PROBLEMATIC INTERNET USE, FLOW AND PROCRASTINATION IN THE WORKPLACE

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Declaration

I hereby declare that this dissertation is my own work. It is submitted for the Master's degree in Industrial Psychology at the University of the Witwatersrand, and has not been submitted to any other university, or for any other degree.

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Abstract

Recent research indicates that some users of the Internet experience personal and/or professional disruptions due to their time spent online. Is this problematic use of the Internet a result of high involvement and enjoyment of interacting with this highly sophisticated medium? Or is using the Internet problematically a result of boredom and distraction, a tool used to avoid doing unpleasant tasks?

This study aimed to investigate the nature of problematic Internet use within the South African workplace, and the effect this has on an organisation and an individual. It also aimed to expand upon previous research in this area, by considering the predictive effect of the relationship between flow and procrastination on problematic Internet use. Questionnaires containing a biographical information sheet, internet use form, and three well-established measures, including the Problematic Internet Use Questionnaire (PIUQ), a Self-report (Flow) Scale, as well as the distraction subscale of the Online Cognition Scale (OCS), were converted into a webpage and placed on the website of IT Web. This sampling method yielded a final sample of 1399 respondents, consisting of 1065 men and 334 women.

The results of this study illustrated significant differences between individuals experiencing problematic Internet use, and those using the Internet in a healthy manner. In addition, the findings of this study indicated that there was a positive relationship between the constructs of problematic Internet use, flow and procrastination, with a degree of overlap between them, thus confirming that flow and procrastination are good predictors of problematic Internet use and that these three concepts are not completely separable.

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Introduction

The Internet has become an increasing part of many people's day-to-day working lives. As with the introduction of other mass communication technologies, issues concerning use, abuse and addiction have surfaced. Spending time on the Internet has become an activity as social and marketable as going to the movies. In any "addiction," a person becomes compulsively dependent upon a particular kind of stimulation to the point where obtaining a steady supply of that stimulation becomes the sole and central focus of their lives (Griffiths, 2000). Many employees and office workers who spend time online doing non-work activities could be costing businesses a great deal of money. It is clear that Problematic Internet Use (PIU) is a serious cause for concern - particularly to employers.

The issue of problematic Internet use needs to be taken seriously. Problematic Internet use, in all its variety is only just being considered a potentially serious occupational issue. Problematic Internet use is a term used to describe people who have become psychologically "addicted' to the Internet or one aspect of the Internet (e.g. online gambling, cybersex, WWW surfing, chat rooms, etc.) (Griffiths, 1998). Problematic Internet use can be found in any age, social, educational, or economic range (Beard & Wolf, 2001). Managers, in conjunction with personnel departments and employment counsellors, need to ensure that they are aware of the issues involved and the potential risks that problematic Internet use can bring to both employees and the organisation. Problematic Internet use at work can have serious repercussions not only for the individual but also for employees who befriend problematic Internet users and for the organisation itself, as it could be a form of procrastination where employees seek refuge from work activities. Problematic Internet use can be a hidden

activity, and the growing availability of Internet facilities in the workplace is making it easier for problematic use to occur in many different forms. It has the potential to be a social issue, a health issue and an occupational issue and should be taken seriously by all employers who allow the use of the Internet in their day-to-day business.

The aim of this research does not only want to use flow and procrastination to predict problematic Internet use, but also wants to examine the overlapping of these three constructs, as they appear to be highly related in theory and very much part of an individual's working life. Flow is feeling a "sense of loss of time" and is viewed as a positive state, especially in terms of work output, where there will be an increase in work activity and productivity. Employees who experience flow while using the Internet at work do not necessarily have a problem, it is the work and the tasks the employee is neglecting while becoming absorbed on the Internet, which may be viewed as problematic. Therefore questions are raised as to what the flow-state does to the individual employee's psychological and social well-being. Problematic Internet use can become a tool for procrastination, but it is important to note that it may not be the Internet which causes procrastination; it may merely lead employees to increase their use of the Internet, in a problematic way. It is thus clear that these concepts are difficult to define independently, as they are highly related to each other in conjunction with work life. Flow, in a sense, is very similar to procrastination in that the individual is not in complete control of their time. A flow-state leaves an individual completely absorbed in the task at hand, and can very easily lead to a sense of loss of time. Procrastination, although viewed similarly, has a more negative connotation attached to it, in that it is viewed more as time wastage. The employee is

avoiding a task and so finds other activities to fill their time, thus delaying certain, and sometimes more important tasks. It thus becomes quite clear that problematic Internet use may become the tool for both these activities, flow and procrastination, to occur. This may not arise as being problematic to the individual, especially if they work on the Internet and use it as a means to complete various work tasks. Problematic Internet use, as it will become clearer in the discussion that follows, is not viewed as problematic based on the amount of time an individual spends on the Internet. Rather, it is viewed as problematic based on the reasons the individual uses the medium, as well as what is neglected in terms of roles and tasks when using the Internet (Brenner, 1997).

Problematic Internet use can be seen as an extension of flow, these concepts can be similarly experienced if the employee still experiences a "sense of loss of time" and becomes engrossed in the task they are performing. However, problematic Internet use is seen to have a negative output if the task the individual is so deeply involved in is not work-related, and work activity and productivity decrease as a result. Workplace flow is viewed as positive, and this state of flow may be experienced while using the Internet. This is not necessarily problematic Internet use, as the task may be work-related and the Internet is being used as a tool to complete the job. It is important to note that employees working in the Information Technology (IT) industry are likely to be using the Internet more widely and so may experience an overlapping of the above two constructs. Problematic Internet use is not a function of time online, but of disturbances in one's life as a result of Internet use (Morahan-Martin & Schumacher, 2000). It is the motivation which leads a person there and the activity they are involved in while online, which make it problematic.

Often, people find themselves procrastinating in relation to a specific task and might perhaps seek comfort on the Internet. Thus, the Internet is a release for these people, an outlet for procrastination, as a means to avoid work-related tasks. In this sense procrastination and flow can be seen to be opposite in terms of work productivity and the completion of tasks. If an employee is procrastinating at work, it is unlikely they are experiencing any form of work-related flow. However, these individuals may experience flow while using the Internet, and they may be using the Internet as a form of procrastination regarding another task.

The discussion presented below will begin by providing an overview of the available literature regarding the constructs of problematic Internet use, procrastination and flow, as the interrelatedness of these three concepts will be explored in this study. Having set out the theoretical foundation for the study, it will then continue by focusing upon the research questions to be investigated in the study. This discussion will then be followed by the methodology chapter, in which the research design, procedure, measuring instruments, sampling methods, data analysis and ethical considerations that were used in the study will be highlighted and critically evaluated. The results that were obtained in the study will then be presented in tabular form, where they will be evaluated and briefly described. This will then be followed by the final chapter of this report, which will consist of an in-depth discussion, where the results of the study will be discussed and contextualised in relation to previous research, followed by a consideration of the theoretical and practical implications of the findings, an overview of the limitations of the study, and directions for future research. The interrelatedness of these three concepts (problematic Internet use, procrastination, flow) will be explored in this study.

Chapter 1: Literature Review

Introduction

Access to the Internet is now commonplace and widespread, and can be done easily from the home and/or workplace (Davis, Flett & Besser, 2002). Employees who abuse Internet privileges have become a major concern among today's corporations (Brenner, 1997). New monitoring devices allow managers to track Internet usage. One major company tracked all traffic going across its Internet connection and discovered that only twenty-three percent of their Internet usage was business-related, based on the types of information employees were accessing while at work (Neuborne, 1997 as cited in Young, 1996). According to a survey of Human Resource directors, approximately 70% of companies provide Internet access to more than half of their employees and recent statistics show that problematic Internet use among employees is on the rise (Young & Case, 2004). In a survey of 1439 employees by Vault.com, an online analyst firm, 37% admitted to making use of the Internet constantly at work, 32% used the Internet a few times a day, and 21% made use of the Internet a few times a week (Adschiew, 2000 as cited in Young & Case, 2004). In a survey of 224 corporations by Websense, Inc., an electronic monitoring firm, 64% of the companies have disciplined, and more than 30% have terminated employees for inappropriate use of the Internet (Websense Inc., 2000 as cited in Young & Case, 2004). Specifically, accessing pornography (42%), online chatting (13%), gaming (12%), sports (8%), investing (7%), and shopping at work (7%) were the leading causes for disciplinary action or termination. This issue has become

critical as organisations attempt to minimise productivity losses that result from such problematic use (Young & Case, 2004).

Some problematic Internet use is game and competition oriented, some fulfil more social needs. Problematic Internet use can be associated with significant social, psychological, and occupational impairment, such as going onto the Internet and using this as an excuse to avoid performing daily chores and also to avoid work related tasks (Brenner, 1997; Scherer, 1997; Young, 1996). However, some problematic Internet use, may simply be an extension of flow. If an employee uses the Internet to complete tasks related to work, and thus spends the majority of their working day on the Internet, they may become completely absorbed in what they are doing and may experience a feeling of loss of time.

Given that the prevalence of problematic Internet use is strongly correlated with increased access to Internet activities; it is not surprising that the development of regular online use is increasing problematic behaviour regarding Internet use across the population. While many believe the term "addiction" should only be applied to cases involving ingestion of a drug (Walker, 1989; Rachlin, 1990), similar criteria have been applied to a number of problematic behaviours such as pathological gambling (Mobilia, 1993; Griffiths, 1991; 1990), computer addiction (Shotton, 1991) and video game addiction (Keepers, 1990).

There has been much controversy and disagreement among researchers regarding the appropriate term or phrase used to describe problems associated with excessive

Internet use. Young initially preferred the term "Internet Addiction Disorder" (Young, 1996b) and later, along with other authors "Pathological Internet Use" (Young, 1999; Davis, 2001; Morahan-Martin & Schumacher, 2000). There have also been numerous phrases used to describe individuals who use the Internet problematically. Brenner (1997), Egger and Rauterberg (1996), Young (1996, 1998, 1999), Beard and Wolf (2001) and Young and Rodgers (1998 as cited in Morahan-Martin & Schumacher, 2000) all used the term "Internet addict" while Morahan-Martin and Schumacher (2000) preferred "pathological Internet user." The most popular term utilised in the literature is "Internet Addiction," however more recently, the term "Problematic Internet Use" (Shapira, Goldsmith, Keck, Khosla & McElroy, 2000; Thatcher & Goolam, 2005) has gained in popularity. It is thus the researcher's position that this term more accurately reflects the phenomenon of excessive Internet use. While there are commonalities between excessive Internet use and an "addiction," excessive Internet use does not result in all of the symptoms and behaviours associated with a "chemical addiction," such as emotional withdrawal (Beard & Wolf, 2001). Therefore for the purpose of the present research the above-mentioned labels of excessive Internet use in a problematic way will be referred to as Problematic Internet Use (PIU).

This literature review will begin with an in-depth discussion of the construct of problematic Internet use, which will be defined, and its importance explored. The discussion will then continue with a detailed review of the theory on procrastination. This will then be followed by an exploration of the construct flow, where the main definition and past research, will be highlighted and discussed. The review will then

conclude by providing the research questions to be considered in the current study. The construct of problematic Internet use will be explored in more detail below.

Problematic Internet Use

The concept of "addiction" is not easy to define, but central to it is dependence on a substance or an activity. **"**Addiction" may be defined as a repetitive habit pattern that increases the risk of disease and/or associated personal and social problems…"often experienced subjectively as 'loss of control' [that] continues despite volitional attempts to abstain or to moderately use" (Marlatt, Baer, Donovan & Kivlahn, 1988 as cited in LaRose, Lin, & Eastin, 1995, p. 3). The term "addiction" is not officially recognised in the DSM-IV (American Psychiatric Association, 2000). The closest the DSM-IV comes to recognising the term, is for substance dependence disorders. Although originally linked only with substance use, there is growing recognition of behavioural "addictions" such as gambling, overeating, and exercise. Included within behavioural "addictions" are behaviours that relate to the use of machines, such as playing video games, amusement machines and using computers (Widyanto & McMurran, 2004). Technological "addictions" are operationally defined as non-chemical (behavioural) "addictions," which involve human-machine interaction. They can be either passive (e.g. television) or active (e.g. computer) and usually contain inducing and reinforcing features which may contribute to the promotion of "addictive" tendencies (Griffiths, 1995).

Problematic Internet use, can be broadly defined as the use of the Internet that creates psychological, social, school, and/or work difficulties in a person's life (Beard &

Wolf, 2001). Previous research on problematic Internet use has concentrated on excessive uses of the Internet; that is Internet "addiction," and was based on work about other "behavioural addictions," such as pathological gambling (Griffiths, 1995). It has been argued that these behavioural "addictions" are not very different to "chemical addictions" with regards to core components of "addiction" such as salience, tolerance, emotional withdrawal, mood modification, conflict, and relapse.

Young (1996) defined problematic Internet use as an impulse-control disorder, which does not involve an intoxicant. Young presented a definition for Internet related disorders, called Pathological Internet Use (PIU), adapted from the DSM-IV but from criteria associated with pathological gambling (Young, 1998). Her research developed an eight-item questionnaire to use as a screening instrument for PIU. Participants in offline and online surveys were considered "addicted" when answering "yes" to five (or more) of the questions. Young (1996) stated that the cut off score of "five" was consistent with the number of criteria used for Pathological Gambling and was seen as an adequate number of criteria to differentiate normal from problematic Internet use. This definition requires that individuals meet five of eight criteria for problematic Internet use to qualify as an "addict." These include (1) preoccupation with the Internet, (2) need for longer amount of time online, (3) repeated attempts to reduce Internet use, (4) withdrawal when reducing Internet use, (5) time management issues, (6) environmental distress (family, school, work, friends), (7) deception around time spent online, and (8) mood modification through Internet use (Young, 1998). In adopting criteria symptoms similar to that of pathological gambling, Young argued that PIU assumes more similarity to an impulse control disorder rather than to substance dependency (Leung, 2004).

Young (1999) claims problematic Internet use is further categorised by five specific subtypes, they are cybersexual "addiction;" cyber-relationship "addiction;" net compulsions; information overload and computer "addiction." The types of problematic Internet use in the workplace, Young (1999) proposed, are cybersexual Internet use, online friendship/relationship Internet use, problematic Internet activity use, problematic online information use, criminal Internet use, and miscellaneous Internet use. Cybersexual Internet use involves the accessing of adult websites for cybersex and cyberporn during work hours. Online friendship/relationship Internet use involves conducting an online friendship or relationship during work hours. This category might also include the use of e-mailing friends or engaging in discussion groups. Problematic Internet activity use involves using the Internet during work hours to do non work-related activities (e.g. online gambling, online shopping, online travel booking, online computer gaming, and online day trading of stocks). This type of activity may be one of the most common forms of problematic Internet use in the workplace (Young, 1999). Problematic online information use involves the problematic use of Internet search engines and databases. Typically, this type of use involves individuals who search for work-related information but who end up wasting hours of time with little relevant information gathered. This may be procrastination as it is an avoidance of work, but it is important to note that it may be deliberate, or it may be accidental or non intentional. Criminal Internet use involves seeking out individuals who then become victims of sexually related Internet crime (e.g. online sexual harassment). The fact that these types of problematic Internet uses involve criminal acts may have severe implications for employers. Miscellaneous Internet use involves any activity not found in the previous categories, such as the digital manipulation of images on the Internet for entertainment purposes (Young, 1999).

From the above-mentioned subtypes of problematic Internet use, it is clear that an individual may experience problematic Internet use in different ways regarding the content they access while on the Internet. These different ways may be experienced in two distinct types of problematic Internet use: specific and generalised. Specific problematic Internet use includes those people that are dependent on a specific function of the Internet. This includes overuse of online material/services, online auction services, and online gambling, for example. These dependencies are content-specific, and they would exist in the absence of the Internet (Davis, 2001). Where specific PIU is related to only one aspect of the Internet, and exists entirely independent of multiple Internet functions, generalised problematic Internet use involves using the Internet to waste time online without a clear objective. Thus, the Internet user is not looking for any specific function or content the Internet provides, they are merely using and gaining satisfaction from the pure use of the Internet. It might be projected that procrastination plays a significant role in both the development and maintenance of generalised PIU (Davis, 2001). Individuals with generalised PIU use the Internet to put off their responsibilities. This wasted time results in significant problems with regards to daily functioning, as responsibilities get put off and pressures increase (Davis, 2001). It has been argued (Griffiths, 1999) that many excessive Internet users are not problematic Internet users but just use the Internet as a medium to give rise to other problematic behaviours. For example, "gambling addicts" or "computer game addicts" who engage in their chosen behaviour online are not "addicted" to the Internet. This is specific PIU as the Internet is just the means these individuals use to engage in the chosen behaviour.

Over the past few years, problematic Internet use has gained significant credibility as a new clinical disorder (Greenfield, 1999; Morahan-Martin, 1997; Scherer, 1997; Young, 1998 as cited in Young & Case, 2004). Symptoms include a preoccupation with the Internet, increased anxiety when offline, hiding or lying about the extent of online use, and impairment to real-life functioning (Young & Case, 2004). It is clear that the long-term effects of problematic Internet use may have more far-reaching effects for the company for which the Internet user works than for the employee himself or herself. Problematic use also suggests that there may not necessarily be any negative effects for the user other than a decrease in work productivity. A decrease in work productivity, may be a result of procrastination where the employee avoids spending time on work projects and rather spends time in areas unrelated to work (Griffiths, 2003).

The research presented on problematic Internet use is relatively limited having been confined to online studies of self-reported problematic Internet users (Brenner, 1997; Egger, 1996; Thompson, 1996; Young, 1996, 1997a, b; Young and Rodgers, 1998 as cited in Morahan-Martin & Schumacher, 2000). However it suggests that it does indeed exist, and shows that it affects very few Internet users (Griffiths, 1998). These problematic users are usually people who use Internet chat rooms or partake in fantasy role-playing games – activities that they would not engage in except on the Internet itself. In these cases, the Internet may provide the user an alternative reality. This allows him or her to experience feelings of immersion and anonymity; feelings that may lead to an altered state of consciousness. This may be a state of flow, in that individuals become engrossed in the activity. There are a number of factors that make online contacts potentially seductive and/or "addictive." Such factors include the

disinhibiting and anonymous nature of the Internet. Disinhibition is clearly one of the Internet's key appeals as there is little doubt that the Internet makes people less inhibited (Griffiths, 1998). It has been shown that the Internet can be used to counteract other deficiencies (e.g. relationships, lack of friends, physical appearance, disability, and coping) in a person's life by using the Internet to meet friends and make contacts, and feeling secure in knowing that you may never have to (physically) meet with the other person (Griffiths, 2000).

The increased awareness that problematic Internet use is a legitimate concern, has been researched and primarily examined the characteristics linked to "at risk" populations causing such a dependence upon the Internet (Loytsker & Aiello, 1997 as cited in Young, 1998). These authors utilised a multiple regression analysis and found that higher levels of boredom proneness, loneliness, social anxiety and private self-consciousness all predict problematic Internet use as it was operationalised in their research. These characteristics have also been found to be experienced by those who procrastinate over a certain task (Steel, Brothen & Wambach, 2001), reporting that they therefore focus their attention on the Internet as a means to avoid a particular work task (Steel, et al., 2001).

Morahan-Martin and Schumacher (2000) examined problematic Internet use in college students and found a small proportion of users admitting to using the Internet for sexual purposes. Problematic Internet users accounted for 8% of the total sample and were more likely to be male (54% males) than female (46% females) and to use technologically sophisticated channels and online games. Other defining

characteristics of problematic Internet users were that they were more likely to use a wide variety of Internet services, and were more likely to use the Internet to meet new people, for emotional support, to talk to others with the same interest, to play interactive games like MUDs (Multi-User Domains), to gamble and to engage in online sexual behaviour (Morahan-Martin & Schumacher, 2000; Young, 1996). Reliance on the Internet to overcome loneliness (Scherer, 1997; Young & Rogers, 1998; Morahan-Martin & Schumacher, 2000), to develop a feeling of mastery or to provide a means of escape (Morahan-Martin & Schumacher, 2000) indicate a state in which the pure use of the Internet, as opposed to the content which the individual can access on the Internet, becomes rewarding in itself (LaRose, Lin & Eastin, 1995). This is generalised problematic Internet use and is clearly an aspect of flow, as the person enjoys the activity of using the Internet and explores the various features available.

There are many factors that make problematic Internet use in the workplace seductive. Research in the area of computer-mediated communication has shown that virtual environments have the potential to provide short-term comfort, excitement, and/or distraction, which may involve procrastination (Griffiths, 2000). These reasons alone provide compelling evidence as to why employees may engage in non work-related Internet use. There are also other reasons (e.g. opportunity, access, affordability, anonymity, convenience, escape, disinhibition, social acceptance, and longer working hours). Given the wide accessibility of the Internet, it is becoming cheaper and cheaper to use online services. Furthermore, for many employees, Internet access is free of charge at their place of work (Griffiths, 2000). The anonymity of the Internet allows users to engage privately in their behaviours of choice in the belief that the

chance of being caught by their employer is minimal. Anonymous online behaviours can provide a potential escape from the stresses and strains of real life. This anonymity may also provide users with a greater sense of perceived control over the content, tone, and nature of their online experiences, thus resulting in a flow experience. Problematic Internet use usually occurs in the familiar and comfortable environment of one's home or workplace, thus reducing the feeling of risk and allowing even more adventurous behaviours with little fear of being caught (Griffiths, 2000). However, this is dependent upon whether organisations have electronic monitoring in place. Employees will use the Internet less at work when knowing they are being monitored, not only because of the amount of time they may be known to be wasting and what tasks are being neglected while doing so, but also with regards to the content they are wanting to view on the Internet.

Studies have shown that some people neglect their work, family, social and academic responsibilities, suffer social isolation, face financial difficulties, and even report physical problems as a result of their overuse of the Internet (Griffith, 2000; Young, 1996b; 1999). Symptoms such as obsessive thoughts about the Internet, tolerance, diminished impulse control, inability to cease using the Internet, and emotional withdrawal have been cited as characterising unhealthy use of the Internet (Young, 1999). Young and Rodgers (1998) found that serious relationship problems were reported by 53% of the 396 case studies of problematic Internet users interviewed, with marriages and intimate dating relationships mostly disrupted due to cyberaffairs and online sexual compulsivity. In another study by Young and Rodgers (1998) it was found that the problematic Internet users in their study used the Internet an average of 38 hours per week for non-academic or nonemployment purposes, which

caused detrimental effects such as poor grade performance among students, discord among couples, and reduced work performance among employees. This is compared to those not experiencing problematic Internet use who used the Internet an average of 8 hours per week, with no significant consequences reported. Predominantly, the interactive capabilities of the Internet such as chat rooms or online games were seen to be the most attractive and led to problematic behaviours (Young & Rodgers, 1998). In their study personality traits of those considered dependent users of the Internet were conducted. Results of this research showed that dependants were classified and ranked high in terms of self-reliance, emotional sensitivity and reactivity, vigilance, low self-disclosure, and non-conformist characteristics (Young & Rodgers, 1998). Similar results were also reported in the results of a survey administered by Young (1996) and found that respondents using the Internet problematically used the medium for an average of 38 hours a week. Nearly 80% of those who used the Internet problematically engaged in two-way communication forums such as chat rooms and interactive games.

Past research has investigated, using a self-selected online sample, the criteria for compulsive Internet use. It was found that dependants of the Internet use it to escape from negative feelings. The vast majority of respondents admitted to feelings of time distortion, accelerated intimacy, and feeling uninhibited when online (Young, 1998). Scherer (1997) surveyed 531 students about their Internet usage using a checklist of ten clinical symptoms to parallel the symptoms of substance abuse and dependency. Results indicated that 13% of the sample reported that their Internet use had interfered with their academic work, professional performance, or their social lives. Others

described skipping sleep, ignoring family responsibilities, and showing up late for work to fulfil their desire to visit chat rooms and search the Web (Scherer, 1997).

There have been many suggested predictors of problematic Internet use. The most obvious is Internet usage, and the most commonly reported predictor in this regard is length of time spent online (Davis, 2001; Morahan-Martin & Schumacher, 2000; Widyanto & McMurran, 2004; Young, 1996b). The longer the time spent online, the greater the likelihood of experiencing problems with the Internet. However, a problematic Internet user is not defined purely by the number of hours that they spend online. Rather, a problematic Internet user is someone whose excessive use of the Internet leads to adverse physical or emotional consequences (e.g. damages a social relationship, forgets to exercise or feed themselves, etc.) or symptoms of emotional withdrawal when they are not online. Widyanto and McMurran (2004) found that using the Internet for personal use was a better predictor of problematic Internet use rather than using the Internet for work purposes. The duration of Internet use among the respondents ranged from two months to over ten years (Widyanto & McMurran, 2004) and 60% of the respondents stated that their professions required them to use the Internet (Widyanto & McMurran, 2004). Some studies have found that younger users (Brenner, 1997; Widyanto & McMurran, 2004) and those who have recently started to use the Internet (Widyanto & McMurran, 2004) were also most likely to experience symptoms of problematic Internet use.

Based on popular stereotypes (O'Neill, 1995; Rheingold, 1993 as cited in Morahan-Martin & Schumacher, 2000) as well as previous research on computer hackers and

their attitudes (Shotten, 1991; Turkle, 1984, 1985 as cited in Morahan-Martin & Schumacher, 2000), it was predicted that problematic Internet users were more likely to be males, technologically sophisticated, use real-time interactive activities such as online games and chat lines, and feel comfortable and competent online (Morahan-Martin & Schumacher, 2000). This stereotype is due to the widely held view that males predominantly utilise and feel comfortable with information technologies (Busch, 1995; Shotton, 1991 as cited in Young, 1996). Morahan Martin and Schumachers' (2000) study found that 27% of students reported no symptoms of problematic Internet use, while 65% reported one to three symptoms and 8% of respondents reported four or more symptoms and were considered to have problematic Internet use. It was found that problematic users were more likely to be males and to use online games as well as technologically sophisticated sites. They used more Internet sites and made more use of the Internet for various activities than those with limited or no symptoms of problematic Internet use.

In a survey done by Petrie and Gunn (1998) it was found that those who defined themselves as experiencing problems when using the Internet were equally likely to be female as male, and have a mean age close to 30, contradicting the stereotype which has developed of problematic Internet users as teenage males. In Petrie and Gunn's (1998) study, 46% of the respondents identified themselves as problematic Internet users. These characteristics may reflect the fact that older, female users are more likely to volunteer to participate in research (Rosnow & Rosenthal, 1996) and that the proportion of female Internet users was growing rapidly (Petrie and Gunn, 1998).

In a telephone survey done by Leung (2004) it was found that problematic Internet users were young females. The sample of this study included 699 complete interviews. It was stated that research in the past, has profiled the problematic Internet user as a predominantly young, introverted, computer-orientated, and a socially unskilled male teenager who has little or no social life and/or self-confidence (Leung 2004).

A study by Young (1996) compared various differences between 396 respondents experiencing problematic Internet use and 100 respondents not experiencing problematic Internet use. Young referred to those who have problematic Internet use as "Dependents" and those who did not experience problematic Internet use as "Non-Dependents." This study was done by means of a survey that used both open-ended and closed-ended questions and could be administered by telephone interview or electronic collection. Results of the study showed significant differences between the "Dependents" and "Non-Dependents." The length of time using the Internet differed substantially. A total of 83% of "Dependents" had been online for less than one full year which might suggest that using the Internet problematically happens rather quickly from one's first introduction to the service and products available online. In order to ascertain how much time respondents spent online, they were asked to provide a best estimate of the number of hours per week they currently used the Internet. These estimates were based upon the number of hours spent "surfing the Internet" for pleasure or personal interest (e.g. personal e-mail, scanning news groups, playing interactive games) rather than academic or employment related purposes. "Dependents" spent nearly eight times the number of hours per week as that of "Non-Dependents" when using the Internet. "Dependents" gradually developed a daily

Internet habit of up to ten times their initial use as their familiarity with the Internet increased. "Non-Dependents" reported that they spent a small percentage of their time online with no progressive increase in use. This suggests that excessive use may be a distinguishable characteristic of those who develop dependence to online usage. An additional interesting result from this study found that "Non-Dependents" predominantly used those aspects of the Internet such as e-mail, and those which allowed them to gather information. Comparatively, "Dependents" predominantly used the two-way communication functions available on the Internet. This study also reflected that "Non-Dependents" reported no adverse affects due to the use of the Internet, except poor time management because they easily lost track of time once online. However, "Dependents" reported that excessive use of the Internet resulted in personal, family, and occupational problems. A total of 51% of the "Dependents" indicated severe impairment related to their working day. "Dependents" reported significant work-related problems when they used their employee online access for personal use. These work-related problems may be that employees find themselves neglecting work tasks when using the Internet at work for personal use. This may result in failure to get the necessary work done in time or at all, as well as a noticeable decrease in productivity.

Leung (2004) found that problematic Internet users are usually heavy users of the Internet regardless of how long they have been using the Internet. This finding is inconsistent with Young's claim that new users are more vulnerable to problematic Internet use. It was also found that those with problematic Internet use reported more use of marketing and social interaction-oriented activities and e-mailing. Thus, it is interesting to note that those with problematic Internet use are usually attracted by

two way communication or social interaction-oriented activities. This indicates that they enjoy being able to control games and gain pleasure from exploring multiple identities in the process of recreating and obscuring some aspects of their true self on the Internet.

Egger and Rautenberg (1996) devised a questionnaire to assess usage, feelings, and experiences of Internet use. This questionnaire was posted on the Internet and attracted 454 responses, of which 10% identified themselves as using the Internet problematically. It was reported that these problematic Internet users spent more time on the Internet, and their usage was increasing. They felt more driven and looked forward to their next Internet session, they reported feeling anxious and nervous if their use of the Internet was restricted, and often lied about their online activities. In addition, they also felt more guilty or depressed when they spent a long time on the Internet (Widyanto & McMurran, 2004) and easily lost track of time and felt that the Internet caused problems in their jobs, finances, and socially (Young, 1997). Brenner (1997) found that the most common problems experienced by Internet users was time management. Based upon 185 responses to an online survey these results showed that 17% of respondents used the Internet more than 40 hours per week, 58% said that others had complained about their excessive Internet usage, and 46% indicated getting less than 4 hours of sleep per night due to late night log-ins. Brenner also found that older users experienced fewer problems, despite spending as much time online as younger users (Brenner, 1997).

Davis, Flett and Besser (2002) focussed on procrastination, impulsivity, and social rejection as key elements of problematic Internet use in their study with a sample of

211 undergraduate Industrial/Organisational psychology students. The aim of this study was to provide a clearer and more comprehensive understanding of the various dimensions of problematic Internet use. Participants reported spending an average of 13 hours online in a normal week, and ten percent of participants had found themselves in trouble at school or at work for inappropriate Internet use. It was also reported that the distraction dimension of the Internet was positively associated with number of hours spent online per week. Internet distraction involves using the Internet as an activity of avoidance. Distraction and hours online per week were both highly related to a global measure of impulsivity and problematic Internet use. Not surprisingly, the results of this study showed that distraction is highly related to procrastination and history of being reprimanded at school or work for improper Internet use.

Procrastination and distraction are seen to be related in that the individual is procrastinating about a given task or job, they are therefore being distracted by another more pleasant, and interesting activity. This distraction may not necessarily be the cause for the procrastination or vice versa, however the activity of procrastinating is a distraction away from a task or an activity, which needs to be completed. This relationship between distraction, procrastination, and problematic Internet use has important implications within organisations. Procrastination is negatively related to other personality traits, such as conscientiousness and agreeableness (Watson, 2001), which have well-established associations with productivity and work performance (Witt, Burke & Barrick, 2002). Furthermore, procrastination is positively related to stress and negative self-evaluation (Flett, Blackstein & Martin, 1995), and negatively with productivity (Ferrari, 1992 as cited

in Davis, Flett & Besser, 2002). If the employee is spending vast amounts of time online and avoiding work tasks, productivity in the organisation will inevitably suffer (Davis, Flett & Besser, 2002).

Having discussed the construct of problematic Internet use, this review will now continue with a discussion regarding the construct of procrastination.

Procrastination

Procrastination is a psychological behaviour that affects everyone to some degree or another. With some it can be a minor problem; with others it is a source of considerable stress and anxiety. Procrastination, which at first sounds like a simple behaviour, is in fact quite complex. It involves emotions, skills, thoughts or attitudes, and factors we are unaware of. Furthermore, the causes and dynamics of putting an important but unpleasant task aside vary from person to person and from task to task for the same person (Tucker, 1996). Procrastination is only remotely related to time management (procrastinators often know exactly what they should be doing, even if they can not do it).

Although several definitions for procrastination exist, integrating them indicates procrastination is an intended action that is voluntarily delayed, despite expectations that this delay will fail to maximise one's utility. A meta-analysis of the causes and effects of procrastination reveals several consistent findings regarding task effects, individual differences, and the intrinsic aspects of procrastination. Only a combination of these theories is consistent with procrastination's strongest and most

reliable findings (Steel, Brothen & Wambach, 2001). Procrastination also appears to be a troubling phenomenon. People most strongly characterise procrastination as being bad, harmful, and foolish (Briody, 1979). Justifying this viewpoint, several studies have linked it to individual performance, with the procrastinator performing more poorly overall (Beswick, Rothblum, & Mann, 1988; Steel, Brothen, & Wambach, 2001; Wesley, 1994), and to individual well-being, with the procrastinator being more miserable in the long-term (Knaus, 1973; Lay & Schouwenburg, 1993; Tice & Baumeister, 1997). At higher levels of analysis, procrastination has been linked to several organisational and societal issues. Gersick (1988) describes how teams consistently delay the bulk of their work until deadlines approach. Building on this base, we procrastinate when we delay beginning or completing an intended course of action (Beswick & Mann, 1994; Ferrari, 1993a; Lay & Schouwenburg, 1993; Lay & Silverman, 1996 & Milgram, 1991).

Thus, it becomes clear that individuals procrastinate for different reasons and in different ways. Tucker (1996) suggests it is helpful to think in terms of two fundamental kinds of procrastinators: one tense and the other relaxed. The tense type often feels both an intense pressure to succeed and a fear of failure; the relaxed type often feels negatively toward his/her work and forgets about it (Solomon & Rothblum, 1984 as cited in Tucker, 1996). The tense-afraid type of procrastinator is described by Fiore (1989 as cited in Tucker, 1996) as feeling overwhelmed by pressures, unrealistic about time, uncertain about goals, dissatisfied with accomplishments, indecisive, blaming of others or circumstances for his/her failures, lacking in confidence, and sometimes perfectionistic. Thus, the underlying fears are of failing, lacking ability, being imperfect, and falling short of overly demanding

goals. This type thinks his/her worth is determined by what he/she does, which reflects his/her level of ability. He/she is afraid of being judged and found wanting. This kind of procrastinator will get over-stressed and over-worked until he/she escapes the pressure temporarily by trying to relax, but any enjoyment gives rise to guilt and more apprehension (Tucker, 1996).

The role of negative reinforcement in procrastination is easy to see (i.e. some behaviour or thought enables a person to escape some unpleasant but necessary work). That escape - procrastination - is reinforced. Each procrastinator develops their own unique combination of escape mechanisms, such as emotions (fears, resentment, and social needs), thoughts (irrational ideas, cognitive strategies, and self-consciousness), skills and lack of skills (Tucker, 1996). The type of escape the procrastinator relies upon may very well be on the Internet, as suggested by Davis et al, (2002). This is indeed what the present study intends to examine, if employees find themselves using the Internet as a tool for their procrastination. If this is the case, then it is interesting to establish if it is this procrastination taking place on the Internet, which is the source of individuals' problematic Internet use.

According to the clinical literature (Burka & Yuen, 1983; Knaus, 1979), rebelliousness, hostility, and disagreeableness are thought to be major motivations for procrastination. For those individuals with these personality traits, externally imposed schedules are more likely experienced as aversive, and thus avoided. Also, by delaying work and starting it on one's own schedule, autonomy is reasserted. Haycock (1993) identified the availability of distractions as one of the top reasons

contributing to procrastination. The Internet as a distracter is possibly very common in the workplace of today, as it is so widely available and easy to use.

The connection between conscientiousness and procrastination is also very strong. Ones and Viswesvaran (1996) summarise much of the work done on conscientiousness, noting that people high in this trait are described as planful, organised, industrious, persistent, goal-directed, and self-controlled. Costa and McCrae (1992) describe those high in this trait as "sensible and rational in making decisions" (p. 25), while those low in this trait as "more lackadaisical in working towards their goals" (p. 16). In addition, Ones and Viswesvaran's (1996) general theory of conscientiousness suggests that conscientiousness is associated with several process mechanisms that should lessen procrastination within an individual. First, the conscientious individual should spend more time on tasks, meaning that less delay becomes more likely. Second, they persist in pursuing their goals, meaning that they are again less likely to put off tasks when faced with temptations or obstacles. Third, they avoid counterproductive behaviours, which procrastination represents at times. This theory of conscientiousness suggests that procrastination is a personality trait, which does not appear to be empirically supported but does provide some interesting thought on how procrastination becomes an often-occurring activity for some individuals.

Another aspect of conscientiousness that is strongly related to procrastination is achievement motivation. Those high in achievement motivation set more difficult goals for themselves and often enjoy performance for its own sake, which can be related to the construct of flow, and finding enjoyment in the task at hand (Costa &

McCrae, 1992; Spence & Helmreich, 1983). One way it may affect procrastination is by allowing work to be intrinsically engaging and thus less aversive. Accordingly, one of the first findings in the field of procrastination is that procrastinators tend to have lower achievement drives (Lum, 1960). Also supportive are the results obtained regarding locus of control, a broad indicator of intrinsic motivation (Deci & Ryan, 1985).

Two predictable effects that have been observed when looking at procrastination are timing of rewards and punishments, and task aversiveness. People tend to favour tasks that are more pleasant in the short-term even if they are detrimental to themselves in the long-term. Also, the more intrinsically unpleasant a task, the more likely people are to avoid doing that task (Lewin, 1935). Task aversiveness refers to actions that people find unpleasant. By definition, people seek to avoid aversive stimuli, and consequently, the more aversive the situation, the more likely people are to avoid it (procrastinate). Though there may be a variety of reasons people dislike a task, if they do find it unpleasant, research indicates they are indeed more likely to put it off. Individuals may use the Internet as a tool for procrastination; therefore, if a task at work is found to be aversive, then more pleasant tasks are sought out, and these may be associated with using the Internet and performing online activities (Steel, Brothen & Wambach, 2001). As has been stated earlier, there are many qualities of the Internet which individuals find pleasant, such as the control experienced while exploring online as well as the expression of identity and the process of recreating and obscuring some aspects of one's true self while on the Internet.

Researchers argue that if people procrastinate over tasks because they are aversive or stressful, then those who are more susceptible to experiencing stress should procrastinate more. Results do not support anxiety as a source of procrastination and negative affect appears to be essentially unrelated to observed procrastination (Steel, Brothon & Wambach, 2001). This suggests that those who are more anxious or have more negative affect may be harsher judges of their own behavior, but are not necessarily procrastinators or poorer performers (Carver & Scheier, 1990; Ellis, 1989; Sarason, Sarason, & Pierce, 1990).

Several researchers have considered what type of task adversity is best correlated with procrastination. Jobs characterised by lower autonomy, task significance, and feedback, were likely to increase decisional procrastination (Lonergan & Maher, 2000), though were less related to behavioural procrastination (Coote-Weymann, 1988). Instead, behavioural procrastination was most strongly associated with the aversive task components of frustration, resentment, and boredom (Blunt & Pychyl, 2000; Briody, 1979; Haycock, 1993; Strongman & Burt, 2000). Similar results were found using experimental methodology (Senécal, Lavoie & Koestner, 1997; Sigall, Kruglanski, & Fyock, 2000). The more boring and difficult a task was made, the more likely people delayed doing it. However, if the challenge appears too overwhelming or unable to be accomplished, then that individual loses interest in the task and will go to great lengths to avoid doing that task, thus procrastinating about other more enjoyable tasks he/she feels they will succeed in. This is irrespective of what the outcome may be, whether this is detrimental to them in the long-term, as has been stated earlier. A challenge that is perceived to be too difficult for the individual

to succeed in is also related to flow in that no flow will be experienced if the individual thinks the challenge is too overwhelming or does not match their skills.

Recently, some research from applied social psychology has also implicated procrastination as a key indicator of problematic Internet use. Lavoie and Pychyl (2001) tested the relationship between time spent online and procrastination. Although time spent online represents only one element contributing to the variance of problematic Internet use (Morahan-Martin & Schumacher, 2000), this may explain why problematic Internet users typically have occupational and academic difficulties, most likely due to lapses in productivity (Young, 1999; Ho & Lee, 2001). In their web-based survey of 308 Internet users, Lavoie and Pychyl (2001) found that more than 50% of respondents reported frequent Internet procrastination, and they spent 47% of their time online procrastinating (Lavoie & Pychyl, 2001). Moreover, Internet procrastination was positively correlated with perceiving the Internet as entertaining and as providing a relieffrom stress (Lavoie & Pychyl, 2001).

Researchers have investigated evaluation anxiety or test anxiety with a wide range of measures. Meta-analytic results indicate its relationship is almost identical to that of trait anxiety; it has a weak but reliable connection with procrastination. Senécal et al. (1997) found further support. Procrastinators were more likely to put off difficult and boring tasks when they expect to be evaluated. Independent of fear of failure, self-efficacy and self-esteem has also been argued to have direct links to procrastination and performance (Bandura, 1986; Burka & Yuen, 1983). Procrastinators might not feel that their actions will change their situation, thus they concentrate on managing their emotional reactions to the situation instead. Consequently, in order to cope, they

tend to use an emotion-oriented rather than a task-oriented style (Berzonsky, 1992; Flett, Blankstein, & Martin, 1995). Additional evidence suggests that procrastinators tend to spend more time on projects if they are likely to fail, while the opposite relationship is seen for non-procrastinators (Lay, 1990).

It has been proposed that people should procrastinate less as they age and learn. As O'Donoghue and Rabin (1999) conclude, "many people procrastinate only moderately, not because of intrinsic self-control, but because they have developed schemes to overcome procrastination" (p. 807). It is evident that we can learn how to avoid procrastination. Ainslie (1992) as well as Baumeister, Heatherton and Tice (1994) review considerable research showing that people tend to procrastinate less with repeated practice of not procrastinating. This is interesting since problematic Internet use has been linked to age, as people get older they are less likely to suffer from problematic Internet use (O'Donoghue & Rabin, 1999; Ainslie, 1982; Baumeister, Heatherton & Tice, 1994; Thatcher & Goolam, 2005). Although no confirmatory research has yet been found, this may suggest that problematic Internet use decreases with age because individuals have learned to procrastinate less, thus there is less reason for them to use the Internet as a tool to avoid completing other tasks.

Internet procrastination in the workplace has been called "cyberslacking." This can result in significant losses in productivity in the organisation when such behaviour is occurring in multiple employees over a period of time (Greenfield, 1999). The relationship between problematic Internet use and procrastination has important

implications. It implies that some people may use the Internet to cope with stress (Davis, Flett & Besser, 2002). More specifically, procrastination involves cognitive task avoidance and engaging in activities with the implicit goal of distraction from things that one is supposed to do (Lay, 1986). Davis et al. (2002) found that the distraction dimension of problematic Internet use was strongly related to procrastination. They argued that certain individuals use the Internet to avoid certain stressful or demanding situations. However, it must be noted that the opposite is not true, just because an individual spends an excessive amount of time online, does not mean that that person is procrastinating or experiencing stressful or demanding situations.

In the workplace, problems due to procrastination and lack of self-control appear to be on the rise as jobs are expected to become increasingly unstructured or at least self-structured (Cascio, 1995; Hunt, 1995). This absence of imposed direction means that the competent worker must create order out of the imminent chaos – he or she must self-manage or self-regulate (Kanfer & Heggestad, 1997). As structures continue to decrease, the opportunity to procrastinate will concomitantly increase which could lead to an increase in problematic Internet use, if the Internet is indeed a source of procrastination.

The final section of this review will now focus on the theory of flow.

Flow

In 1975 Csikszentmihalyi coined the term 'flow' to refer to 'optimal experience' events (Csikszentmihalyi, 1975). Flow describes a state of complete absorption or engagement in an activity. A "flow activity" is one in which the mind becomes effortlessly focussed and engaged, rather than falling prey to distractions. Such an activity will usually comprise a clear set of goals, timely and appropriate feedback, and most importantly, a perception of challenges that are well matched to the user's skills. As a result, a user might obtain a high degree of control over the activity and experience deep engagement or concentration. The activity will become enjoyable for its own sake and will often lead to a lack of awareness of the passage of time. This can be linked to problematic Internet use as one can become engrossed in an online activity and enjoy the deep engagement which includes aspects of self-esteem and control, which is lacking in the tasks procrastinators are seen to be avoiding (Pearce & Howard, 2004).

The term flow refers to a state of consciousness that is sometimes experienced by individuals who are deeply involved in an enjoyable activity. The experience is characterised by common elements and a balance between the challenges of an activity and the skills required in meeting those challenges; clear goals and feedback; concentration on the task at hand; a sense of control; merging of action and awareness; a loss of self-consciousness; and a distorted sense of time (Pace, 2004). Many of these attributes, especially a sense of control an individual has over an activity seem to be missing from problematic Internet use. The individual does not often have clear goals and feedback, or a sense of control over their Internet activity.

However, they may have a clear course of action and awareness of their Internet activities and will most likely experience a distorted sense of time, similar to experiencing a flow-state. Therefore while there is definitely some overlap between these concepts, they also appear quite theoretically distinct from each other.

Flow is an important consideration as it encapsulates some of the affective aspects of human behaviour. The majority of current thinking conceptualises flow as a desirable and somewhat enduring emotional state that an individual may enter during an activity. Flow may arise from the engagement either with the Internet itself or from the task being performed while using the Internet (Pearce & Howard, 2004). Flow has been postulated by many as a desirable state to support learning (Csikszentmihalyi, 1975; Webster, Trevino & Ryan, 1993 as cited in Pearce & Howard, 2004). Previous research has found that attitudinal outcomes such as positive affect, pleasure, and satisfaction result from the flow experience (Csikszentmihalyi, 1975; Levy, 1983; Piaget, 1962; Sandelands, Ashford, & Dutton, 1983). These attitudinal outcomes are seen to be experienced when the individual becomes completely absorbed in what they are doing, this can be viewed as positive if it is work-related, however it is not viewed as such if the individual is neglecting activities at work which need their attention. Some employers might see this as procrastination.

Flow theory has been empirically supported (Csikszentmihalyi, 1975; Csikszentmihalyi & LaFevre, 1989; Kusyszyn, 1977; Bowman, 1982 as cited in Trevino & Webster, 1992) and has been suggested as a construct that is useful for

describing human interaction with computers (Csikszentmihalyi, 1990; Ghani, 1991). Flow is "the holistic sensation that people feel when they act with total involvement" (Csikszentmihali, 1975, p. 36). Flow has also been defined in terms of an intrinsically enjoyable experience, with importance drawn to the peak experience and the peak performance of a task. Flow may include either of these independently or may include both (Privette & Bundrick, 1987). Flow has also been seen to demonstrate the effect of an individual intensely involved in an activity, it is as if nothing else seems to matter to that person, except the experience itself because it is enjoyable (Csikszentmihalyi, 1990). "Flow represents the extent to which (a) the user perceives a sense of control over the computer interaction, (b) the user perceives that his or her attention is focussed on the interaction, (c) the user's curiosity is aroused during the interaction, and (d) the user finds the interaction intrinsically interesting" (Trevino & Webster, 1992, p. 542). These four dimensions of the flow construct are linked and interdependent. However, one flow dimension experienced alone does not reflect the total flow experience (Trevino & Webster, 1992). The two key characteristics of flow include total concentration and the enjoyment of the activity. As has been stated, there is an optimum level of challenge relative to a certain skill level. Therefore an additional factor affecting the experience of flow is a sense of control over one's environment (Ghani & Deshpande, 1993).

As computers continue to proliferate throughout organisations, there is growing interest in identifying factors that influence how individuals learn and adjust to the new technology. There are variations in the way individuals approach computer technology (Nelson, 1990 as cited in Ghani & Deshpande, 1993). The theory of optimal flow has been proposed as a useful framework for studying the experience of

individuals as they learn and use computers, and for identifying the factors that influence this experience (Ghani, 1991). The theory of optimal flow was originally developed by Csikszentmihalyi (1990) to describe "the state in which people are so intensely involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost for the sheer sake of doing it" (p. 4). One could argue that in the current research this "great cost" could be where an individual may be experiencing problematic Internet use. Although flow is not only experienced on computers or while using the Internet, the pure enjoyment of going online may be what the individual becomes so intensely involved in, and finds that nothing else seems to matter, the experience of the Internet itself becomes very enjoyable. One of the effects of the flow experience for computer users comes from the immediate feedback that computers provide to their users, this activity takes the form of greater experimentation, browsing, and exploratory behaviours (Webster, 1989 as cited in Ghani & Deshpande, 1993).

In studies researching the role of affect in human interaction with computers, the related concepts of flow (Csikszentmihalyi, 1975), motivation and play are frequently explored. These are often grouped as 'affective factors' and are used to complement the effectiveness, efficiency and satisfaction aspects of user-experience, which could lead to an increase in problematic Internet use (Bentley, Johnston & Baggo, 2003). Research suggests that playfulness may be a useful construct for understanding human-computer interactions. For example, Hiemstra (1983 as cited in Webster, Trevino & Ryan, 1993) reported that employees frequently used the word play in describing their computer interactions. Previous research suggests that higher experiences of playfulness result in immediate subjective experiences such as positive

mood and satisfaction (Csikszentmihalyi, 1975; Levy, 1983; McGrath & Kelly, 1986; Sandelands, Ashford & Dutton, 1983 as cited in Webster, Trevino & Ryan, 1993). Therefore, employees who interact more playfully with computers should view computer interactions more positively than those who interact less playfully. Consequently, they may be more motivated to engage in more frequent computer interaction in the future. It is important to note, that playfulness may also have negative effects, such as longer time to task completion (Sandelands, 1988 as cited in Webster, Trevino & Ryan, 1993). For example, playfulness may lead to non-productive computer interactions, such as playing computer games at work, or making trivial revisions to the format of a document (Nash, 1990 as cited in Webster, Trevino & Ryan, 1993). This may also be indicative of procrastination, which also leads to longer time for task completion and non-productive activities. Thus online playfulness may be similar to procrastination if the individual is conducting non work-related tasks and by so doing is avoiding more important tasks, which are work-related. The individual may be procrastinating by being playful online.

Thus, playfulness can be seen to be an important indicator of flow. It is predicted by the antecedents of skill (through control), challenge (through arousal), as well as focused attention, and leads to the consequences of positive affect, more exploratory behaviour on the Internet, and greater expected Internet use in the future (Novak, Hoffman & Yung, 1998). The term play has been used by researchers to describe the highly involved, enjoyable, and trial-and-error behaviour of computer users (Katz, 1987; Webster, 1989 as cited in Ghani & Deshpande, 1993). According to research on flow, and related work on play and intrinsic motivation, the perceived challenge of an activity is one of the key determinants of the experience an individual derives from

the activity (Csikszentmihalyi, 1975; Deci & Ryan, 1985). Thus it can also be seen that play might be related to problematic Internet use, in terms of exploratory behaviour. If an individual is not using the Internet for a specific purpose, for instance, there is no specific content they are searching for, they may merely explore the Internet for the experience of being online, which is generalised problematic Internet use. Thus the relationship between problematic Internet use and flow may be the result of exploratory behaviour online.

Thus far it has been shown that flow is a multidimensional construct (Csikszentmihalyi, 1975) that represents the user's perception of the interaction with a medium as playful and exploratory. Flow theory suggests that involvement in a playful, exploratory experience - the flow state - is self-motivating because it is pleasurable and encourages repetition (Miller, 1973). Flow is a continuous variable (Day, 1981; Ellis, 1973), ranging from none to intense. A "flow activity" is one in which the mind becomes effortlessly focussed and engaged, rather than falling prey to distractions (Pearce & Howard, 2004). Therefore, with regards to a work activity, the more procrastination an individual experiences, the less flow-state will be experienced. However, if the individual has been distracted away from a work task and uses the Internet as a means to procrastinate, then it is possible that the individual will enjoy the experience online and find themselves in a state of flow.

The survey study by Webster, Trevino and Ryan (1993) investigated the dimensionality of flow. They proposed that flow is a multidimensional construct characterised by four dimensions: control, attention focus, curiosity, and intrinsic

interest. The study was also aimed at exploring the interrelationships of the flow dimensions, as well as specific correlates of flow. The results were that all correlations with flow were significant and in the proposed direction. Therefore the four dimensions are interrelated, and flow is significantly correlated with modifiability, experimentation, expected software use, perceived communication effectiveness, quantity of communication, and actual electronic mail system use (Webster, Trevino & Ryan, 1993).

A study done by Ghani and Deshpande (1993) aimed to examine the mediating role of flow on user behaviour and collected data from individuals using computers as part of their day-to-day work. The sample resulted in 149 respondents. On average, these individuals had been using computers at work for about seven years and were currently averaging 20 hours of computer use a week. The study showed results that challenge had a significant relationship with flow, as individuals were found to be in a higher state of flow if their skills matched the challenge necessary to perform a given task. Perceived control was also found to strongly influence flow. This study was consistent with prior research (Ghani, 1991) in that the perceived task challenge and a sense of being in control were the key factors that resulted in the state of enjoyment and intense concentration called optimal flow (Ghani & Deshpande, 1993).

Flow theory predicts that a user will experience flow if their perception of the challenge of a task is balanced with, or slightly greater than, their perception of their skills to carry out the task. If these are out of balance, then the user may become anxious (challenge much greater than skills) or bored (challenge much less than skills)

(Pearce & Howard, 2004). Thus, flow states occur when an individual thinks they can accomplish a given task based on their knowledge and skills, but this task must still provide some sort of challenge which they have to overcome. However, this task must not pose too much of a challenge as this will result in the individual becoming disinterested. This aspect of becoming disinterested can be seen to incorporate feelings of procrastination, as it will most likely lead to individuals putting tasks aside, which need to be completed. Procrastination may result if the employee becomes anxious, this is if the challenge is much greater than their skills or they may become bored if the challenge is much less than their skills. The perception of these challenges and skills has been theoretically described as the most meaningful reference point for the presence or absence of flow and similarly the presence or absence of procrastination (Massimini & Carli, 1988).

"Flow could have a negative impact if it engages and distracts an individual away from the task at hand. Given the intrinsic enjoyment offered by many online activities, and the difficulty of many work tasks, this can be a real danger" (Pearce & Howard, 2004, p. 9). In today's busy and demanding workplace the issues proposed in the research described, regarding employees experiencing problematic Internet use, procrastination and flow are important in determining where productivity losses and time wastage are resulting from.

Theoretical Rationale

This literature review has aimed to present an overview of the available research in the areas of problematic Internet use, flow and procrastination. In addition to this, it has aimed to demonstrate the link and potential relationships between these variables. It is clear that the concepts of problematic Internet use, procrastination and flow are hard to define and problematic to explain when looking at their interrelatedness because they share many similarities and appear to be theoretically overlapping.

Although experiencing procrastination and finding yourself in a state of flow are different in many ways, they also share many similarities. Flow and procrastination are very much a part of an individual's working life, and can both take place at the same time. It is quite common to find that procrastinating over a certain task can lead to involvement and greater interest in another, more enjoyable and preferred task and thus leads to experiencing a state of flow. The state of flow experienced while being involved in this "new task" is essentially a form of procrastinating over the "old task." Therefore, procrastination can give rise to feeling and being in a state of flow, however it is unlikely that a state of flow would lead an individual to procrastinate. Also, flow and procrastination are similar in that they can both take place on the Internet, using this medium as a tool to either procrastinate over a given task or to find oneself in a state of flow. Flow and procrastination extend their similarity with regards to individuals not being in complete control of their time. A flow-state leaves an individual completely absorbed in the task at hand, and can very easily lead to a "sense of loss of time." Procrastination however has a more negative connotation in

that it is viewed more as "time wastage." It is thus evident that both flow and procrastination can give rise to problematic Internet use.

Employees who experience flow while using the Internet at work do not necessarily have problematic Internet use, it is the nature of the work being done and the tasks the employee is neglecting while becoming absorbed on the Internet, which may be problematic. Additionally, it may not be the Internet which causes procrastination; it may merely lead employees to an increase in their use of the Internet, in a problematic way. At the same time, problematic Internet use can be seen as an extension of flow, as these concepts can be similarly experienced if the employee experiences a "sense of loss of time" and is engrossed in the task they are performing. Procrastination can lead to problematic Internet use if the individual uses the Internet to waste time and avoid work-tasks which need to be completed. However problematic Internet use is not a function of time online, but of disturbances in one's life as a result of Internet use. Internet use is not viewed as problematic based on the amount of time an individual spends using the Internet. Rather, it is viewed as problematic based on the reasons the individual uses the medium, as well as what is neglected in terms of roles and tasks when using the Internet. As has been mentioned, it is the motivation which leads a person there and the kinds of activities they are involved in while online which make it problematic.

From the obvious theoretical overlaps between these constructs, it is thus imperative that they be looked at in conjunction, especially within the workplace, as these are activities which present themselves to individuals on a daily basis. Having completed

this discussion, this review will now present the research questions to be examined for the purpose of this study.

Research Questions

The research thus derives two research questions:

Question 1: To what degree are the concepts of problematic Internet use (PIU), flow and procrastination overlapping?

Question 2: What is the relationship between flow and procrastination in predicting problematic Internet use (PIU)?

Chapter 2: Methodology

This chapter aims to provide a detailed description of the process that was followed throughout the duration of the study. The research design, procedure, measuring instruments, sampling methods, data analysis and ethical considerations that were used in this study to test the research questions mentioned in the literature review, will be discussed in more detail below.

Research Design

According to Kerlinger (1986) the purpose of research is to provide answers to questions. Thus, in the current study, the research design is elaborated upon as "a form of plan or strategy that specifies the procedure used in seeking an answer to the research question" (Christensen, 1985, p. 155). This study made use of a quantitative research methodology, as the data is recorded and analysed numerically. As the independent variables (procrastination and flow) could not be manipulated by the researcher, this study may be classified as a non-experimental, ex-post facto research design. This approach does not allow for causal inferences to be made about the areas of concern, but does allow for associations to be made (Neale & Liebert, 1986). The strengths of non-experimental designs are that they are useful in settings in which the researcher is unable to exercise control. Furthermore, the benefits of non-experimental research design include; flexibility, cost-effectiveness as well as the ease of this design, all of which are considered to be suitable for the present study.

According to Neale and Liebert (1986) a study of this nature is one in which the researcher has no control over either the subjects (the individuals of interest) or the treatment (the experiences of interest). This study may be further classified as a cross-sectional design (Babbie & Mouton, 2001) as it is based on an observation of a number of variables (problematic Internet use, flow and procrastination) occurring at the same point in time, without repeat measures (Rosenthal & Rosnow, 1996). In addition, cross-sectional measures are administered to a single sample at a particular moment in time and no repeat measures are applied (Rosenthal & Rosnow, 1991). The advantage of using this research design is that the study is conducted in a natural setting and avoids the criticisms associated with artificial environments, for instance low ecological validity (Rosenthal & Rosnow, 1991).

The procedure that was used in the current study will be discussed in more detail below.

Procedure

The researcher approached the editor at a large South African online magazine company, IT Web, where she sought permission to conduct her research. The researcher was granted access. The questionnaire, which consisted of a biographical information form, the Internet use questionnaire, the Problematic Internet Use Questionnaire (PIUQ), the distraction subscale of the Online Cognition Scale (OCS), and the Self-Report (Flow) Scale was converted into a webpage and placed on the website of IT Web. A link from the homepage of the online magazine invited volunteers to complete the questionnaire and directed them to a brief explanation of

the research (see Appendix A). If a respondent volunteered to participate they were able to read the instructions and complete the questionnaire online.

Once respondents had completed the questionnaire they were directed to a webpage that provided information regarding problematic Internet use. Contact details of a free counselling service were also provided on this webpage should the respondent have felt that they were experiencing symptoms of problematic Internet use. Data were collected from 9 to 21 November 2005. The length of time for data collection was considered ideal as it allowed a sufficient amount of time for interested respondents to participate in the study. It also meant the questionnaire was less susceptible to abuse by individuals, such as completing the questionnaire more than once due to the questionnaire being available for a longer period of time. Responses to the online questionnaire were converted into spreadsheet format and emailed to the researcher at the end of the data collection period. Data checking was performed on the data set to remove any incomplete or duplicate responses. The researcher experienced great difficulty in checking the completed questionnaires for duplicates. This was due to no individual identifying information asked of the respondents. Duplicates were determined by examining the time at which the questionnaires had been submitted and checking if identical biographical information had been received near the same time. This method was successful in determining if a respondent had accidentally pressed the "submit button" more than once. Though this process was controlled as best it could be, it was still possible for a single respondent to complete multiple spurious responses, and this occurred only if they changed their answers each time they submitted a complete questionnaire.

Measuring Instruments

The following section aims to explore the measuring instruments that were used in this study. Respondents were asked to complete a questionnaire, which comprised five sections. The first section contained nine biographical questions, the second section contained seven questions relating to respondents' use of the Internet, and the last three sections comprised of the Problematic Internet Use Questionnaire (PIUQ), the distraction subscale of the Online Cognition Scale (OCS) and lastly, a Self-Report Scale measuring the flow state.

Biographical Information Form

The biographical information form (see Appendix B) was designed to elicit certain background information from the participants in the study. Participants were asked to fill in information regarding their gender, race, age, level of education, present marital status and whether they were full-time or part-time employees. Participants were also asked to provide certain information regarding their employment in the organisation in which they work, such as their occupation and job title. An important question was that of which sector participants currently work in. This information was observed as being important in that it allowed the researcher to group the respondents into two categories, those who stated that they were working within the Information Technology (IT) sector and those who stated that they were working within other sectors. This information has important implications when looking at the amount of hours participants spend online and how they were using this time.

Use of Internet Form

The second section of the questionnaire contained seven questions relating to respondents' use of the Internet (see Appendix C). This section was developed by the researcher in order to gain more knowledge about the participants' use of the Internet. This section was important to include in the questionnaire, as it was helpful in gaining more information about how the participant spends his/her time online and for how long he/she performs these activities. The questions included in this section of the questionnaire examined how and where the respondents connected to the Internet. It also gained information about how long respondents had been using the Internet and which Internet resources they usually used. The questions examined how many days a week on average respondents used the Internet and how long their average Internet session was.

Problematic Internet Use Questionnaire (PIUQ)

In order to look at problematic Internet use of the respondents, the Problematic Internet Use Questionnaire (PIUQ) (Thatcher & Goolam, 2005) was used (see Appendix D). These twenty items were specifically designed to assess self-reported problematic Internet use. Respondents were asked to indicate on a 5-point Likert-type format (from "never" to "always") the extent of various symptoms or behaviours of problematic Internet use, where 1 is an indication of low problematic Internet use and 5 indicates high problematic Internet use. The PIUQ therefore assesses problematic Internet use on a scale of 20 to 100 (where 100 is an indication of having problematic Internet use). The PIUQ demonstrated good reliability. The Cronbach alpha coefficient in the current study was .92, which is almost identical to the reliability obtained by Thatcher and Goolam (2005) in their development of the psychometric

properties of the Problematic Internet Use Questionnaire (PIUQ). The Cronbach alpha coefficient was .90 in their study (Thatcher & Goolam, 2005)

Distraction subscale of the Online Cognition Scale (OCS)

The Online Cognition Scale (OCS), was developed and validated by Davis, Flett and Besser (2002). The OCS is a 36- item questionnaire that measures pathological Internet use. Items were drawn from symptoms described in the literature on problematic Internet use, and particularly focussed on cognitions rather than behaviours. The OCS was also adapted from related measures of procrastination, depression, impulsivity, and pathological gambling. The OCS contains four subscales: loneliness, diminished impulse control, social comfort, and distraction. Procrastination and distraction have been found to be highly related (Davis, Flett & Besser, 2002). Procrastination involves cognitive task avoidance and engagement in activities with the implicit goal of distraction from things that one is supposed to do (Davis, Flett & Besser, 2002). Therefore in order to measure respondents' levels of procrastination for the purpose of this study, the distraction subscale of the Online Cognition Scale has been used (see Appendix E). Respondents were asked to indicate on a 7-point Likert-type format (from "Strongly disagree" to "Strongly agree") the likelihood of using the Internet as a means to be distracted and procrastinate, where 1 is an indication of low procrastination and 7 indicates high procrastination. Examples of statements include "I sometimes use the Internet to procrastinate," "Using the Internet is a way to forget about the things I must do but don't really want to," and "When I am online I don't think about my responsibilities." The subscale demonstrated good reliability. The Cronbach alpha coefficient in the current study

was .89. Davis, Flett and Besser (2002) demonstrated high reliability for the distraction subscale of the OCS, with a Cronbach alpha coefficient of .81.

Self-Report (Flow) Scale

One commonly used technique of measuring flow is to survey participants, after an activity, to obtain Likert-scale ratings for the affective measures of control, engagement and enjoyment (Webster, Trevino & Ryan, 1993; Ghani, 1991). From these measures a score is derived that represents the overall degree of flow for the activity. In order to look at the flow experience of the respondents, a Self-Report Scale measured the participants flow state (see Appendix F). Self-report Scales are appropriate for studying subjective states such as playfulness or flow (Davis, 1986; Sandelands & Buckner, 1989 as cited in Webster, Trevino & Ryan, 1993). The self-report Scale comprises 12 items and was adapted and expanded by Webster, Trevino and Ryan (1993). It is based on the research of Csikszentmihalyi (1975), Malone (1981), and Sandelands et al., (1983) and has been used in the study done by Webster, Trevino and Ryan (1993) on correlates of flow in human-computer interactions. Responses are scored on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). Scores of 7, indicate a high state of flow. Statements 2, 4, 5 and 10 were reverse scored in order to standardise the scoring of the scale and ensure that a score of 7 indicates a person is in a state of flow. This scale demonstrated good reliability. The Cronbach alpha coefficient in the current study is .74. Cronbach alpha coefficient was found to be .72 in the study by Webster, Trevino and Ryan (1993).

Each of these measures has demonstrated good reliability and is therefore proven to have good psychometric properties. The procedure that was followed in the current study will now be discussed in more detail below.

Sample and Sampling

The following section of this chapter aims to provide an in-depth discussion of the sample and sampling methods that were employed in this study

Once duplicates had been removed, a total of 1399 usable questionnaires were obtained from a survey placed on the website of a prominent South African online magazine. The respondents of the present study were volunteers and therefore formed a non-probability convenience sample (Rosenthal & Rosnow, 1991). The general descriptors of this sample are summarised in Table 1. The survey method was important to use in the current study, as it directly reached its target population within the context of interest. Internet users are still a relatively small proportion of the general population in South Africa and thus are difficult to survey in large numbers using other methods. The Internet-based survey method allowed a broad sampling of age ranges, cultural and educational backgrounds**.** A large sample size increases the robustness of the results. The online survey offered the researcher less control in selecting respondents in that any individual interested, or just accessing the survey by chance, may have participated. In the present study however, it was clear that the researcher targeted an appropriate population for the requirements of the study through the use of an online IT magazine, namely, individuals using the Internet and those who have interest in the IT industry.

A full set of biographical details for the sample may be observed in Table 1 below.

Table 1: Biographical details of the sample

Variable	Frequency N	Percentage %
Gender		
Male	1065	76
Female	334	24
Race		
White	1179	84
Black	87	6
Indian	56	4
Coloured	37	3
Other	36	3
Age		
18 – 23	99	7
24 – 29	378	27
30 – 35	314	23
36 – 41	223	17
42 – 47	144	11
48 – 53	100	7
54 – 59	68	5
60+	38	3
Marital Status		
Single	517	37
Married	755	54
Divorced	92	7
Widowed	29	2
Highest Qualification		
Matric	238	17
Certificate	138	10
Diploma	403	29
Bachelors	259	19
Honours	171	13
Masters	149	11
Doctorate	17	1

Variable	Frequency N	Percentage %
Sector		
Banking/Finance	98	7
Construction/Engineering	51	4
Consulting	88	6
Education	59	4
Marketing/Advertising	84	6
Government	32	2
Healthcare/Pharmaceutical	36	3
Information Technology	633	46
Legal/Real estate	21	2
Manufacturing (non	62	5
computer)	19	1
Non-profit	13	1
Parastatal, electricity, water	48	
Retail/wholesale	105	9
Telecommunications	21	2
Transportation		
Work		
Full-time	1292	94
Part-time	80	6

From Table 1 it is evident that this sample is similar to other samples obtained in the South African context (Thatcher & Goolam, 2005). The final sample includes 1065 (76%) men and 334 (24%) women. Of these individuals, 1179 (84%) were White, 87 (6%) Black, 37 (3%) Coloured, 56 (4%) Indian, and 36 (3%) Other. The majority of respondents were young, between the ages of 24 and 35 (24-29: 27%; 30-35: 23%) and most likely to be married (54%) or single (37%) and working full-time (94%). The respondents were most likely to have a University degree (44%), or a post-Matric diploma (29%). The researcher chose the particular breakdown of age in order to create categories, which could then be analysed and statistically interpreted.

The majority of respondents were employed in a professional capacity (82%) or a semi-professional capacity (18%). In addition the respondents were most likely to be working in the Information Technology (IT) sector (46%) or in Telecommunications (9%), although there was a fair distribution of respondents from other sectors of the economy. The dominance of respondents from the IT sector was most likely an artefact of the location of the questionnaire (a popular online magazine for IT professionals). Of course, this raises questions about the generalisability of the sample and will be discussed later.

The present research is specifically concerned with problematic Internet use, it is therefore useful to provide details on the Internet use of respondents. These are summarised in Table 2. The most common access point onto the Internet for respondents was from work (94%) and from home (74%), but usually from both locations. Most respondents had access to the Internet from one (29%) or two (62%) locations. The majority of respondents had been using the Internet for longer than eight years (49%) or between five and eight years (37%) with a fair proportion of the respondents having used the Internet for less than five years (15%). Respondents were most likely to use the Internet for up to two hours a day (51%), although there were a number of respondents who were using the Internet for between three and five hours a day (29%), with the majority of respondents going onto the Internet seven days a week (42%), or five days a week (37%). This high percentage of Internet use is an interesting indication that people are accessing the Internet from work. The most common use of the Internet was for the WWW (97%) and E-mail (95%), although Newsgroups (29%) and Instant messaging (42%) were also quite popular. As has been stated earlier, the categories created for length of use of the Internet and

the average hours online per day, were particularly chosen in order to allow for statistical analysis.

Table 2: Respondents use of the Internet

Variable	Frequency N	Percentage %
Location of Internet Access		
Work	1311	94
Home	1039	74
Internet Café	73	5
Other Family member	72	5
Friends	70	5
Other	35	3
Number of Locations		
1 Location	406	29
2 Locations	873	62
3 Locations	64	5
4 Locations	33	2
5 Locations	8	1
6 Locations	14	1
Length of use of the Internet		
< 6 months	3	< 1
6 – 12 months	9	< 1
1 – 2 years	22	2
2 – 5 years	169	12
5 – 8 years	511	37
> 8 years	685	49
Average Hours Online per Session		
0 – 2 hours	703	51
3 – 5 hours	393	29
6 – 10 hours	191	14
11 – 15 hours	47	3
16 – 20 hours	16	1

Variable	Frequency N	Percentage %
21 – 25 hours	3	< 1
26 – 30 hours	4	< 1
36 – 40 hours	5	< 1
40+ hours	13	1
Number of days spent on the Internet		
1	8	1
2	14	1
3	36	3
4	24	2
5	495	37
6	207	14
7	566	42
Use of Internet Applications		
WWW	1363	97
Email	1325	95
Online Chat	239	17
Online Interactive Games	178	13
Newsgroups	402	29
Online Instant Messaging	593	42
Peer-to-peer file sharing	333	24
Telnet	177	13
Telephony	597	43
FTPI	376	27

On the basis of participants responses to the Problematic Internet Use Questionnaire (PIUQ), participants were classified as having problematic Internet use (if their score was 70+), a tendency towards problematic Internet use (if their score was 40-69), and no experiences of problematic Internet use (If their score was below 39). These particular cut-offs were used in the current study because they have been previously used in a study by Thatcher and Goolam (2005), where the psychometric properties of the Problematic Internet Use Questionnaire were developed.

A person with "problematic Internet use" would be spending excessive amounts of time on the Internet. As a result, they would be jeopardising other work and/or social commitments. There are indications that they would be neglecting their own psychological health to engage in online activities. A respondent with a "tendency towards problematic Internet use" would begin to display some (but not all) of the characteristics of a respondent with "problematic Internet use". The respondent with "no problematic Internet use" would be a respondent who would be able to create a balance between their online activities and other work and/or social engagements.

The numbers of people who fell into these pre-defined categories according to the PIUQ score is given in Table 3.

Table 3: Internet use frequency

Internet Use Category	**Frequency N**	**Percentage %**
No problematic Internet use	832	60
Tendency towards problematic Internet use	522	37
Problematic Internet use	45	3

As can be seen, only 3% of respondents fell into the category of having "problematic Internet use". There are a large number of respondents who have a "tendency towards problematic Internet use" (37%). The majority of the respondents (60%) appear to be using the Internet responsibly and seem to be balancing their Internet use with their other life responsibilities.

Respondents who fell into the category of having "problematic Internet use," typically connect from work and home (40%) or from work only (20%) with the other problematic Internet users connecting from multiple places but usually 4 or more locations. When the problematic Internet user goes online they spend an average of 8 hours in a single Internet session. Problematic Internet users have a greater likelihood of having many favourite online activities.

As can be seen in Table 4, it was found that the majority of respondents who have problematic Internet use are White, but since the majority of respondents were also White, this provides no additional predictive information. It is evident in the South African context that race is quite clearly related to socio-economic factors and in this case, access to technology. The results obtained in this study can assume that Black people in South Africa, despite being the majority, also have the lowest degree of access to technology such as the Internet. They may also have a low representation in the Information Technology (IT) sector. In terms of age, it was found that there were more respondents with problematic Internet use between the ages of 24 and 35. In terms of highest educational qualification, it is quite clear that respondents with the highest educational level of a Diploma, Matric, Certificate or Honours are most likely to be experiencing problematic Internet use. It was also clear from an analysis of the number of locales, that the more locales that a person accesses (or has access from), the more likely they are to engage in problematic Internet use.

Table 4: Sample compared to those with problematic Internet use

Variable	All Respondents (Sample = 1399)		Respondents with Problematic Internet Use (Sample = 45)	
	Frequency N	Percentage %	Frequency N	Percentage %
Gender				
Male	1065	76	39	87
Female	334	24	6	13
Race				
White	1179	84	38	84
Black	87	6	3	7
Indian	56	4	3	7
Coloured	37	3	1	2
Other	36	3	0	0
Age				
18 – 23	99	7	6	14
24 – 29	378	27	14	32
30 – 35	314	23	14	32
36 – 41	223	17	6	14
42 – 47	144	11	1	2
48 – 53	100	7	2	4
54 – 59	68	5	0	0
60+	38	3	1	2
Educational Qualification				
Matric	238	17	13	29
Certificate	138	10	5	11
Diploma	403	29	14	31
Bachelors	259	19	4	9
Honours	171	13	5	11
Masters	149	11	3	7
Doctorate	17	1	1	2
Sector				
Banking/Finance	98	7	0	0
Construction/Engineering	51	4	3	7
Consulting	88	6	6	13
Education	59	4	2	4
Marketing/Advertising	84	6	0	0
Government	32	2	1	2
Healthcare/Pharmaceutical	36	3	0	0
Information Technology	633	46	21	47
Legal/ Real-estate	21	2	0	0
Manufacturing (non-computer)	62	5	4	9
Non-profit	19	1	0	0
Parastatal, electricity, water	13	1	1	2
Retail/Wholesale	48	4	1	2
Telecommunications	105	9	4	9
Transportation	21	2	2	5
Number of locales				
1	406	29	373	27
2	873	62	590	42
3	64	5	125	9
4	33	2	155	11
5	8	1	31	2
6	14	1	125	9

Data Analysis

The following section aims to discuss the techniques that were employed in order to analyse the data that were collected in this study.

Descriptive Statistics

Descriptive statistics are used to describe the data simply (Howell, 1999). The frequency procedure was employed in this study to measure the variables of gender, race, age, marital status, level of education, occupation and job title, the sector in which the respondent works in, as well as a number of questions with regards to online behaviour. This enabled the researcher to gain a comprehensive understanding of the composition of the sample and a means to describe the sample adequately.

Independent Sample T-test

A further analysis of the demographic variable of the sector the respondents worked in was undertaken using the independent sample t-test. While not directly hypothesised in the current study, it was felt that it would be of interest to look if there were any differences in the results obtained within the current sample. Especially in terms of those respondents who stated that they work within the IT sector and those who stated that they work within other sectors.

Independent sample t-tests are used when one is comparing the mean of one population against the mean of a second population (Howell, 1999). The purpose of the independent sample t-test is to determine whether there is a significant difference between the two means (Howell, 1999). The larger the difference between the means,

and the smaller the within-group variability for any given sample size, the greater the magnitude of the t-value. The larger the t-value, the lower the level of probability. Consequently, this enables one to reject the null hypotheses since it implies that there is no difference between the means (Howell, 1999; Rosenthal & Rosnow, 1991). This technique was used in order to investigate whether the researcher would treat the respondents working within the IT sector and respondents working within other sectors as two different samples, thus comparing them throughout the study, reporting different results. If the means were found to be similar, respondents would be treated as one complete sample, as it is possible that respondents within the current sample are IT professionals working within different sectors.

Factor Analysis

"The fundamental logic of factor analysis is based on the idea that it is possible to manipulate statistically the empirical relationships among several indicators to reveal a common unobserved factor or hypothetical construct" (Neuman, 2000, p. 502). Factor analysis aims to summarise the data in fewer dimensions, whereby the observed variables are related to unobservable constructs called factors. This method assumes that the scores for each of the respondents is made up of various numbers of common factors, and an amount specific to the respondent (Howell, 1999). The aim of factor analysis is to explain relationships among several correlated variables in terms of a few conceptually meaningful, relatively independent factors (Anastasi, 1988).

Factor analysis incorporates the use of Eigenvalues, which indicate the proportion of the variance as explained by each factor, and a technique called Kaiser's Criterion

draws out Eigenvalues larger than one. The larger the Eigenvalue, the more variance is explained by each factor (Rosnow & Rosenthal, 1991).

Factor Analysis was used in the present study to validate the Problematic Internet Use Questionnaire (PIUQ), the distraction subscale of the Online Cognition Scale (OCS) and the Self-Report Flow Scale. Factor Analysis was considered appropriate to use in the present study as it has been said to be a measure of the constitutive meaning of constructs or their construct validity (Kerlinger, 1986). Factor Analysis was also used in order to investigate the overlap of problematic Internet use, procrastination and flow.

Correlations

Correlation expresses the degree of correspondence or the relationship between two sets of scores (Murphy & Davidshofer 1998) and is a form of descriptive research (Rosenthal & Rosnow, 1991)

Pearson's correlation was used in this study to determine the relationships between problematic Internet use, flow and procrastination.

Partial Correlations

The statistical technique of partial correlations is employed in an attempt to measure the correlation between two variables, after each variable's relationship with a third extraneous variable has been removed (McCall, 1990). Partial correlations were therefore employed in this study in an attempt to measure the extent to which the variables of problematic Internet use, flow and procrastination influenced the main

relationship between two of the variables, when the third had been removed. It therefore examines the degree to which the third variable moderates the relationship between the two main variables.

Multiple Stepwise Regression

Regression analysis is the statistical procedure that is employed in order to determine the association between variables (Babbie & Mouton, 2001). In order to establish whether problematic Internet use may be predicted by procrastination and/or flow, the multiple stepwise regression procedure was undertaken, during which a regression equation is produced. This equation essentially functions as a model for the current data set by describing how the linear combination of two or more variables will best predict the criterion variable. This technique was undertaken in addition to the Pearson Correlation technique, as multiple stepwise regression is able to identify a crucial feature of the relationships between variables in addition to those conferred by the correlation technique. It is able to determine the relative influence or importance of each predictor variable on the dependent variable

The ethical considerations that were used in this study will be explored in more detail below.

Ethical Considerations

It is recognised that in undertaking a study of this nature several ethical considerations need to be accounted for.

The researcher made sure that the participants were not deceived in any way, with regards to this study. This was achieved by ensuring that the sampling methods used, and the treatment that the participants received, was of a high standard and was maintained throughout the duration of the study. This was achieved by providing a thorough explanation of the research and its aims so that all respondents were informed. The respondents were made fully aware of how and why the research was being conducted and were given information on how they would contribute to the study and how their responses would be used. In addition, a free counselling service was made available to those respondents who felt they may be experiencing problematic Internet use. In addition, an e-mail address was also made available so as to invite any queries and/or comments regarding the research, in this way making the researcher available to the participants.

Informed consent was obtained from all of the participants taking part in the study. The respondents were well informed about the purpose and nature of the study and it was explained to the respondents that by completing and returning the questionnaire, they were giving their consent to participate in the study.

Moreover, the researcher ensured that the anonymity and confidentiality of the participants was maintained, by ensuring that no personal details were taken from the

participants, and that the information that was gathered through the questionnaires, was only analysed by the principal researcher in order to develop the findings of the study.

While the respondents were asked to reflect upon their personal views and experiences, they were not forced to answer the questions in the questionnaire, thereby protecting their right to privacy. The respondents were not placed under any pressure to answer the questionnaire and were not advantaged or disadvantaged in any way for choosing to participate or not participate in the study.

Chapter 3: Results

This chapter aims to present the results that were obtained for this study. It will therefore begin by discussing the reliability of each of the measuring instruments used in this study, and will then continue by describing the results of the various statistical techniques that were employed in order to test the research questions of the study. The statistical analysis of the raw data was carried out on the SAS computer programme.

Reliability

The internal consistency of the variables that were used in the present study, were tested. Internal consistency methods are used to "estimate the reliability of a test based solely on the number of items in the test, and the average intercorrelation among test items" (Murphy & Davidshofer, 1998, p. 118). The test scores of an individual have to be consistent on different occasions or over time in order for a test to be reliable. The reliability is based on the intercorrelations among all the single test items and the higher the correlation the stronger the reliability (Rosenthal & Rosnow, 1996). The popular method of measuring internal consistency, which is known as Cronbach's alpha coefficient, was used in this study. Cronbach's alpha is a widely used method for establishing reliability and provides a comprehensive measure of homogeneity of the various scales used and this is needed for further analysis of the results (Anastasi, 1988).

Table 5: Internal Consistency Reliability

Measuring Instruments	Number of Items	N	Alpha	Mean	Standard Deviation	Range (Min-Max)
Problematic Internet Use Questionnaire (PIUQ)	20	1399	.92	39.30	13.22	20 – 100
Distraction subscale of the Online Cognition Scale (OCS)	7	1399	.89	21.48	9.71	7 – 49
Self Report Scale (FLOW)	12	1399	.74	53.65	9.76	12 – 84

As demonstrated in Table 5, the internal consistency measures for the three scales that were used are highly satisfactory, with the alpha coefficients for the measures of problematic Internet use, procrastination, and flow being reported as .92, .89 and .74 respectively.

As can be seen in Table 5, the mean score for the Problematic Internet Use Questionnaire is 39.30. This is closer to the minimum score, which is 20.00 than to the maximum score of 100.00. Similarly the mean score for the distraction subscale of the Online Cognition Scale is closer to the minimum score of 7.00 with a mean score of 21.48 in relation to the maximum score of 49.00. These scores, one may infer, indicate that although some variances in scores are evident, the majority of the sample reflect low levels of problematic Internet use and low levels of procrastination. On the other hand the Self-Report Scale measuring flow, with a mean score of 53.65 is closer to the maximum score of 84.00 than to the minimum

score of 12.00, and so one may infer that employees show a high average of experiencing flow while using the Internet.

Differences between IT sector respondents and other respondents

An independent sample t-test was conducted in order to ascertain whether there were any statistical differences between the means of respondents working within the IT sector and respondents working within other sectors with regards to each scale and the number of hours spent online. There were no significant differences found on the means between the groups as is shown in Table 9. These two groups are therefore treated as one in this study. Given the nature of the data collection site (an online IT magazine), it is likely that all respondents have a strong interest in IT, and perhaps all work within IT departments but within different sectors.

Table 6: T-test for respondents working in the IT sector and other sectors

Variable	Sector	Mean	t Value	Pr > t
Problematic Internet Use	IT sector	39.18	-.19	.85
	Other sectors	39.31	-.19	.85
Procrastination	IT sector	21.15	-1.06	.29
	Other sectors	21.70	-1.06	.29
Flow	IT sector	53.66	.03	.98
	Other sectors	53.65	.03	.98
Number of Hours spent Online in a single session	IT sector	1.88	1.00	.31
	Other sectors	1.81	1.00	.31

Factor Analysis

A principal components factor analysis was conducted in order to determine the factor structure of each of the scales, namely the Problematic Internet Use Questionnaire (PIUQ), the distraction subscale of the Online Cognition Scale (OCS) and the Self-Report (Flow) Scale, as a form of construct validation.

Factor Analysis of the Problematic Internet Use Questionnaire

An assumption of factor analysis, namely a minimum of five subjects per item (Rosenthal & Rosnow, 1991), has been satisfied by the current sample of 1399 individuals for the Problematic Internet Use Questionnaire, which comprises 20 items. Kaiser's criterion of unity was used to assess the number of factors that should be included. From Table 7a, Eigenvalues greater than one were included and therefore according to these criteria, 3 factors should be used. In interpreting the factor analysis, hierarchical factor loadings and Eigenvalues were considered. The Eigenvalues explaining each of the first four factors of this scale can be seen below.

Table 7a: Kaiser's Criterion: Eigenvalues for PIUQ

Factor	**Eigenvalue**	**Proportion**
1	8.35	.42
2	1.66	.08
3	1.17	.06
4	.96	.05

The larger the Eigenvalues (which determine the proportion of variance explained by each factor), the more variance is explained by the factor. From Table 7a, one can see that only three factors had Eigenvalues greater than 1. A varimax factor analysis rotation was conducted, this indicates the maximum number of factors to extract (Kline, 1994).

The three factors generated are distinct from each other and can be seen from the factor loadings in Table 7b below.

Table 7b: Rotated varimax factor loadings for PIUQ

Item	Problematic Internet Use Questions	Factor 1	Factor 2	Factor 3
1	How often do you find that you stay online longer than you intended?	.22	.17	.75
2	How often do you neglect household chores to spend more time online?	.58	.07	.06
3	How often do you prefer the excitement of the Internet to intimacy with your partner?	.61	.15	.23
4	How often do you form new relationships with fellow online users?	.49	.09	.19
5	How often do others in your life complain to you about the amount of time you spend online?	.63	.13	.27
6	How often does your work suffer because of the amount of time you spend online?	.09	.71	.45
7	How often do you check your e-mail before something else that you need to do?	.08	.17	.57
8	How often does your job performance or productivity suffer because of the Internet?	.06	.70	.46
9	How often do you become defensive or secretive when anyone asks you what you are doing online?	.33	.69	.10
10	How often do you block out disturbing thoughts about your life with soothing thoughts on the Internet?	.61	.44	.00
11	How often do you find yourself anticipating when you will go online again?	.70	.32	.08
12	How often do you fear that life without the Internet would be boring and empty?	.63	.07	.15
13	How often do you snap, yell, or act annoyed if someone bothers you while you are online?	.67	.28	.13
14	How often do you lose sleep due to late-night log-ins?	.68	.03	.32
15	How often do you feel preoccupied with the Internet when offline, or fantasise online?	.72	.35	-.01
16	How often do you find yourself saying “just a few more minutes” when online?	.58	.28	.40
17	How often do you try to cut down the amount of time you spend online and fail to do so?	.46	.45	.28
18	How often do you try to hide how long you’ve been online?	.28	.72	.04
19	How often do you choose to spend more time online over going out with others?	.73	.14	.11
20	How often do you feel depressed, moody, or nervous when you are offline, and these feelings go away once you are back online?	.72	.35	-.66

The goal of the above matrix was to obtain a clear pattern of loadings where factors were clearly marked by high loadings for some variables and low loadings for others. Practical significance states that factor loadings greater than .30 are considered to meet the minimal level; loadings of .40 are considered to be more important and lastly if factors are .50 and above they are considered to be significant (Kline, 1994; Hair, Anderson, Tatham & Black, 1988). In Table 7b, the underlined figures indicate the significant factor loadings of the Problematic Internet Use Questionnaire items. As expected, the first factor loaded significantly on almost all items.

Accordingly, from these observations it can be deduced that three factors are dominant in the present scale, thus suggesting its corresponding high degree of multidimensionality and further reinforces the psychometric validity of this instrument. A three-factor solution was also found to be dominant in a study developing the psychometric properties of the Problematic Internet Use Questionnaire (PIUQ) done by Thatcher and Goolam (2005). In their study, the three factors, which were found to be dominant, were Online preoccupation, Adverse effects and Social interactions. Similarly, these three factors were found in the present study, with some variance in the items comprising each factor.

Factor Analysis of the Self-Report (Flow) Scale

An assumption of factor analysis, namely a minimum of five subjects per item (Rosenthal & Rosnow, 1991), has been satisfied by the current sample of 1399 individuals for the Self-Report (Flow) Scale, which comprises 12 items. Kaiser's criterion of unity was used to assess the number of factors that should be included.

From Table 8a Eigenvalues greater than one were included and therefore according to this criteria, 4 factors should be used.

Table 8a: Kaiser's Criterion: Eigenvalues for Self-Report (Flow) Scale

Factor	Eigenvalue	Proportion
1	4.19	.35
2	1.64	.14
3	1.26	.11
4	1.01	.08
5	.78	.07

The larger the Eigenvalues (which determine the proportion of variance explained by each factor), the more variance is explained by the factor. From Table 8a, one can see that only four factors had Eigenvalues greater than 1. A rotated varimax factor analysis was conducted to maximise the variance and thus indicated the maximum number of factors to extract (Kline, 1994).

The four factors generated are distinct from each other and can be seen from the factor loadings in Table 8b.

Table 8b: Rotated varimax factor loadings for Self-Report (Flow) Scale

Item	Self-Report (Flow) Questions	Factor 1	Factor 2	Factor 3	Factor 4
1	When using the Internet, I feel in control.	.22	.87	-.02	-.01
2	I feel that I have no control over my interaction with the Internet.	.01	-.03	-.03	.85
3	The Internet allows me to control the computer interaction.	.20	.85	-.07	-.12
4	When using the Internet, I think about other things.	-.01	-.14	.84	-.05
5	When using the Internet, I was aware of distractions.	-.02	.045	.86	-.06
6	When using the Internet, I was totally absorbed in what I was doing.	.34	.22	.25	-.48
7	Using the Internet excites my curiosity	.79	.19	-.09	-.23
8	Interacting with the Internet makes me curious.	.81	.13	-.14	-.27
9	Using the Internet arouses my imagination.	.77	.20	-.08	-.21
10	Using the Internet bores me.	.63	.06	.20	.29
11	Using the Internet is intrinsically interesting.	.77	.11	.07	.01
12	The Internet is fun for me to use.	.73	.14	.02	.07

In Table 8b, the underlined figures indicate the significant factor loadings of the Self-Report (Flow) Scale items (Kline, 1994; Hair, et al., 1988). As expected, the first factor loaded significantly on the majority of the items.

Accordingly, from these observations it can be deduced that four factors are dominant in the present scale, thus suggesting its corresponding high degree of multidimensionality and further reinforces the psychometric validity of this instrument. Four factors were also found to be dominant within the study done by Webster, Trevino and Ryan (1993). Their four factors were found to be Control, Attention focus, Curiosity and Intrinsic interest, which were similar to the four factors found in the present study, namely Control, Distraction (Attention focus), Curiosity

and Absorption (Intrinsic interest), however there were differences with regards to the items which comprised the four factors.

Factor Analysis of the distraction subscale of the Online Cognition Scale

An assumption of factor analysis, namely a minimum of five subjects per item (Rosenthal & Rosnow, 1991), has been satisfied by the current sample of 1399 individuals for the distraction subscale of the Online Cognition Scale (OCS), which comprises 7 items. Kaiser's criterion of unity was used to assess the number of factors that should be included. From Table 9a Eigenvalues greater than one were included and therefore according to this criteria 1 factor should be used.

Table 9a: Kaiser's Criterion: Eigenvalues for distraction subscale of OCS

Factor	**Eigenvalue**	**Proportion**
1	4.28	.61
2	.77	.11

From Table 9a, one can see that only one factor had an Eigenvalue greater than 1. A varimax factor analysis rotation was conducted and indicated only one factor is to be extracted (Kline, 1994).

Table 9b: Rotated varimax factor loadings for procrastination subscale of OCS

Item	Subscale of Online Cognition Questions	Factor 1
1	When I am online I don't think about my responsibilities.	.72
2	When I have nothing better to do, I go online.	.55
3	I find that I go online more when I have something else I am supposed to do.	.82
4	When I am online, I don't need to think about offline problems.	.77
5	I sometimes use the Internet to procrastinate.	.80
6	I often use the Internet to avoid doing unpleasant things.	.88
7	Using the Internet is a way to forget about the things I must do but don't really want to do.	.88

The underlined figures in Table 9b indicate the significant factor loadings (Kline, 1994; Hair et, al., 1988). As expected, the factor loaded significantly on all items, thus disclosing the apparent unidimensionality of this questionnaire and the high degree of correlation amongst items.

Correlations between Flow, Procrastination and Problematic Internet Use

One research question to be investigated in the current study aimed to establish what extent the constructs of flow and procrastination are related, and whether they can predict problematic Internet use. In order to gain a better understanding of these relationships, the researcher conducted a number of correlations. The results of these statistical analyses will be discussed in further detail below.

Correlations were conducted in an attempt to determine the nature of the relationship between the constructs of flow, procrastination, and problematic Internet use. The results of these correlations suggest that there is a positive correlation between problematic Internet use and flow ($r = .46$, $p < .01$), flow and procrastination ($r = .41$, $p < .01$), and between hours online and procrastination ($r = .36$, $p < .01$). A strong positive correlation was found between problematic Internet use and procrastination ($r = .67$, $p < .01$). A weaker positive correlation was found between hours online and problematic Internet use ($r = .21$, $p < .01$) and between hours online and flow ($r = .17$, $p < .01$). These results may be observed in more detail in Table 10.

Table 10: Correlation coefficients for the research variables and hours online

	PIU	**PROC**	**FLOW**
PIU			
PROC	0.67***		
FLOW	0.46***	0.41***	
HOURS ONLINE	0.21***	0.36***	0.17***

*** $p < .01$
PIU = Problematic Internet Use, PROC = procrastination, FLOW = Flow, HOURS ONLINE = Hours spent online in a single session.

Multiple Stepwise Regression

The research questions to be investigated in this study aimed to determine whether there was a relationship between flow and procrastination in predicting problematic Internet use and the degree to which these three concepts overlap. In order to test this, the researcher first conducted a multiple stepwise regression analysis, which measured whether there were relationships between the constructs of problematic Internet use, procrastination, flow and length of time respondents spend online in a single session.

The result of this analysis indicates there is a significant relationship between the dependent variable (problematic Internet use) and the independent variables (procrastination, flow and length of time online). The entire model was found to be significant. Therefore, there is sufficient evidence to suggest that an individual's level of procrastination, experiences of flow at work, and the amount of time they spend online influence their levels of problematic Internet use. Additionally, it may be noted that these variables are positively related to one another, meaning that large values of problematic Internet use would be associated with large values of procrastination, experiences of flow at work and longer amounts of time spent online. These results show that procrastination, flow and the amount of time respondents spend online are good predictors of problematic Internet use, as there is a high degree of overlap between them. The entire regression model was found to be significant and is shown in Table 11.

Table 11: An analysis of the relationship between procrastination, flow, length of time respondents spend online and problematic Internet use

STEP	R- Square	Additional Variance Explained	F Value	Pr > F
1 Procrastination	.45	.45	1112.94	< .01 *
2 Procrastination and Length of time online	.50	.05	135.83	< .01 *
3 Procrastination, Length of time online and Flow	.53	.03	101.96	< .01 *

* $p < .01$

Partial Correlations between Flow, Procrastination and Problematic Internet Use

Partial correlations were conducted in order to test whether there were any mediating effects between the variables of flow, procrastination and problematic Internet use The results of this statistical technique suggested that removing problematic Internet use from the analysis did affect the relationship between flow and procrastination. This means that problematic Internet use does mediate the relationship between flow and procrastination, and implies that problematic Internet use is technically a connection between flow and procrastination. Similar results were found if procrastination was removed. Thus, procrastination mediates and is technically a connection between problematic Internet use and flow. When removing flow from the analysis, although there is a slight difference in scores after flow was partialled out, the correlation remained fairly stable, and one could argue that the relationship

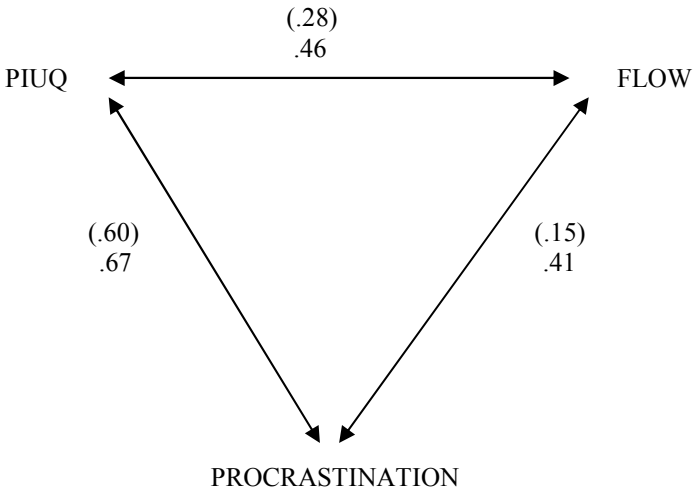
between problematic Internet use and procrastination is unaffected by their relationships to flow. This implies that flow remains independent. These results are shown in Table 12 and Figure 1.

Table 12: Correlations and Partial correlations

Correlation Variables	**Correlation Before Partialling Out**	**Correlation After Partialling Out**
Self-Report (Flow) Scale and subscale for the Online Cognition Scale (OCS)	***.41	***.15 (PIUQ)
Self-Report (Flow) Scale and Problematic Internet Use Questionnaire (PIUQ)	***.46	***.28 (PROCRASTINATION)
Procrastination subscale for the Online Cognition Scale (OCS) and Problematic Internet Use Questionnaire (PIUQ)	***.67	***.60 (FLOW)

*** P<.01

Figure 1: Correlations and Partial correlations



Note: Figure 1 provides a visual representation of the relationship between the three instruments, with the correlations in brackets depicting the strength of the relationship after partialling out the third variable.

Principal Components Factor Analysis to determine Factor Pattern

A principal components factor analysis was conducted in order to determine whether items from the same scales load on the same factors. Kaiser's criterion was used to assess the number of factors that should be included. From Table 13a Eigenvalues greater than one were included and therefore according to this criteria 8 factors should be used. Eigenvalues identify how much information is in each new variable, however Kaiser's criterion overestimates the number of factors that should be used (Royce, 1973). Therefore the proportion of variance explained is used in conjunction with Kaiser's criterion.

In Table 13a the cumulative column is used instead and placed on a scree plot, see Figure 2. From this, one can see that either a six or a seven-factor principal components factor analysis should be used as the graph flattens out at this point and the cumulative frequency is above the recommended 40% (Royce, 1973). Taking Kaiser's criterion, the scree plot and the cumulative frequency into consideration, it was decided that seven factors should be used, as Kaiser's criterion usually overestimates the number of factors that should be used (Royce, 1973). The following factor loadings were based on the results from the orthogonal varimax rotation that was used to assess the seven factors as this procedure maximises the variance of the squared loadings (Cureton & D'Agostino, 1983).

Table 13a: Eigenvalues for the Principal Components Factor Analysis

	Variance Explained	Eigenvalue	Difference	Proportion	Cumulative
1	12.32	12.32	9.20	0.32	0.32
2	3.12	3.12	0.83	0.08	0.40
3	2.29	2.29	0.68	0.06	0.45
4	1.62	1.62	0.25	0.04	0.50
5	1.37	1.37	0.13	0.04	0.53
6	1.24	1.24	0.18	0.03	0.56
7	1.07	1.07	0.05	0.03	0.59
8	1.01	**1.01**	0.03	0.03	0.62
9	0.98	0.98	0.10	0.03	0.64

Figure 2: Scree Plot displaying seven factor pattern

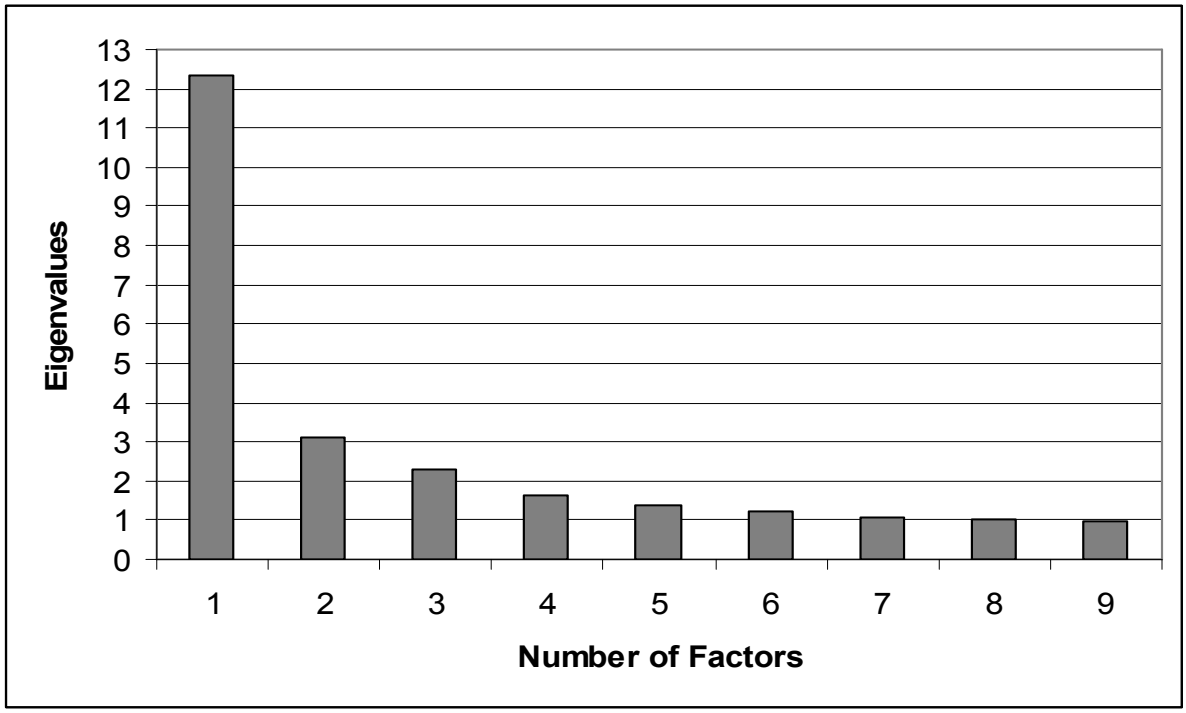


Table 13b: Rotated factor pattern for the PIUQ, distraction subscale of the OCS and the Self-Report (Flow) Scale

		Factors						
Item	**Statement**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
PIUQ 1	How often do you find that you stay online longer than you intended?	0.31	0.16	0.18	-0.04	**0.66**	0.08	0.11
PIUQ 2	How often do you neglect household chores to spend more time online?	**0.67**	0.21	0.12	-0.13	0.42	0.04	0.12
PIUQ 3	How often do you prefer the excitement of the Internet to intimacy with your partner?	**0.64**	0.15	0.11	0.06	0.13	0.07	0.05
PIUQ 4	How often do you form new relationships with fellow online users?	**0.45**	0.18	0.09	0.02	0.05	-0.13	0.10
PIUQ 5	How often do others in your life complain to you about the amount of time you spend online?	**0.71**	0.08	0.10	0.01	0.19	0.01	0.00
PIUQ 6	How often does your work suffer because of the amount of time you spend online?	0.19	0.33	0.06	0.41	**0.59**	-0.07	-0.06
PIUQ 7	How often do you check your e-mail before something else that you need to do?	0.00	0.14	0.09	0.07	**0.50**	0.17	0.16
PIUQ 8	How often does your job performance or productivity suffer because of the Internet?	0.14	0.37	0.03	0.38	**0.60**	-0.06	-0.06
PIUQ 9	How often do you become defensive or secretive when anyone asks you what you are doing online?	0.37	0.23	0.07	**0.52**	0.27	-0.07	-0.07
PIUQ 10	How often do you block out disturbing thoughts about your life with soothing thoughts on the Internet?	**0.59**	0.22	0.06	0.36	0.02	0.04	0.01
PIUQ 11	How often do you find yourself anticipating when you will go online again?	**0.62**	0.19	0.17	0.30	-0.00	0.02	0.06
PIUQ 12	How often do you fear that life without the Internet would be boring and empty?	**0.50**	0.08	0.26	0.06	0.01	0.05	0.08
PIUQ 13	How often do you snap, yell, or act annoyed if someone bothers you while you are online?	**0.66**	0.21	0.08	0.21	0.08	0.14	0.06
PIUQ 14	How often do you lose sleep due to late-night log-ins?	**0.71**	0.19	0.14	-0.09	0.15	0.05	0.15
PIUQ 15	How often do you feel preoccupied with the Internet when offline, or fantasise online?	**0.65**	0.11	0.12	0.38	-0.03	0.05	0.09
PIUQ 16	How often do you find yourself saying “just a few more minutes” when online?	**0.60**	0.28	0.20	0.13	0.31	-0.01	0.08
PIUQ 17	How often do you try to cut down the amount of time you spend online and fail to do so?	**0.52**	0.20	0.10	0.36	0.31	0.01	0.02
PIUQ 18	How often do you try to hide how long you’ve been online?	0.31	0.20	0.03	**0.60**	0.26	0.00	-0.03
PIUQ 19	How often do you choose to spend more time online over going out with others?	**0.69**	0.20	0.15	0.08	-0.03	0.02	0.10

		Factors						
Item	**Statement**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
PIUQ 20	How often do you feel depressed, moody, or nervous when you are offline, and those feelings go away once you are back online?	**0.66**	0.15	0.07	0.37	-0.08	0.04	0.08
PROC 1	When I am online I don't think about my responsibilities	0.29	**0.60**	0.07	0.22	0.07	0.19	0.09
PROC 2	When I have nothing better to do, I go online	0.18	**0.48**	0.06	-0.04	0.05	-0.12	0.12
PROC 3	I find that I go online more when I have something else I am supposed to do	0.27	**0.72**	0.07	0.15	0.22	-0.02	0.11
PROC 4	When I am online, I don't need to think about offline problems	0.35	**0.63**	0.12	0.29	-0.00	0.16	0.11
PROC 5	I sometimes use the Internet to procrastinate	0.15	**0.77**	0.20	0.03	0.15	-0.11	0.10
PROC 6	I often use the Internet to avoid doing unpleasant things	0.21	**0.82**	0.13	0.10	0.17	0.00	0.08
PROC 7	Using the Internet is a way to forget about the things I must do but don't really want to do	0.27	**0.79**	0.09	0.20	0.16	0.07	0.08
FLOW 1	When using the Internet, I feel in control	0.19	0.19	0.22	0.05	0.03	-0.09	**0.74**
FLOW 2	I feel that I have no control over my interaction with the Internet	-0.06	-0.14	-0.03	**-0.58**	0.02	-0.12	-0.19
FLOW 3	The Internet allows me to control the computer interaction	0.17	0.12	0.21	0.09	0.05	-0.10	**0.80**
FLOW 4	When using the Internet, I think about other things	0.02	-0.01	-0.01	0.05	-0.01	**0.82**	-0.15
FLOW 5	When using the Internet, I was aware of distractions	0.12	0.05	-0.04	0.02	0.04	**0.82**	0.00
FLOW 6	When using the Internet, I was totally absorbed in what I was doing	0.22	0.18	**0.36**	0.16	0.06	0.28	0.27
FLOW 7	Using the Internet excites my curiosity	0.08	0.17	**0.80**	0.11	0.08	-0.08	0.17
FLOW 8	Interacting with the Internet makes me curious	0.08	0.16	**0.83**	0.11	0.06	-0.09	0.14
FLOW 9	Using the Internet arouses my imagination	0.19	0.12	**0.78**	0.10	0.02	-0.06	0.16
FLOW 10	Using the Internet bores me	0.16	0.01	**0.57**	-0.12	0.05	0.08	-0.14
FLOW 11	Using the Internet is intrinsically interesting	0.14	-0.01	**0.74**	-0.01	0.08	0.08	0.08
FLOW 12	The Internet is fun for me to use	0.06	0.13	**0.67**	-0.03	0.04	0.00	0.05

Factor 1

From the seven-factor principal components factor analysis found in Table 13b it is evident that the majority of the items of the Problematic Internet Use Questionnaire (PIUQ) load on Factor 1. No other items from the other two questionnaires loaded on Factor 1, only items from the PIUQ. When looking at the items which loaded on Factor 1 (Table 13b) it is evident that they are focussed around the excitement which the Internet provides, and also about favouring online activities to everyday tasks. It is also related to time management and fantasising about being online when offline. In the study by Thatcher and Goolam (2005), factor 1 showed similar result to the present study, where factor 1 focussed on respondents'online preoccupation.

Factor 2

All the items from the distraction subscale of the Online Cognition Scale (OCS) loaded onto Factor 2. No other items from the other two questionnaires loaded on Factor 2, only items from the distraction subscale of the OCS. These results may be viewed in Table 13b.

Factor 3

Items from the Self-Report (Flow) Scale loaded on Factor 3. It is interesting to note that these were the only items that loaded onto Factor 3 and appear to look at the absorption, arousal and curiosity the Internet provides. In the study done by Webster, Trevino and Ryan (1993), items from the Self-Report (Flow) Scale loaded onto four factors, as in the present study, where one factor was the Curiosity respondents experienced.

Factor 4

Only three items loaded onto Factor 4. Two of the items were from the Problematic Internet Use Questionnaire. They are "How often do you become defensive or secretive when anyone asks you what you are doing online?" and "How often do you try to hide how long you've been online?" The third item was from the Self-Report (Flow) Scale, it read "I feel that I have no control over my interaction with the Internet" which was reversed scored. It is clear that these are grouped in terms of control over the Internet interaction and about hiding what activities are being performed online.

Factor 5

Four items from the Problematic Internet Use Questionnaire loaded onto Factor 5. These were all grouped around time management, and how work and productivity suffer because of online usage and may be viewed in Table 13b. In Thatcher and Goolam's (2005) study, they found seven items from the Problematic Internet Use Questionnaire loaded onto a factor they called "adverse effects."

Factor 6

Only two items from the Self-Report (Flow) Scale loaded onto Factor 6. They were both reversed scored and both relate to distractions when online. The items read as follows "When using the Internet, I think about other things" and "When using the Internet, I was aware of distractions." Webster, Trevino and Ryan (1993) found these items to be loading onto a factor which they named "attention focus."

Factor 7

Similarly only two items from the Self-Report (Flow) Scale loaded onto Factor 7, and both are found to relate to control over the interaction with the Interenet. The items read as follows “When using the Internet, I feel in control” and “The Internet allows me to control the computer interaction.” Webster, Trevino and Ryan (1993) also found items from the Self-Report (Flow) Scale loading onto a factor they called “control.”

Chapter 4: Discussion

This chapter aims to provide an in-depth discussion of the results that were obtained in the study, in light of the literature presented in the literature review. Although not part of the research questions, this chapter will begin with an exploration of the characteristics of the sample used in this study and then, the prevalence of problematic Internet use will be discussed. The research questions that were tested in the study will then be highlighted and discussed in more detail below, followed by a consideration of the theoretical and practical implications of these findings, a discussion regarding the inherent limitations of the study and directions for future research will conclude this chapter.

Research Findings

Characteristics of the Sample

Before moving on to a discussion of the actual research questions and the results that were obtained in the current study, this discussion will now focus upon the nature of the sample that was used in this study. A discussion of this nature is of great importance to the current study in that it is likely to provide us with an indication of the inherent characteristics of the sample that was obtained, information which when combined with the information elicited by the measures of problematic Internet use, flow, and procrastination may provide alternative explanations for the findings that were obtained in the study.

As has been stated in Chapter 1, it has been noted that problematic Internet use has been linked to age, as people get older they are less likely to suffer from problematic Internet use (Thatcher & Goolam, 2005). Brenner (1997) noted that older users experienced fewer problems, despite spending as much time online as younger users. The age of the men and women in the sample is observed as an important factor to consider in a discussion of this nature, in that it is likely to provide us with additional insight and possible explanations for the results that were obtained in this study.

The age of the individuals in the current study, which ranged from 18 to over 60, is especially useful in this analysis where the constructs of problematic Internet use, flow and procrastination are concerned. The current sample showed a range of ages was obtained, closely matched to the study by Widyanto and McMurran (2004) who reported participants ages ranging from 13 to 67 and proves to be broader than the sample of 699 participants reported by Leung (2004) where respondents' ages were between 16 and 24. It is also interesting to note that those in their twenties and thirties (i.e. relatively "younger" workers in this study) are much more likely to have been exposed to a computer and Internet use at a relatively early age, perhaps as early as junior school in some cases. This is a much less likely scenario for older employees because they would have completed high school (and in many cases, university) before the personal computer became commonplace. Thus, the opportunity for older workers to interact with computers and the Internet before entering the workplace was much more limited. It is therefore reasonable to assume that older workers may not experience problematic Internet use as much as younger workers based on when they may have been introduced and when they became accustomed to using it. On the other hand this may be an indication that younger

users find using the Internet to be a novel experience and therefore more attractive and "addictive."

Much of the past research done on problematic Internet use, predicted that problematic Internet users were more likely to be males. Morahan-Martin and Schumacher (2000) found within their sample of problematic users, that they were more likely to be male (12%) than female (3%). Results such as this may be linked to the typical stereotype that males predominantly utilise and feel more comfortable with informational technologies than women.

In a survey done by Petrie and Gunn (1998) it was found that those who defined themselves as experiencing problematic Internet use were equally likely to be female as male. Also in a survey done by Leung (2004) it was found that problematic Internet users were young females. These findings contradict the stereotype, which has developed of Internet "addicts" as teenage males, and may reflect the fact that older, female users are more likely to volunteer to participate in research and that the proportion of female Internet users is growing rapidly (Rosnow & Rosenthal, 1996). Within the current study, there were 1065 males, with 39 males (4%) reporting problematic Internet use compared to 334 females, where 6 females (2%) reported problematic Internet use. In terms of race, it was found that the majority of respondents who have problematic Internet use were White, but since the majority of respondents were also White, this provides no additional predictive information.

Educational background of respondents reported within a study by Young and Rodgers (1998), reported that 30% had a high school degree or less, 38% had an

associate's or bachelor's degree, 10% had a master's degree or doctorate, and 22% were still in school. Additionally, Leung (2004) found that 42% of respondents had completed high school, 30% were university graduates, and less than 1% had a postgraduate degree. In terms of highest educational qualification within the current study, it has been reported that respondents with the highest educational level of a diploma, matric, certificate or honours were found to be most likely to be experiencing problematic Internet use

There have been many suggested predictors of problematic Internet use. The most obvious is Internet usage, and the most commonly reported predictor in this regard is length of time spent online (Davis, et al., 2002; Morahan-Martin & Schumacher, 2000; Widyanto & McMurran, 2004; Young, 1996b). Many people think that the longer the time spent online, the greater the likelihood of experiencing problems with using the Internet. A problematic Internet user however is not defined purely by the number of hours that they spend online. Rather, a problematic Internet user is someone whose excessive use of the Internet leads to adverse physical or emotional consequences or physical and emotional withdrawal symptoms when they are not online.

Young (1996) found that when using the Internet, the length of time spent online differed substantially between respondents experiencing problematic Internet use and those who did not experience any. A total of 83% of problematic Internet users had been online for less than one full year which might suggest that "addiction" to the Internet happens rather quickly from one's first introduction to the services and products available online. Leung (2004) found that problematic Internet users were

usually heavy users of the Internet regardless of how long they had been using the Internet. The findings of the current study are consistent with Leung and are found to be inconsistent with Young's claim that new users are more vulnerable to problematic Internet use, as 51% of Problematic Internet users were found to be using the Internet for over eight years, 37% were found to have been using the Internet between five and eight years, and only 4% had been using the Internet for less than one full year.

Young and Rodgers (1998) reported that the problematic Internet users in their study used the Internet an average of 38 hours per week for non-academic or non-employment purposes. This is compared to respondents who practiced healthy Internet use and used the Internet an average of 8 hours per week with no significant consequences reported. The current study also reflected that respondents who were not experiencing problematic Internet use reported no adverse affects due to the use of the Internet, except poor time management because they easily lost track of time once online. These findings correlate well with an additional study cited in Widyanto and McMurran (2004) which include results of a study by Brenner (1997) where the most common problems experienced by Internet users was time management. Brenner (1997) showed that 17% of respondents used the Internet more than 40 hours per week, 58% said that others had complained about their excessive Internet usage, and 46% indicated less than 4 hours of sleep per night due to late night log ins. Brenner's results are very interesting as they can be related to procrastination and flow. The most common problem experienced with using the Internet was found to be time management. As has been described in the literature review, both procrastination and flow are concerned with the concept of time management. On the one hand employees become so involved in a work task, they seem to lose track of time, this of

course is a problem related to managing one's time. On the other hand, employees may not be using their time wisely and instead of completing work tasks, may be procrastinating and filling their time with other activities. This is viewed as time wastage.

Davis, Flett and Besser (2002) found that participants reported spending an average of 13 hours online in a normal week, and ten percent of participants had been in trouble at school or work for inappropriate Internet use. Results from the present study indicated that respondents experiencing problematic Internet use spend on average, 13 hours on the Internet in a single session, compared to those not experiencing problematic use, who would average 4 hours in a single session. These results show that problematic Internet users in the current study are heavy users of the Internet, because the majority of problematic Internet users (76%) in the current study use the Internet seven days a week. This can be similarly compared to respondents in other studies averaging 40 hours per week.

In terms of the information which individuals seek on the Internet, Morahan-Martin and Schumacher (2000) found that problematic Internet users were more likely to use more technologically sophisticated sites, such as a wide variety of Internet services, and online games. Similarly, Young (1996) found that those with problematic Internet use predominantly used the two-way communication functions available on the Internet. Nearly 80% of problematic Internet users engaged in two-way communication forums such as chat rooms and interactive games. Young (1996) also found that respondents' not experiencing problematic Internet use, predominantly used those aspects of the Internet, such as e-mail and those which allowed them to

gather information. Thus, those with problematic Internet use are usually attracted by two way communication or social interaction activities. Within the present study respondents who fell into the category of having "problematic Internet use," typically connect from work and home (41%) or from home only (34%) with the other problematic Internet users connecting from multiple places but usually four or more locations. It is also important to note that the majority of the current sample comprised respondents working within the IT sector, their use of the Internet and the activities they perform while online may differ substantially from employees working within other sectors. Thus, due to the nature of the sample obtained in the current study, it may not be directly comparable to other studies on problematic Internet use. The majority of the sample used the WWW and e-mal as their preferred activities while online.

Prevalence of problematic Internet use

Given that prevalence of behaviour is strongly correlated with increased access to an activity, it is not surprising that the development of regular online use is increasing across the population. The prevalence of problematic Internet use in the current study was found to be 3%. This prevalence rate appears to be lower than Morahan-Martin and Schumacher's (2000) sample of college students (8%), Egger and Rauterberg's (1996) Swiss sample (10%), Scherer's (1997) sample of students (13%) and Petrie and Gunn's (1998) UK sample (46%). Young's (1996) prevalence rate of 80% must be discarded since she was specifically targeting Internet 'addicts' for inclusion in her study. The prevalence rate in this sample is low in comparison to other studies. This was expected because of the low Internet penetration rate, and high costs of Internet access in South Africa. The prevalence rate in this sample similarly matched that of

Thatcher and Goolam's (2005) South African study where the prevalence rate was found to be 2%.

The measures used to establish problematic Internet use, have been inconsistently applied across various studies, which makes comparisons extremely difficult. Egger and Rauterberg (1996), and Petrie and Gunn (1998) devised their own detection instruments. Morahan-Martin and Schumacher (2000) used a 13-item questionnaire (all those who scored four or more affirmative answers were defined as pathological Internet users) and Scherer (1997) used a checklist of ten clinical symptoms to parallel the symptoms of substance abuse and dependency. Additionally, there are large variations in the prevalence rate depending on the sample. Scherer (1997) and Morahan-Martin and Schumacher (2000) obtained restricted samples comprised of students. Only Petrie and Gunn (1998) report a general survey of a self-selected sample of Internet users to establish the prevalence of problematic Internet use. In terms of the present study, the researcher managed to obtain a successful range of demographics within the sample. It is not surprising that the majority of the respondents work within the IT sector, as the survey was posted on a popular IT magazine website. Despite this similarity, which was present across a large portion of the sample, a good variation was present in terms of all other variables.

The reliabilities of the scales used in the current study were found to be highly satisfactory with the Cronbach alpha coefficients being .92, .89, and .74 for the Problematic Internet Use Questionnaire (PIUQ), the distraction subscale of the Online Cognition Scale (OCS) and the Self-Report (Flow) Scale. A principal components

factor analysis was conducted in order to validate these scales and suggested the multidimensionality of the scales and further reinforced their psychometric construct validity, as the factors approximated the original scales.

What is the relationship between flow and procrastination in predicting problematic Internet use? and To what extent do these concepts overlap?

The research questions investigated in this study aimed to establish the relationship between flow and procrastination, and to what extent these constructs had an impact on predicting problematic Internet use. In addition, they also aimed to investigate the extent to which the three concepts overlapped. In order to gain a better understanding of these relationships, the researcher conducted a number of statistical analyses.

As has been mentioned earlier, a number of respondents in the present study (46%) currently work within the Information Technology (IT) sector. At the start of the research the researcher expected differences to be found between respondents working within the IT sector and respondents working within other sectors with regards to how they spent their time online and how they would experience flow, procrastination and problematic Internet use. The reasoning for this expectation was that differences would possibly be found with those people who actually use the Internet to complete work projects, and use the Internet for work purposes. This would impact the reason as to why they spend so much time online, and possibly could result in experiencing more flow. The work task, which they may be completing, would include using the Internet as a tool, and a means to get the job done. After conducting an independent sample t-test the results showed no significant

differences were found between the mean scores of respondents working within the IT sector and those working within other sectors. These results were based on the number of hours the respondents spent online and their responses to the Problematic Internet Use Questionnaire (PIUQ), the Self-Report (Flow) Scale and to the distraction subscale of the Online Cognition Scale (OCS). The researcher thus concluded that these two groups would be regarded and treated as one sample as no differences were found. It was surprising to find that no differences existed between these two groups. It can therefore be deduced that the respondents in the current study, may not necessarily all be working within the IT sector, however they may be working or heading the IT departments of the various sectors in which they work. Since the research took place on an IT magazine website, there is also a strong likelihood that respondents may have a high degree of interest in Information Technology.

These findings are similar to a study done by Widyanto and McMurran (2004) who reported that 60% of respondents stated that their professions required them to use the Internet. A study done by Ghani and Deshpande (1993) aimed to examine the mediating role of flow on user behaviour and collected data from individuals using computers as part of their day-to-day work. The sample showed results that the concept of challenge had a significant relationship with flow. Perceived control was also found to strongly influence flow. Ghani and Deshpande's (1993) study was consistent with prior research (Ghani, 1991) in that the perceived task challenge and a sense of being in control were the key factors that resulted in the state of enjoyment and intense concentration called optimal flow (Ghani & Deshpande, 1993). People who use the Internet to complete their work are obviously spending more time online

than the average employee, with regards to how much work is completed. Results from the multiple stepwise regression, conducted in the present study, showed that the amount of time spent online is a predictor of problematic Internet use. However, these results should be read with caution, as this is not the only predictor of problematic Internet use. Time spent online represents only one element contributing to the variance of problematic Internet use (Morahan-Martin & Schumacher, 2000). The best predictor of problematic Internet use in the current study was procrastination. If a respondent is spending a large amount of time online but is doing so in order to complete work tasks, then this is not likely to be problematic. However, if the respondent is spending large amounts of time online procrastinating, this is problematic. It is important to distinguish the motives for spending large amounts of time online and the kinds of activities which take place while online.

Correlations were conducted in order to determine the nature of the relationship between the constructs of flow, procrastination, problematic Internet use, and the amount of time respondents spent online. The results of these correlations suggested that there was a strong positive correlation between problematic Internet use and flow, where the correlation was .46. A strong positive correlation of .67 was also found between problematic Internet use and procrastination. In addition, a moderate positive relationship was found between procrastination and amount of time spent online, and a weaker positive relationship was found between amount of time spent online and problematic Internet use, and amount of time spent online and flow. As all these correlations were positively related to each other, it suggests that an increase in the one would result in an increase in the other. For example, an increase in problematic Internet use, may be the result of an increase in experiences of flow while

using the Internet, or it may be a result of the individual using the Internet as a tool for procrastination. In turn, an increase in experiences of flow and a greater amount of procrastination, may be the result of an increase in problematic Internet use due to more time spent online. Research on procrastination has found it to be an indicator of problematic Internet use (Loytsker & Aiello, 1997 as cited in Young, 1998; Davis, Flett & Besser, 2002). This may explain why problematic Internet users typically have occupational and academic difficulties, most likely due to lapses in productivity.

It has been stated throughout this study that the most common problems experienced by Internet users was time management. Haycock (1993) identified the availability of distractions as one of the top reasons contributing to procrastination. The Internet as a distracter is very common in the workplace of today, as it is so widely available and easy to use. It is also interesting to note that the present study indicates that if an individual's experience of flow increases then so too does their level of procrastination ($r = .41$). An example provided here is employees who find themselves consumed in what they are doing, they therefore tend to neglect other important tasks. They may also use the present task that they are so interested in performing as a means to procrastinate or avoid completing other tasks. Therefore it becomes clear that problematic Internet use, flow and procrastination are strongly related. It is the concept of time, and the loss of sense of control, which is the common connector between these three constructs; whether it involves experiencing a sense of loss in time because of high involvement in a task (flow), both positively and negatively in terms of what is being neglected or wasting time by using the Internet to avoid doing other tasks (procrastination).

The theory of optimal flow has been proposed as a useful framework for studying the experience of individuals as they learn and use computers, and for identifying the factors that influence this experience. The results of the current study have explained that many of the respondents experience flow when interacting with the Internet. This may be problematic if the respondents are experiencing this state of flow while doing non work-related activities or if they get too caught up in one task and neglect other tasks, as this may be detrimental to many organisations. The individual may have turned to activities on the Internet due to procrastination, or avoidance of other work tasks. It is viewed positively if the individual is experiencing a state of flow while using the Internet for work purposes, and was not driven there by any sort of distraction. It is also suggestive that respondents only experience negative consequences such as problematic Internet use, if they perceive their use to be a result of procrastination.

This research conducted partial correlations in an attempt to determine whether the relationships between two of the constructs of problematic Internet use, flow and procrastination would be affected in any way if one of the constructs were partialled out. When removing problematic Internet use from the analysis, the relationship between flow and procrastination was affected, as the correlation between these two scales was decreased. This implied that problematic Internet use connected flow and procrastination. Similar results were found when procrastination was removed. Thus, procrastination is seen to also connect and mediate the relationship between problematic Internet use and flow as the correlation decreased to .27 after partialling out. These interesting results seem to be theoretically impossible, as problematic Internet use and procrastination cannot both be predictors of flow. It seems more

viable that procrastination would be the better predictor of flow, as one is more likely to procrastinate first before a flow-state can be experienced The findings in this research indicate that the relationship between problematic Internet use and procrastination is unaffected by their relationship to flow. After flow was removed, the correlation remained fairly stable and still significant at .60, also implying that flow remains independent. These results imply that the relationship between procrastination and flow contribute independently towards predicting problematic Internet use. This can be seen in the results, which show the relationship between procrastination and flow to be affected when problematic Internet use is partialled out. Thus, problematic Internet use is a connector of the relationship between the two. These results also confirm that when individuals use the Internet as a tool for procrastination, they may not necessarily experience a state of flow. Flow remains independent. However, when an individual experiences a state of flow while using the Internet, or while experiencing problematic Internet use, this may be the result of procrastination. It may be the individual's procrastination, which led them to experience problematic Internet use. The partial correlations show that procrastination seems to be a better predictor of problematic Internet use, than flow. The correlation between procrastination and problematic Internet use shows that these two constructs are highly related with a correlation of .67, the highest of all the correlations obtained. Flow does not significantly affect this relationship. After partialling out, the relationship between procrastination and problematic Internet use remained fairly stable. This deduction is further confirmed from the results of the relationship between flow and procrastination when procrastination was partialled out. The correlation was reduced implying that procrastination connects flow and problematic Internet use. In addition, although flow and procrastination are related, it

is the presence of problematic Internet use, which causes a greater relationship to occur between the two. Although not changing the significance, problematic Internet use is seen to affect the relationship and can be seen as a connector of the two constructs.

Several researchers have considered what type of task adversity is best correlated with procrastination. Jobs characterised by lower autonomy, task significance, and feedback, were likely to increase decisional procrastination (Lonergan & Maher, 2000), though were less related to behavioural procrastination (Coote-Weymann, 1988). Instead, behavioural procrastination was most strongly associated with the aversive task components of frustration, resentment, and boredom (Haycock, 1993; Strongman & Burt, 2000). Similar results were found using experimental methodology (Senécal, Lavoie & Koestner, 1997; Sigall, Kruglanski & Fyock, 2000). The more boring and difficult a task was made, the more likely people delayed doing it. Therefore, the more procrastination is experienced, the less flow state is experienced. However, results in the present study show that flow is positively correlated with procrastination, in that an increase in procrastination will also see an increase in the flow experience. It could be argued, and further research would need to be conducted to confirm this, but perhaps respondents working within different jobs find them to be far too difficult or perhaps even bo ring when considering their own skills in successfully completing tasks, and could be an indication of their procrastination. However, the nature of these respondents' jobs would need to be evaluated and the type of procrastination (decisional or behavioural) they experience would need to be determined to make any sound conclusion.

In order to gain a better understanding of the relationships between the constructs of problematic Internet use, flow and procrastination, the researcher conducted a stepwise regression analysis. The researcher also wanted to see what the relationship was between problematic Internet use, not only with flow and procrastination, but also with regards to the amount of time respondents spent online.

The results indicated that there is a significant predictive relationship between the dependent variable (problematic Internet use) and the independent variables (procrastination, flow and amount of time spent online). The entire model was found to be significant and therefore presents sufficient evidence to suggest that an individual's levels of procrastination, experiences of flow at work, and the amount of time they spend online influence their levels of problematic Internet use. The high significance of procrastination, further confirms the proposition made earlier that procrastination may be a better predictor of problematic Internet use. These results show that procrastination, flow and amount of time spent online are each significant predictors of problematic Internet use.

A principal components factor analysis was conducted to further test the overlapping of the three constructs and scales used in the present study, and to investigate if they were distinct from one another. Seven factors were extracted, and the three scales did not separately load on the seven different factors. This provided evidence of concept overlap amongst some of the items within the scales used in the study. It must be noted, that although these concepts overlap, they were not found to overlap as much as theoretically expected.

Most of the items of the Problematic Internet Use Questionnaire (PIUQ) loaded on Factor 1. No other items from the other two questionnaires loaded onto Factor 1. Despite the more obvious overlaps, the Problematic Internet Use Questionnaire (PIUQ) is seen to be relatively distinct form the Self-Report (Flow) Scale and the distraction subscale of the Online Cognition Scale (OCS), as it was the only scale which had items loading onto Factor 1. These items related mostly to the excitement which the Internet provides, and also favouring online activities to everyday tasks. Thus it concerns time management and fantasising about being online when offline. In the study by Thatcher and Goolam (2005) factor 1 showed similar results to the present study, where factor 1 focussed on respondents online preoccupation. Four other items of the PIUQ loaded onto factor 5. These were all grouped around how work and productivity suffer as a result of online usage. No other items from the other two scales loaded onto this factor. In Thatcher and Goolam's (2005) study, they found seven items from the Problematic Internet Use Questionnaire loaded onto a factor they called "adverse effects." The remainder of the PIUQ items loaded onto Factor 4, along with an item from the Self-Report (Flow) Scale. This is the only overlap in constructs. It is clear that these were grouped in terms of control over the Internet interaction and about hiding what activities are being performed online. Therefore, when there is an experience of loss of control found while in a flow state, this is where an overlap is found with regards to problematic Internet use.

The distraction subscale of the Online Cognition Scale (OCS) is seen to be distinct from the other two scales as all the items from the distraction subscale of the OCS loaded neatly onto Factor 2. This was the only loading on Factor 2. Factor 3, showed a loading of the majority of the Self-Report (Flow) Scale items. Seven of the 12 items

from this scale loaded onto Factor 3. No other items from the other two scales loaded on this Factor. In the study done by Webster, Trevino and Ryan (1993), items from the Self-Report (Flow) Scale loaded onto four factors, as in the present study, where one factor was the Curiosity respondents experienced. Two items from the Self-Report (Flow) Scale loaded by themselves onto Factor 6. Webster, Trevino and Ryan (1993) found these items to be loading onto a factor which they named "attention focus." Two items from the Self-Report (Flow) Scale loaded by themselves onto Factor 7. Webster, Trevino and Ryan (1993) also found items from the Self-Report (Flow) Scale loading onto a factor they called "control." From this it can be seen that the distraction subscale of the OCS is completely distinct from the other two scales and, although one item from the Self-Report (Flow) Scale and two items from the PIUQ each loaded more on one specific factor, it can also be seen that there is a small amount of overlap between the items from the PIUQ and from the Self-Report (Flow) Scales. Item 2 from the Self-Report (Flow) Scale: "I feel that I have no control over my interaction with the Internet;" item 9 from the PIUQ: "How often do you become defensive or secretive when anyone asks you what you are doing online?" and item18 from the PIUQ: "How often do you try to hide how long you've been online?" all loaded onto Factor 4. These items question respondents about the control, which they have over their online usage. This can be seen in terms of their individual perception about their online usage as well as the perceptions others may form about them and their online usage.

In summary to answering the research question, there does appear to be a small amount of overlap between the concepts of problematic Internet use, flow and procrastination. The results from the various correlations that were carried out

illustrated that there are positive relationships between the Problematic Internet Use Questionnaire (PIUQ), the Self-Report (Flow) Scale and the distraction subscale of the Online Cognition Scale (OCS) as all correlations were found to be significant and Pearson's correlation coefficient was found to be above .30. Therefore according to the correlations there is strong evidence to conclude that there is a lack of distinction between the three scales, and thus the three constructs. High levels of experiencing one construct will result in experiencing high levels in the other constructs, although possibly for independent reasons. The partial correlations showed that procrastination and problematic Internet use, are both connectors of the relationship found between the other constructs, however flow was found to remain independent and did not affect the relationship between procrastination and problematic Internet use when it was removed. Thus a relationship exists between procrastination and flow and they do each predict problematic Internet use. It was also confirmed from the partial correlations and from the multiple stepwise regression analysis that procrastination may be a better predictor of problematic Internet use. Thus, when procrastination occurs, it is likely to theoretically lead to problematic Internet use, however this may not necessarily be accompanied with the experience of a flow state while interacting with the Internet. From the findings of the factor analysis, one may further conclude that there is a definite overlap between the Problematic Internet Use Questionnaire (PIUQ) and the Self-Report (Flow) Scale. This suggests that in certain circumstances these two constructs will converge, where an individual will experience a flow state when using and controlling their usage of the Internet thus resulting in problematic Internet use, whereas in other cases they will be distinct from one another. Implying that a person experiencing problematic Internet use, may not necessarily experience a state of flow while interacting with and using the Internet.

Theoretical and Practical Implications

The section of this chapter aims to highlight and discuss the theoretical and practical implications of the research findings that were obtained in this study,

This research has shown that the concepts of problematic Internet use, flow and procrastination are very similar to each other at face value, as one can clearly see the overlap which exists from the literature that was obtained. However, for the sample in the current study, the data does not overlap as much as theoretically expected. The results for this particular sample have shown that respondents do not procrastinate by using the Internet; rather, they use the Internet for work purposes as they do work predominantly within the IT sector and spend the majority of their working day interacting with and using the Internet for work purposes. The results obtained indicate sufficient evidence that the use of the Internet for the current sample is more likely a medium which they want to be distracted away from, rather that being distracted by, and so it is not the Internet which they use as a tool for their procrastination.

The kind of information to be elicited by the current study may prove to be particularly beneficial in the development of a number of programmes and interventions, which will aim to assist individuals within organisations in coping with the experience of problematic Internet use in the workplace. In analysing the best predictor of problematic Internet use, namely procrastination, more can be done within an organisation to limit this activity. These strategies and interventions will

not only be expected to assist individuals who directly experience problematic use of the Internet, but will also be expected to prevent their symptoms from negatively influencing other individuals within the organisation, thereby preventing the amplification of the problem. This will not only be expected to further benefit these individuals, who may derive pleasure in being able to carry out their work roles with precision and ease, but will also be expected to benefit the organisation itself, which will be more likely to demonstrate favourable levels of employee satisfaction and productivity, as opposed to the past where it would have been likely to demonstrate low levels of productivity and motivation.

Limitations of the Study

It was voiced by Leedy (1993) that all research studies have shortcomings of some sort. There are a number of limitations that may have affected the final results of this study. These limitations, which may be divided into areas such as the research design, sample and sampling, and the procedure that was followed, will be briefly considered below.

The cross-sectional research design that was used may have influenced the results that were obtained in this study. Cross-sectional research designs, which involve observing subjects at a single point in time, (Babbie & Mouton, 2001) are usually susceptible to what Breakwell, Hammond and Fife-Schaw (1995) refer to as the time of measurement effects. The findings obtained in this study with regards to the relationship between problematic Internet use, flow and procrastination may have

been influenced by an uncontrollable event, which may have influenced the overall findings of the study.

The sample size that was obtained in this study was found to be small when comparing it to the millions of Internet users within South Africa. However, the sample in this study is larger than many previous survey methodologies on problematic Internet use (e.g. Egger & Rautenberg, 1996; Petrie & Gunn, 1998; Davis et al, 2002). It is also noted that the sample size and biographical description of the sample obtained is not wholly representative of the general South African population, as it was posted on an online IT magazine. This implies that the sample is not fully representative of the South African population, creating difficulty in adequately generalising its results to this population. In relation to the representativeness of the demographic categories within the sample, the overwhelming dominance of White individuals may have affected the representativeness of racial groups within the South African population.

The use of volunteer sampling, which relies on the availability of subjects (Babbie & Mouton, 2001) is also a potential limitation to this particular study. This is because employees within the different organisations who may have been experiencing problematic Internet use may have been more obliged, motivated and interested in completing the questionnaire, a trend that is likely to have influenced the findings of the study**.** Rosenthal and Rosnow (1991) believe that the volunteer may only volunteer because they have a vested interest in the topic. This may have occurred in the current study, resulting in employees who experience problematic Internet use

being more likely to respond. While this may be the case, it is a part of social research that cannot be controlled, and could not be avoided in a study of this nature.

In general, it has been argued that self-report questionnaires are prone to response set bias and response styles (Anastasi, 1982). Likert-type scales can be problematic because different combinations of several scale items can result in the same overall score or result (Rosenthal & Rosnow, 1991). Although the preamble attached to the questionnaire informed the respondents that their responses would remain confidential and anonymous, the possibility still exists that they may have provided socially desirable responses. This may have resulted in many respondents who are experiencing problematic Internet use, to not have been found using the Internet problematically.

Another limitation to the current study is that respondents may have easily responded more than once to the questionnaire. Once the final sample had been collected on the database, the researcher did check for duplicates; however respondents may have succeeded in responding more than once to the questionnaire by changing some of their personal particulars, and so making the completed questionnaires different and impossible to differentiate between. While this was controlled as best it could by the researcher it would have been expected to have an effect on the number of completed questionnaires that were returned in the study, and the type of information received.

Another limitation regarding the measurement of flow has been demonstrated in a study done by Pearce and Howard (2004), with 59 student participants, and looked at monitoring the construct of flow during a short online learning activity (40 minutes)

in which deep engagement was essential. The study aimed to find participants move in and out of flow states, as opposed to the current study, which measured flow in a single measure. Pearce and Howard (2004) therefore designed an experiment to monitor flow attributes in a more fine-grained fashion and to observe users' movements amongst the flow states and aimed to measure two measurement techniques that focused on flow as a process and flow as a state. The study measured flow throughout the exercise, and monitored the students' challenge and skill perceptions at the end of each of seven learning activities. The challenge-skill ratios derived from the data categorised students into one of three states 'anxiety', 'boredom' or 'flow' after each activity in the exercise. The results of the study showed that students moved frequently between states during the exercise indicating that flow is a more complex concept than can be represented by a singular measure. In addition, the study observed that flow needs to be regarded as a process that changes throughout an activity (Pearce & Howard, 2004). Therefore taking a single measure of flow, such as has been done in the current study, might not have been sufficiently sensitive.

A final limitation to the current study was the difficulty of accurate assessment of actual Internet use. This was deemed difficult to determine because of underreporting of the amount of hours spent on the Internet, either because of the individual's state of denial or because of the individual losing track of time while using the Internet. It is thus suggested that a more accurate diary-keeping method may be an alternative for future research, in order to gain more accurate responses - provided of course, that respondents agree to keep a diary reporting their Internet use. An additional question, which could have been incorporated, would have been to ask respondents to

stipulate how many hours they spend online for work activities, and non-work activities, as this would have aided the researcher in gaining a better understanding of the reasons for Internet usage in terms of work and pleasure. In addition, it would have also been useful to question respondents on the amount of hours they spend on the Internet every day and not only how long each Internet session is, as was asked in the present study.

While these limitations are significant, this study provides a workable framework for further exploration of problematic Internet users.

Directions for Future Research

Individually, the constructs of problematic Internet use, procrastination and flow have been researched and have gained attention in the past. Problematic Internet use, which is a relatively new research area, has gained very little recognition and attention with regards to its impact on individuals both at home and within the workplace. Although these constructs have been researched independently, no research has looked at the impact these three constructs have on each other, their relationship and interrelatedness and how they overlap.

It is recommended that they be further researched, specifically with regards to their relationship and interrelatedness within organisational settings. This would clarify the present research findings as valid and reliable. It would also contribute to an important field lacking in research as these three concepts combined are all real-life phenomena that affect individuals and organisations on a daily basis.

As many of the results for this study were significant and provided further interesting findings and a better understanding of these constructs, further research regarding the relationships between these three constructs under investigation, is advisable. In addition, there are a number of factors, which have been pointed out as limitations to the present study, which could be improved on for future research. Although a large sample size was obtained, future research should aim for a more demographically representative sample. It should aim to be more wholly representative of the general South African population. By doing so, the results will be more generalisable and will not be dominated by any one type of group within the South African population.

Future research should also practice qualitative research methods by conducting interviews with those individuals found to have problematic Internet use. By combining both quantitative and qualitative methods, more accurate information would be gained concerning the activities of individuals using the Internet and their rationale for using the Internet. This would aid in an accurate assessment of actual Internet use. A more holistic perspective of the Internet user would be gained and would aid in further understanding of problematic Internet use, and factors which affect the continuation of these behaviours.

As has been stated earlier regarding the measurement of flow, although a single measure of flow was taken within the current study, future research could follow the work of Pearce and Howard (2004) and measure flow throughout an activity. This would involve monitoring the construct of flow during a short online learning activity. This seems plausible since flow is a state an individual experiences and moves in and

out of, therefore the flow state should be measured in terms of its duration and intensity.

Taking the current research into consideration, and improving on the limitations which have been mentioned, there are a number of exciting possibilities for future research in the area of problematic Internet use, and looking at concepts contributing to its development and continuation.

Conclusion

The changing nature of the South African workforce has led to many changes in lifestyle patterns of individuals in society. Thus there is an ever-increasing need for up-to-date knowledge in the area of problematic Internet use in the workplace and in one's personal life. The increased interest in this area may be attributed to the fact that individual's experiences of problematic Internet use, are seen to be fundamental in contributing to the functioning of the organisations in which they work. Productivity and motivation levels are seen to decrease if employees steer away from their demands of work and increase their Internet behaviours for non work-related activities.

This study aimed to investigate the nature of the relationship between problematic Internet use, flow and procrastination. Having established that there were significant relationships between these three constructs, it then aimed to establish what kind of relationship exists between these and whether flow and procrastination could be predictors of problematic Internet use. The study also examined differences within the present sample in terms of the sectors in which the respondents worked and also compared variables between those respondents who experience problematic Internet use, and those who do not. The findings of this research suggested that flow and procrastination are significant predictors of problematic Internet use. This finding is important for our current knowledge base, where organisations may use this knowledge to better their productivity levels and ensure measures to look after employees experiencing problematic Internet use, not only to help the individual, but also to ensure a healthy work environment for all to strive and grow in. Ultimately, to secure a more successful future for the organisation. This study suggests that

problematic Internet use is a relevant and important topic when measuring constructs such as flow and procrastination, and for continuing information systems research. It is clear that the overlapping of these three constructs are important determinants for future workplace dynamics and productivity outcomes. Organisations would thus aid in learning more about employees' behaviours at work and their approaches to work tasks.

It is believed that this study represents an important step in furthering the empirical study of problematic Internet use and will provide a basis for future work in this area. The findings of the current study, as mentioned above, are therefore essential in that they may assist industrial/organisational psychologists in developing coping strategies and interventions, which will aim to assist individuals within the organisation in coping with the experience of problematic Internet use. This will not only be expected to benefit individuals who directly experience the costs and consequences of problematic use, thereby benefiting their families and those in their immediate surroundings, but will also be expected to benefit the organisation, who will not only be comprised of more healthy individuals, but will also be likely to demonstrate, and reap the benefits of, more favourable levels of productivity.

Millions of people around the world use the Internet to find information, communicate with friends, work, play, and otherwise function well on this medium. The Internet should not be viewed as a negative resource, nor should it be vilified. On the contrary, the Internet is an exciting medium that is constantly evolving into an essential part of daily living. Healthy Internet use refers to using the Internet for an expressed purpose in a reasonable amount of time without cognitive or behavioural

discomfort. Healthy Internet users can separate Internet communication with real life communication. They employ the Internet as a helpful tool rather than a source of identity. This study shows that we must be aware of the negative consequences of overuse and misuse of the Internet, and understand the behaviour of people who use it in a problematic way.

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Appendix A

Subject Information Sheet

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Psychology
School of Human & Community Development
Private Bag 3, Wits 2050, South Africa. Telephone: +27 11-717-4500/2/3/4. Fax: +27-11-717-4559

Hello. My name is Gisela Wretschko. I am a student at the University of the Witwatersrand doing my Masters degree in Industrial Psychology. I am currently doing research in the area of problematic Internet use, looking at how employees are spending large amounts of time on the Internet often doing tasks unrelated to work and therefore decreasing work productivity. I am also looking at flow and how employees become so positively involved in the work they are doing, they feel a sense of 'loss in time" and lastly I am looking at procrastination in the workplace. I would like to invite you to participate in this study.

Participation in this research will involve completing the following questionnaires, and should take no longer than 20 minutes to complete. Participation is voluntary, and your responses will remain confidential. Your completed questionnaires will only be processed by myself and your responses will only be looked at in relation to all other responses. This means that at the end of the research, feedback will be given in the form of group responses and not individual perceptions, that is, you will remain anonymous.

If you choose to participate in the study please complete the following questionnaires as carefully and honestly as possible. Your responses will go into a database and will only be used for the purpose of this research. This will ensure that no one will have access to the completed questionnaires, and will ensure your confidentiality.

Thank you for taking the time to consider participating in this study. This research will contribute to a larger body of knowledge of workplace dynamics. Feedback on the results of this research will be posted on the IT Web website.

Kind Regards

Gisela Wretschko
gwretschko@webmail.co.za
0824512502

Appendix B

Biographical Information Form

Please complete the following information, which will be used for descriptive purposes:

Gender

Male	Female

Race

White	Black	Indian	Coloured	Other

Age

18 - 23	24 - 29	30 - 35	36 – 41

42 - 47	48 - 53	54 - 59	60+

What is your highest level of education?

Bachelors	Certificate	Diploma	Doctorate

Honours	Masters	Matric

What is your present occupation? _____

What is your job title? _____

What sector do you work in?

Consulting	Design	Education	Engineering	Financial

Government	Human Resources	Information Technology	Legal	Professional

Sales and Marketing	Technical	Other (please specify)

Are you a full-time or part-time employee?

Full-time	Part-time

Present marital status

Single	Married	Divorced

Appendix C

Internet Use Form

Where do you connect from? (Select all applicable items)

Work	
Home	
Cyber/Internet Café	
Family	
Friends	
Other	

How do you usually connect?

Dial-up access	Direct access (ie Lan, leased line)

How long have you been using the Internet?

< 6 months	6-12 months	1-2 years

2-5 years	5-8 years	>8 years

How many days a week on average do you use the Internet? _____

How long is your average Internet session? _____

Which of the following Internet resources do you use?
(Select all applicable items)

World Wide Web (WWW)	
Chat sites	
Peer-to-peer file sharing systems	
Newsgroups	
Telnet	
E-mail	
Online games	
File transfer Protocol (FTP)	
Instant messaging	
Other (please specify)	

Appendix D

Problematic Internet Use Questionnaire

Please answer the following questions using the following scale:

Not Applicable or Rarely	-1
Occasionally	-2
Frequently	-3
Often	-4
Always	-5

(1) How often do you find that you stay online longer than you intended?

1	2	3	4	5

(2) How often do you neglect household chores to spend more time online?

1	2	3	4	5

(3) How often do you prefer the excitement of the Internet to intimacy with your partner?

1	2	3	4	5

(4) How often do you form new relationships with fellow online users?

1	2	3	4	5

(5) How often do others in your life complain to you about the amount of time you spend online?

1	2	3	4	5

(6) How often does your work suffer because of the amount of time you spend online?

1	2	3	4	5

(7) How often do you check your e-mail before something else that you need to do?

1	2	3	4	5

(8) How often does your job performance or productivity suffer because of the Internet?

1	2	3	4	5

(9) How often do you become defensive or secretive when anyone asks you what you are doing online?

1	2	3	4	5

(10) How often do you block out disturbing thoughts about your life with soothing thoughts on the Internet?

1	2	3	4	5

(11) How often do you find yourself anticipating when you will go online again?

1	2	3	4	5

(12) How often do you fear that life without the Internet would be boring and empty?

1	2	3	4	5

(13) How often do you snap, yell, or act annoyed if someone bothers you while you are online?

1	2	3	4	5

(14)How often do you lose sleep due to late-night log-ins?

1	2	3	4	5

(15)How often do you feel preoccupied with the Internet when offline, or fantasise online?

1	2	3	4	5

(16)How often do you find yourself saying “just a few more minutes” when online?

1	2	3	4	5

(17)How often do you try to cut down the amount of time you spend online and fail to do so?

1	2	3	4	5

(18)How often do you try to hide how long you’ve been online?

1	2	3	4	5

(19)How often do you choose to spend more time online over going out with others?

1	2	3	4	5

(20)How often do you feel depressed, moody, or nervous when you are offline, and these feeling go away once you are back online?

1	2	3	4	5

Appendix E

Distraction subscale of the Online Cognition Scale

For each statement, please decide whether you agree or disagree, using the following 7 point scale.

Strongly Disagree	-1
Disagree	-2
Slightly Disagree	-3
Neutral	-4
Slightly Agree	-5
Agree	-6
Strongly Agree	-7

(1) When I am online I don't think about my responsibilities.

1	2	3	4	5	6	7

(2) When I have nothing better to do, I go online.

1	2	3	4	5	6	7

(3) I find that I go online more when I have something else I am supposed to do.

1	2	3	4	5	6	7

(4) When I am online, I don't need to think about offline problems.

1	2	3	4	5	6	7

(5) I sometimes use the Internet to procrastinate.

1	2	3	4	5	6	7

(6) I often use the Internet to avoid doing unpleasant things.

1	2	3	4	5	6	7

(7) Using the Internet is a way to forget about the things I must do but don't really want to do.

1	2	3	4	5	6	7

Appendix F

Self-report (Flow) Scale

Please answer the following statements using the following scale:

Strongly Disagree	-1
Disagree	-2
Slightly Disagree	-3
Neutral	-4
Slightly Agree	-5
Agree	-6
Strongly Agree	-7

(1) When using the Internet, I feel in control.

1	2	3	4	5	6	7

(2) I feel that I have no control over my interaction with the Internet.

1	2	3	4	5	6	7

(3) The Internet allows me to control the computer interaction.

1	2	3	4	5	6	7

(4) When using the Internet, I think about other things.

1	2	3	4	5	6	7

(5) When using the Internet, I was aware of distractions.

1	2	3	4	5	6	7

(6) When using the Internet, I was totally absorbed in what I was doing.

1	2	3	4	5	6	7

(7) Using the Internet excites my curiosity.

1	2	3	4	5	6	7

(8) Interacting with the Internet makes me curious.

1	2	3	4	5	6	7

(9) Using the Internet arouses my imagination.

1	2	3	4	5	6	7

(10) Using the Internet bores me.

1	2	3	4	5	6	7

(11) Using the Internet is intrinsically interesting

1	2	3	4	5	6	7

(12) The Internet is fun for me to use.

1	2	3	4	5	6	7