appears to have some merit.

In terms of reflecting on the research methodology and research methods, we may be guided by Rotter (1990) who tells us to be guarded against regarding individual differences as fixed traits or types, implying that they could be more usefully regarded as points along a continuum, not fixed but dynamic and subject to modification and relocation through self-re-evaluation in the light of experience, maturity perhaps, and in our context, the recipes that formulate academic success or relative failure and the self-reinforcing cycle of both the individual and collective (that is, institutional) success-failure paradigm existing at this academic level. This means that we must be cautious about drawing generalized conclusions on the basis of specific results, but conversely in the context of this small-scale research enquiry, we should also not dismiss the possibility of generalization too avidly if

specific results do not provide us with the evidence that we need to evaluate an hypothesis positively. This is because it is possible that the generalized result may remain shrouded within evidence yet to be unearthed, or would become more clearly evident as a result of a modification or slight re-focus of the research questions being posed. It is the feeling of the researcher in this case, that the research methodology and theories that attempt to underpin it are sound but that they need reflection on their 'heuristic value and how this is embedded in a broader theory of behaviour' (ibid p490), and specifically here, how this behaviour may be evidence of a link between personal study regimes and attitudes to disability. The parameters that this enquiry has attempted to evaluate need careful redefinition in the light of the complexity of the results that have been uncovered so that a clearer path might be identified for the research track to follow. Nevertheless, the value of the visual representation of the interrelations of complex components of the 'self as a learner' have been the most useful 'result' of this project and that as an evaluative technique there may be merit in pursuing this aspect of the research design further.



**2. Would you say that you use ATS computer workstations...**

- Often
- Sometimes
- Rarely
- Never

**3. In which locations do you regularly use computers in connection with your studies...?**

- I use University computers in areas that are close to where I receive my teaching
- I use University computers in the Hartley Library public workstation rooms
- I use University computers in the ATS workstation rooms
- I don't use University computers much
- I use my own laptop computer in places on the campus that are convenient to me
- I use my own computer at home
- I use a computer somewhere else - please tell me where -->>>
- I don't use any computers much

**4. I am also interested in your attitudes towards dyslexia.**

In the list of statements below please indicate whether you generally agree with or generally disagree with each one to give me an idea of how you feel. Please try to complete them all;

- | I agree ... with the statement below .....   | ..... or | I disagree            |
|--|----------|-----------------------|
| <input type="radio"/> I am able to settle down to my work anytime, anyplace  |          | <input type="radio"/> |
| <input type="radio"/> The learning environment at University is considerate of the needs of dyslexic students      |          | <input type="radio"/> |
| <input type="radio"/> I've had help with strategies for dealing with my dyslexia but it hasn't made any difference |          | <input type="radio"/> |
| <input type="radio"/> I feel too embarrassed to ask for help with my studies                                       |          | <input type="radio"/> |

- |   |  |                       |
|---|--|-----------------------|
| <input type="radio"/>                             | However hard I try, I'll never be as good as someone without dyslexia                    | <input type="radio"/> |
| <input type="radio"/>                             | I often felt pretty stupid at school   | <input type="radio"/> |
| <input type="radio"/>                             | I find it quite difficult to concentrate on my work most of the time                     | <input type="radio"/> |
| <input type="radio"/>                             | I believe that my dyslexia impacts a great deal on my academic progress                  | <input type="radio"/> |
| <input type="radio"/>                             | If I try hard I can achieve just as much as anyone else                                  | <input type="radio"/> |
| <input type="radio"/>                             | I believe that my grades are as much to do with luck as with any effort on my part       | <input type="radio"/> |
| <input type="radio"/>                             | I don't think my dyslexia makes me any more anxious than anyone else                     | <input type="radio"/> |
| <input type="radio"/>                             | I feel guilty about being dyslexic   | <input type="radio"/> |
| <b>I agree ... with the statement below .....</b> | <b>..... or</b>  | <b>I disagree</b>     |
| <input type="radio"/>                             | I don't consider myself to be disabled   | <input type="radio"/> |
| <input type="radio"/>                             | I will always be held back by my dyslexic difficulties                                   | <input type="radio"/> |
| <input type="radio"/>                             | I am usually surprised if I get good marks   | <input type="radio"/> |
| <input type="radio"/>                             | I use strengths related to my dyslexia to help me with study strategies                  | <input type="radio"/> |
| <input type="radio"/>                             | I approach my written work with enthusiasm   | <input type="radio"/> |
| <input type="radio"/>                             | I don't think my dyslexia makes any difference to the way I tackle my work               | <input type="radio"/> |
| <input type="radio"/>                             | I don't think about my dyslexia much   | <input type="radio"/> |
| <input type="radio"/>                             | I keep knowledge about my dyslexia to myself   | <input type="radio"/> |
| <input type="radio"/>                             | I approach my written work with a high expectation of success                            | <input type="radio"/> |
| <input type="radio"/>                             | My friends know I'm dyslexic   | <input type="radio"/> |
| <input type="radio"/>                             | Teachers' help at school made little difference to my progress so I didn't ask them much | <input type="radio"/> |
| <input type="radio"/>                             | I don't use any of the support services because it makes me feel different               | <input type="radio"/> |

- My contributions in discussions is usually rubbish, so generally I don't bother

I agree ... with the statement below ..... or I disagree

- I believe my dyslexia helps me to be more creative
- It would make no difference to my progress if my tutors knew about my dyslexia
- I need to work much harder than my friends to get similar grades
- I can manage my studies quite adequately without any help

5. If you would like to tell me more about your views on the ATS, or about how you study in the the University, or about your feelings towards your dyslexia you can use the text field below:

6. It is possible that I might like to follow up your reply to this questionnaire with a short interview to find out a little more about your views.

If you would be happy to for me to do this, please leave me your e-mail contact below:

My e-mail address is:

7. Are you... male:  or female:
8. Are you... an undergraduate:  or a postgraduate:



This is the end of the questionnaire - thank you very much for your help;

To send your reply, please click the Submit button ---->>>

## Appendix 2 - Questionnaire Question 4 statements

Statements are listed here in their original order where each group of 6 statements falls within each of the 5 psychological constructs being explored in the order: Affective Process; Anxiety, Regulation and Motivation; Self-efficacy; Self-esteem; Learned Helplessness;

### Affective Process

- I am able to settle down to my work anytime, anyplace
- I feel too embarrassed to ask for help with my studies
- I feel guilty about being dyslexic
- I will always be held back by my dyslexic difficulties
- I use strengths related to my dyslexia to help me with study strategies
- I don't think about my dyslexia much

### Anxiety, Regulation and Motivation

- However hard I try, I'll never be as good as someone without dyslexia
- I find it quite difficult to concentrate most of the time
- I don't think my dyslexia makes me any more anxious than anyone else
- I approach my written work with enthusiasm
- I need to work much harder than my friends to get similar grades
- I often feel frustrated when trying to study <sup>12</sup>

### Self-Efficacy

- I believe that my dyslexia impacts a great deal on my academic progress
- I am usually surprised if I get good marks
- I don't think my dyslexia makes any difference to the way I tackle my work
- I approach my work with a high expectation of success
- I believe my dyslexia helps me to be more creative
- I can manage my studies quite adequately without any help

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<sup>12</sup> this statement was omitted in error in the questionnaire published on-line

## Self-Esteem

- I often felt pretty stupid at school
- If I try hard, I can achieve just as much as anyone else
- I don't consider myself to be dyslexic
- I keep knowledge of my dyslexia to myself
- I don't use any of the support services because it makes me feel different
- My contributions in discussions is usually rubbish, so generally I don't bother

## Learned Helplessness

- The learning environment at University is considerate of the needs of dyslexic students
- I've had help with strategies for dealing with my dyslexia but it hasn't made any difference
- I believe that my grades are as much to do with luck as with any effort on my part
- My friends know I'm dyslexic
- Teachers' help at school made little difference to my progress so I didn't ask much
- It would make no difference to my progress if my tutors knew about my dyslexia

The random number generator (Haahr, 2007) was then applied to randomize the number group 1 - 30 to generate a new statement order which was then used to re-order the statements into the questionnaire. The intention was to increase the reliability of the responses by trying to remove the effects of respondents noticing similarities between adjacent statements and subsequently being led into selecting a similar response rather than an honest one.

- I am able to settle down to my work anytime, anyplace
- The learning environment at University is considerate of the needs of dyslexic students
- I've had help with strategies for dealing with my dyslexia but it hasn't made any difference
- I feel too embarrassed to ask for help with my studies

- However hard I try, I'll never be as good as someone without dyslexia
- I often felt pretty stupid at school
- I find it quite difficult to concentrate most of the time
- I believe that my dyslexia impacts a great deal on my academic progress
- If I try hard I can achieve just as much as someone without dyslexia
- I believe that my grades are as much to do with luck as with any effort on my part
- I don't think my dyslexia makes me any more anxious than anyone else
- I feel guilty about being dyslexic
- I don't consider myself to be disabled
- I will always be held back by my dyslexic difficulties
- I am usually surprised if I get good grades
- I use my strengths related to my dyslexia to help me with study strategies
- I approach my written work with enthusiasm
- I don't think my dyslexia makes any difference to the way I tackle my work
- I don't think about my dyslexia much
- I keep knowledge about my dyslexia to myself
- I approach my written work with a high expectation of success
- My friends know I'm dyslexic
- Teachers' help at school made little difference to my progress so I didn't ask them much
- I don't use any of the support services because it makes me feel different
- My contributions in discussions is usually rubbish so generally I don't bother
- I believe my dyslexia helps me to be more creative
- It would make no difference to my progress if my tutors knew about my dyslexia

- I need to work much harder than my friends to get similar grades
- I can manage my studies quite adequately without any help

### Appendix 3 - Questionnaire Question 4 statements and locus of control internal/external assignment corresponding to response agree/disagree

The table shows each statement from Question 4 and the response either 'agree' or 'disagree' and which response corresponds to a marker of **internal** or **external** locus of control.

response indicating INTERNAL LoC:	Question 4 statement:	response indicating EXTERNAL LoC:
AGREE	I am able to settle down to my work anytime, anyplace	DISAGREE
DISAGREE	I feel too embarrassed to ask for help with my studies	AGREE
DISAGREE	I feel guilty about being dyslexic	AGREE
DISAGREE	I will always be held back by my dyslexic difficulties	AGREE
AGREE	I use strengths related to my dyslexia to help me with study strategies	DISAGREE
AGREE	I don't think about my dyslexia much	DISAGREE
DISAGREE	I find it quite difficult to concentrate on my work most of the time	AGREE
AGREE	I don't think my dyslexia makes me any more anxious than anyone else	DISAGREE
AGREE	I approach my written work with enthusiasm	DISAGREE
AGREE	I need to work much harder than my friends to get similar grades	DISAGREE
DISAGREE	I often feel frustrated when trying to study <sup>13</sup>	AGREE
DISAGREE	However hard I try, I'll never be as good as someone without dyslexia	AGREE
DISAGREE	I believe that my dyslexia impacts a great deal on my academic progress	AGREE
DISAGREE	I believe that my grades are as much to do with luck as with any effort on my part	AGREE
AGREE	I don't think my dyslexia makes any difference to the way I tackle my work	DISAGREE
AGREE	I approach my written work with enthusiasm	DISAGREE
AGREE	I believe my dyslexia helps me to be more creative	DISAGREE

<sup>13</sup> as reported previously, this statement was omitted in error in the final publication of the questionnaire

AGREE	I can manage my studies quite adequately without any help	DISAGREE
DISAGREE	I often felt pretty stupid at school	AGREE
AGREE	If I try hard, I can achieve just as much as anyone else	DISAGREE
AGREE	I don't consider myself to be disabled	DISAGREE
DISAGREE	I keep knowledge about my dyslexia to myself	AGREE
DISAGREE	I don't use any of the support services because it makes me feel different	AGREE
DISAGREE	My contributions in class are usually rubbish, so generally I don't bother	AGREE
DISAGREE	The learning environment at university is considerate of the needs of dyslexics	AGREE
DISAGREE	I've had help with strategies for dealing with my dyslexia but it hasn't made any difference	AGREE
DISAGREE	I am usually surprised if I get good marks	AGREE
AGREE	My friends know I'm dyslexic	DISAGREE
DISAGREE	Teachers' help at school made little difference to my progress, so I didn't ask much	AGREE
DISAGREE	It would make no difference to my progress if my tutors know about my dyslexia	AGREE

#### Appendix 4 - The e-mail-form generated from a questionnaire submission

(email-to) ad6@soton.ac.uk  
(subject) Response to my questionnaire  
(from-name) Andrew Dykes  
(from-email) ad6@soton.ac.uk  
(I use computers with my studies:) OFTEN  
(I use ATS facilities) OFTEN  
(I use computers in the ATS workstation rooms) YES  
(use own computer at home) YES  
(I am able to settle down to my work anytime, anyplace) DISAGREE  
(The learning environment at Uni is considerate of the needs of dyslexics) DISAGREE  
(I've had help with strategies for dealing with my dyslexia but it hasn't made any difference) AGREE  
(I feel too embarrassed to ask for help with my studies) DISAGREE  
(However hard I try, I'll never be as good as someone without dyslexia) DISAGREE  
(I often felt pretty stupid at school) AGREE  
(I find it quite difficult to concentrate on my work most of the time) AGREE  
(I believe that my dyslexia impacts a great deal on my academic progress) AGREE  
(If I try hard I can achieve just as much as anyone else) DISAGREE  
(I believe that my grades are as much to do with luck as with any effort on my part)  
AGREE  
(I don't think my dyslexia makes me any more anxious than anyone else) DISAGREE  
(I feel guilty about being dyslexic) DISAGREE  
(I don't consider myself to be disabled) AGREE  
(I will always be held back by my dyslexic difficulties) AGREE  
(I am usually surprised if I get good marks) AGREE  
(I use strengths related to my dyslexia to help me with study strategies)AGREE  
(I approach my written work with enthusiasm) DISAGREE  
(I don't think my dyslexia makes any difference to the way I tackle my work) DISAGREE  
(I don't think about my dyslexia much) DISAGREE  
(I keep knowledge about my dyslexia to myself) DISAGREE  
(I approach my written work with a high expectation of success) DISAGREE  
(My friends know I'm dyslexic) AGREE  
(Teachers' help at school made little difference to my progress so I didn't ask them much)  
AGREE  
(I don't use any of the support services because it makes me feel different) DISAGREE  
(My contributions in discussions in usually rubbish, so generally I don't bother) DISAGREE  
(I believe my dyslexia helps me to be more creative) DISAGREE

(It would make no difference to my progress if my tutors knew about my dyslexia)

AGREE

(I need to work much harder than my friends to get similar grades) DISAGREE

(I can manage my studies quite adequately without any help) AGREE

(textarea)

-----  
going for help with studies takes up more of my time when i'm already struggaling with too much work and not enough time, and it rarely helps as i can't explain why i'm struggaling otherwise i would have just done in in the first place.

the read & write softwear and the ats room have helped me most. and book /printing allowance as i can have the things in front of me & underline/bend courners over which i couldnt weith a libary book

all the forms assosated with getting help, or reimbersment for books etc means that i keep putting it off forms are something i am daunted by.

-----  
(textfield) #####@soton.ac.uk

(gender) MALE

(student status) UNDERGRADUATE

(Submit) Submit

## Appendix 5: Details of data coding

The data from the questionnaire responses was value coded in order that it would be possible to use a quantitative analysis procedure on the results where appropriate. For this purpose, coded data was subsequently inserted into the statistical analysis software application, SPSS.

The response to question 1: 'would you say that you use computers in connection with your studies...' was coded: 'often' = 1, 'sometimes' = 2, 'rarely' = 3, 'never' = 4;

The response to question 2: 'would you say that you use ATS computer workstations...' was coded in the same way as question 1;

The response to question 3: 'in what locations do you regularly use computers in connection with your studies...' was coded in response to a selection in the appropriate check box on the questionnaire indicating an affirmative use of computer workstation in the location specified, where a check box ticked was coded as 1, left unchecked was coded as 0;

Since locus of control features so highly as a construct that appears to form the basis upon which so many others are componental (Judge et al., 2002), the numerical coding of the responses to each statement in Question 4 was developed with this as the guiding principle. Hence, the agree/disagree response was coded so that if the response indicated a marker for INTERNAL locus of control the response was coded 1, indicating a marker for an EXTERNAL locus of control the response was coded 0, and if there was no response for the statement this was coded 0.5. (Refer to Appendix 3 for the assignment of internal/external with respect to agree/disagree for each statement). This coding method was applied so as to be in line with the original rationale of the enquiry which was that students who exhibited a more internal locus of control were less likely to use the support service, hence it was felt that positively biasing responses in this way would enable a score to be calculated both within each of the five psychological construct groups, where the maximum score will be 6, the minimum score will be 0, and also a combined, overall score for locus of control this being the sum of the scores for the five groups.

Question 5 was a text field (space for additional comments from the respondent) so coding was not possible;

Question 6 was a text field (respondent's e-mail contact details) so coding was not possible;

Questions 7 and 8, interrogating gender and student status were coded so that gender male = 1, female = 2, and student status undergraduate = 1, post graduate = 2;

## Appendix 6 - Locus of Control Profiles

Shown here is the complete set of Locus of Control Profiles for the 41 respondents to the questionnaire. They are provided here in numerical order of respondent but an attempt to spot similarities between them to enable groups of profiles to be established where clear differences between the groups can be spotted is also presented at the end.

Also included is the text inserted in the text field of question 5 in the questionnaire where respondents were invited to tell more about their feelings about their dyslexia, how they felt it impacts on their study and any other comments they wanted to record concerning study at the university or the facilities and resources of the Assistive Technology Service. In many cases no comments were recorded and this has been indicated as such, but where the text field was used, the dialogue that was inserted has been copied verbatim, which also provides a sharp insight into the difficulties with language and writing that many of these individual are trying their best to deal with. It was felt that reviewing this text in the context of the Locus of Control Profile displayed with it could also provide some insight into the contribution that this representation of the data collected may usefully inform the wider discussion.

Comments concerning the value of the profiles and a discussion on what they are informing, is provided in the main body of the text.

The profiles that follow are grouped as described in the commentary in the section above, Qualitative Analysis, and this grouping listed again here for convenience:

Group A: #7, #11, #16, #24, #28, #29, #32 #34, #37, #38, #40

- profiles in Group A showed the most even balance between the 5 psychological constructs with none showing a particular strength or weakness;

Group B: #6, #9, #12, #13, #15, #20, #23, #27, #33, #35, #39

- profiles in Group B showed a more pronounced bias towards Self-Efficacy, and also Affective Process, and to a lesser extent Learned Helplessness although these three constructs were generally stronger than the other two;

Group C: #1, #5, #14, #17, #18, #21, #22, #26

- profiles in Group C showed a bias towards strong Internal Locus of Control in areas of Learned Helplessness and less so, Self-Efficacy with a significantly less pronounced representation for Anxiety, Regulation and Motivation;

Group D: #2, #4, #25, #30, #36

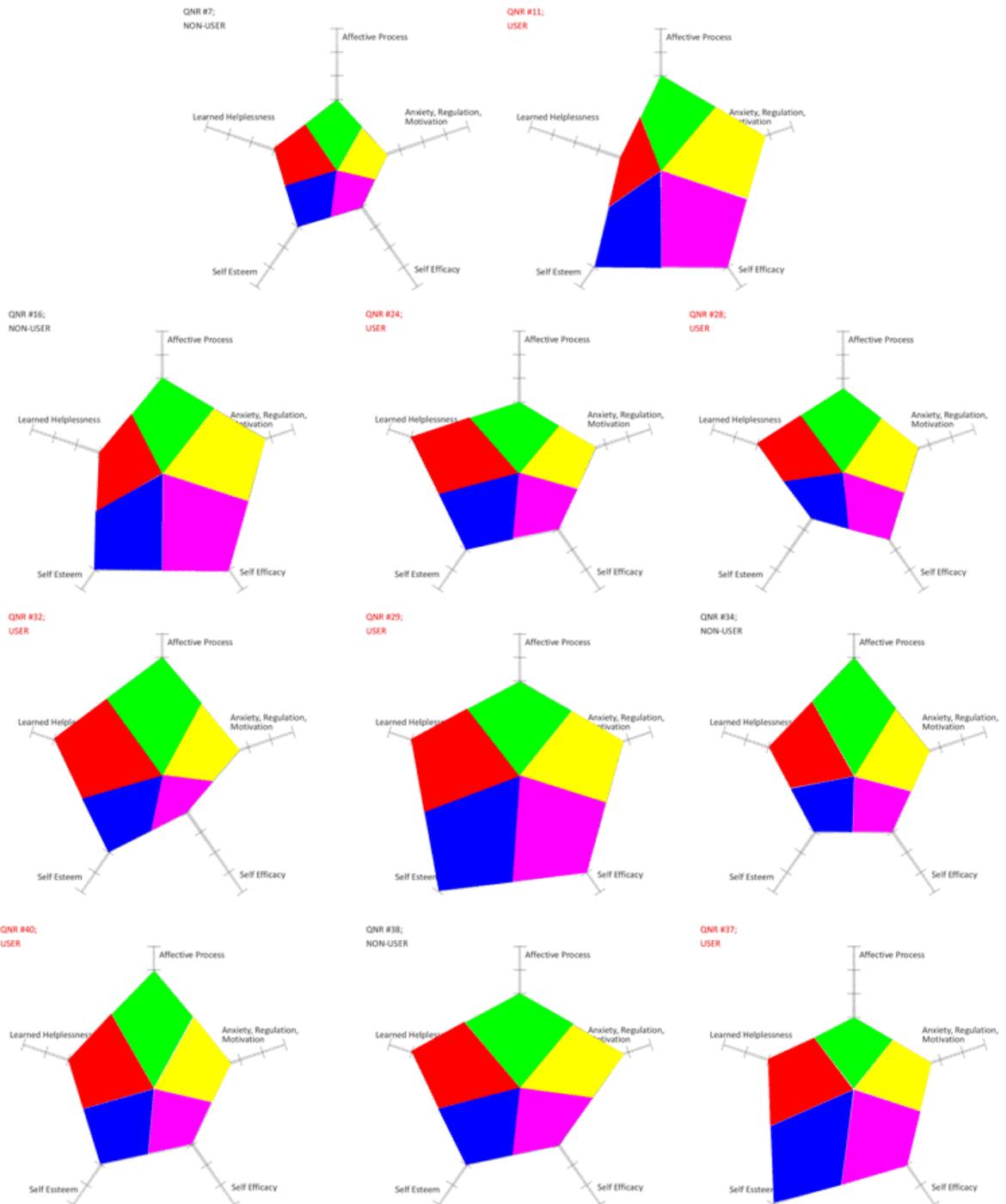
- profiles in Group D were strongly biased towards Learned Helplessness ;

Group E: #3, #8, #10, #19, #31, #41

- profiles in Group E did not fit into any of the other four groups and comprised a mixture of balances for the 5 constructs. In the case of respondents #3, #41 these profiles showed zero scores in one construct and respondent #10 showed zero scores in two constructs.

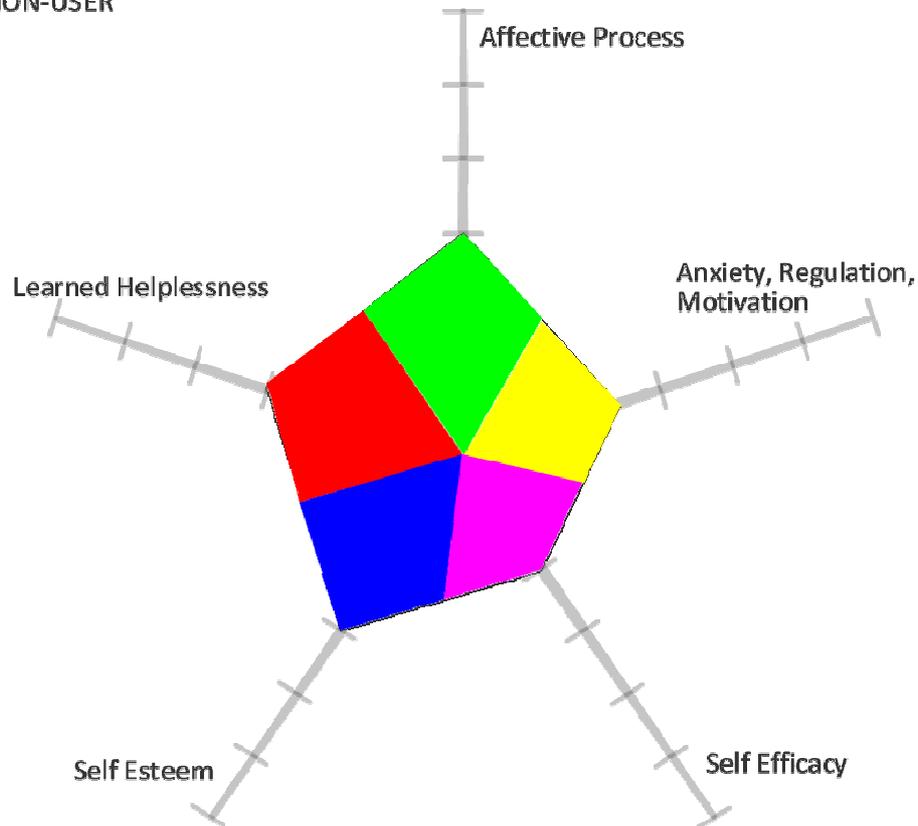
**Group A Internal Locus of Control Profiles (shown together):**

**Respondents: #7, #11, #16, #24, #28, #29, #32 #34, #37, #38, #40**



Group A profiles shown individually together with respondent comments where given:

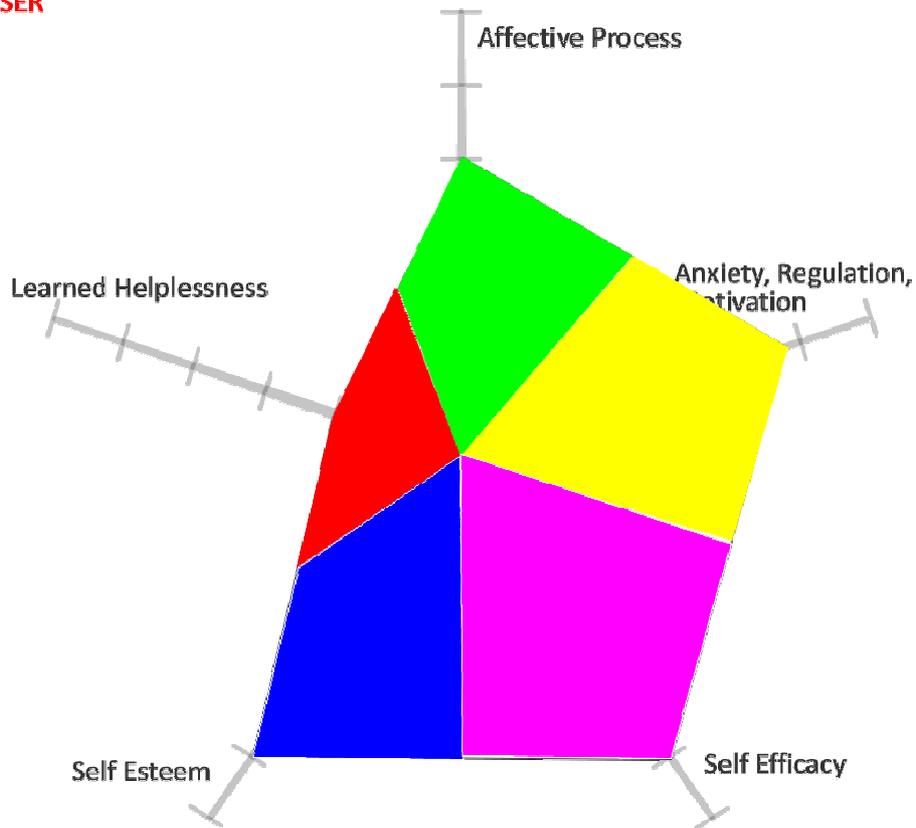
QNR #7;  
NON-USER



Q5:

Extra support is not given in the right way. How does extra time in exams help? It doesn't reflect what would happen in the real world. More focused tuition concentrating on different skill areas (such as practical, visual and aural) would be of a lot more benefit, or changing the assessment techniques.

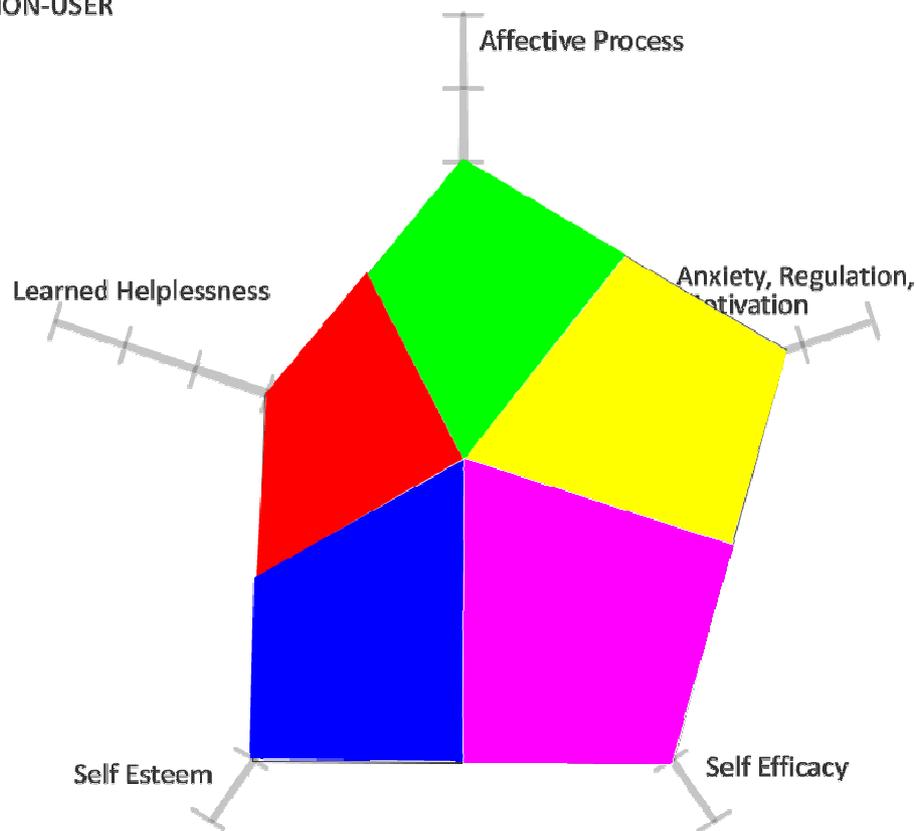
QNR #11;  
USER



Q5

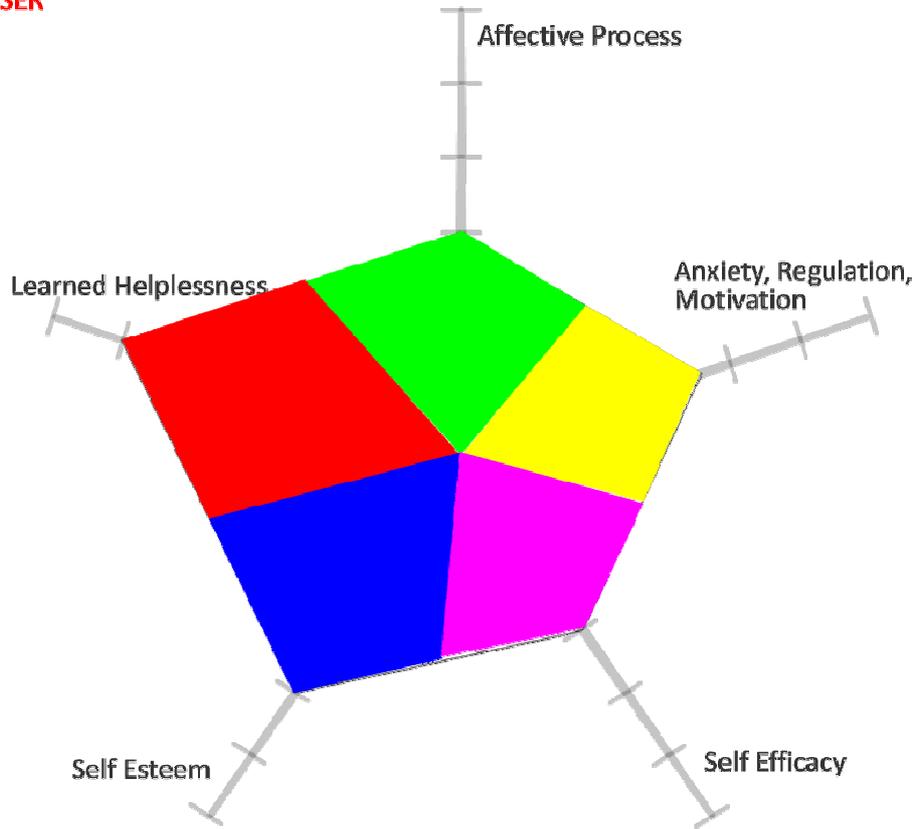
I have never found out much about dyslexia. I was diagnosed at college after my AS levels. I believe that the extra time in my exams helped me at first. However, I believe that now I am slower than ever during exams as I have got used to the extra time. My spelling and reading sometimes gets worse when I think about dyslexia. I get annoyed with the fact that people can blame bad spelling etc. on dyslexia.

QNR #16;  
NON-USER



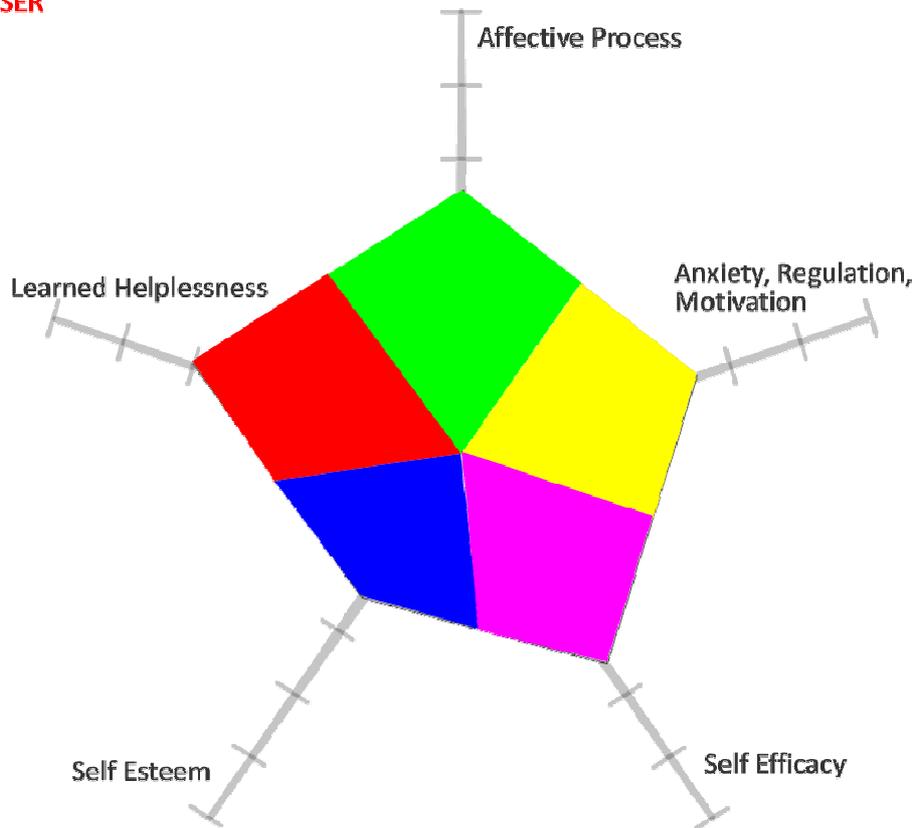
Q5:  
no comments provided by respondent

QNR #24;  
USER



Q5:  
no comments from respondent

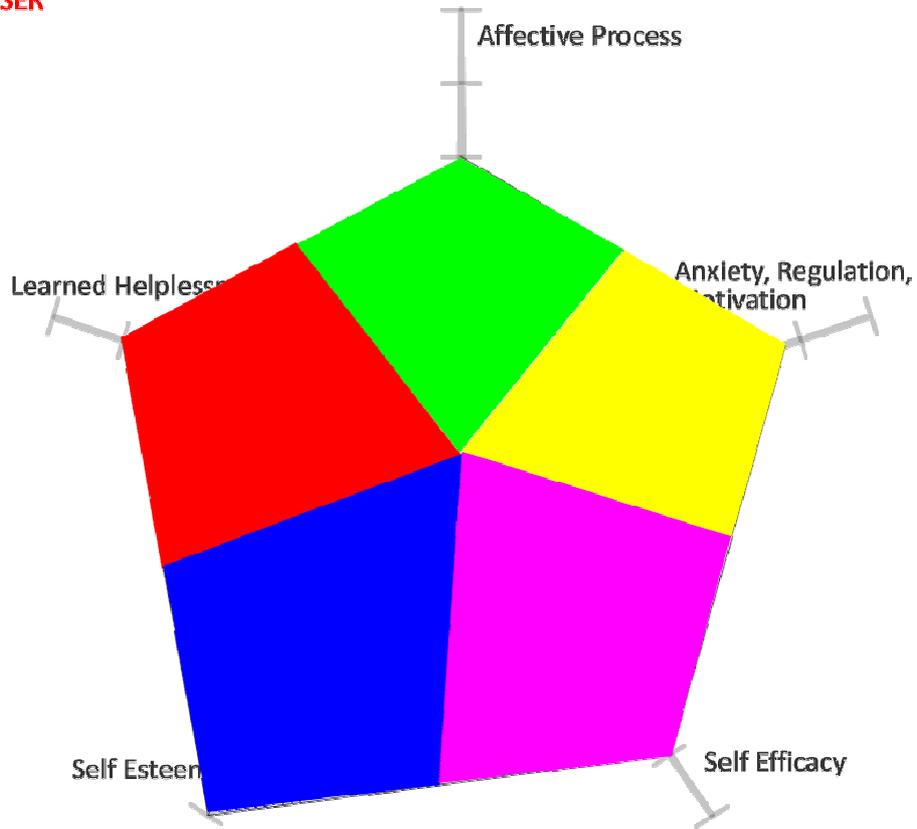
QNR #28;  
USER



Q5:

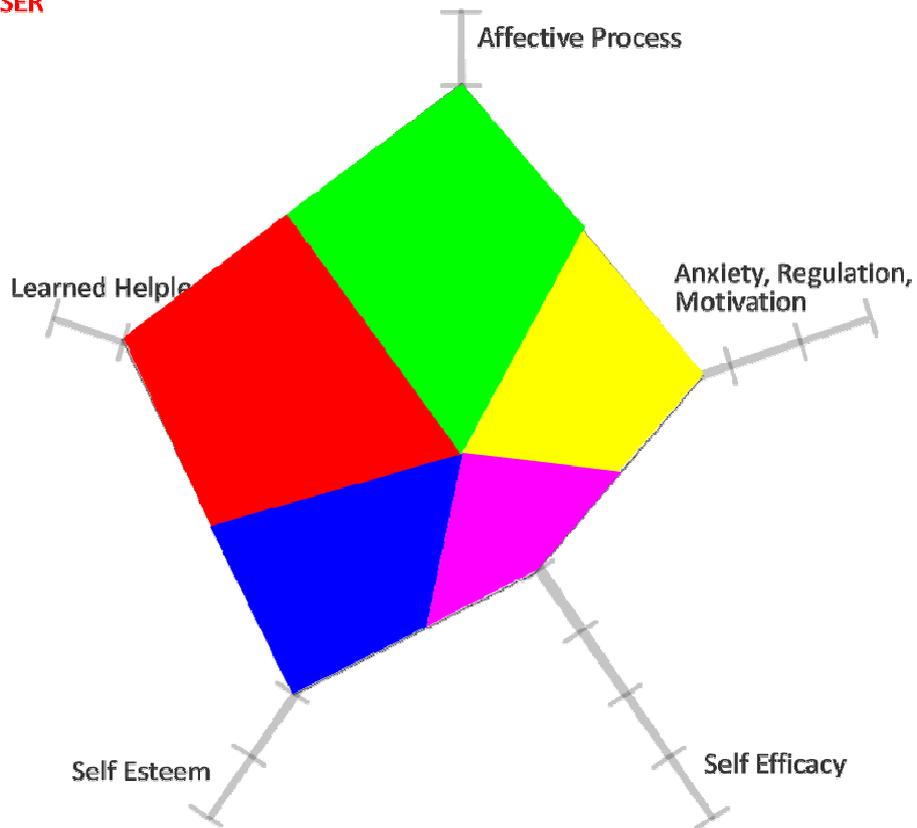
I did not use dys support at all last year. I would prefer to ask for help when needed and find the extra time in having to organise dys support well in advance is not helpful as I would much prefer to ask for help as and when I have a problem. I never go to Hartley library as it means another drive down and parking is not available. Extra time was not given for the written part of year 2(reflective journal) I could have handed it later but was told it might mean resubmitting all my artwork to help Prof Gibbons remember my work!

QNR #29;  
USER



Q5:  
no comments from respondent

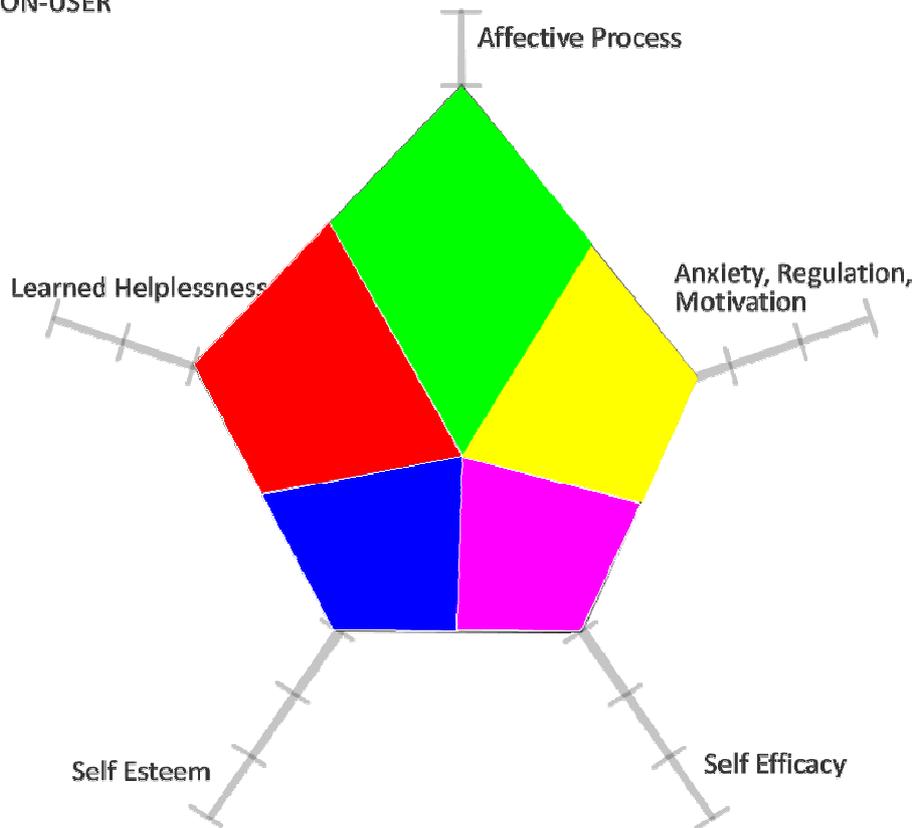
QNR #32;  
USER



Q5:

A great deal of help all the way through school years has helped me a lot. The ATS facilities at hartley are amazing, and i have only stated that i use them occasionally due to being an oceanography student, mainly studying down at the NOC.

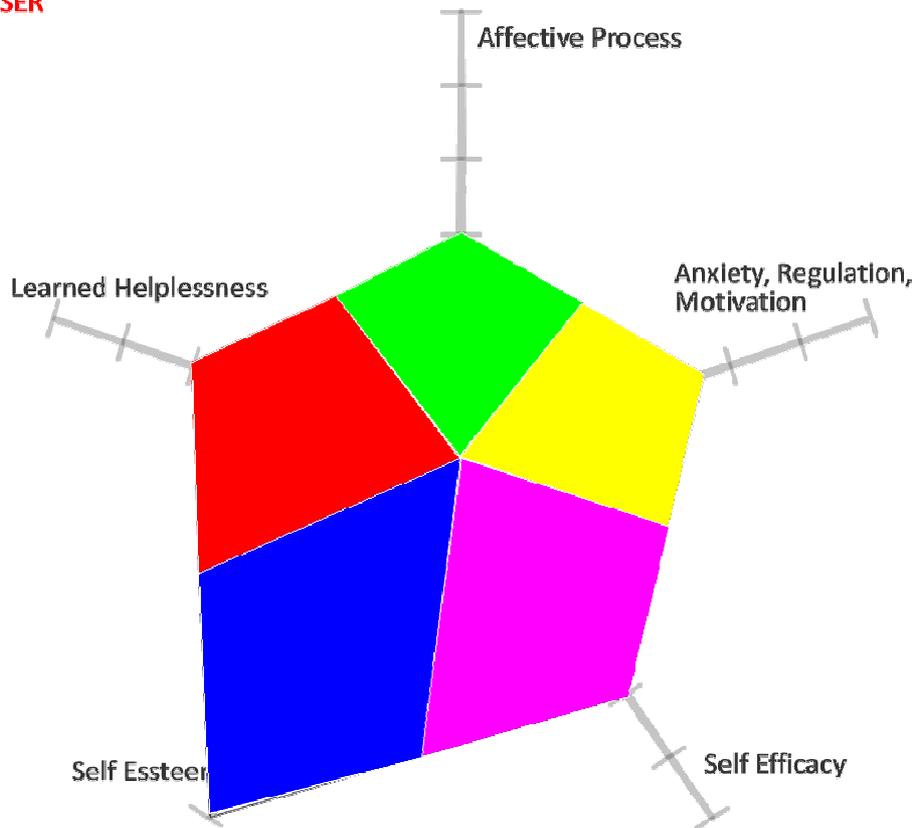
QNR #34;  
NON-USER



Q5:

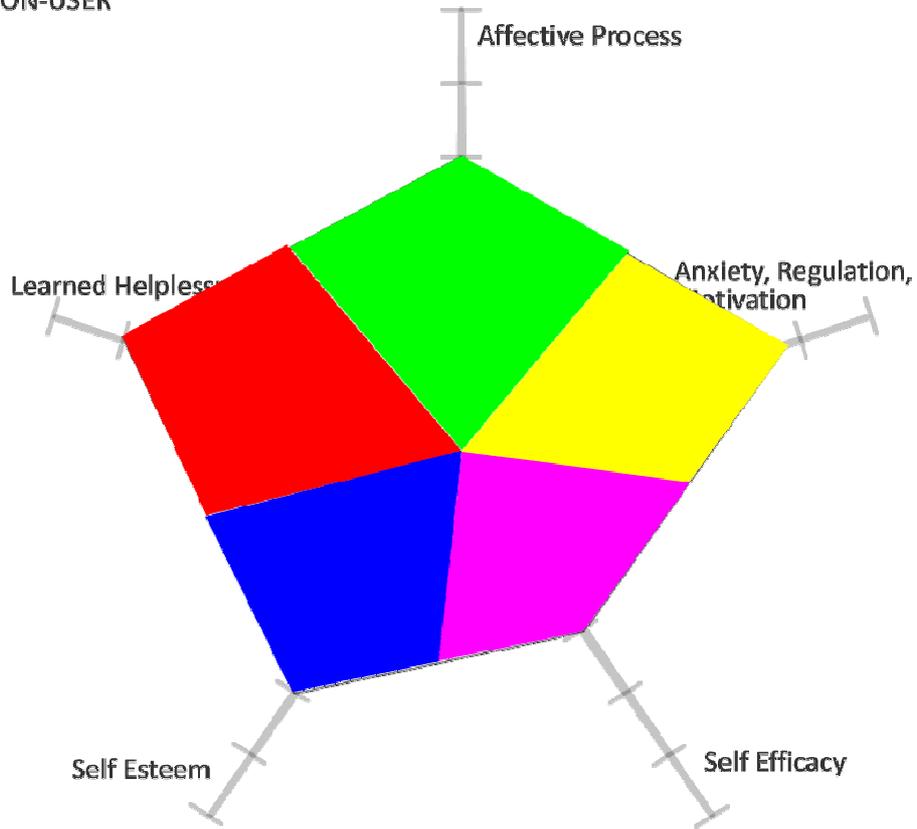
I find reading large chunks of text, searching databases and getting started on written work especially difficult. I am unable to use support study sessions as I am already finding it hard to keep up with course work and don't have time. I receive no support as I am a mature student without bursary. I avoid using computers at university as they are not set up the same as mine at home and I find it confusing. My course is heavily focused on research projects and using SPSS and inferential stats - very confusing and short amount time to pick up. I am doing a medical course and I am very good at the practice and in clinical session but struggle with some aspects of academic study.

QNR #37;  
USER



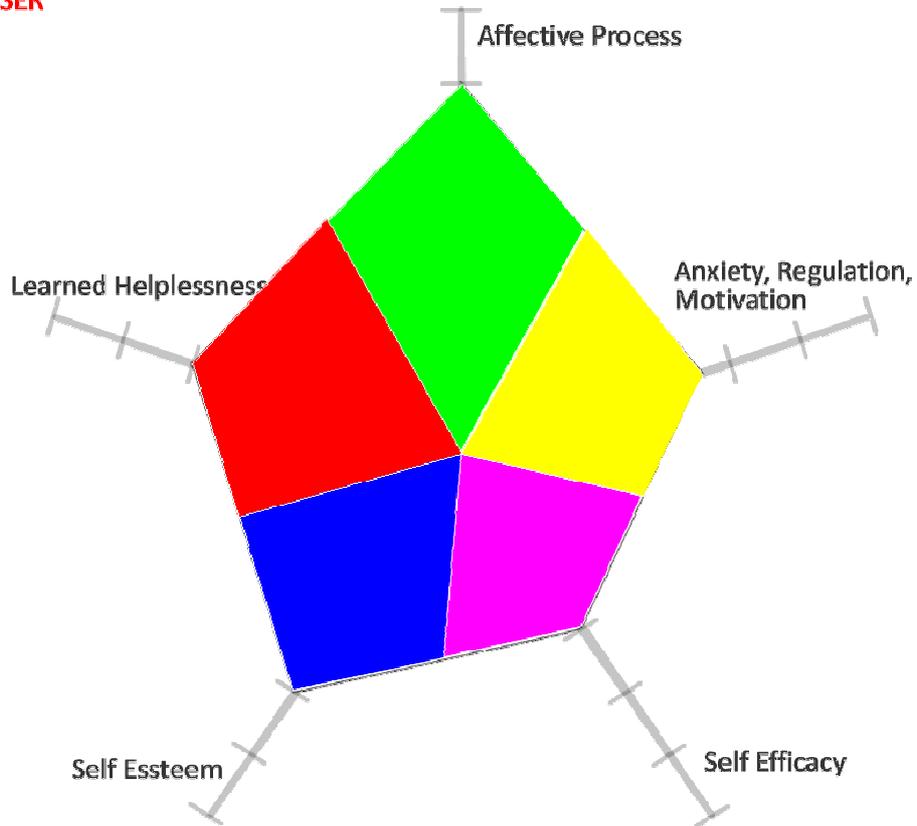
Q5:  
no comments from respondent

QNR #38;  
NON-USER



Q5:  
no comments from respondent

QNR #40;  
USER

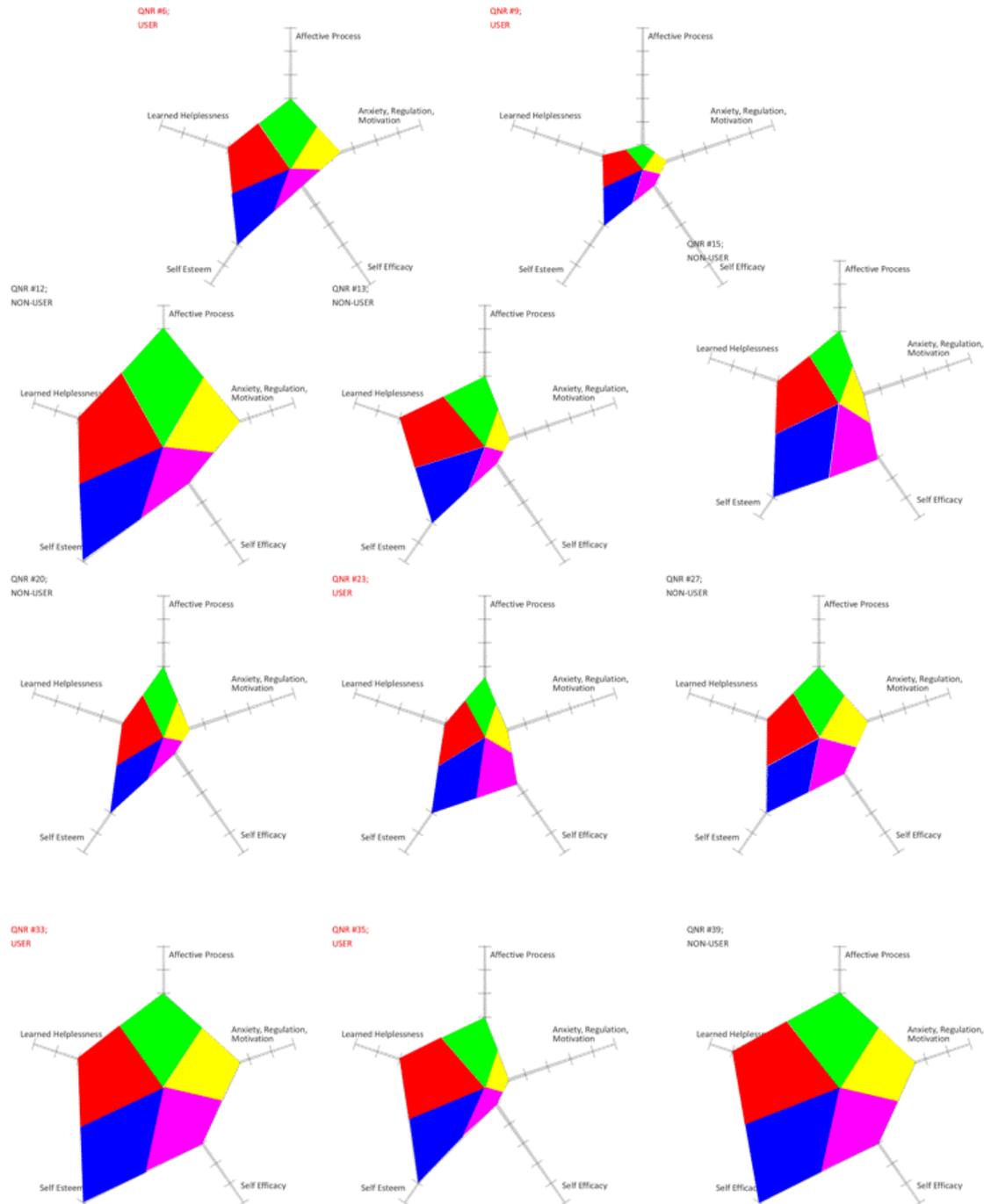


Q5:

The ATS has been very helpful in many aspects of my studies. It is a place where there are normally computers which provide extra programs and space for working. The staff are the most helpful asset to the centre as they have helped me in a number of problems due to my writing.

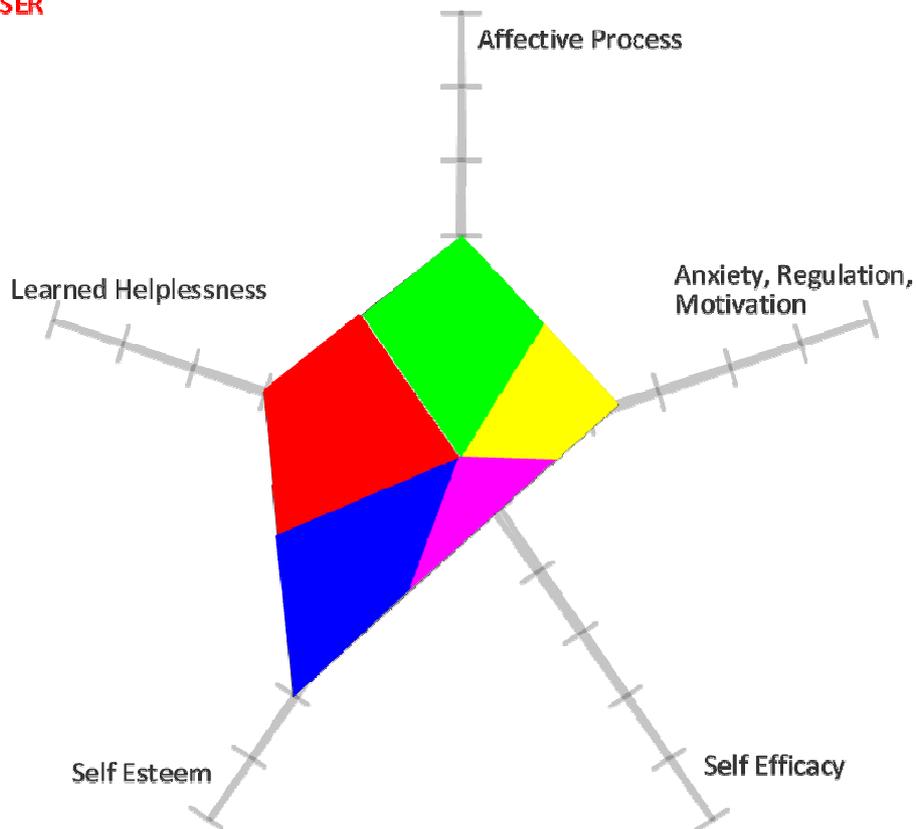
**Group B Internal Locus of Control Profiles (shown together):**

**Respondents: #6, #9, #12, #13, #15, #20, #23, #27, #33, #35, #39**



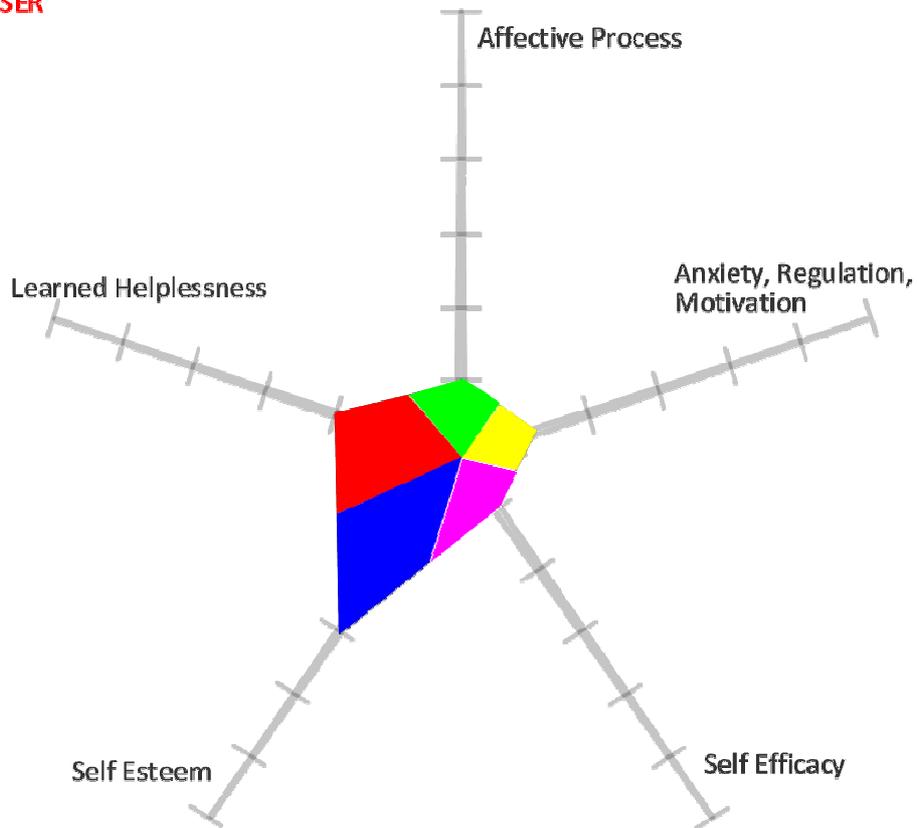
Group B profiles shown individually together with respondent comments where given:

QNR #6;  
USER



Q5:  
no comments from respondent

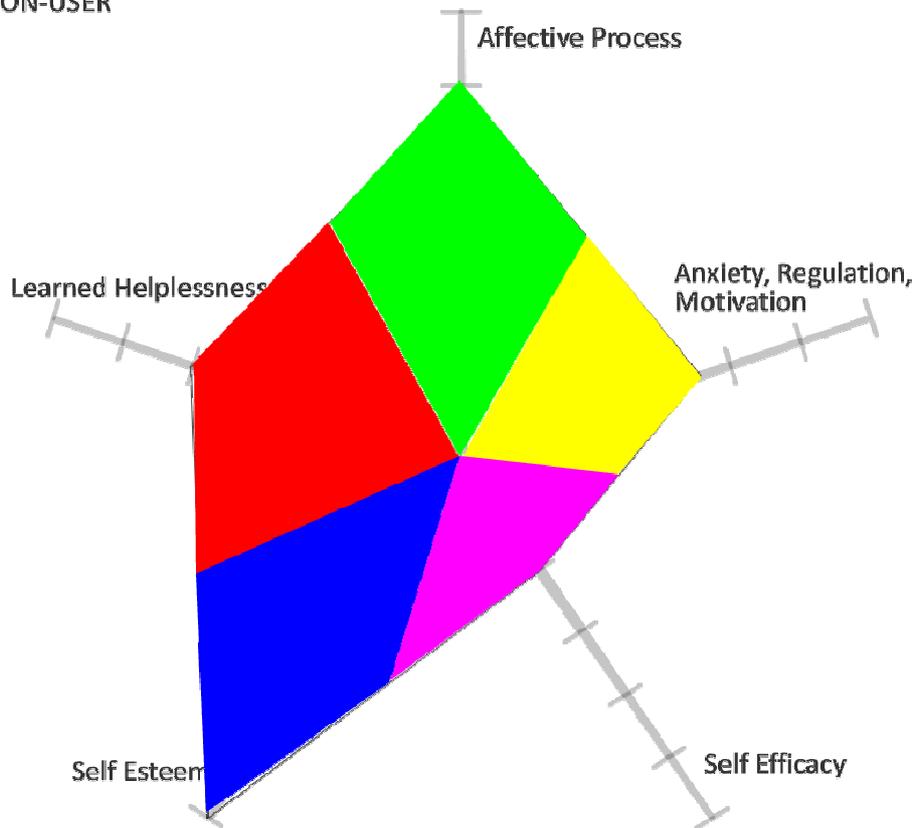
QNR #9;  
USER



Q5:

Am not sure dyslexia is real, because i believe everyone if given the chance to prove it could be a bit dyslexic. So perhaps my problem is than am not as interlignet as others, or that my lack of confidence from an early age decreased my mental capability.

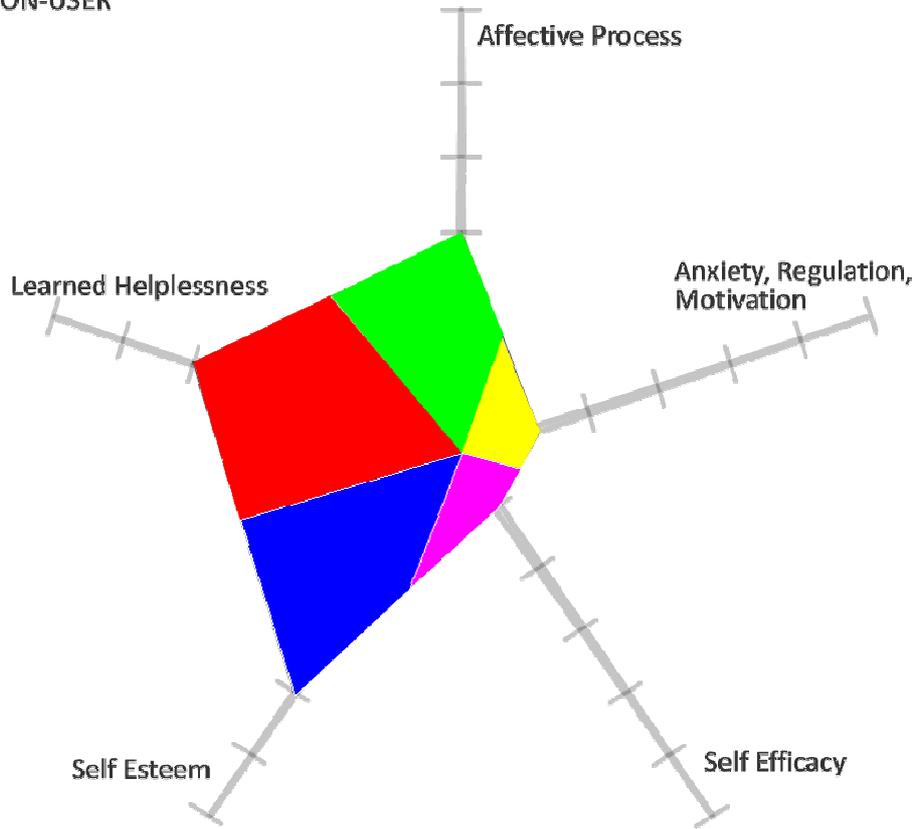
QNR #12;  
NON-USER



Q5:

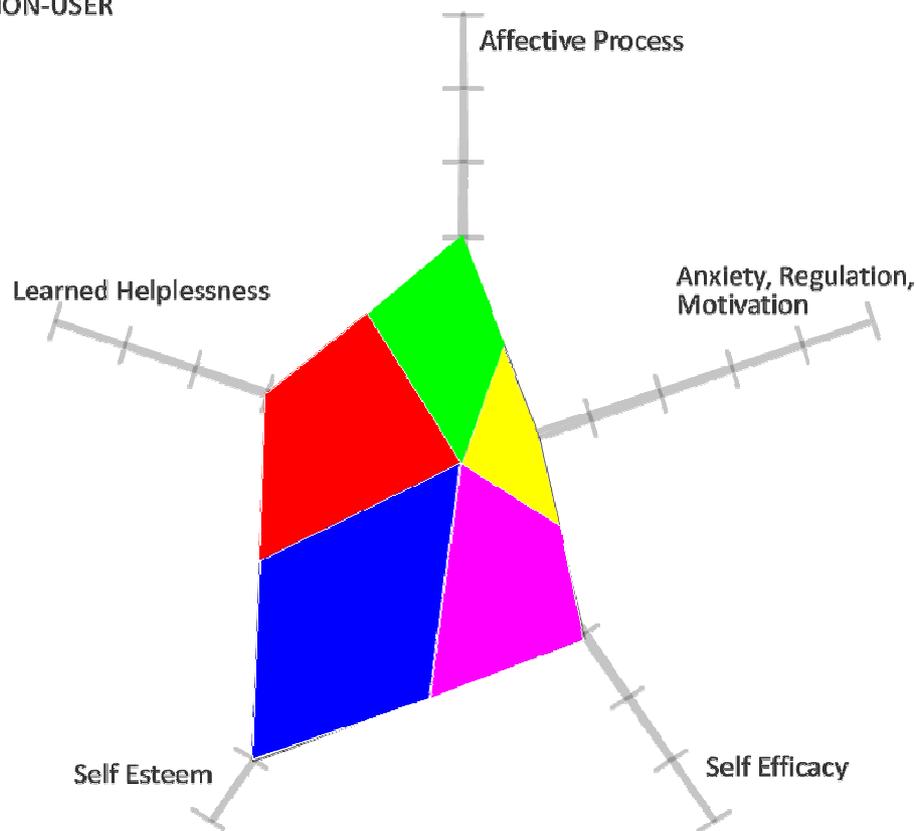
Dyslexia is seen too much as a reading and writing disorder. The way art is now assessed at Winchester school of art (ie via research journals instead of a dissertation) discriminates greatly against my own learning challenges. A dissertation I can tackle a 'research journal' defeats me - I am just not hard wired in that way so no amount of Janet and John explanations work, I just end up feeling stupid 'cos I just don't get it.

QNR #13;  
NON-USER



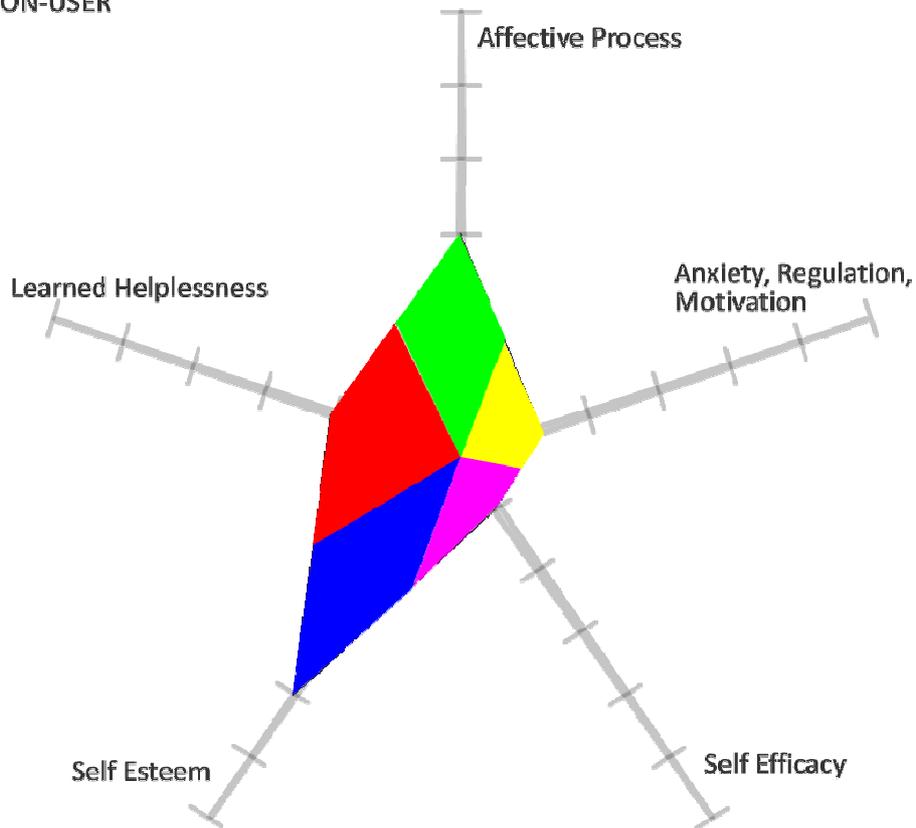
Q5:  
no comments from respondent

QNR #15;  
NON-USER



Q5:  
no comments from respondent

QNR #20;  
NON-USER



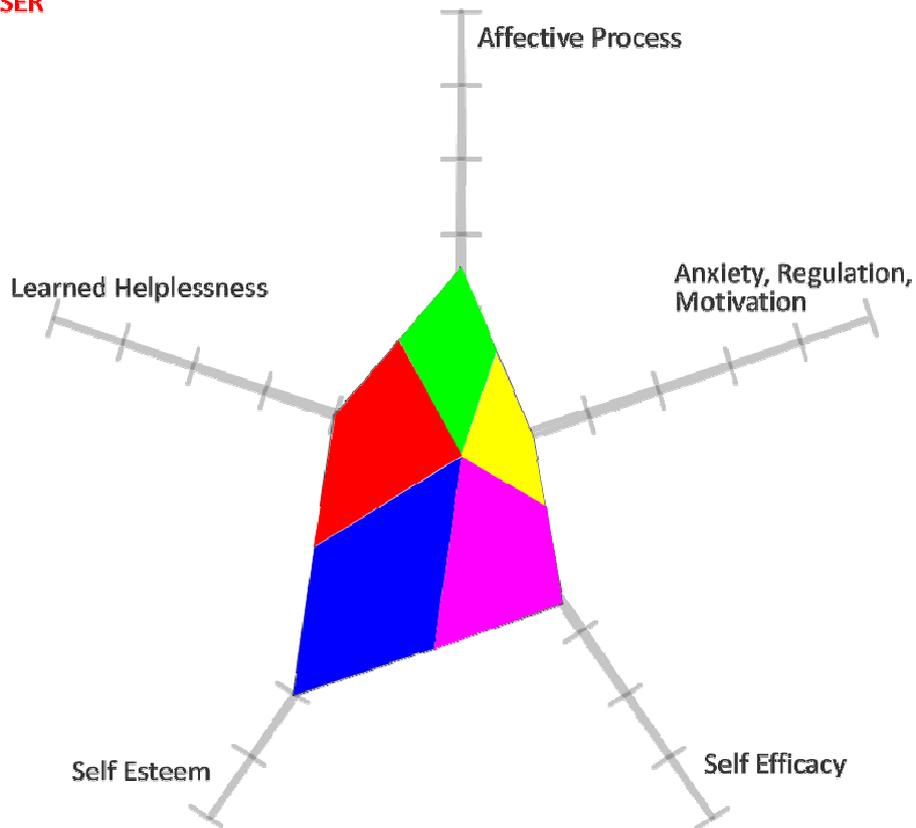
Q5:

going for help with studies takes up more of my time when i'm already struggling with too much work and not enough time, and it rarely helps as i can't explain why i'm struggling otherwise i would have just done in in the first place.

the read & write softwear and the ats room have helped me most. and book /printing allowance as i can have the things in front of me & underline/bend corners over which i couldnt weith a library book

all the forms assosated with getting help, or reimbersment for books etc means that i keep putting it off forms are something i am daunted by.

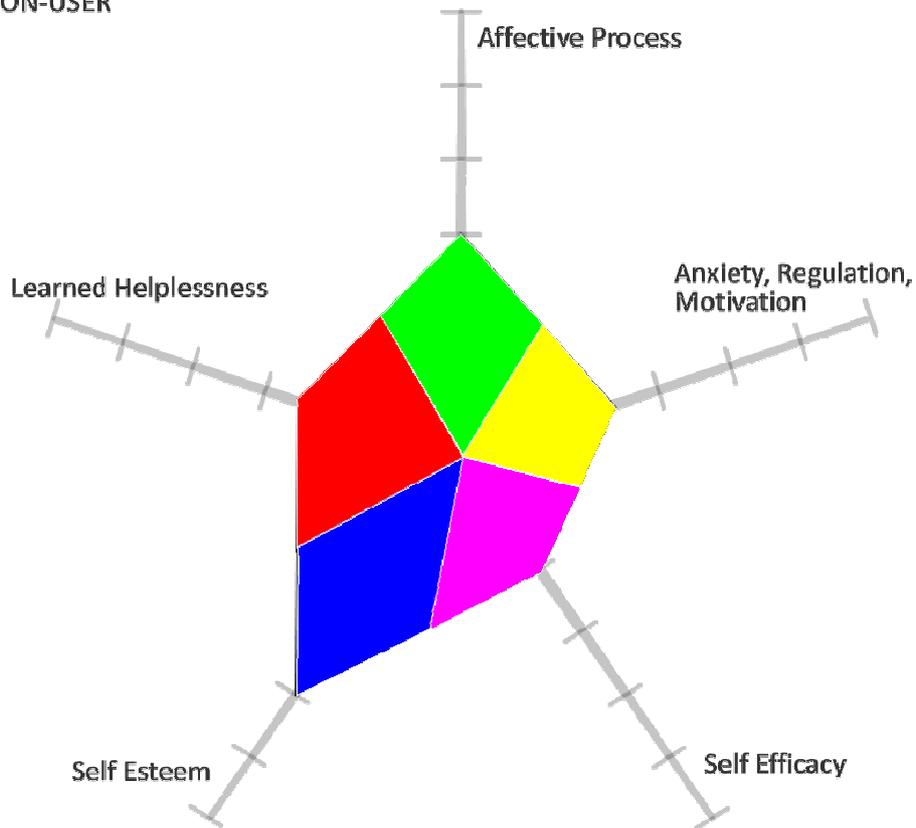
QNR #23;  
USER



Q5:

I think that the ATS provided at Southampton University is excellent. I am very pleased with the ATS workstations and the large desks with good chairs and lightint. When I first registered with ATS, the o I do not really think there is much of a need for the ATS room to be staffed. I find it disturbs me when people come into the ATS room and ask staff for help as I often find the staff do talk quite loudly. I often find my work stops when they are talking and then I have to try and start again. Saying this, I have found staff very helpful when I have asked them questions about registering with ATS, and I do think that there is a need for them but perhaps not in the ATS workstations room.

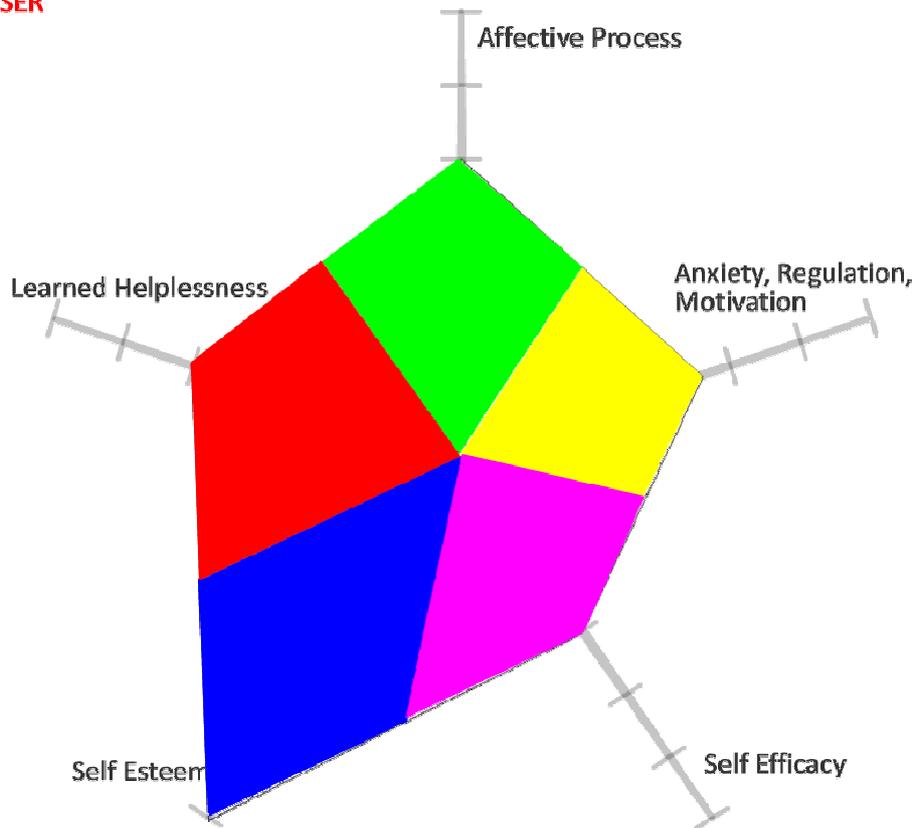
QNR #27;  
NON-USER



Q5:

firstly I feel some of these questions are a bit leading for an unbiased questionnaire. In my accedemic studies I have always had good grades but never found it easy to concentrate on my work. Occasionally I have moments of inspiration, almost like a light bilb moment, and I find it much easier to work. I am not sure if it is acceptable for me to work like this or if I subconciouly use it as an excuse to be bone idle. I am embarased when slow to complete work in class. I rarley complete an exam paper in the required time.

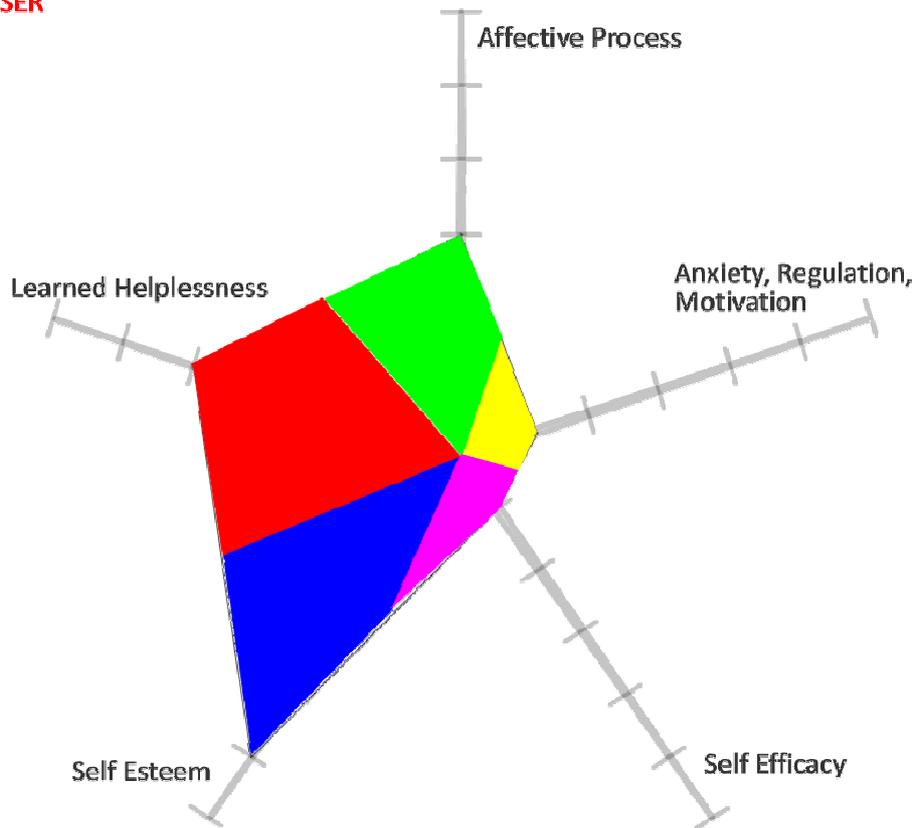
QNR #33;  
USER



Q5:

I feel although dyslexia held me back alot at school by the time i was at 6th form i had overcome most of my weaknesses. yes my spelling and writing speed arnt the best but i feel they are of an acceptable level now even though they were very poor at school (had Assistants in my lessons to help me). one thing i notice i still do quite often when im writing, say a word like 'because', as the second cilible is quite strong i will write cause not because i cant spell it just as the second part of dominates the word. i hope im making sence. I also find occationally i will be thinking one work and write a completly differnt work but that is related. for example i will be thinking force but write power. power never came into my head yet i find myself writing it im oviously cross wired somewhere.

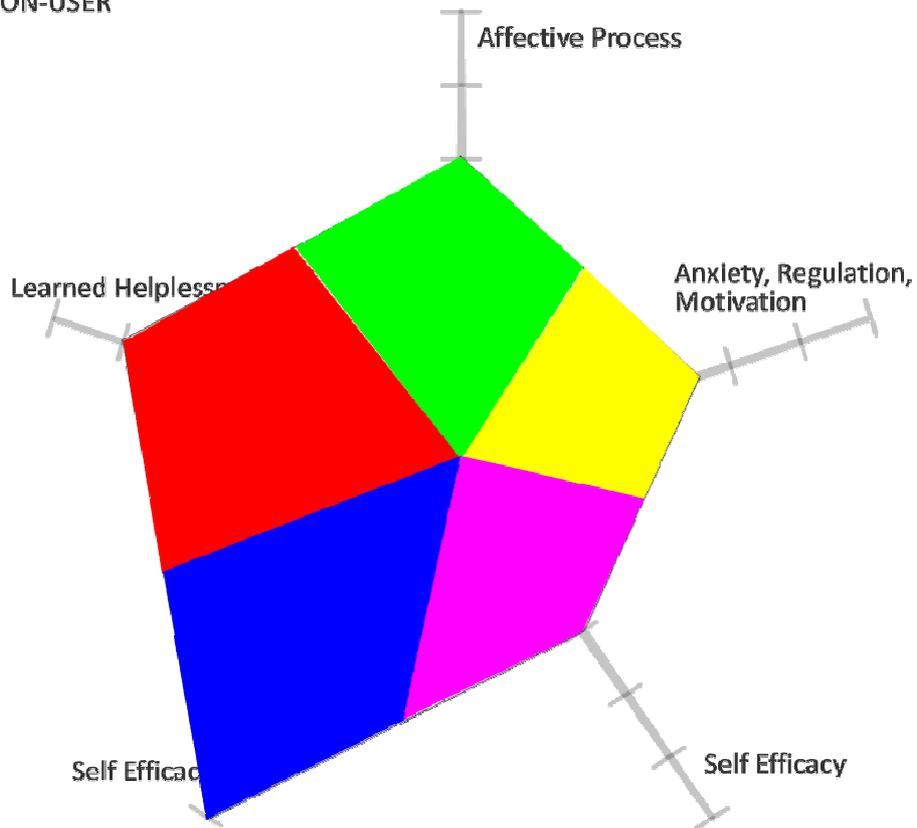
QNR #35;  
USER



Q5:

I feel comfortable using the computers in the ats when searching for research. i can concentrate more in this area than at home. It is also comforting to be around be who may have similar difficulties with essays ect. I oftern see a few of my course mates in there and this made me relise that there are many people who have dsylexia.

QNR #39;  
NON-USER

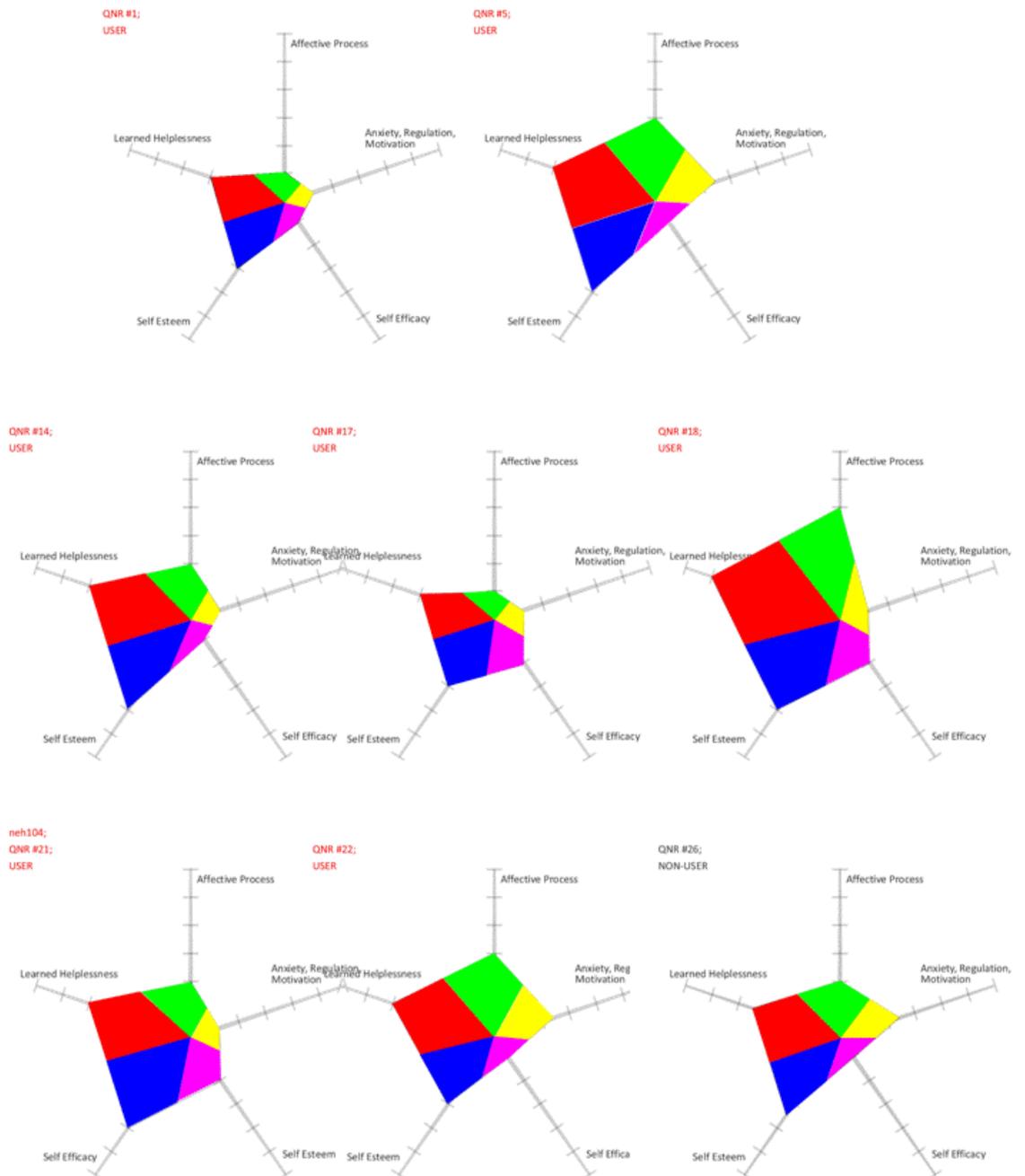


Q5:

I found primary school the hardest place, firstly because I didnt know why i couldnt spell but also because of the way they treated me. I was seperated all the time and made out to be different i feel this wasnt the best way to deal with me.

**Group C Internal Locus of Control Profiles (shown together):**

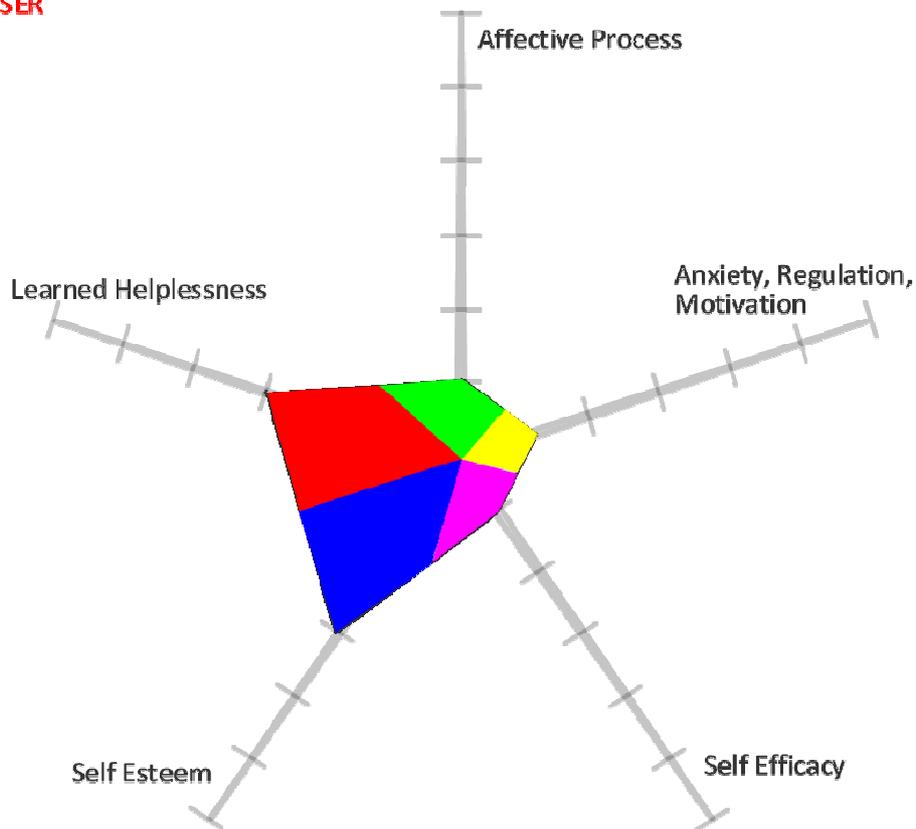
**Respondents: #1, #5, #14, #17, #18, #21, #22, #26**



Group C profiles shown individually together with respondent comments where given:

QNR #1;

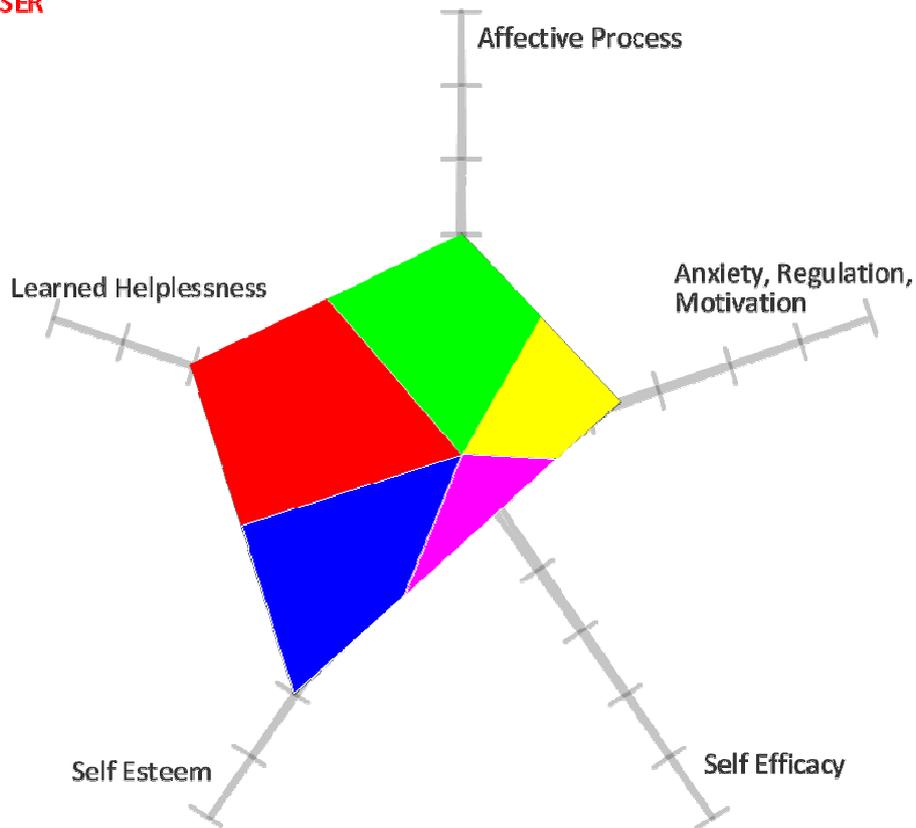
USER



Q5:

i think the ATS room is great as i cannot go into the normal workstations it makes me anxious and really stresses me out. But i think that each buliding such as Murray/Lanchester should have a small room with mabey 4 computers or even two so that you are able to work in your buuiling if you need help but working in the ATS room is good as Linda/Andrew can help you not just with work but really good to give support and advice!!It will aslo be useful to have a few more trained to same standard as them!

QNR #5;  
USER



Q5:

I certainly work a lot harder than others to achieve similar grades. It always takes me long to complete a task, particularly when there is a lot of reading involved. My writing work and exam marks do not reflect the knowledge that I have because I find it very difficult to express what I think on paper. I hate exams because I never finish them even with extra time and I know that I can do the work. My spelling is quite bad so I often feel embarrassed when writing in front of others. I always use the dictionary on my home computer and would like to be able to use one on the computers in the ATS room.

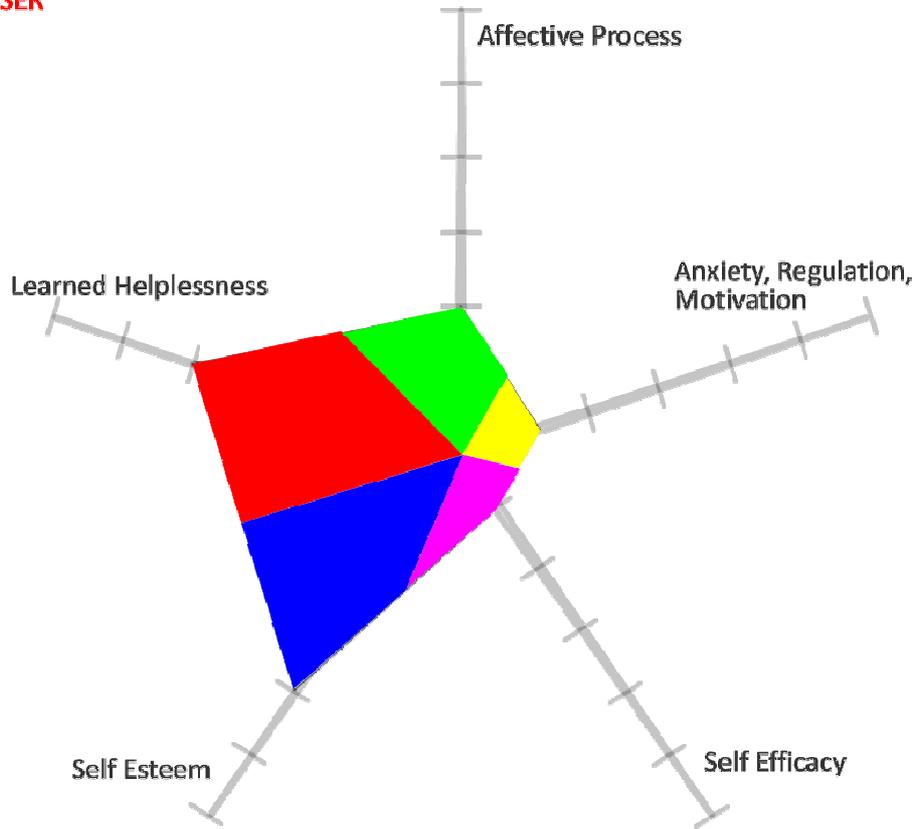
I believe that people without dyslexia do not understand the difficulties I have. They often think I can do things like them. Such as remembering what was said in a lecture without referring to my notes.

I have learnt the hard way that it is important to let others know that I am dyslexic when working in a group project. As it affects the way I study and a task will always take me longer than others.

My dyslexia has taught me to be determined and to work to my strengths. But I wish that I was not dyslexic!

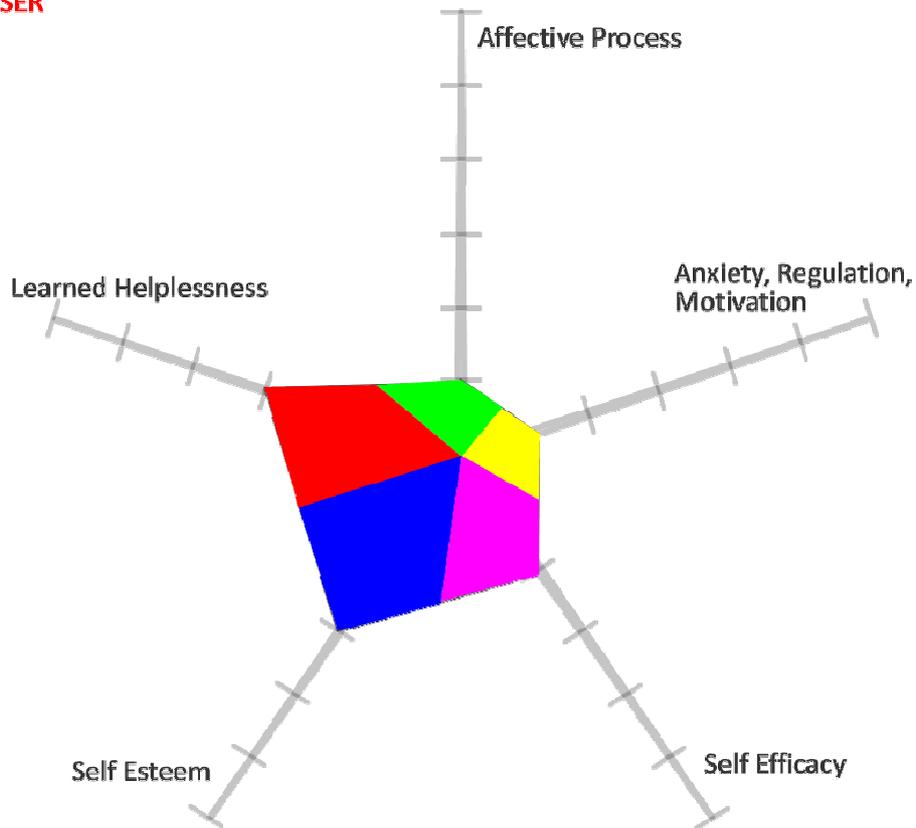
I am very happy to talk to you, as i think it is an area that people need to understand better.

**QNR #14;  
USER**



Q5:  
no comments from respondent

QNR #17;  
USER



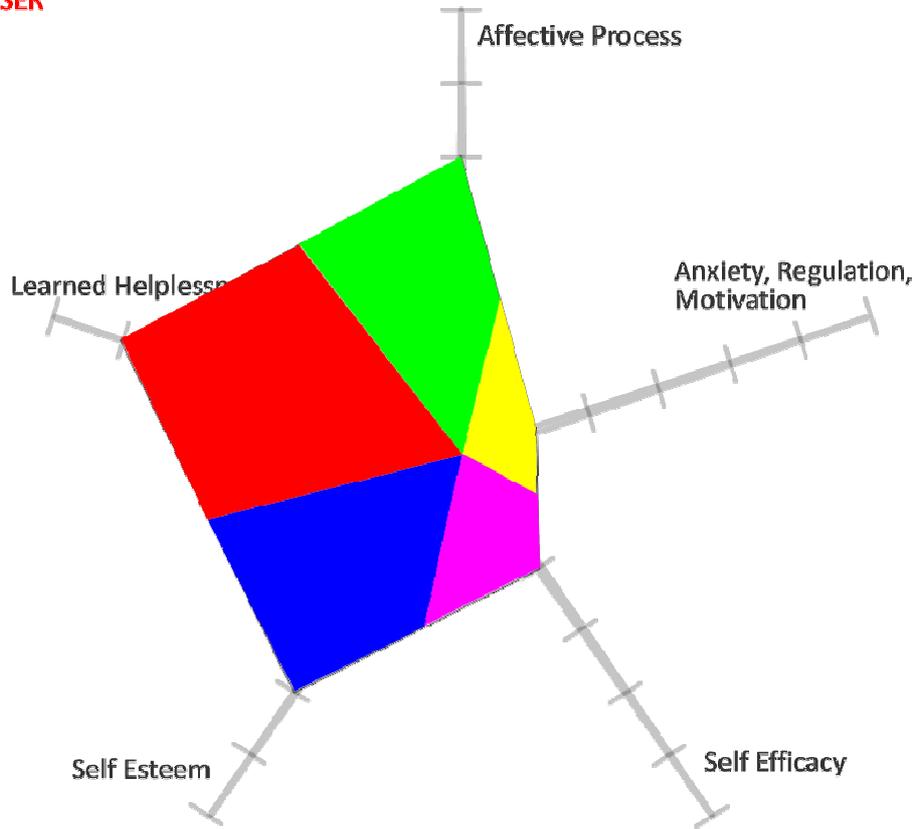
Q5:

ATS is a great service, it has helped me a great deal over the last 3 years. I often feel it is the only place i can focus on work.

I think the Hartley library is a good place to work but i like smaller spaces with fewer people. I am sure it can't be the same for everyone as most people have no problem working in the larger more open parts of library but i cannot focus. The Turner sims library level 4 is my main hide out!

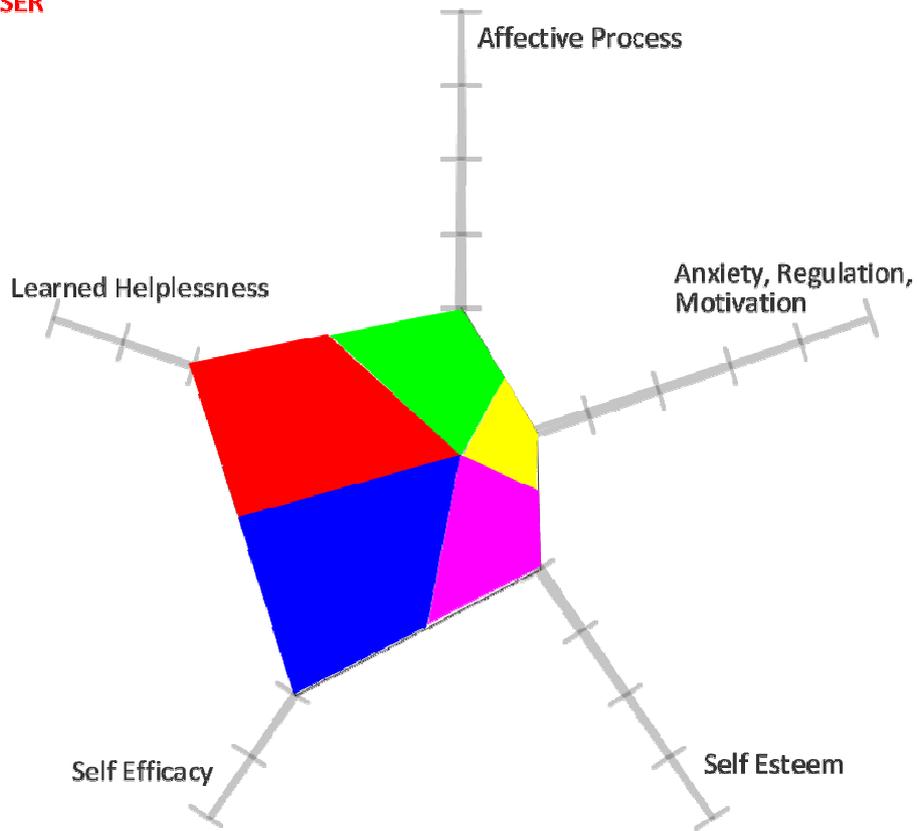
As for using PC's i have to my writting is beyond bad! Its embaressing and i wouldnt be at university if it wasnt for my laptop!

QNR #18;  
USER



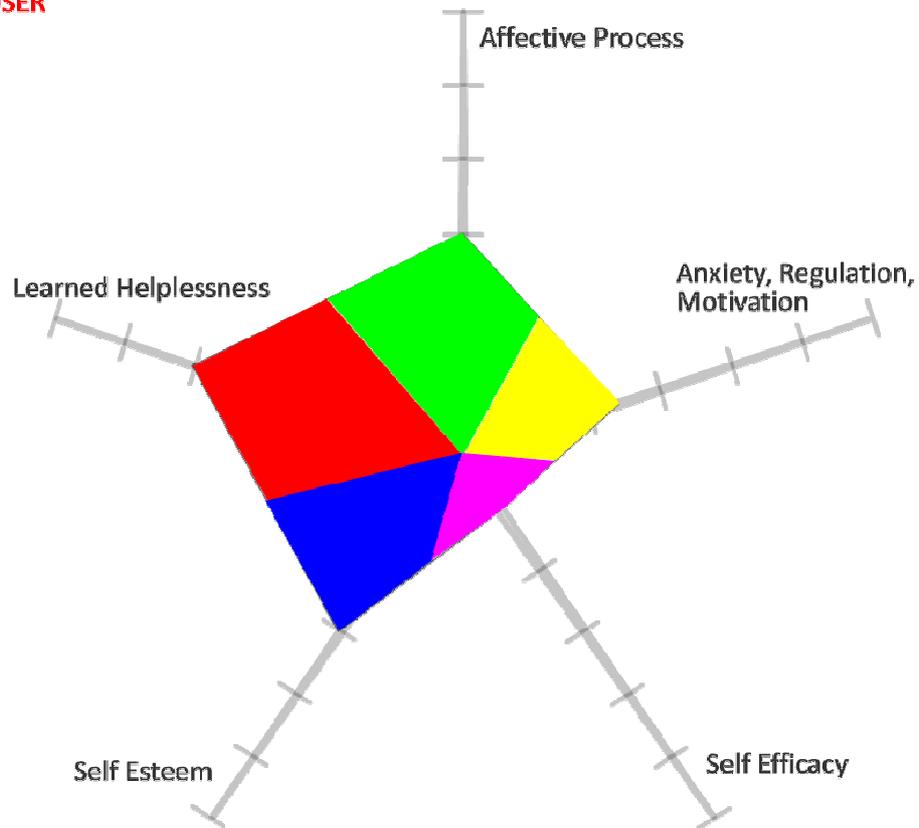
Q5:  
no comments from respondent

neh104;  
QNR #21;  
USER



Q5:  
no comments from respondent

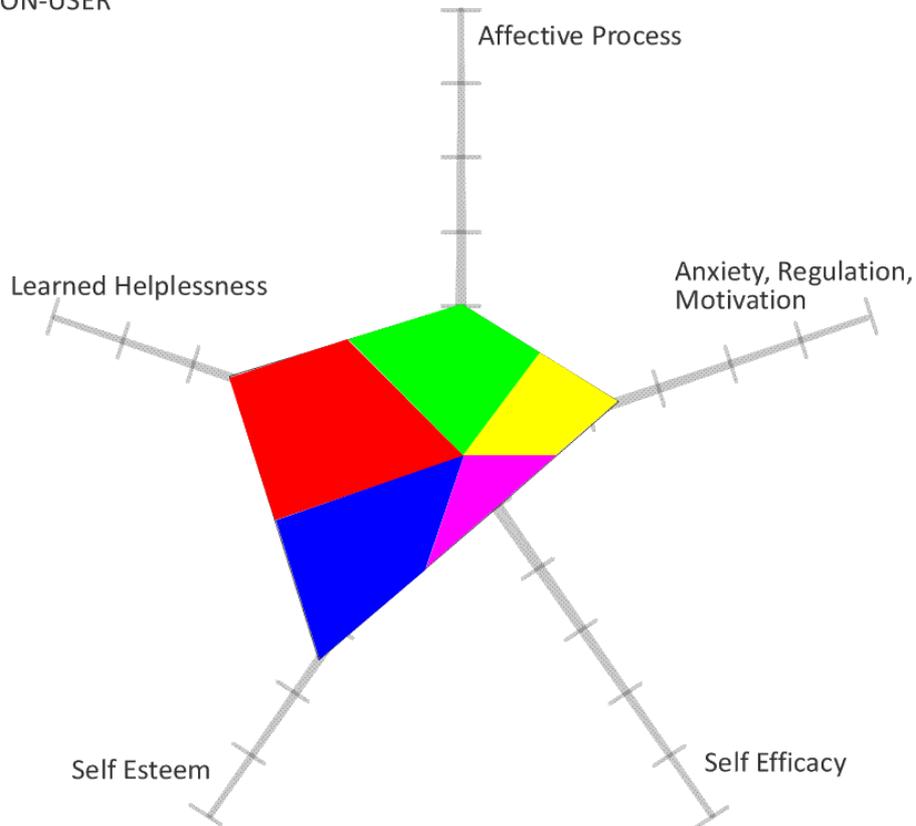
QNR #22;  
USER



Q5:

It is a great facility and I find it especially useful during the revision periods and also if I cannot finish an essay at home I finish it there.

QNR #26;  
NON-USER



Q5:

I find the ATS rooms at the libry a really good place to study.

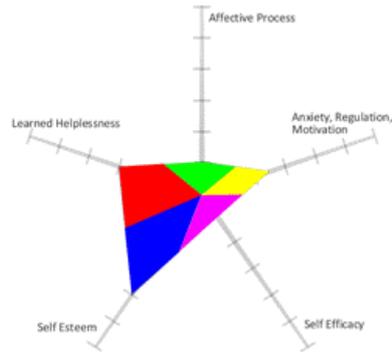
I worry about telling future employers that I am dyslexic in case it prevents them from hiring me.

I have failed an essay before and I was told that it was because I was careless with my grammer and spelling, but the marker was aware that I am dyslexic. She didn't see a problem with her comment, but it angered me, as i wasnt being careless and i had had friends proof read the essay before hand.

Group D Internal Locus of Control Profiles (shown together):

Respondents: #2, #4, #25, #30, #36

QNR #2;  
NON-USER



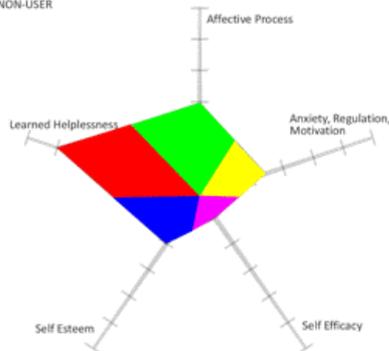
QNR #4;  
USER



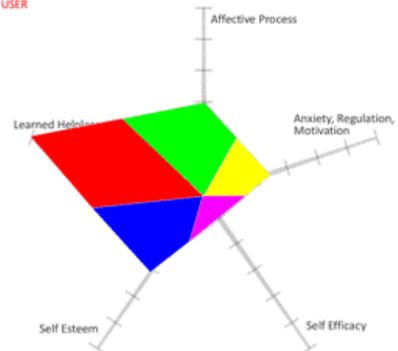
QNR #25;  
USER



QNR #30;  
NON-USER

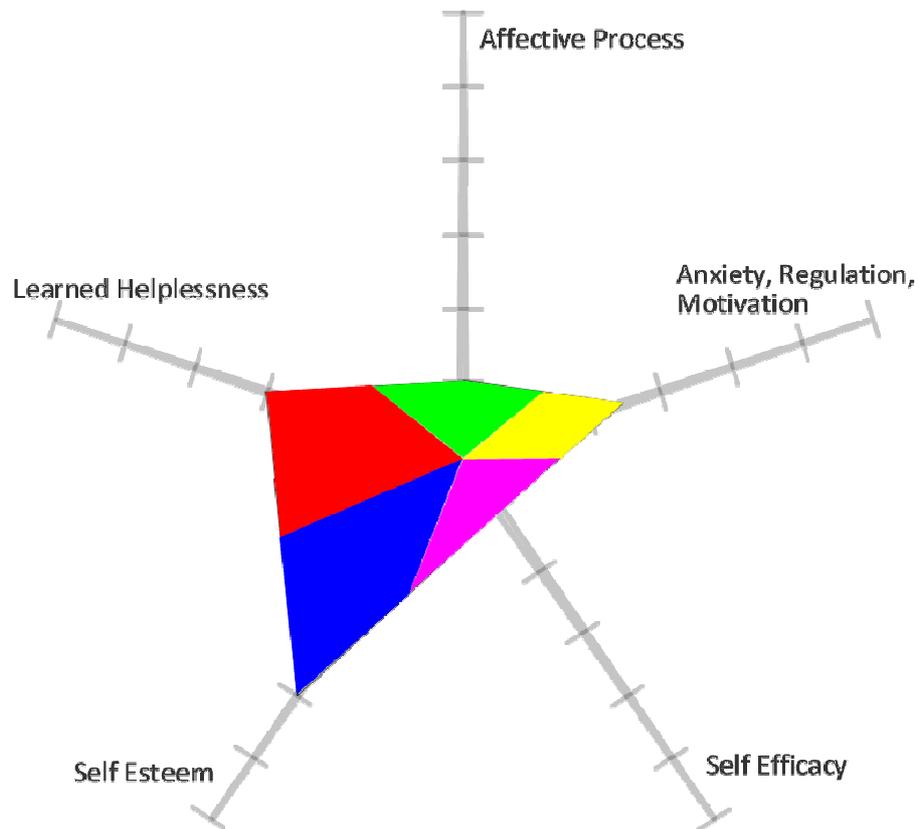


QNR #36;  
USER



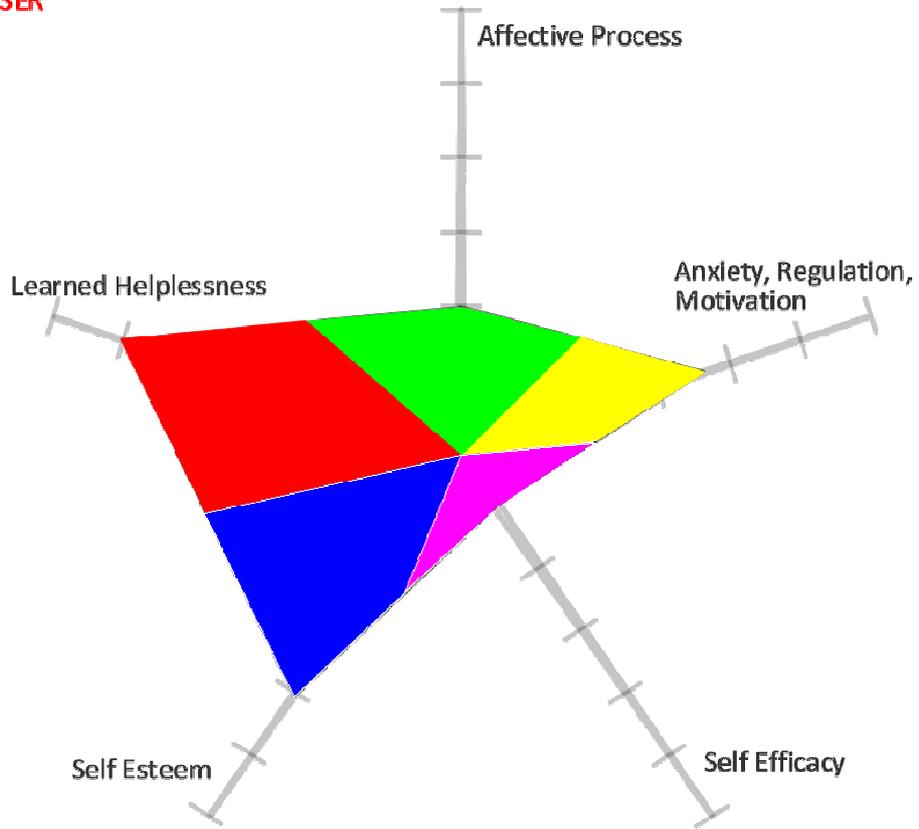
Group D profiles shown individually together with respondent comments where given:

QNR #2;  
NON-USER



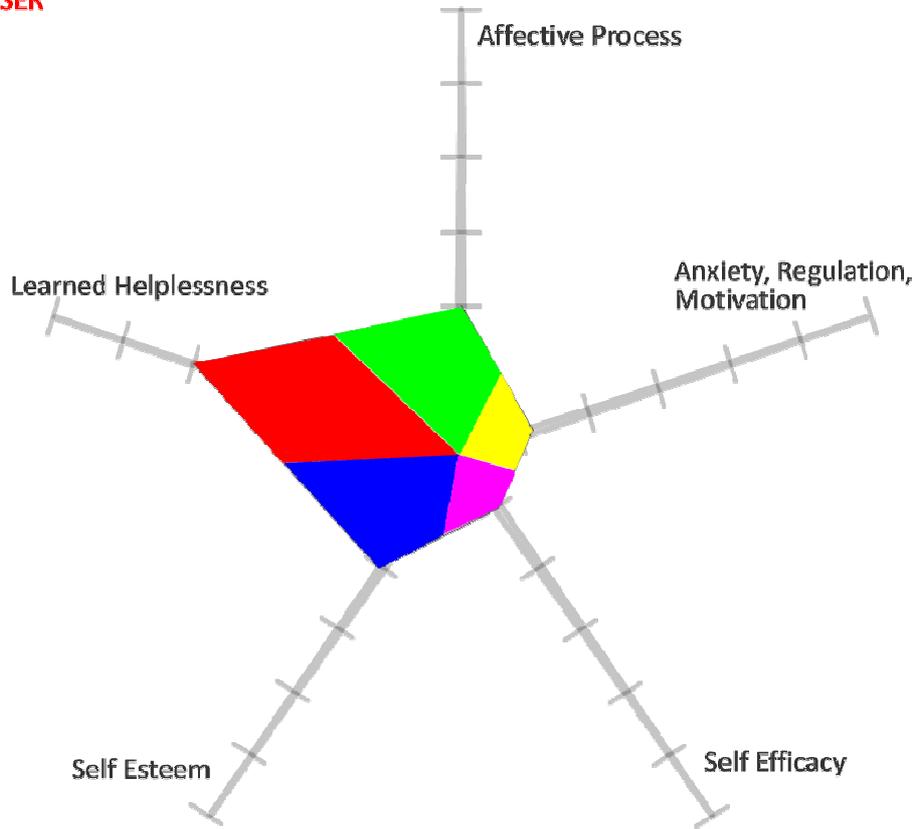
Q5:  
no comments from respondent

QNR #4;  
USER



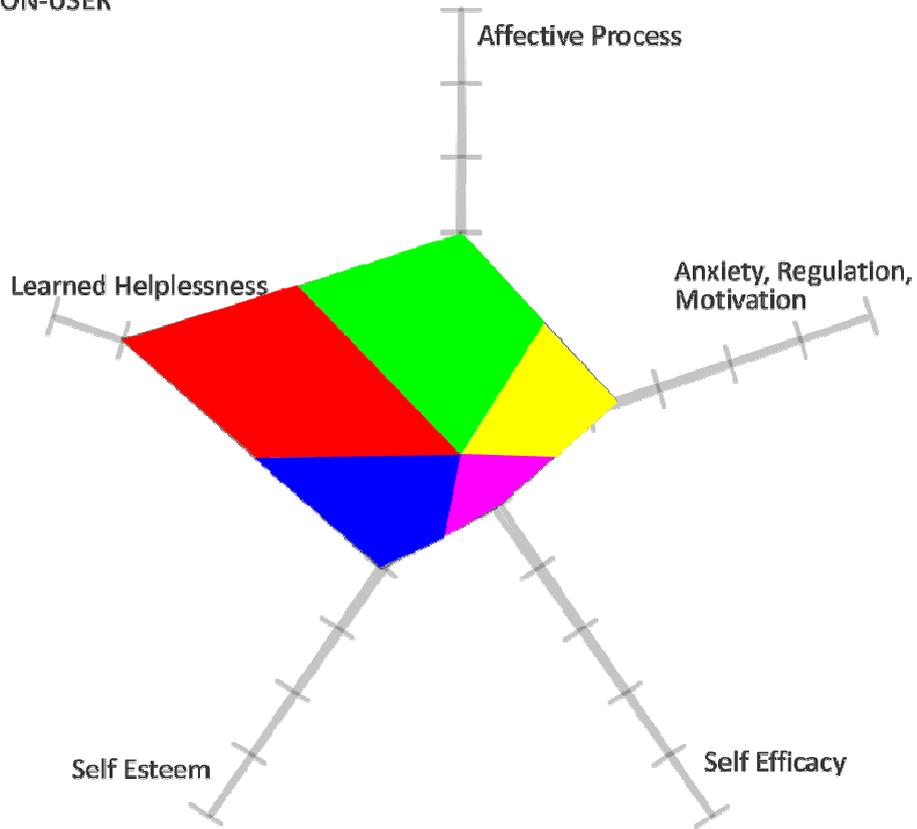
Q5:  
no comments from respondent

QNR #25;  
USER



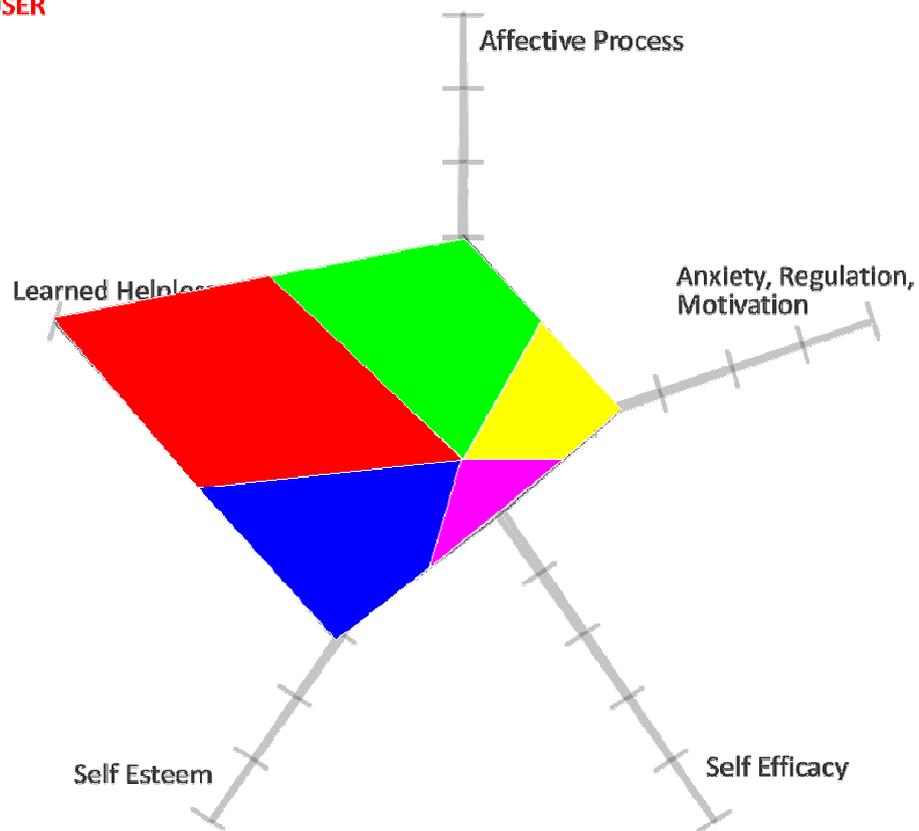
Q5:  
no comments from respondent

QNR #30;  
NON-USER



Q5:  
no comments from respondent

QNR #36;  
USER

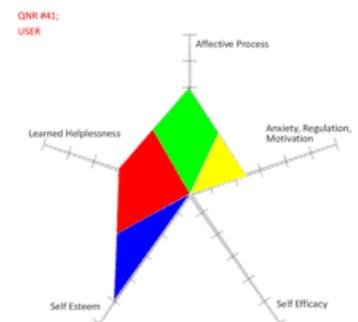
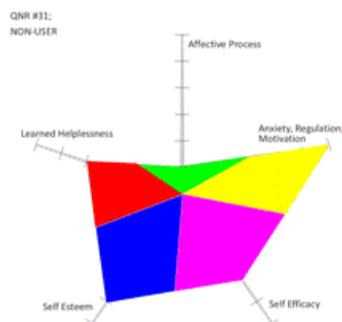
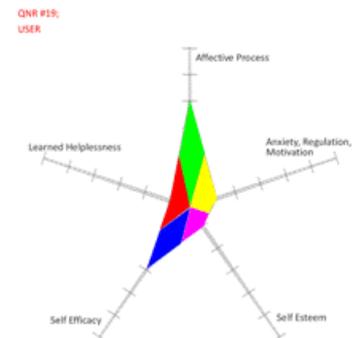
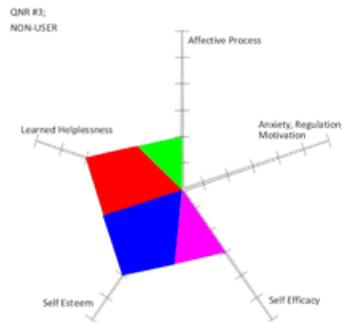


Q5:

it has been good but i probably haven't used it as much as i should have.

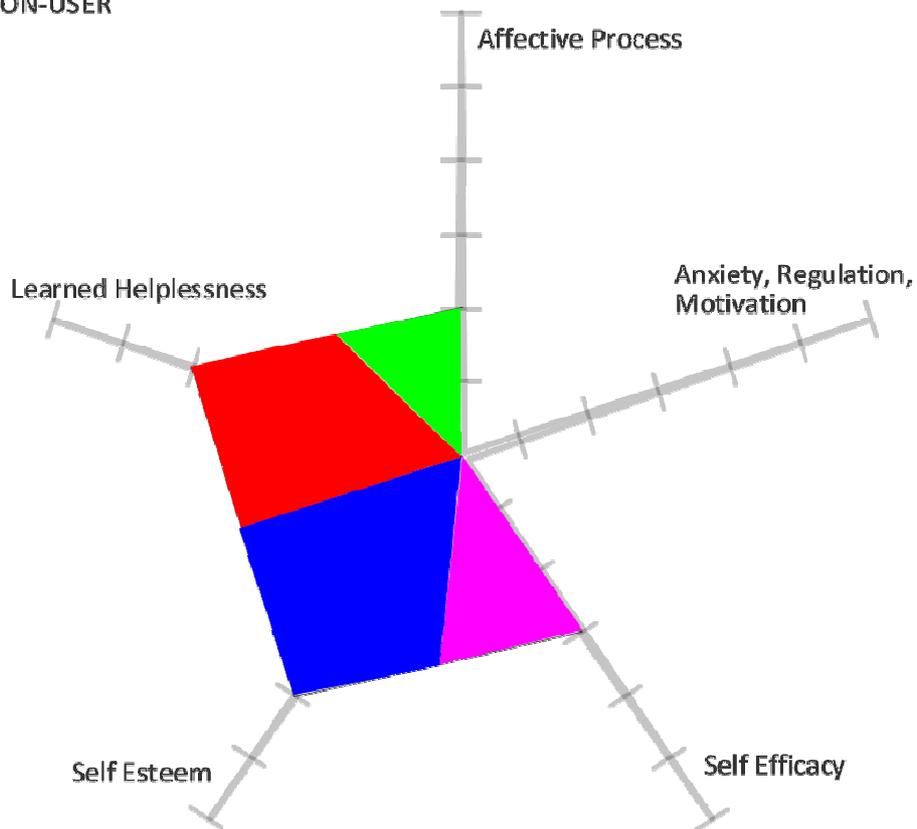
Group E Internal Locus of Control Profiles (shown together):

Respondents: #3, #8, #10, #19, #31, #41



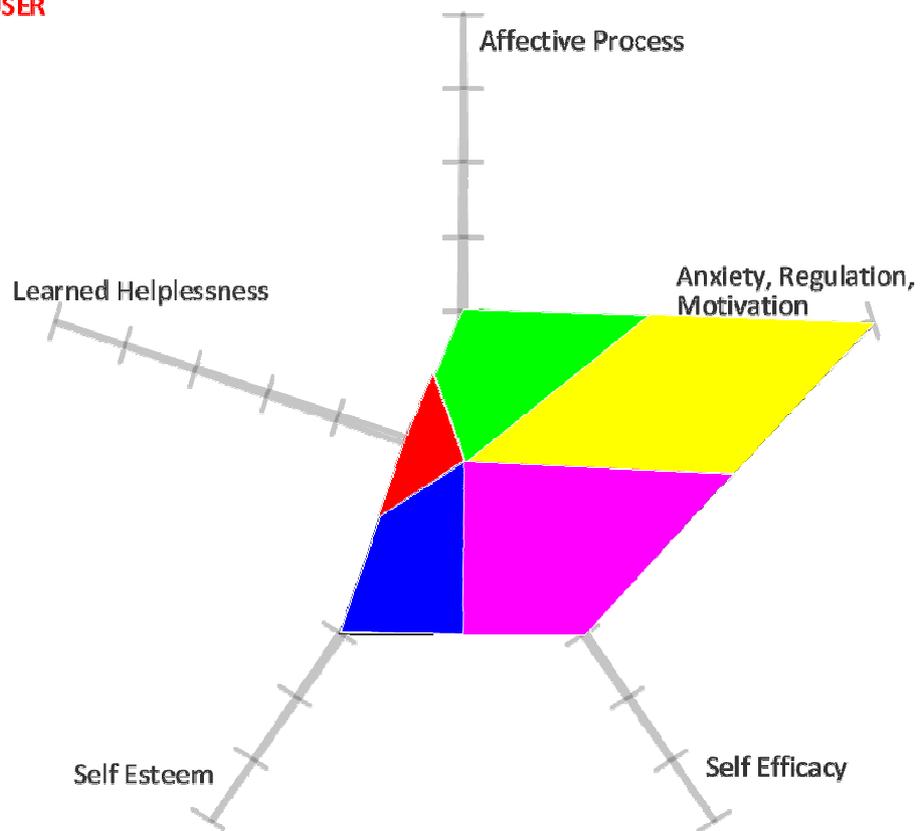
Group E profiles shown individually together with respondent comments where given:

QNR #3;  
NON-USER



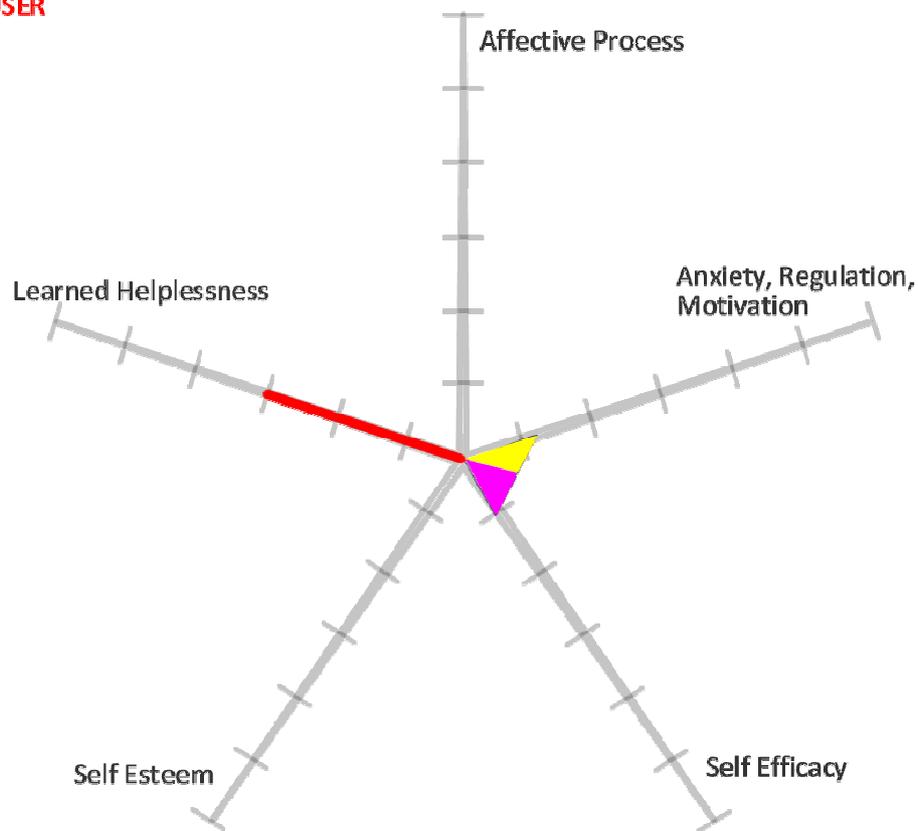
Q5:  
no comments from respondent

QNR #8;  
USER



Q5:  
no comments from respondent

QNR #10;  
USER



Q5:

I certainly work a lot harder than others to achieve similar grades. It always takes me long to complete a task, particularly when there is a lot of reading involved. My writing work and exam marks do not reflect the knowledge that I have because I find it very difficult to express what I think on paper. I hate exams because I never finish them even with extra time and I know that I can do the work. My spelling is quite bad so I often feel embarrassed when writing in front of others. I always use the dictionary on my home computer and would like to be able to use one on the computers in the ATS room.

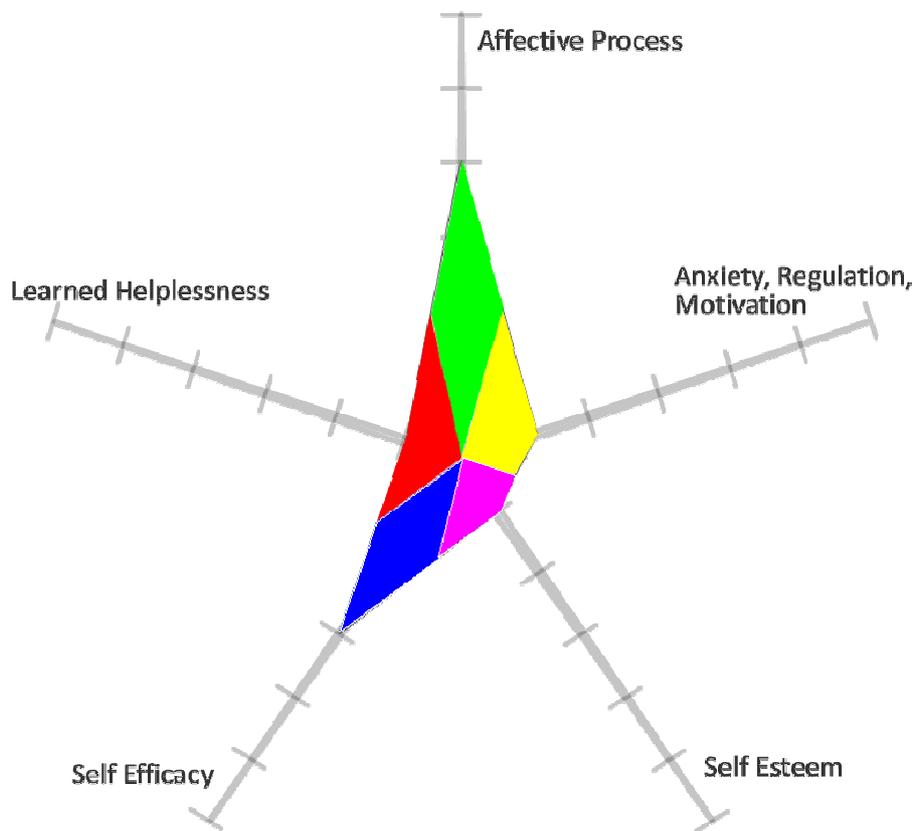
I believe that people without dyslexia do not understand the difficulties I have. They often think I can do things like them. Such as remembering what was said in a lecture without referring to my notes.

I have learnt the hard way that it is important to let others know that I am dyslexic when working in a group project. As it affects the way I study and a task will always take me longer than others.

My dyslexia has taught me to be determined and to work to my strengths. But I wish that I was not dyslexic!

I am very happy to talk to you, as i think it is an area that people need to understand better.

QNR #19;  
USER



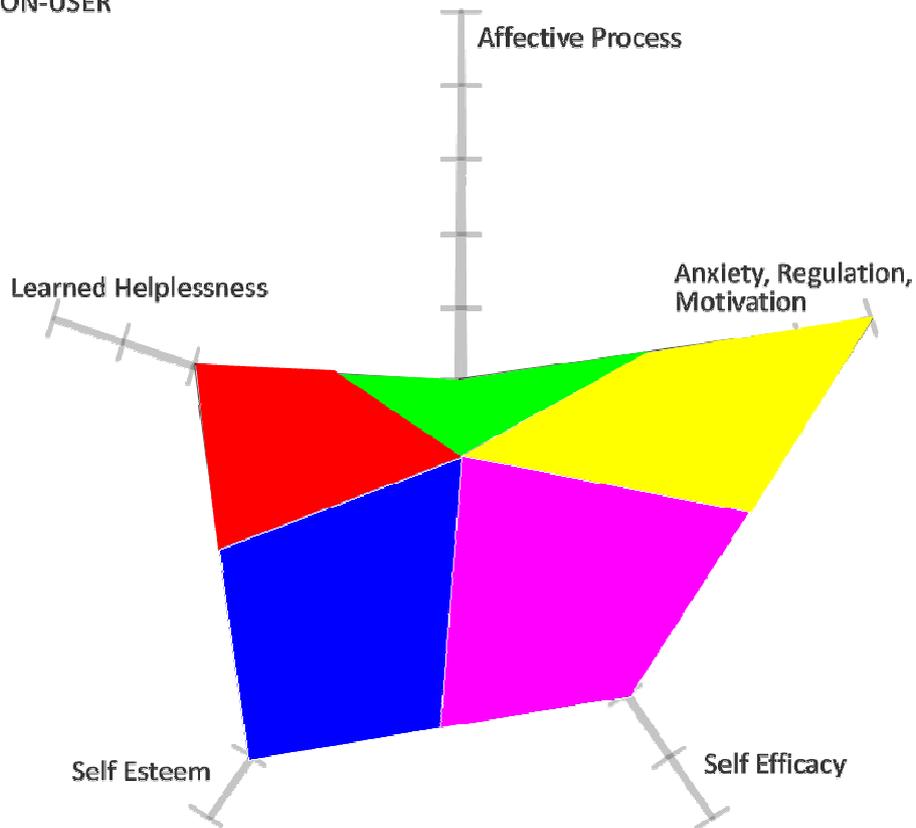
Q5:

University is a very do it yourself type of institution. There is no one to pressure you to do the work, so if you find something hard to get your head around, have bad organisational skills it is very easy to get left behind and soon get overwhelmed with what u have to do. It is very easy to slip through the net so to speak. I think for ATS students, there perhaps should be regular monitoring to make sure that work is being completed. I know myself at the start of the year you get the course handouts which say you should be doing 40hrs work a week each module etc. Just read through it and leave it to one side. Then again it is higher education, and the point is to push oneself in order to show maturity as well as a willingness to work and succeed. By receiving too much help does it negate the achievement from completing a degree. The whole argument of higher education and eliteism can be seen in general, are too many people doing too many courses?? Pers!

onally, I think too many people do degrees, but at the same time think everyone should be given the opportunity to self improve, or carry out work in some way which they enjoy. ATS is of good use, and the staff are friendly, and i think it is good part of the university which is there to help people succeed to their best. I think it is of utmost importance to be tolerant of others and to help, as everyone have different skills. Oh and i think lecture

notes should be provided to everyone, personally i miss a lot, so now just end up listening to take a lecture in. Dictophones are a lot of effort as playing back, i know i am too lazy to do that, not sure about everyone else. I just end up borrowing friends notes. Sorry about the ramblings, just random thoughts as they came into my head- no essay plan here :) Best of luck with the dissertation. David

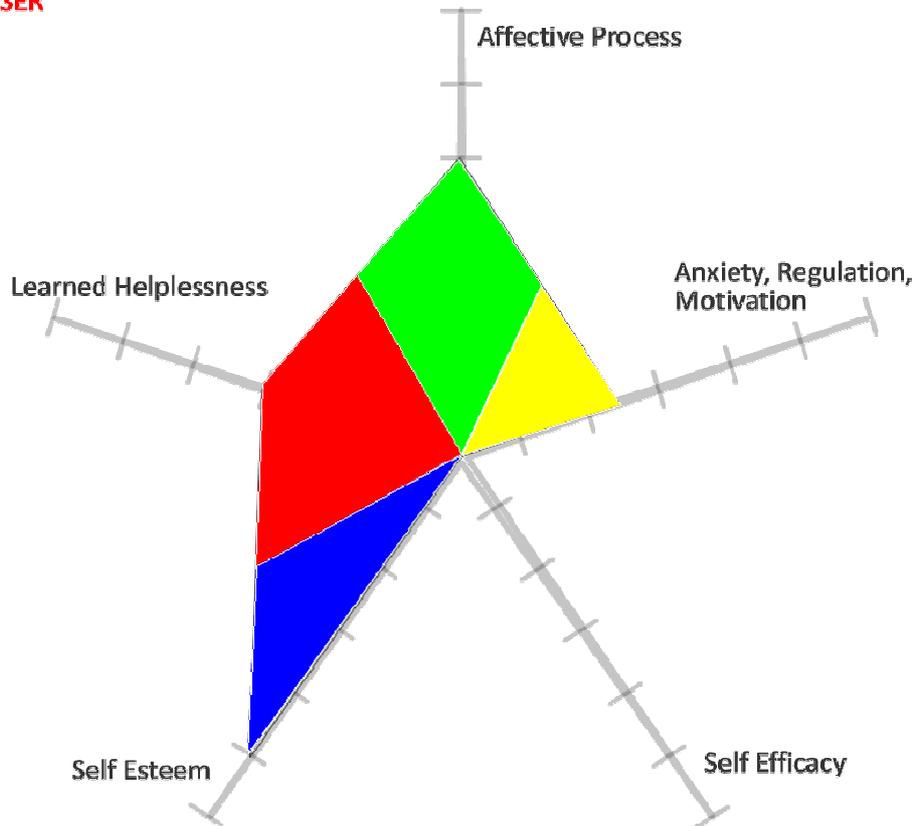
QNR #31;  
NON-USER



Q5:

I feel comfortable using the computers in the ats when searching for research. i can concentrate more in this area than at home. It is also comforting to be around be who may have similar difficulties with essays ect. I oftern see a few of my course mates in there and this made me relise that there are many people who have dsylexia.

QNR #41;  
USER



Q5:

As a mature student it was a big shock to find out I was dyslexic coming to terms with being a disabled student was hard. I have no problems explaining to people that I am dyslexic, when I do not understand something most people think the written word is the problem but thought process is sometimes different which I think most people have problems with understanding what dyslexia is.

### **Extra References**

- (Avramidis and Skidmore, 2004)
- (Boxall et al., 2004)
- (Chappell et al., 2001)
- (Fuller et al., 2004)
- (Goode, 2007)
- (Goodley, 2001)
- (Greenbank, 2006)
- (Ho, 2004)
- (Nunan et al., 2000)
- (Rodgers and Namaganda, 2005)
- (Santhanam and Hicks, 2004)
- (Skelton, 2002)
- (Stein, 2001)
- (McCann and Garcia, 1999)
- (Lin et al., 2003)

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