# Key human factors in the e-readiness of academic employees at higher education institutions

**Luni Vermeulen***

## Abstract

The increasing use of technology in teaching and learning brought about changed work environments and changed job requirements for academic employees at higher education institutions, necessitating their e-readiness. However, all academic employees do not necessarily embrace the use of technology in teaching and learning.

Research was conducted to determine the e-readiness of academic employees of the North-West University, Potchefstroom Campus, in South Africa, and the role of key human factors in their e-readiness. The empirical results revealed that key human factors such as pace and style of technology adoption, preferred learning style and personal work behavioural style, play a role in their e-readiness. Thus, considering the importance of academic employees' e-readiness, it is argued that these key human factors need to be assessed with a view to enhance academic employees' e-readiness. In this respect the article argues that the e-readiness assessment of academic employees must be included in the human resource performance appraisal process.

As outcome of the research, a framework was developed for assessing the e-readiness of academic employees during their performance appraisals, as well as determining and assessing the role of key human factors in their e-readiness in order to draft an e-profile which will provide guidance in terms of structuring unique training and development approaches for each e-profile.

**Key words:** E-readiness, key human factors, pace and style of technology adoption, learning style, work behavioural style, academic employees, higher education institutions

*PhD Public Administration, Senior Lecturer, School of Social and Government Studies Faculty of Arts, North-West University, Potchefstroom Campus, South Africa. Luni.Vermeulen@nwu.ac.za

## Introduction

The technological revolution of the 21st century presents higher education institutions (HEIs) with one of the biggest adaptation challenges in its history (Amirault & Visser, 2009:62; Smyre, 2006; Tadmore, 2006: 287; Carnesale, 2000: 3–4;7). Higher education institutions should either adjust to this innovative reality or they will be in danger of losing their standing as principal educational institutions (Amirault & Visser, 2009: 62; Bates, 2010). In many instances the use of e-learning at South African HEIs has become increasingly important (Le Roux, 2009; Njenga & Fourie, 2010: 199; Mutula, 2003: 1), not only for creating new teaching and learning opportunities by means of greater knowledge sharing than traditional classroom teaching and learning and control over time, place and pace of study, but also in providing access to resources beyond the borders of those traditionally available in university libraries (JISC, 2009: 8; Stone, 2008: 526; SA, 2004: i).

The online learning facilitator, that decides which technologies to use and how it should be used, plays a significant role in this process (JISC, 2009: 8; Achimugu Oluwagbemi & Oluwaranti, 2010: 27). Online learning facilitators need to be aware of the various tools and media that are available and how to select and use those that will best serve the learning purpose (JISC, 2009: 8; Takalani, 2008: 1–2). E-learning[1] as blended approach to teaching and learning, with the skilful and suitable incorporation of technology with face-to-face classroom teaching (Cardwell & Madigan, 2004: 26–27; University of Calgary, n.d:1; Dziuban, Moskal & Hartman, 2005: 4; cf Graham, 2004: 3), is a significant element of 21st century teaching and learning practice (JISC, 2009: 9).

Furthermore, the profile of the current day student has changed from that of a traditional student. The average tertiary student is between 18 and 25 years old with the vast majority

---

[1] For the purpose of this research, e-learning is not regarded as a distance learning or remote learning tool, or a specialist area, but it is regarded of the broader aim of enhancing teaching and learning through the use of suitable technology (JISC, 2009: 6–8). The focus of e-learning is on the enhancement of learning by more effective and comprehensive use of digital technologies (JISC 2009: 8) and is therefore not intended to replace the teacher, but to use technology to increase the focus on pedagogic skills (JISC 2009: 5). E-learning should employ ICT skills to access, analyse, evaluate, integrate, and present information; to create knowledge and new information by adapting to and functioning in a knowledge society by using suitable technology and communicate information; by constructing information; and by mastering communication and collaboration skills (SA, 2004: 14).

between 18 and 22 years (HEMIS, 2010) and can be categorised as Generation Y. Generation Y refers to people born between 1980 and 2000 (Naidoo, 2005). This age category refers to Generation Y in the United States of America; in the South African context these students are mostly regarded as born from 1990 onwards (Steyn, Badenhorst & Kamper, 2010: 177; 185; cf Msimang, 2008).

Within this context of technological development, the needs and preferences of the 21st century student, the changing higher education environment, the increasing use of technology in teaching and learning, and the significant role of online learning facilitators in e-learning, the e-readiness [2] of academic employees (hereafter referred to as academics) became imperative. In order to enhance the e-readiness of academics, it is necessary to assess their level of e-readiness against particular criteria. The article therefore argues for the inclusion of the assessment of the e-readiness of academics during human resource performance appraisals. The article also explains the relation between key human factors and e-readiness. For the purpose of this study key human factors such as personal work behavioural style, preferred learning style and pace and style of technology adoption are considered. The impact of these human factors on the e-readiness of an academic is established in the article.

As outcome of the research, a framework was developed for assessing the e-readiness of academic employees during their performance appraisals, as well as determining and assessing the role of key human factors in their e-readiness in order to draft an e-profile which will provide guidance in terms of structuring unique training and development approaches for each e-profile.

**Research methodology**

An extensive review of scholarly literature was conducted on the various aspects related to key human factors in the e-readiness of academics. A literature review was also conducted on e-readiness and the assessment of the e-readiness of academics through human resource performance appraisals, providing a theoretical framework.

---

[2] For the purpose of this research *e-readiness* refers to the willingness and preparedness of academics to use e-learning in teaching and learning, implying that they have the necessary technical skill, the skill to use and adapt teaching and learning strategies that best suit e-learning, the psychological readiness to use technology in teaching and learning, and the ability to use e-learning to optimally enhance learning.

The article follows an explanatory approach. Explanatory research aims to provide explanations of phenomena (Durrheim, 2009: 44). In the article the researcher explains the role of particular key human factors on the e-readiness of academics. Further, the research design was developed in consideration of the interpretive paradigm. The interpretive paradigm sustains the belief that the reality that is studied consists of people's subjective experiences of the external world (Terre Blanche & Durrheim, 2009:7). In this article it is argued that the e-readiness of academics, consist of their subjective perceptions of the use of technology in teaching and learning.

Empirical research was conducted by means of both quantitative and qualitative approaches. Through the empirical research, the most common work behavioural styles amongst academic employees at the Potchefstroom campus of the North-West University (NWU), used as case study for the research, were determined.

A qualitative method was chosen for data collection in order to explain the subjective reasons and meanings that lie behind employees' teaching and learning perceptions pertaining to the use of technology in teaching and learning, and how their perceptions, that lead to their chosen approaches, correlate with their work behavioural style. For this purpose, the technique of a focus group discussion and interviews was used. For the focus group discussion 20 academics were purposefully selected to participate, of which 10 were able to. The availability of academics played a role in this selection. Participants were purposefully selected to include employees that use various approaches to teaching and learning.

The use of technology in teaching and learning was used as the yardstick for academics' willingness to make use of innovative teaching and learning approaches. The focus group thus included employees who are relatively comfortable using technology in teaching and learning and have a certain level of e-readiness, as well as those employees who are either not using technology at all or are only using it because they are expected to, are not e-ready and do not understand the advantages of the available technology. In addition to the focus group discussion, interviews were held with various e-learning and human resource management (HRM) specialists at the NWU. The interviewees were selected for their expert knowledge in these fields.

A quantitative method was, however, also chosen for data collection. For this purpose, the survey technique was by means of a self-administered questionnaire that was used to collect

data to determine academics' subjective perceptions of the use of technology and/or innovation in teaching and learning. The questionnaire was distributed to 300 permanently appointed academics at the Potchefstroom campus of the NWU via electronic mail. Eighty five (85) completed questionnaires were returned.

**Rationale for e-readiness assessment of academic employees**

As alluded to in the Introduction, the use of technology in teaching and learning brought about changed work environments and changed job requirements for academics at HEIs (cf OECD, 2004). The changed job requirement compels academics to adapt to new job requirements. All job incumbents did not necessarily change with the new job requirements associated with their jobs and therefore did not necessarily embrace the use of technology in teaching and learning for several reasons. Research (Proctor & Doukakis, 2003: 268; Robbins, 2003: 559–560) shows that employees usually resist change in the workplace due to various reasons such as inter alia, fear of the unknown, habits (comfort zones), inadequate information and communication, threats to status, fear of failure and lack of perceived benefits. It is, however, important that academics adapt to changing job requirements in order for the university to remain relevant in times of change (Amirault & Visser, 2009: 62) and to be able to optimally be of service the 21$^{st}$ century student, predominantly belonging to Generation Y (HEMIS, 2010; Halse & Mallinson, 2008: 1). The changed job requirements therefore call for the e-readiness of academics to enable them to successfully take on the use of e-learning as a learning enhancing tool.

From a human resource management perspective it can be argued that it is important to enhance the e-readiness of academics through training and development to ensure employees are well-skilled and capable to fulfil the new job requirements. The NWUs policies are in support of providing students with the best possible education and learning experiences. However, an academic that is not e-ready will not be able to use e-learning optimally as learning tool. This lack of e-readiness can most probably be attributed to a number of factors such as challenging technology, a lack of sufficient computer literacy, inadequate technology-related training, an inability to make the paradigm shift from traditional classroom teaching and learning to e-learning, a lack of understanding the use and purpose of e-learning, an increased workload, fear of the unknown and a threat to the comfort zone, to name a few (cf Bozarth, 2006: 2–4; cf Kottolli, 2008: 1).

As further also alluded to in the Introduction, it is necessary to assess academics' level of e-readiness against particular criteria in order to enhance their e-readiness. The article therefore proposes that the assessment of the e-readiness of academics should be included during their human resource performance appraisals. It is further argued that human factors impact on an employee's e-profile and should thus be assessed to determine an employee's level of e-readiness. A personal development plan will subsequently be drafted for each employee. For this assessment and development purpose a theoretical framework is developed where employees can be plotted according to their personal work behavioural style, preferred learning style and pace and style of technology adoption. The framework will thus make provision to identify uniquely structured training and development interventions that should be introduced through the employee development process. It will also make provision for which motivational strategies should be applied to enhance e-readiness and performance of academics. Presently, neither the literature of human resource performance appraisal nor the literature of e-readiness or e-learning makes provision for particularly assessing the e-readiness of academics. Furthermore, the e-readiness of academics is currently not included in their performance appraisals at the NWU as it is not yet compulsory for employees to use in their teaching and learning (De Wit, 2010).

In addition to the requirement of e-readiness, academics need to realise that the same teaching and learning strategies applied for traditional classroom learning cannot be used for online learning. The use and implementation of e-learning as a changed job requirement calls for academics at HEIs to acquire not only new skills to teach online, but also how to use online resources and tools to enhance the learning experience and facilitate communication for learning to take place (JISC, 2009: 7). Communication in the online environment is different from face-to-face communication, as it can be both synchronous and asynchronous and is not time dependant (Huang, 2002: 28; Miller, 2005: 1). In support of this notion, the importance of communication and support from academics as a significant factor to their online learning experience, is constantly highlighted by students (Sutton, 2004; Alexander, 2001 :242).

As mentioned, currently, the majority of undergraduate students can be categorised as Generation Y (cf HEMIS, 2010) and was born in an era of technological and sociological change (Kezi, 2009: Online1). This generation prefers learning to be fun, relaxed and interactive and therefore a traditional teaching and learning approach does not appeal to them

(Gleeson, 2003: Online4; Price, 2009: 3; cf Naidoo, 2005: Online). According to Halse and Mallinson (2008: 1) students belonging to Generation Y portray particular characteristics which impact on their interaction with others and their environment, how they connect and learn, as well as the assortment of technologies they use to do so. They are characterised by a high level of technical literacy (Gen Y Report, 2010: 24; Song, Singleton, Hill & Koh, 2004: 59). Some of the technologies often used by this generation include live virtual classrooms, podcasts, blogs, social networks and collaborative editing (Halse & Mallison, 2008:1). Considering these characteristics and technologies this generation prefers, can guide academics to adapt or customise teaching and learning approaches to enhance learning (Halse & Mallinson, 2008: 1; cf Song et al., 2004: 59) by inter alia, making use of technology in teaching and learning.

In an interview with the Section Head: Information Technology Support at the NWU, Potchefstroom Campus, it was revealed that the majority of academics make use of only the basic applications of e-leaning, namely the communications tools (*messages* and *announcements*) and information tools (providing *resources*, and a *schedule*), but do not use technologies such as *podcasts*, *blogs*, *forums*, *wikis* and *social networks* which are the typical technologies that appeal to this generation of students and therefore the e-learning platform is not used innovatively to enhance the learning experience (Le Roux, 2009). The Section Head: Information Technology Support also indicated that in many instances academics make use of the e-learning platform because it is expected of them by their line managers, but that it is not used in a manner that facilitates learning to take place (Le Roux, 2009). E-learning interventions are therefore usually not interactively and creatively applied, which can easily cause disinterest and boredom with the Generation Y learners. This situation further stresses the need for an adjustment of teaching and learning strategies to use e-learning as a learning enhancing tool, which can be handled through training and development. It can be argued that full time residential students from this generation will embrace a blended approach of learning where technology is incorporated in the learning experience. It is therefore evident that academics at HEIs cannot *ad infinitum* continue to use traditional classroom teaching and learning strategies and need to incorporate e-learning in their teaching and learning strategies.

Furthermore, Rautenbach (2007: 16) indicates that teaching and learning has changed. Outcomes-based education (OBE) principles call for a changed role of both the learner and the facilitator where learners must have more independence and must control their own

learning events (Rautenbach, 2007: 16; Butler, 2004: 11; Gunderman, Williamson, Frank, Heitkamp & Kipfer, 2003: 16). The facilitator is no longer a traditional teacher (someone who provides knowledge), but a facilitator of learning (someone who enables learners) (Rautenbach, 2007: 16). Ramsden (2003: xii) is of the opinion that the first step to become a good facilitator is to understand learners' experiences of learning. Milliken and Barnes (2002: 225) indicate that this implies that teaching and learning strategies may have to be adapted to focus on the enhancement of learners' learning. The application of new technology can be brought into play to improve both the teaching and learning experience (Milliken & Barnes, 2002: 226; SA, 2004: 8). However, all academics do not necessarily understand the need to adapt their teaching and learning approaches or the need to use technology to enhance the learning experience. It is argued that certain key human factors play a role in this regard.

## Key human factors

Johannes (2007: 63) asks the question: "If we need new roles, new pedagogical approaches, new knowledge and skills and new online environments for the e-learning practice, should we not also look at new attributes for the person performing the job?" This question makes sense as the success of e-learning depends to a great extent on the competence and communication of the academic (JISC, 2009: 8; Achimugu et al., 2010: 27; Cardwell & Madigan, 2004: 26–27; Dziuban et al., 2005: 4). Human factors are thus significantly important.

Employees will react differently to the changed job requirement and some will resist it (Proctor & Doukakis, 2003: 268), for the reason that employees have different personalities, intelligence, abilities, values, backgrounds and attitudes which influence their behaviour (Armstrong, 2006: 240–244). It is therefore necessary to understand and appreciate the factors that affect how employees behave in the work environment to manage them effectively (Armstrong, 2006: 239). Particularly when employees are confronted with a new job requirement, it calls for managers to be sensitive, communicate well, provide the necessary support and motivate employees (Landes, 2006: 29; Gitman & McDaniel, 2008: 187; Hansson, 2009).

The article therefore emphasises the importance of considering key human factors when introducing a new technology. The DISC-factors of Thomas International (N.d.) are used as guideline for personal work behavioural style and are brought into relation to the likely e-

readiness profile of an academic. Further, the learning styles of Honey and Mumford (1982) are discussed with a view to determine the impact of employees' learning style preference on their technology adoption. The technology adoption cycle of Rogers (1962) is used to discuss the pace and style of technology adoption, as the technology adoption categories of the cycle reflect academics' levels of e-readiness. The interrelatedness of these human factors also receives attention.

## Pace and style of technology adoption

An employee's pace and style of technology adoption refer to the characteristic individual manner in which an employee will respond or adapt to a new technology or innovation (*style*) and how fast or slow the employee will adopt (*pace*). The article argues that style and pace of technology should also be assessed with the e-readiness assessment of an academic and the subsequent development process.

Employees have different rates of technology adoption; therefore Rogers (1995: 262) indicates various adopter categories. The diffusion model of Rogers (1995: 262) proposes five adopter categories, namely *innovators*, *early adopters*, *early majority*, *late majority* and *laggards*. Zemsky and Massey (2004) use these categories to illustrate e-learning's pattern of innovation and change. The categories can be summarised as follows:

- **Innovators** (2%): These are learners who enjoy exploring new ideas and are driven by intrinsic motivators.
- **Early adopters** (13%): These are learners who adopt once the concept has been proven. They are viewed as opinion leaders and decision-makers who have the vision to adapt an emerging technology to an opportunity and are driven by extrinsic motivators. They have the foresight to match an emerging technology to a strategic opportunity (Oliver, 2001:6).
- **Early majority** (35%): These are the eventual users of technology who do not like to take the risks of pioneering, but see the advantages of tested technologies driven by usability and success of the technology; they are the beginning of the mass market.
- **Late majority** (35%): These are learners who adopt when half of the population has already done so. They are followers who dislike the disruptions of new technologies and are more conservative.

- **Diehards (laggards)** (15%): These are learners who resist adopting innovations and perform the valuable service of regularly pointing out the discrepancies between the day-to-day reality of the product and the claims made for it (Beshears, n.d.).

Carr (2007: 9) explains that for *innovators* and *early adopters*, the existence of a technology in itself will be reason enough for them to pursue it, since they have a natural willingness and interest to explore. One can argue that *perceived usefulness*[3] and *perceived enjoyment*[4] will be high for these groups. Their *perceived ease of use*[5] may also be high since these are the people that are willing to face challenges and overcome obstacles easier than people in the other categories.

However, the *early majority* (and the other adopter categories to follow them) have a tendency to find use in something usually only when it relates to problems in their own disciplines (Zemsky & Massey, 2004: 9–10). Only if it can be confirmed that the new technology is effective, efficient and effortlessly applied to their focused needs, they will be likely to adopt it (Zemsky & Massey, 2004: 10). It could be argued that employees falling in the *early majority* and *late majority* categories of the technology adoption cycle may need to be encouraged to use technology in teaching and learning by the use of motivators such as incentives or rewards, as there is resistance to some extent, and they need a certain degree of convincing or motivation.

However, Rogers (1995: 221) indicates that employees who receive incentives for adoption to e-learning possibly will change the patterns of adoption. The use of incentives will probably lead to faster adoption by employees who would have otherwise adopted slowly or not at all, and can negatively affect sustainability of adoption (Rogers 1995: 221). Incentives can thus enhance the rate of adoption, but it is possible that it may cause a reduction in quality (Elgort, 2005: 183). It is therefore necessary that line managers do not haphazardly use incentives and rewards to motivate academics towards increased use of e-learning, but that it is well-planned, thought through and connected to an employee's e-profile. Important

---

[3] *Perceived usefulness* refers to ''the degree to which a person believes that using a particular system would enhance his/her job performance'' (Davis 1989: 320 in Roca & Gagné 2008: 1586; cf Adams, Nelson & Todd 1992: 227–228; Shen, Lin & Huang 2006: 272).

[4] *Perceived enjoyment* is the "the extent to which the activity of using a computer system is perceived to be personally enjoyable in its own right aside from the instrumental value of the technology'' (Sun & Zhang 2006: 620; Davis et al 1992 in Roca and Gagné 2008: 1587; Dickinger, Arami & Meyer 2008: 5).

[5] *Perceived ease of use* refers to ''the degree to which a person believes that using a particular system would be free of physical and mental effort'' (Davis 1989: 320 in Roca & Gagné 2008: 1587; cf Adams et al 1992: 227–228; Shen et al 2006: 272).

in this respect, is that training and development should be focused broader than the obtainment of a technical skill, but should also include the philosophy of e-learning pertaining to its use and purpose. The benefits and use of e-learning as learning tool should rather be the motivating factor.

It can further be argued that *perceived enjoyment* will be low for these categories as they are slower to adapt and will probably only start enjoying the new technology, once they obtained the skill and experience the benefits thereof. Therefore, their *perceived usefulness* may be moderate to high, as they may be able to understand the benefits of the new technology, but their *perceived ease of use* will be low until the technology has been mastered.

Employees of the *innovator* category will typically be intrinsically motivated and eager to take on challenges. An *innovator* therefore, will most likely embrace the change and job demand and not portray a lack of e-readiness. The *early adopter* category will also accept the new challenge relatively easily, as they are visionary thinkers, opinion leaders and change agents. It is important that leaders in HEIs focus on how to cross the gap between these two groups (*innovators* and *early adopters*) and the *early majority* (mass market), since the *early majority* will adopt slower and portray resistance to some extent to the new technology. This is usually the biggest component of employees in the institution and it is therefore imperative that managers should consider how to motivate these employees to firstly adapt to the new technology and secondly to determine training and development interventions to enhance performance.

In addition to the level of technology adoption, each employee has a different style of approaching learning and adapting to a new concept or job demand (Dewhurst & FitzPatrick, 2007: 14). A number of these learning styles will be outlined in the following section and it will be determined how these learning styles impact on an academic's e-readiness.

**Learning styles**

Learning styles refer to various approaches or techniques of learning and involve educating methods, which seemingly allow learners to learn effectively (Guild, 2001: Online; Park & Lee, 2001: Online656; Felder & Henrique, 1995: 21; Azhar, 2008: Online5). The way in which learners prefer a particular way to interact with stimuli and information is termed their learning style (Palade, Howlett & Jain, 2003: Online1230; Felder & Henrique, 1995: 21).

Research done by Swinton (2006: Online1) reveals that everybody has a preferred learning style; employees will learn more successfully if they can use their preferred learning style (Swinton, 2006: Online1; cf Robbins, 2009: 459). On the other hand, employees are likely to be discouraged if the only learning opportunities available to them do not allow them to use their preferred learning style and it will therefore affect their ability to learn (Swinton, 2006: 1; Robbins, 2009: 459). Learning styles influence the manner in which individuals attach their own meaning to the subject matter or skill being taught (Roy 2006: 22). Online teaching and learning must therefore be structured in such a manner that it makes provision for all learning styles (Salmon, 2003: 110).

Academics' learning style preferences play a significant role in their adoption to the use of technology in teaching and learning and therefore, their e-readiness. For instance, right brain dominated people may prefer a holistic and visual approach, while left brain dominated people may prefer a systematic, step-by-step approach (Vermeulen, 2005: 8). Employees have different traits, such as skills, aptitudes and preferences for processing information and constructing knowledge from information, and therefore provision should be made that they can learn in the manner with which they are most comfortable (Magoulas & Chen, 2006: 327).

Further, for the purpose of enhancing an employee's e-readiness, it is important to take into consideration that the ideal is to use a combination of active, practical, theoretical and reflective learning activities (Honey & Mumford, 1982: 25–29; Dewhurst & FitzPatrick, 2007: 14; Arp, Woodard & Mestre, 2006: 29; Boyatzis & Kolb, 1995: 3). There is a universal acceptance amongst researchers in the field of learning styles that a learner's learning approach influences his/her performance and attainment of outcomes (Cassidy, 2004: 420). Assessing the learning styles of academics can therefore assist in understanding how employees learn and which approach should be applied to maximise employees' motivation towards e-learning and their eventual performance.

Jackson, Furnham, Forde and Cotter (2000: 223) point out that a connection exists between learning styles and occupation personality types (Bakx, Van der Sanden & Vermetten, 2002: 1229; Jackson & Lawty-Jones, 1996: 293). Although this article does not focus on individual personality styles, this premise supports the notion that an individual's learning style is to

some extent connected to a person's personality. It also emphasises the usefulness of including the assessment of an academic's learning style (which will partly indicate the personality type of the employee) in the performance appraisal with a view to draft a training strategy, consistent with the employee's learning style preference.

Various learning styles and models are indicated and researched by psychologists, but for the purpose of this article the learning styles of Honey and Mumford (1982) were chosen. The following learning style categories are identified by Honey and Mumford (1982: 25–29):

- **Activists** – individuals who prefer to deal with new challenges and experiences and should receive a range of activities to keep them interested.

- **Pragmatists** – individuals who require a link between the training and the end-result required of them. They will determine the practical value and use of what they are being taught.

- **Theorists** – individuals who require good structure and sufficient time to explore the relevance between ideas and scenarios. They are analytical and detail-conscious and need to think things through in a logical step-by-step manner.

- **Reflectors** – individuals who spend a significant amount of time to think intensively about the activities and concepts provided to them online. *Reflectors* fall into the category that probably benefits the most from web-based teaching and learning (Liu, 2007: 41). Downing and Chim (2004) in Liu (2007: 41) found that individuals who are *reflectors* tend to be extroverted in the online environment whereas they may be introverts in the traditional classroom setting.

It can be argued that academics that are *activists* can be compared to the *innovator* and *early adopter* of the technology adoption cycle, who is an employee with a vision of the benefits of technology in teaching and learning. The *activist* will, however, prefer to be the leader and rather give direction (cf Honey & Mumford, 1982: 56). It can be argued that both the *perceived enjoyment* and *perceived ease of use* of employees belonging to these categories will be high. *Activists* thrive on new challenges and if an activating learning style is combined with an *innovator* category of technology adoption, it can be assumed that the employee will embrace the new job demand and will enjoy trying out online tools and possibilities. Employees, portraying the *activist* learning style will also perceive the

technology to be *easy to use* as they do not fear new, unfamiliar challenges and are likely to "play around" with the new technology and *enjoy* the experience while they are mastering it.

The *pragmatist* may be compared to people falling under the *early majority* category of the technology adoption cycle. This group will make the paradigm shift from traditional classroom teaching and learning to e-learning once the concept has been proven. It can therefore be argued that the *perceived ease of use* will be very important to an employee portraying the pragmatist learning style. As long as they are not convinced of the use and purpose of the technology they will not adopt to using it. The same can be said regarding their *perceived enjoyment*; when they realise the possibilities of the use and purpose of e-learning and the rationale behind it, they will start using it and in the process start enjoying it as they have realised its value in learning.

The *theorist* may be compared to people in the *early majority* or *late majority* category, needing more time to become familiar with the use of technology in teaching and learning. They will analyse and review information before they adopt the use of technology in this way and will eventually make the paradigm shift. Once they adopt the use of technology for e-learning, they tend to flourish in the online environment owing to their systematic and analytical approach (Arp et al., 2006: 30). The *reflector*, similar to the *theorist*, may be compared to people in the *early majority* and *late majority* category. Prior to adopting the use of technology, they will consider it intensively and listen to others' views, considering them before taking action or incorporating their own views. With both the *theorist* and *reflector* learning styles *perceived ease of use* will take time as employees belonging to these learning style categories take time thinking concepts over, especially if combined with the *early majority* and *late majority* categories, which also take time to determine the use of e-learning. Employees belonging to the *late majority* category may remain negative pertaining to *perceived ease of use* and it is possible that they will only eventually adapt to e-learning as it is expected of them by managers and/or learners, as indicated in the previous section. As these employees' ease of use will take long, they will also not *perceive* it to be *enjoyable* as they do not have the skill and do not know the purpose of e-learning.

The above discussion shows that academics naturally tend towards a particular learning style. This learning style relates and indicates an employee's preferred way of interacting with and adapting to new information and demands. These learning styles need to be assessed during a performance appraisal as part of an academic's e-readiness assessment and should be

considered during goal-setting and drafting of a personal development plan. By considering these learning styles during the developmental part of the performance appraisal process, training and development interventions can be structured in a manner to suit this learning style. This approach is likely to increase the employee's motivation and will make the technology adoption process easier. The abovementioned learning styles will therefore be included in the framework in which employees can be plotted during performance assessment.

In addition to employees' pace and style of technology adoption and their preferred learning style, employees also have different work behavioural styles. The personal work behavioural styles, as third key human factor in this research, is discussed in the next section.

**Personal work behavioural style**

Employees portray different qualities, skills, abilities and prefer various methods to deal with information, to gather knowledge from information, and to apply their knowledge to real-life problem solving (Magoulas & Chen, 2006: 327). Thus, employees have different approaches and preferences to work. Xu and Tuttle (2004: 22) explain that interpersonal aspects are more important to an employee's success in the workplace than technical skill. An interpersonal aspect that is likely to differ between employees is work style; for instance, some employees approach problem solving in a cautious, systematic manner, whereas others favour innovative solutions (Xu & Tuttle, 2004: 22). In this article the **D**ominance **I**nfluence **S**teadiness **C**ompliance (**DISC**) factors of Thomas International will be used to describe personal work profile patterns of academics.

The DISC profiling instrument is a useful and well-known assessment instrument to determine the attributes that will contribute to an employee's personal work behavioural styles (Thomas International, 2005). The DISC profiling instrument describes human work behavioural styles in four dimensions. A DISC profile reports a style or characteristic of behaviour in a work situation. Four dimensions or "typical patterns of interaction" of a person in the working environment are important (Thomas International, n.d.). All people have all four behavioural preferences but to various extents. The relationship of the four preferences to each other construct a profile pattern which gives information about a person's probable behavioural responses (Mills, 2011). Thomas International (N.d.) identifies the following four dimensions:

- **Dominance**: This category considers the manner in which problems are addressed. Individuals of this category are concerned with results. They are typically competitive, with high performance standards, and focused on achieving goals, solving problems, and accepting challenges.

- **Influence**: This category considers the manner in which people are dealt with. Individuals of this category like people and want to be liked in return. They are typically charming, optimistic, outgoing, and focused on networking, conversation, and working with others.

- **Steadiness**: This category considers the manner in which an individual paces him- or herself. Individuals of this category are concerned about relations. They are typically sympathetic, friendly, good listeners, "finisher completers", and team players, who work hard and create a stable environment.

- **Compliance**: This category considers the manner in which rules and procedures are followed. Individuals of this category are concerned with accuracy and research every aspect of a situation, considering each possibility before making a decision (Witt, n.d.). They typically have high standards, particularly for themselves; can be perfectionists and prefer systems, processes, procedures, as well as predictable and consistent outcomes.

It is evident that an academic displaying a high *dominance* factor profile is likely to be motivated and inspired by a challenging and dynamic environment and enjoys experimenting with new technologies at a fast pace. Further, such an employee is unlikely to be motivated by incentives and rewards but will most probably be intrinsically motivated and has an inclination to set challenging goals (Thomas International, n.d.). It can be argued that employees with a high *dominance* factor will typically be *innovators* on the technology adoption cycle, with the *activist* learning style. When an academic portrays a high *dominance* factor and low *steadiness* and *compliance* factors, it can be assumed that the profile of the online learning facilitator tends to favour the achievement of results irrespective of unfavourable circumstances (Johannes, 2007: 256). These employees will experience high levels of *perceived ease of use* and *perceived enjoyment* due to the challenging and innovative nature of their profiles.

An academic with a high *dominance* factor will prefer an unstructured environment, which allows for frameworks and directions to guide people on how to act, tolerate innovative

thought, creative problem-solving and independence to act, not prescribing strict rules and procedures (Thomas International, n.d.). It can be argued that the development interventions for an online learning facilitator portraying a high *dominance* factor should be innovative, exciting and creative with challenging tasks. It is evident that academics belonging to this category will adapt to teaching and learning with technology easily and will not portray a lack of e–readiness. It can furthermore be argued that academics with a high dominance factor will connect relatively easy with young learners from Generation Y due to the same need for innovation and creativity (Thomas International, n.d.; Naidoo, 2005).

Academics portraying high *steadiness* and *compliance* factors and a low *dominance* factor will tend to favour standard operating procedures, a traditional approach and maintaining the status quo (Johannes, 2007: 256-257). Factors such as attention to detail and ensuring quality and standards are important (Johannes, 2007: 257). It can further be assumed that structure and security within a clearly defined learning environment will appeal to these employees. Academics belonging to these categories can be compared to the *early majority* and *late majority* categories of the technology adoption cycle, as well as the *theorist* and *pragmatist* learning styles. Their *perceived ease of use* of e-learning will initially be negative as it will put their status quo and comfort zones at risk. Likewise, they will not initially *perceive* e-learning to be *enjoyable* and will only change their perceptions over a long period of time.

Shelton, McKenna and Darling (2002: 372) state that, not only do employees have different work profile patterns, they regularly also have diverse values and interests. Further, employees are inclined to have a preference for various types of job tasks and work cultures (Shelton et al., 2002: 372; cf Liu, 2010; Switzer, 2010). Liu (2010) asserts that managers that want to obtain objectives and achieve performance from their subordinates need to understand that employees have different work profile patterns and will therefore be differently motivated. An employee's personal work behavioural style thus plays a significant role in the manner in which he or she will adapt to technology and should therefore be included in an employee's e-profile.

**The assessment of e-readiness of academics during performance appraisal**

Performance appraisal encompasses the assessment of employees' performance (evaluative part), as well as their potential for further development (Rademan & De Vos, 2001: 54; cf Grobler et al., 2002: 260; 266). The concept and practice of development is in particular

relevant to this article, since the aim is to determine the level of e-readiness of an academic through performance appraisal to determine the need for and the extent of development required to improve the level of e-readiness. Further, the academic, the institution and society (the learners and the future work places) should all benefit from employee development (Cardno, 1995: 118; Maurer et al., 2002: 432; Adam, 2010).

It remains the responsibility of line managers to ensure that their subordinates are well-trained and have the competence to provide quality teaching and learning to students (Bartridge, 2004: 1). Line managers at HEIs should, through the assessment of e-readiness during the performance appraisal, determine the training and development needs pertaining to e-learning. Line managers are further also responsible to see to it that employees' performance goals are aligned to organisational goals. Not only should training needs be identified, but time and opportunity for training should also be granted.

It can be argued that line managers are responsible for determining the stage/s of technology adoption in which academics are through e-readiness assessment during the performance appraisal process. The assessment process is usually followed with a development plan and subsequent relevant development interventions and employees should be involved in the goal-setting process. Motivating employees and providing a rationale as to the relevance of e-learning within the framework of organisational objectives are necessary for the eventual performance of an academic as an online learning facilitator.

## Empirical results

During the empirical research it became clear that certain key human factors (personal work behavioural style, preferred learning styles, and employees' position/category on the technology adoption cycle) play a role in an academic's e-readiness. Certain trends and similarities could be observed between these human factors. For example, a particular learning style revealed by an employee in most instances typically portrayed a typical DISC factor and a specific category of technology adoption pace and style. The following particular matches became evident, indicated in table 1 below:

**Table 1:  Matches between personal profile patterns, learning styles and pace and style of technology adoption**

| Personal profile pattern (DISC factor) | Learning style | Technology adoption (pace and style) |
|---|---|---|
| Dominance | Activist | Innovator |
| Influence | Reflector | Late majority |
| Steadiness | Theorist | Early majority |
| Compliance | Pragmatist | Early adopter |

The last two matches indicated in table 1, the *early majority-steadiness-theorist* and the *early adopter-pragmatist-compliance* matches represent the e-profiles of the majority of respondents, namely 79%. These e-profiles can thus be related to employees' level of comfortableness with the use of e-learning, as indicated in table 2 below.

**Table 2: Matches between personal profile patterns, learning styles, pace and style of technology adoption, and e-learning perceptions when trained and first being used**

| Personal work behavioural style (DISC factor) | Learning style | Technology adoption (pace and style) | Perceptions towards e-learning after trained and used for the first time |
|---|---|---|---|
| Dominance | Activist | Innovator | Very eager to teach online |
| Influence | Reflector | Late majority | Still did not want to teach online |
| Steadiness | Theorist | Early majority | Comfortable, but will never be first choice |
| Compliance | Pragmatist | Early adopter | Looked forward, once mastered the skill |

Table 3 below indicates these profiles, placed in order of the perceived highest level of e-readiness to the lowest level of e-readiness.

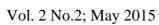**Table 3: E-readiness levels**

| E-readiness levels (highest to lowest) | Personal profile pattern (DISC factor) | Learning style | Technology adoption (pace and style) | Perceptions towards e-learning after trained and used for the first time | Respondents % |
|---|---|---|---|---|---|
| Very high | Dominance | Activist | Innovator | Very eager to teach online | 13 |
| Relatively high | Compliance | Pragmatist | Early adopter | Looked forward, once mastered the skill | 46 |
| Moderate | Steadiness | Theorist | Early majority | Comfortable, but will never be first choice | 33 |
| Low | Influence | Reflector | Late majority | Still did not want to teach online | 8 |

Respondents to the questionnaire portrayed a relatively high (46%) or moderate (33%) level of e-readiness. If these results are considered to be generally representative of the academics of the NWU, Potchefstroom Campus, it is clear that successfully training and developing employees portraying the *early adopter-compliance-pragmatist* and the *early majority-steadiness-theorist* pertaining to the use and purpose e-learning, the bulk of the academic workforce at the NWU will be well-skilled and able to implement e-learning optimally to support world class learner learning. If the 13% of respondents who portray a dominance-activist-innovator e-profile is considered to the bulk of academics portraying the abovementioned two e-profiles (79%), it brings the total of e-ready academics to 92%. Undoubtedly this will make a difference in the effectiveness of use of e-learning.

Table 4 indicates the matches between personal profile patterns, learning styles, pace and style of technology adoption, e-learning perceptions when trained and first being used and type of motivation.

**Table 4: Matches between personal profile patterns, learning styles, pace and style of technology adoption, e-learning perceptions when trained and first being used and type of motivation**

| E-readiness levels (highest to lowest) | Personal profile pattern (DISC factor) | Learning style | Technology adoption (pace and style) | Perceptions towards e-learning after trained and used for the first time | Motivation | Age of respondents % |
|---|---|---|---|---|---|---|
| Very high | Dominance | Activist | Innovator | Very eager to teach online | Intrinsic | 13 |
| Relatively high | Compliance | Pragmatist | Early adopter | Looked forward, once mastered the skill | Mostly extrinsic, but also intrinsic | 46 |
| Moderate | Steadiness | Theorist | Early majority | Comfortable, but will never be first choice | Extrinsic | 33 |
| Low | Influence | Reflector | Late majority | Still did not want to teach online | Extrinsic | 8 |

Employees belonging to the *innovator-activist-dominance* profile will be intrinsically motivated. This category of employees will be intrinsically motivated as they perform an activity for its own sake and enjoy performing it (Gagné & Deci, 2005: 331; Vansteenkiste et al., 2007: 253). Intrinsic motivation refers to a condition in which an individual feels interest, pleasure and enthusiasm by taking on task-related activities (Gagné & Deci, 2005: 331; Vansteenkiste et al., 2007: 253; Ryan & Deci, 2000: 56). Employees belonging to this profile will not portray a lack of e-readiness and will embrace the challenge of a new job demand.

Another e-profile category that is also intrinsically motivated (to some extent), but can also rely on extrinsic motivation, is the *early adopter-pragmatist-compliance* category, representing 46% of the respondents of the questionnaire. Literature has identified *early adopters* to be extrinsically motivated, but since they are also regarded as strategic thinkers (Zemsky & Massey, 2004: 9–10), some of them may be intrinsically motivated. It can be argued that *pragmatists* will be extrinsically motivated as the technology adoption will not be a natural process of grabbing opportunities to them as with the *innovators* or *activists*, as they will first determine the practical value and use of what they are being taught and will require

a link between the training and the end-result required of them (Honey & Mumford, 1982: 25). Further, the *compliance* DISC factor indicates that an employee portraying this e-profile prefers predictable and consistent outcomes (Thomas International, n.d.) and may therefore need encouragement in the form of incentives or rewards to adapt to the new job demand.

The other e-profile, represented by a significant number of respondents (33%), the *early majority-theorist-steadiness* profile, is mostly extrinsically motivated, implying that external rewards and incentives may be necessary to encourage these employees towards goal accomplishment pertaining to the new job demand. This is due to the fact that the *late majority* only adopts when half of the population has already done so and they dislike the disruptions of new technologies (Zemsky & Massey 2004: 10). Therefore, they will need external motivation to adapt to the changed job demand.

If these profiles are considered to be generally representative of the academics of the NWU, Potchefstroom Campus, it implies that the categories representing the majority of academics will mostly need extrinsic motivation. If the University lacks the necessary funds to provide financial incentives, they will have to think creatively of other incentives to motivate employees towards goal accomplishment. This also places a significant responsibility on the line manager or support in this respect, as employees will need support and encouragement throughout the learning curve.

It is important to keep in mind that other variations of e-profiles can emerge with e-readiness assessment and that these profiles are used as examples to draft a strategy, as they surfaced as most eminent during the empirical research. Before the training and development interventions can take place it is necessary to draft a personal development plan for each academic, based on the employee's e-readiness assessment during a performance appraisal. The next section will discuss the implementation of the e-readiness assessment and the subsequent training and development by means of a framework, developed for this purpose.

**Theoretical framework for the e-readiness assessment of academics**

As the performance appraisal process consists of not only an evaluative component, but also a development component, the e-readiness assessment should be followed with a personal development plan, indicating uniquely structured training and development opportunities.

The research indicated that key human factors (pace and style of technology adoption, preferred learning style and personal work behavioural style) play a role in the e-readiness assessment and therefore argues that these human factors should be included in the e-readiness assessment of academics. An academic's key human factors will be indicative of his/her e-readiness indicators and the training and development approach to be followed. Once the key human factors are assessed, and an e-profile is drafted, the employees' e-readiness indicators will be apparent and the training and development interventions can be structured.

Tables 5, 6 and 7 indicate the e-readiness framework, based on the outcome of an employee's e-readiness assessment. Potential matches that may emerge after an academic's key human factors (technology adoption, preferred learning style and personal work behavioural style) have been assessed, are indicated, as well as the unique training and development approach that should be structured for an employee.

**Table 5: The technology adoption – personal work profile pattern match**

| Personal work profile pattern (DISC profile) | | Dominance | Influence | Steadiness | Compliance |
|---|---|---|---|---|---|
| | Innovator | Unstructured; freedom to explore; internal motivation; visual aids; fast pace | | | |
| | Early Adopter | Structured/unstructured; freedom to explore; internal motivation; visual aids; instructor that demonstrates; relatively fast pace | Structured; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; opportunity for socialisation; relatively fast pace | | Structured, step-by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; relatively fast pace |
| | Early majority | | Structured; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; opportunity for socialisation | Structured, step-by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes | Structured, step-by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes |
| | Late majority | | Structured; external motivation; visual aids; | Structured, step-by-step approach; external | Structured, step-by-step approach; external |

| Technology adoption style and pace | | Activist | Pragmatist | Theorist | Reflector |
|---|---|---|---|---|---|
| | | | instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; opportunity for socialisation; enough opportunity to reflect and ask questions | motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; enough opportunity to reflect and ask questions | motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; enough opportunity to reflect and ask questions |
| | **Diehard/ Laggard** | | | Structured; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; enough opportunity to reflect and ask questions | Structured; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; enough opportunity to reflect and ask questions |

**Table 6: The technology adoption – preferred learning style match**

| Learning style | | Activist | Pragmatist | Theorist | Reflector |
|---|---|---|---|---|---|
| | **Innovator** | Unstructured; trial and error; freedom to explore; internal motivation; visual aids; fast pace | | | |
| | **Early Adopter** | Structured/unstructured; freedom to explore; internal motivation; visual aids; instructor that demonstrates; match strategically; relatively fast pace | Structured; match strategically; holistic picture; future benefits; step-by-step approach; external motivation; instructor that demonstrates; visual aids; relatively fast pace | | |
| | **Early majority** | | Structured; match strategically; picture; future benefits; step-by-step approach; external motivation; instructor that demonstrates; visual aids; paper-based notes | Structured; external motivation; step-by-step approach; external motivation; instructor that demonstrates; instructor that gives verbal instructions; visual aids; paper-based notes | Structured; unhurried process; ample opportunity to ask questions and review; opportunity to reflect on progress; external motivation; instructor that demonstrates; instructor that gives verbal instructions; visual aids; paper-based |

| Technology adoption style and pace | | | | | notes |
|---|---|---|---|---|---|
| | Late majority | | Structured; holistic picture; step-by-step approach; external motivation; instructor that gives verbal instructions; instructor that demonstrates; visual aids | Structured; step-by-step approach; external motivation; instructor that demonstrates; instructor that gives verbal instructions; visual aids; paper-based notes | Structured; step-by-step approach; ample opportunity to ask questions and review; opportunity to reflect on progress; external motivation; instructor that demonstrates; instructor that gives verbal instructions; visual aids; paper-based notes |
| | Diehard/ Laggard | | | Structured; step-by-step approach; external motivation; external motivation; instructor that demonstrates; instructor that gives verbal instructions; visual aids; paper-based notes | Structured; unhurried process; ample opportunity to ask questions and review; opportunity to reflect on progress; external motivation; instructor that demonstrates; instructor that gives verbal instructions; visual aids; paper-based notes |

**Table 7: Personal work profile pattern – preferred learning style match**

| Learning style | | Activist | Pragmatist | Theorist | Reflector |
|---|---|---|---|---|---|
| | Dominance | Unstructured; trial and error; freedom to explore; internal motivation; visual aids; fast pace | | | |
| | Influence | | | Structured; step-by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; opportunity for socialisation; enough opportunity to ask questions | Structured; step-by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; opportunity for socialisation; enough opportunity to reflect and ask questions |
| | Steadiness | | Structured; match strategically; holistic picture; practical step- | Structured; step-by-step approach; external motivation; visual aids; | Structured; step-by-step approach; external motivation; visual aids; |

| D I S C | | | by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes | instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; enough opportunity to ask questions | instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; enough opportunity to reflect and ask questions |
|---|---|---|---|---|---|
| | Compliance | | Structured; match strategically; holistic picture; future benefit; practical step-by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes | Structured; step-by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; enough opportunity to ask questions | Structured; step-by-step approach; external motivation; visual aids; instructor that demonstrates; instructor that gives verbal instructions; paper-based notes; enough opportunity to reflect and ask questions |

Once an employee has been plotted within the abovementioned framework (provided by the three tables), the employee's e-profile will be known and uniquely structured training and development interventions for each academic can be planned and implemented. The framework outlines to line managers, human resource managers and Academic Support Services the training and development approach that should be followed with each academic and the preferred nature and structure of the training and development intervention, that is structured or unstructured; step-by-step or freedom; visual aids, paper-based notes, verbal instructions from an instructor or an instructor that demonstrates; internal or external motivation; and opportunity to ask questions and reflect or a relatively fast pace.

The planning of training and development interventions for academics that portray one of the two most prominent e-profiles, as obtained through the questionnaire results, can be approached as follow, based on the e-readiness framework:

**Early adopter-compliance-pragmatist e-profile**

An academic with this e-profile would, according to the above framework, has been plotted on table 5 as an *early adopter-compliance* match, which indicates a structured, step-by-step approach; external motivation; the use of visual aids during training, as well as an instructor

that demonstrates and gives verbal instructions; and a relatively fast pace should be followed during training and development.

The employee would have been plotted as an *early adopter-pragmatist* on table 6, which indicates a structured step-by-step approach; training should be matched with strategic goals; a holistic picture should be provided; future benefits should be underlined; external motivation should be provided; training should be given through an instructor that demonstrates, use visual aids and should be at a relatively fast pace.

On table 7 the employee would have been plotted as a *compliance-pragmatist*, indicating a structured and practical step-by-step approach; training should be matched with strategic goals; a holistic picture should be provided; the future benefit of the training should be explained; external motivation should be provided; training should be done through the use of visual aids, an instructor that demonstrates and that gives verbal instructions, as well as paper-based notes.

Therefore, the results (*early adopter-compliance; early adopter-pragmatist* and *compliance-pragmatist*) obtained from the three tables in the framework reveal an ***early adopter-compliance-pragmatist*** e-profile. This profile was portrayed by 46% of questionnaire respondents. An academic portraying this e-profile should therefore receive e-learning training and development in a structured manner with a practical step-by-step approach. A holistic picture of the role and place of e-learning in the University's teaching and learning framework and goals, as well as within the institutional plan and strategic goals and objectives should be provided. Employees should understand how the training will benefit them in future and why it is imperative to their teaching and learning skills. The person responsible for e-learning training should make use of visual tools such as podcasts and simulations, give verbal instructions, demonstrate the tools to employees and provide paper-based notes for referral when practicing. An employee portraying this e-profile will need to be externally motivated, therefore, the line manager and the human resource manager should decide on the method of motivation that will be followed.

An employee that belongs to the *early adopter* category of technology adoption, as well as the *pragmatist* learning style preference of an employee portraying this profile, it can be assumed that an employee with this profile will adapt to e-learning relatively fast, once the

skill is mastered. Therefore, once the technical skill is obtained, training should focus on e-readiness indicators such as communication, motivation, compassion and counselling (the social nature of e-learning), as these indicators may need to be developed. A focus should also be placed on personal attribute indicators such as innovation and creativity, commitment and time management. Due to the *compliance* DISC factor of this profile (favouring standard operating procedures and the status quo), attention should be given to the practical use, purpose and philosophy of e-learning.

**Early majority-steadiness-theorist e-profile**

An academic with this e-profile would, according to the above framework have been plotted on table 5 as an *early majority-steadiness* match, which indicates a structured, step-by-step approach; external motivation; the use of visual aids during training, as well as an instructor that demonstrates and gives verbal instructions; and a relatively fast pace during training and development.

The employee would have been plotted as an *early majority-theorist* on table 6 and a *steadiness-theorist o*n table 7, which both indicate a structured step-by-step approach; external motivation should be provided; training should be given through an instructor that demonstrates the use of e-learning tools, the use of visual aids and paper-based notes, and ample opportunity should be given to ask questions.

Therefore, the results (*early majority-steadiness; early majority-theorist* and *steadiness-theorist*) obtained from the three tables in the framework reveal an ***early majority-steadiness-theorist*** e-profile. This profile was portrayed by 33% of questionnaire respondents. An academic with this e-profile should therefore receive e-learning training and development in a structured manner with a practical step-by-step approach. The person responsible for e-learning training should make use of visual tools such as podcasts and simulations, give verbal instructions, demonstrate the tools to employees and provide paper-based notes for referral when practicing. An employee portraying this e-profile will need to be externally motivated, therefore, the line manager and the human resource manager should decide on the method of motivation that will be followed.

Training and development for employees that portray the *early majority-steadiness-theorist* e-profile will differ from the *early adopter-compliance-pragmatist* e-profile: Firstly, information on strategic linkages and the practical value of the training will not be such a high priority for employees that portray the *early majority-steadiness-theorist* e-profile as for those portraying the *early adopter-compliance-pragmatist* e-profile. However, this information should ideally be provided to all employees that receive e-learning training, irrespective of their e-profiles. Secondly, employees that portray the *early majority-steadiness-theorist* e-profile will in all likelihood have a more natural ability for the social nature of e-learning and the personal attribute indicators of e-readiness will be more eminent, due to the *steadiness* DISC factor of the profile, that reflects good people skills and good team players (Thomas International, n.d.). Thirdly, training and development for employees that portray the *early majority-steadiness-theorist* e-profile will follow a slower pace than training and development for employees portraying the *early adopter-compliance-pragmatist* e-profile; for two reasons:

- An employee that is categorised in the *early majority* category will portray a bigger lack of e-readiness than an *early adopter* and will be less comfortable with change and new technologies, and will therefore need more technical guidance.
- Secondly, *theorists* will tend to ask more questions than *pragmatists* and will need time to think about activities and challenges posed to them during training.

Only 8% of questionnaire respondents portrayed the ***late majority-influence-reflector*** e-profile. Employees portraying this profile will receive similar training as the *early majority-steadiness-theorist* profile, but even more time must be provided to reflect on activities and challenges and opportunity for socialisation must also be provided. Due to the high *influence* DISC factor employees revealing this profile are likely to do well with the human side of e-learning, as employees with a high *influence* DISC factor are concerned about the manner in which people are dealt with and are typically charming, optimistic, and outgoing, and focused on networking, conversation, and working with others (Thomas International, n.d.), and they will have a natural ability for the following indicators of the e-readiness construct: communication, motivation, compassion and counselling skills. As this category of technology adoption will resist e-learning as long as possible and be hard to convince of its use, employees in this category should firstly be focused on e-readiness indicators such as the

philosophy, use and purpose of e-learning, as well as the needs and preferences of Generation Y learners. A focus on the use and adaptation of teaching and learning strategies is also important. Further, training must be focused on the technical skill due to the *late majority* aspect of this profile, portraying a significant lack of e-readiness. Focus should be placed on training strategies and techniques that will make an employee belonging to this category comfortable, another indicator of the e-readiness construct.

Thirteen percent (13%) of questionnaire respondents portrayed the ***innovator-dominance-activist*** profile. Employees portraying this e-profile will in all likelihood not need to be trained (as they would have explored the e-learning platform on their own, played around and managed to use the tools). Therefore, they will in all probability not have a development need or subsequent need for training and development in this regard. However, if these employees did not master all the tools of the e-learning platform on their own, and from a quality control point of view, line managers can consider, together with the employee, to include e-learning training in their personal development plans. An employee with a high *dominance* DISC factor or an *innovator* technology adoption style is likely to do well with the technical skills, subject competency, comfortableness and willingness, as a high *dominance* factor and *innovators* are competitive, with high performance standards, and focused on achieving goals, solving problems, enjoy exploring new ideas and accept challenges (Thomas International, n.d.; Zemsky & Massey, 2004: 9). The same can be said about an employee with an *activist* learning style that also prefers to deal with challenges (Honey & Mumford, 1982). However, an employee who is an *innovator* prefers an *activist* learning style or portrays a high *dominance* factor, and does not necessarily have good interpersonal skills. Therefore, particular focus can be placed on e-readiness indicators such as learner motivation, communication and compassion.

## Conclusion

The empirical research by means of a self-administered questionnaire, a focus group discussion and interviews revealed two prominent e-profiles indicating various levels of e-readiness, namely an *early adopter-pragmatist-compliance* e-profile and an *early majority-theorist-steadiness* e-profile. The findings made it evident that the traits portrayed by a person belonging to a certain technology adoption category show similarities to traits portrayed by particular learning styles and personal work behavioural patterns. Certain profiles could be identified, based on trends and similarities pertaining to interpersonal traits.

A framework was developed for assessing the e-readiness of academic employees during their performance appraisals, as well as determining and assessing the role of key human factors in their e-readiness in order to draft an e-profile which provides guidance in terms of structuring unique training and development approaches for each e-profile. A personal development plan will subsequently be drafted for each employee. Thus, getting academics e-ready, they will be in a better position to provide in the learning needs of the 21st century student.

**References**

Adam (2010). Employee training and development. MBA Tutorials, Online MBA Community. Available at: http://www.mba-tutorials.com/human-resource-management/505-employee-training-and-development.html. Date accessed: 7 January 2011.

Achimugu, P, Oluwagbemi, O & Oluwaranti, A. (2010). An evaluation of the impact of ICT: diffusion in Nigeria's Higher Educational Institutions. Journal of Information Technology Impact 10(1), 25–34.

Adams, DA, Nelson, RR & Todd, PA. (1992). Perceived usefulness, ease of use, and usage of information technology: a replication. MIS Quarterly 16(2), 227–247.

Alexander, S. (2001). E-learning: developments and experiences. Education and Training 43 (4/5), 240–248.

Amirault, RJ & Visser, YL. (2009). The university in technological change: a historically grounded perspective. Computing of Higher Education Journal 21, 62–79.

Armstrong, M. (2006). A handbook of human resource management practice. 10th edition. Philadelphia: Kogan Page.

Arp, L, Woodard, BS & Mestre, L. (2006). Accommodating diverse learning styles in an online environment, Reference and User Services Quarterly 46(2), 27–32.

Azhar, MUSN. (2008). Learning styles and their impact. Paper presented for methods to business writing. Available at: http://www.docstoc.com/docs/11517765/Learning-Style-And-Their-Impacts. Date accessed: 14 January 2011.

Bakx, AW, Van der Sanden, JMM & Vermetten, YJM. (2002). Personality and individual learning theories: a cross sectional study in the context of social-communicative training. Personality and Individual Differences 32(7), 1229–1245.

Bartridge, T. (2004). Manager's role in a competence-based training and development system. AMEinfo.Com: The Ultimate Middle East Business Resource. Available at: http://www.ameinfo.com/44529.html. Date accessed: 16 October 2010.

Bates, T. (2010). Innovate or die: a message for higher education institutions. E-learning and distance education blog, 28 June 2010. Available at: http://www.tonybates.ca/2010/06/28/innovate-or-die-a-message-for-higher-education-institutions/. Date accessed: 4 January 2011.

Beshears, FM. (N.d.). The technology adoption life-cycle. Available at: http://ist-socrates.berkeley.edu/~fmb/articles/lifecycle/index.html. Date accessed: 10 October 2005.

Boyatzis, RE. & Kolb, DA. (1995). From learning styles to learning skills: the executive skills profile. Journal of Managerial Psychology 10( 5), 3-17.

Bozarth, J. (2006). Classroom trainer resistance to e-learning. Available at: http://www.bozarthzone.com/bozarth_classroom_trainer_resistance_lit_review_2006.pdf. Date accessed: 23 August 2009.

Butler, M. (2004). Outcomes based/outcomes focused education overview. Article contribution to the King Faisel Specialist Hospital and Research Centre (KFSHRC) in Saudi Arabia by PhD candidate. Available at: http://www.kfshrc.edu.sa/files/Outcomes%20Based%20Education.doc. Date accessed: 2 January 2011.

Cardwell, C & Madigan, D. (2004). Promoting e-literacy: an open, blended approach in Higher Education. Journal of eLiteracy, 1, 23–30. Available at: http://www.jelit.org/7/01/JeLit_Paper_2.pdf. Date accessed: 7 January 2011.

Cardno, C. (1995). Diversity, dilemmas and defensiveness: leadership challenges in staff appraisal contexts. School Organisation 15(2), 117–131.

Carnesale, A. (2000). Speech delivered by the Chancellor of the University of California, Los Angeles (UCLA), 31 May 2000, at the Milken Institute Forum. Available at: http://www.milkeninstitute.org/pdf/carnesaletrans.pdf. Date accessed: 6 January 2011.

Carr, VH Jr. (2007). Technology adoption and diffusion. Available at: http://tlc.nlm.nih.gov/resources/publications/sourcebook/adoptiondiffusion.html. Date accessed: 12 March 2009.

Cassidy, S. (2004). Learning style: an overview of theories, models and measures. Educational Psychology 24(4), 419–444.

De Wit, C. (2010). Interview. Director: Human Resource Management, North-West University (NWU), Potchefstroom Campus. Personal Interview, 2 December, Potchefstroom.

Dewhurst, S & FitzPatrick, L. (2007). Why learning is a matter of personal preference. Strategic Communication Management 11(3), 14.

Dickinger, A, Arami, M & Meyer, D. (2008). The role of perceived enjoyment and social norm in the adoption of technology with network externalities. European Journal of Information Systems 17(1), 4–11.

Durrheim, K. (2009). Research design, in Research in practice: applied methods for the social sciences, edited by Terre Blanche, M, Durrheim, K & Painter, D. Cape Town: University of Cape Town Press.

Dziuban, C, Moskal, P & Hartman, J. (2005), in Elements of quality online education: engaging communities, edited by Bourne, J & Moore, JC. Needham, MA: Sloan Center for Online Education.

Efaw, J. (2005). No teacher left behind: how to teach with technology. EDUCAUSE Quarterly 28(4). Available at: http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/NoTeacherLeftBehindHowtoTeachw/157372. Date accessed: 6 January 2011.

Elgort, I. (2005). E-learning adoption: bridging the chasm. Paper presented at the Ascilite Conference in Brisbane, Australia, 4–7 December. Available at: http://ascilite.org.au/conferences/brisbane05/blogs/proceedings/20_Elgort.pdf. Date accessed: 27 October 2010.

Felder, RM. & Henriques, ER. (1995). Learning and teaching styles in foreign and second language education. Foreign Language Annals 28(1), 21-31.

Gagné, M & Deci, EL. (2005). Self-determination theory and work motivation. Journal of Organizational Behavior 26, 331–362.

Generation Y and the Workplace Annual Report. (2010). Issued by Johanson Controls: Global Workplace Innovation. Available at: http://www.johnsoncontrols.com/publish/us/en/search.html. Date accessed: 23 November 2010.

Gitman, LJ & McDaniel, C. (2008). The future of business: the essentials. 4th edition. Mason, OH: South-Westen Cengage Learning.

Gleeson, PB. (2003). Managing and motivating the generations: implications for the student and the employee. Paper presented at a Combined Sections meeting, Tampa, Florida, 12–16 February. Available at: http://www.uwsp.edu/education/facets/links_resources/4413.pdf. Date accessed: 12 March 2011.

Graham, CR. (2004). Blended learning systems: definition, current trends, and future directions, in Handbook of blended learning: global perspectives, local designs, edited by Bonk, CJ & Graham, CR. San Francisco, Calif: Pfeiffer Publishing.

Grobler, PA, Wärnich, S, Carrell, MR, Elbert, NF & Hatfield, RD. (2002). Human resource management in South Africa. 2nd edition. Cornwall: Thompson.

Guild, PB. (2001). Diversity, learning style and culture: new horizons for learning. Available at: http://www.newhorizons.org/strategies/styles/guild.htm. Date accessed: 1 September 2010.

Gunderman, RB, Williamson, KB, Frank, M, Heitkamp, DE & Kipfer, HD. (2003). Learner-centred education. Radiology 227, 15–17. Available at: http://radiology.rsna.org/content/227/1/15.full.pdf+html. Date accessed: 2 January 2011.

Halse, ML & Mallinson, B.J. (2008). Investigating popular internet applications as supporting e-learning technologies for teaching and learning with Generation Y. Paper presented at the Emerge Conference, held at the University of Cape Town, 7–18 July.

Hansson, M. (2009). Being a manager in Sweden. Going Global. Available at: http://old.goinglobal.com/hot_topics/sweden_hansson_manager.asp. Date accessed: 7 January 2011.

Higher Education Management and Information System (HEMIS). (2010). Headcount enrolment in public higher education, by age. Department of Higher Education and Training. Provided by Mr H de Beer, HEMIS.

Honey, P & Mumford, A. (1982). The manual of learning styles. Maidenhead: Peter Honey.

Huang, H. (2002). Toward constructivism for adult learners in online learning environments. British Journal of Educational Technology 33(1), 27–37.

Jackson, CJ, Furnham, AF, Forde, LD & Cotter, T. (2000). The dimensional structure of the Eysenck Personality profiler. British Journal of Psychology 91, 223–239.

Jackson, C & Lawty-Jones, M. (1996). Explaining the overlap between personality and learning style. Personality individual differences 20(3), 293–300.

Johannes, H. 2007. In search of the latent structure of an e-learning practitioner construct. PhD thesis. University of Pretoria, Pretoria.

Joint Information Systems Committee (JISC). (2009). Effective practice in a digital age. Available at: http://www.jisc.ac.uk/media/documents/publications/effectivepractice digitalage.pdf. Date accessed: 31 December 2010.

Kezi Communications. (2009). Generation Y still keeps marketers guessing. Bizcommunity.com: Daily Media, Marketing and Advertising News, 18 June. Available at: http://www.bizcommunity.com/Article/196/347/37031.html. Date accessed: 21 August 2009.

Kottolli, A. (2008). Barriers to e-learning. Blog: thoughts on marketing, innovation and leadership. Available at: http://arunkottolli.blogspot.com/2008/09/barriers-to-e-learning.html. Date accessed: 23 August 2009.

Landes, L. (2006). Getting the best out of people in the workplace. The Journal for Quality and Participation Winter, 27–29.

Le Roux, K. (2009). Section Head: Information Technology Support, North-West University, Potchefstroom Campus. Interview, 1 September, Potchefstroom.

Liu, A. (2010). Managing behavioral styles. Lab Manager Magazine. Available at: http://www.labmanager.com/mtips.asp?ID=122. Date accessed: 4 January 2011.

Liu, Y. (2007). A comparative study of learning styles between online and traditional students. Journal of Educational Computing Research 37(1), 41–63.

Miller, K. (2005). Charisma of an online learning facilitator: do you have it? California Virtual Campus. Available at: http://www.cvc.edu/2005/05/charisma-of-an-online-facilitator-do-you-have-it/. Date accessed: 27 November 2010.

Milliken, J & Barnes, LP. (2002). Teaching and technology in higher education: student perceptions and personal reflections. Computers & Education 39, 223–235.

Mills, J. (2011). DISC profile. Available at: http://www.discprofile.com/. Date accessed: 4 January 2011.

Naidoo, N. (2005). Managers watch out for "Generation Y". Available at: http://www.busrep.co.za/index.php?fSectionId=970&fArticleId=2630972. Date accessed: 21 August 2009.

Njenga, JK & Fourie, LCH. (2010). The myths about e-learning in higher education. British Journal of Educational Technology 41(2), 199–212.

Magoulas, GD & Chen, S. (2006). Editorial: human factors in personalised systems and services. Interacting with computers 18, 327–330.

Maurer, TJ, Pierce, HR & Shore, LM. (2002). Perceived beneficiary of employee development activity: a three-dimensional social exchange model. The Academy of Management Review 27(3), 432–444.

Msimang, Z. (2008). South Africa: Generation Y must ask "why"? (opinion). Mail & Guardian, 8 May.

Mutula, SM. (2003). Assessment of Africa's telematics, policy and regulatory infrastructure: potential for e-learning. Paper presented at the conference of the National Tertiary Education Union, held at the University of KwaZulu-Natal, Durban, 9–11 July.

Oliver, C. (2001). Taking policy governance to the mainstream. Board Leadership Jan–Feb: 6–8.

Organisation for Economic Co-operation and Development (OECD). (2004). Science, technology and innovation for the 21st century. Meeting of the OECD Committee for Scientific and Technological Policy at Ministerial Level, 29–30 January. Final Communique. Available at: http://www.oecd.org/document/0,2340,en_2649_34487_25998799_1_1_1_1,00.html Date accessed: 2 November 2010.

Palade, V, Howlett, RJ & Jain, LC. (2003). Knowledge-based Intelligent Information and Engineering Systems International Conference, Oxford, UK, September. Proceedings, Part II. Available at: http://www.pubzone.org/pages/publications/showVenue.do?venueId=7048. Date accessed: 14 January 2011.

Park, O & Lee, J. (2001). Adaptive Instructional Systems, in The handbook of research for educational communications and technology, edited by Jonassen, DH. A publication of the Association for Educational Communications and Technology. Available at: http://www.aect.org/edtech/ed1/firstedition.asp. Date accessed: 14 January 2011.

Price, C. (2009). Why don't my students think I'm groovy? The new "r"s for engaging millennial learners. Paper presented at the Georgia Health Sciences University's Tech Fair, Augusta, Georgia, 30 October.

Proctor, T & Doukakis, I. (2003). Change management: the role of internal communication and employee development. Corporate Communications 8(4), 268–277.

Rademan, DJ & De Vos, HD. (2001). Performance appraisals in the public sector: are they accurate and fair? Journal of Industrial Psychology 27(1), 54–60.

Ramsden, P. (2003). Learning to teach in higher education. London: RoutledgeFalmer.

Rautenbach, L. (2007). An electronic-learning (e-learning) readiness model for distance education in the workplace. PhD thesis. North-West University, Potchefstroom.

Robbins, SP. (2003). Organizational behaviour. 10th edition. New Jersey: Prentice Hall.

Robbins, SP. (2009). Organisational behaviour: global and South African perspectives. Cape Town: Pearson Education.

Roca, JC & Gagné, M. (2008). Understanding e-learning continuance intention in the workplace: a self-determination theory perspective. Computers in Human Behaviour 24, 1585–1604.

Rogers, EM. (1962). Diffusion of innovations. 1st edition. Glencoe: Free Press.

Rogers, EM. (1995). Diffusion of innovations. 4th edition. New York: Free Press.

Roy, K. (2006). The impact of learning styles on interactivity in asynchronous e-learning. Performance Improvement 45(10), 22.

Ryan, RM, & Deci, EL. (2000). Intrinsic and extrinsic motivations: classic definitions and new directions. Contemporary Educational Psychology 25(1), 54–67.

Salmon, G. (2003). e-Moderating: the key to teaching and learning online. London: Taylor & Francis Books.

Shelton, CD, McKenna, MK & Darling, JR. (2002). Leading in the age of paradox: optimizing behavioral style, job fit and cultural cohesion. Leadership and Organization Development Journal 23(7), 372–379.

Smith, MK. (2000). Curriculum theory and practice. The encyclopaedia of informal education. Available at: http://www.infed.org/biblio/b-curric.htm. Date accessed: 6 January 2011.

Smith, MK. (2003). Learning theory. Ideas, thinkers, practice (Infed). Available at: http://www.infed.org/biblio/b-learn.htm. Date accessed: 2 November 2010.

Smyre, R. (2006). On searching for new genes: a 21st century DNA for higher education. New Horizons for Learning. Available at: http://www.marthalakecov.org/~building/future/smyre4.htm. Date accessed: 6 January 2011.

Song, L, Singleton, ES, Hill, JR & Koh, MH. (2004). Improving online learning: student perceptions of useful and challenging characteristics. Internet and Higher Education 7:59–70.

South Africa (SA). (2004). Draft White Paper on e-Education, 26 August (Notice 1869 of 2004). Cape Town: Formeset Printers.

Steyn, M, Badenhorst, J & Kamper, G. (2010). Our voice counts: adolescents' view on their future in South Africa. South African Journal of Education 30, 169–188.

Stone, NJ. (2008). Human factors and education: evolution and contributions. The Journal of Human Factors and Ergonomic Society (50), 534–539. Available at: http://hfs.sagepub.com/content/50/3/534.full.pdf+html. Date accessed: 4 January 2011.

Sutton, C. (2004). Online learning: does it pass the taste test? Australian Flexible Learning Community. Available at: http://community.flexiblelearning.net.au/TeachingTrainingLearners/content/article_6893.htm. Date accessed: 1 April 2009.

Swinton, L. (2006). Kolb's learning style inventory and Kolb's learning cycle explained: no fluff, no filler, just facts. Available at: http://www.mftrou.com/kolb-learning-style-inventory.html. Date accessed: 12 October 2006.

Switzer, P. (2010). Managing behavioral styles. The Bookkeepers Zone. Available at: http://www.thebookkeepers.co.za/articles/managing-behavioural-styles/. Date accessed: 4 January 2011.

Tadmore, Z. (2006). The Triad Research University or a post 20th century research university model. Higher Education Policy 19, 287–298.

Takalani, T. (2008). Barriers to e-learning amongst postgraduate black students in higher education in South Africa. MEd dissertation, Stellenbosch, University of Stellenbosch.

Terre Blanche, M, Kelly, K & Durrheim, K. (2009). Why qualitative research? in Research in practice: applied methods for the social sciences, edited by Terre Blanche, M, Durrheim, K & Painter, D.  Cape Town: University of Cape Town Press.

Thomas, JA & Pederson, JE. (2003). Reforming elementary science teacher preparation: what about extant teaching beliefs? School Science and Mathematics 103(7), 319–330.

Thomas International. (N.d.). Available at: http://www.thomasint.cn/Theory.asp and http://www.thomasint.cn/ent02a.asp. Date accessed: 3 September 2004; 11 June 2005.

Thomas International. (2005). DISC profiling instruments. Resources provided by Thomas International Registered Analyst.

University of Calgary. (N.d.). Blended approach to teaching and learning: a position paper. Available at: http://commons.ucalgary.ca/documents/Blended%20Learning%20Position%20Paper.pdf. Date accessed: 7 January 2011.

Vansteenkiste, M, Neyrinck, B, Niemiec, P, Soenens, B, De Witte, H & Van den Broeck, A. (2007). On the relations among work value orientations, psychological need satisfaction and job outcomes: a self-determination theory approach. Journal of Occupational and Organizational Psychology 80, 251–277.

Vermeulen, L. (2005). The application and perceived usefulness of WebCT tools in the training of future public service officials. Paper presented at the annual conference of the International Association of Schools and Institutes of Administration (IASIA), July, Como, Italy.

Witt Communications. (N.d.). Available at: http://www.wittcom.com/what_is_disc.htm. Date of access: 24 April 2005; 14 July 2005.

Xu, Y & Tuttle, BM. (2004). Understanding work styles. Business and Economic Review October–December:22–24.

Zemsky, R & Massy, WF. (2004). Thwarted innovation: what happened to e-learning and why. Available at: http://www.irhe.upenn.edu/Docs/Jun2004/ThwartedInnovation.pdf. Date accessed: 14 October 2010.