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Adult Approaches to Learning and Associated Talents.

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ABSTRACT

The aim of this research is to systematically categorize terms describing the means used by talented individuals to develop and maintain their skills in relation to nine talents. One hundred and fourteen participants provided terms describing the acquisition and maintenance of talent in reference to nine talents, during a structured interview. The terms were ordered into seven categories of approaches to learning. The seven categories comprise: effort, understanding, interest, natural ability, performance, pre-occupation and ease. The results show that effort, natural ability, and performance contributed to the acquisition and maintenance of different talents. Males indicated that the acquisition and maintenance of the nine talents were associated more with understanding and performance while women identified more with natural ability in the development and maintenance of talents.

INTRODUCTION

This research is prompted by the absence of a description of learning approaches relevant to adults and concerns that the learning approaches appropriate for measuring student outcomes have not yet been shown to be relevant to adult learners. There is a range of descriptions of adolescent learning, typically forming theories of varying complexity. To date no explanation of learning has used the terms of learners, or observers of learners, to systematically describe components that are used to acquire and maintain skills. The purpose of this research was to define a set of approaches to learning from a nontheoretical perspective and use terms derived from participants to develop the set of higher-order categories of approaches to learning.

In reference to the adolescent learners Stellwagen (2001) maintains that there is little evidence that consistently links using learning styles and positive outcomes for the learner. It is correct that there are a large number of correlational studies that show that specific groups do not use learning styles consistently, but typically, these studies demonstrating group differences do not directly link learning styles to successful educational outcomes (Busato, Prins, Elshout, & Hamaker, 2000). By contrast, there is evidence showing that educative processes informed by learning styles are more effective (Biggs, Lai, Tang & Lavelle, 1999; Doolan & Honigsfeld, 2000; Watkins & Mboya, 1997; Zeegers, 2001). Even at the most general level learning styles reportedly influence self-directed adaptability, autonomy, and maturity (Knowles, 1990). What is problematic about the literature is firstly, the divergence of opinion about the definition of learning styles. Secondly, the research has been conducted using adolescents and young adult respondents within the confines of school based learning, despite the relevance of learning approaches across the lifespan (de la Harpe & Radloff, 2000). Thirdly, the concepts and constructs describing learning styles are typically abstract and associated with the theoretical explanation and not the activity of the learner, as such they are unlikely to assist the development of lifelong, self-directed learners who selectively apply a variety of approaches to learning (Merriam, 2001). Identifying the learning approaches used by adults to acquire

and maintain their skills in a broad range of talents, in non-specialised terms is the aim of this research.

There is large variability in the operationalization and definition of approaches to adolescent learning. For example, frequently cited in the literature are the Biggs Learning Process Questionnaire (1987), Canfield's Learning Inventory (Canfield,1980), Rezler and French's Learning Inventory (Rezler and French, 1975), Schmeck's Inventory of Learning Processes (Schmeck, 1977), the Productivity Environmental Preference Survey (Dunn, Dunn & Price, 1982) Gregorc's Delineator (Gregorc, 1984), and the Learning Styles Inventory-1976/1984, (Kolb, 1976, 1984; Smith & Kolb, 1986). These measures have varying levels of specificity and tap a range of motivational, metacognitive, and processing factors termed learning styles. They typically have the limitation of focusing on school context relevant cognitive processes. That is, learning is defined in reference to traditional instructional terms that typically focus on scholastic and didactically centered approaches to learning. The Learning Styles Inventory -1976/1984, (Kolb, 1976, 1984; Smith & Kolb, 1986) and Dunn and Dunn's (1992) classification of learning styles exemplify this scholastic approach.

The Learning Styles Inventory-1976/1984 , (Kolb, 1976, 1984; Smith & Kolb, 1986) is a frequently reported measure of learning styles in the adult learning literature. It is theoretically grounded on a four-phase cycle representing four styles of learning. Using this instrument the individual obtains a score indicating their preference for being a Diverger, a person who prefers immediate concrete experiences and reflection on observation to inform values and meanings. The Assimilator prefers to use inductive cognitive processes to learn and generates abstract models and representations of their learning material. The Converger prefers to conceptualize and actively experiment to solve problems and apply the information presented. By contrast, the Accomodator takes information from concrete experiences, makes plans, experiments, and effects change given the information. The authors maintain that planning teaching and learning activities that incorporate these elements will assist in the teaching-learning process. The authors do not describe how the improved teaching will occur and given the general nature of the four styles it is difficult to perceive how these are relevant to the range of experiences that adult learners encounter.

A similar criticism of generality of constructs and relevance of the factors to adult learning can be made about Dunn and Dunn's (1992) five-way classification of learning styles. The five learning styles are environmental, emotional, sociological, physiological and psychological. For example, an individual with an environmentally disposed learning style would fluctuate in relation to the sound, light, temperature, and formality of the environment. These authors maintain that management of the above factors and designing them into didactic experiences and teaching presentations will assist learning. Management of the environmental, emotional, sociological, physiological, and psychological aspects of the person and the learning environment is very important but as the scales measure very broad constructs they are unlikely to assist in the identification and differentiation of the ways the adult learner can understand and regulate their individual approach to learning.

A final example of learning styles is provided by Ainley (1993) who clustered students on the pattern of their six learning styles scales from Biggs (1987; surface motives, surface strategies, deep motives, deep strategies, achieving motives, and achieving strategies) The clusters form a comprehensive set that describe how students engage with learning. The six clusters that emerged in Ainley's study were: committed; engaged; detached; disengaged; hopeful, and keen-to-do-well. In an attempt to investigate core beliefs about learning (Brownlee, Boulton-Lewis & Purdue, 2002) respondents will be asked to describe how they believe people who are talented develop and maintain their talents. Thus, the general aim of the research is to define the terms used to describe the acquisition and maintenance of proficiency associated with nine talents (Gardner, 1983, 1993; described below). It is expected that these terms will be able to be ordered into a set of general categories of approaches to learning.

To date no research exists that demonstrates the development of constructs defining how people learn based on grounded techniques (Charmaz, 2000; Strauss & Corbin, 1998). The closest research to a grounded approach was the use a cluster analytic technique to define students used by Ainley (1993). In the current research, the focus is on exploring approaches to learning which are

distinctly different to the learning styles previously defined by Kolb (1976, 1984; Smith & Kolb, 1986) and Dunn and Dunn (1992). To do so Gardner's talent will be utilized.

Table 1: Summary of the Definition of Nine Talents.

Talent	Gardener's Nomenclature	Definition Operation, understanding, sensitivity to, awareness or use of…
1). Language and Communication	Linguistic	Spoken and written languages and a capacity to use language to satisfy goals and express oneself.
2) Mathematical and Logical	Logical and Mathematical	Scientific tasks, inductive and deductive thinking, reasoning, conceptualizing and ordering abstract information.
3) Construction and Spatial Design	Visual and Spatial	Visualization, creation of mental images, representations and operating with them in a three-dimensional or concrete fashion.
4) Physical and Sport Activity	Bodily-kinaesthetic	All or part of one's body in a systematic manner to express oneself or make meaningful movement.
5) Musical and Rhythmic	Musical and Rhythmic	Auditory function, the pitch, discrimination of sound and sensitivity to rhythm, texture and timbre, and the capacity to hear themes and patterns in music.
6) Social and Leadership	Interpersonal Intelligence	Interpersonal contact, operating with others, and awareness of their actions, motivations and ways of functioning.
7) Self-awareness	Intrapersonal Intelligence	Inner states of being and consciousness of self, metacognitive, emotional and behavioral functioning.
8) Nature and Environmental	Naturalistic Intelligence	Nature, the desire to look after, be in, and be associated with, find out about and connect with wildlife, and the natural environment, animals and plants.
9) Spiritual and Religious	Existential Intelligence	The awareness of and involvement in a variety of religious activities and tasks associated with spiritual celebrations and rituals.

Gardner's talents (1983, 1993) have been selected as a proxy to a broad range of educational and work activities because they are sufficiently contained and yet diverse. That is, the talents represent a defined set that is not specific to any particular educational subject, curriculum or work area. The talents are also categories through which individuals have been known to excel. In reference to each talent participants will be asked, "how do people achieve and maintain their level of proficiency?" can be asked in reference to the talents. Gardner's work evolved from cognitive psychology and generated a set of nine distinct categories that provide a framework typically associated with the behavior of highly talented young people (Colangelo & Davis, 1991). These categories are of continuing interest for three reasons. First, they provide a systematic means of categorizing talents through which individuals express their proficiency, whether at work or in recreation. Second, these talents are transferable, across fields of education, work, and recreation. Third, Gardner's talents provide a comprehensive way of categorizing the focus of learning relevant in a variety of settings and relevant to a range of levels of proficiency, the novice, the competent and excelling talented participant. Further, it has been argued that Gardner's intelligences differ on the basis of working styles, such as engagement, persistence, distractibility in learning settings (Sternberg, 1991). These work styles are likely to represent some of the approaches to learning that are of primary interest in this research. The categories that define Gardner's intelligences or talents are considered distinct ways that individuals can know their realities (Lazear, 1990). They have been variously described (Lazear, 1990; Ramos-Ford & Gardner, 1991) and can be summarized as a set

comprising the primary seven talents originally defined by Gardner (1983, 1993; Table 1, point 1-7). The possibility of other domains has been suggested. The most likely eighth domain is a Naturalistic intelligence and the less likely but possible ninth intelligence of Existential intelligence (Carvin, 2000; Gardner, in press; Gardner, 1999; Table 1, point 8 and 9). Following the interest in these domains and because including them provides a more comprehensive set of tasks and activities associated with human occupation, they have been added to make a total of nine talents.

In summary, Gardner's multiple intelligences (1983; 1993) are being adapted to represent a set of nine factors relevant to scholastic, work and other learning settings. The general aim of the research is to define the terms used to describe the acquisition and maintenance of proficiency associated with nine talents by interviewing adults. The responses will indicate the approaches to learning nominated by the respondent to acquire and maintain the talent. The first specific aim of this research is to sort the words and terms stated by respondents, describing the means used to acquire and maintain proficiency associated with talents, into meaningful categories of approaches to learning. The second specific aim is to identify whether a model can be developed to represent the relationship between the sex of the respondent, the learning approach, and the talent. The third specific aim is to investigate the features of the model that best defines the relationship between the approaches to learning, talents, and the sex of the respondent.

METHOD

Participants

The study involved 114 participants. Fifty seven participants were female with an average age of 29.80 years with a standard deviation of 10.16 years. Twenty-seven were married or partnered and twenty-three of the respondents were single; seven were separated. Seventeen females were involved in management and professional occupations. Six were involved in trades and machine operation and the same number were involved in sales occupations. Five respondents were involved in clerical tasks, five were students, four were unemployed and one was retired. The average period of work for the females was 11.77 years with a standard deviation of 9.08 years.

The study also involved 57 male participants. Their average age was 27.40 years with a standard deviation of 12.00 years. Twenty-seven males were married or partnered. Twenty-eight respondents were single and two were separated from a relationship. Seventeen respondents were involved in professional and management roles and 20 were in trades and machine operations. Four respondents were involved in clerical and nine respondents were involved in sales. Six respondents were students and one was retired. The average period of work for males was 11.11 years with a standard deviation of 9.70 years.

The 57 males and 57 females were matched on the following factors: sex, age, occupation, and marital status, in that order. Analysis shows that there were no differences between males and females on the basis of age ($t(112) = 1.16$, $p = .250$), or length of marriage ($t(112) = 0.74$, $p = .462$). Similarly, there were no differences on the basis of male and female participation in types of occupations, $\chi^2=(6) = 10.35$, $p = .111$) and marital status, $\chi^2=(2) = 3.26$, $p = .195$). The respondents were a convenience sample invited to participate by the author.

Procedure

A structured interview was separately undertaken with each respondent separately. Each interview took between 20 and 35 minutes. The respondents were introduced to the interview as a means of inquiring into the methods used by people to gain and maintain their skills in the nine talents (respondents were given a list of the terms with an accompanying definition, as below). Respondents were asked "What are the characteristics and attributes of the people who display the following talents? That is, how do people who are highly proficient or outstanding in the following areas of expertise acquire and maintain the following talents? Please recall a person who has been highly proficient or outstanding in each of the talents, and identify how that person acquired and maintained that level of proficiency." The description of each talent was read to the participant in turn:

1 LANGUAGE AND COMMUNICATION: Communicating ideas, discussing, creative and other writing, reading, acting, telling jokes, playing with language or word games.
2 MATHEMATICAL AND LOGICAL: Recognizing patterns and relationships, 'cracking' codes, solving problems and number patterns or calculating complex problems.
3 CONSTRUCTION AND SPATIAL DESIGN: Making models, drawing, imagining how to build things, reading maps, working with wood, other material or construction sets.
4 PHYSICAL AND SPORT ACTIVITY: Sport/s, exercise, aerobics, physical training, creative movement, dance, acting, miming or other physical activities.
5 MUSICAL AND RHYTHMIC: Music, listening for relaxation or pleasure, rhythm patterns, music playing, performing, reproducing rhythm or pitch by singing or playing.
6 SOCIAL AND LEADERSHIP: Group activities, clubs, cooperative tasks, being with others, community service activities, being responsible or being a leader.
7 SELF-AWARENESS: Finding out about your own feelings and thoughts, focusing on your own behaviour, the behaviour of others, spending time by yourself and thinking about thinking.
8 NATURE AND ENVIRONMENTAL: Looking after nature, being in nature, visiting places where animals live. Finding out about the connections between environments and animals.
9 SPIRITUAL AND RELIGIOUS: Being aware of a spiritual self and world, involvement in different religious activities and tasks, being involved in spiritual celebrations and rites.

Each respondent was invited to discuss how the individual they defined as being proficient or outstanding acquired and maintained their talent. As many words and terms as possible were elicited from the respondent in response to the question. If respondents volunteered more than two responses the words and terms were discussed and the two words or terms that best described how talented people acquire and maintain their proficiency were recorded by the interviewer.

The structured interview method of gathering data follows the recommendations of Hersen and Turner (1995), Keats (1993), Miles and Huberman (1984), and Jick (1983). After the key words and terms were listed they were coded into a database. Finally a comprehensive list of responses to each approach to learning was developed by ordering natural categories that emerged from the data. The criteria for establishing the natural categories of terms required identifying the most frequently occurring words and terms to form open coded categories that were independent of other categories and were refined into axial coding categories and then selective coding of the final list contributing to the categories (Strauss and Corbin, 1998; Miles & Huberman, 1984).

RESULTS

For each of the nine talents two responses were prompted. The 114 respondents generated 1055 responses from females and 919 from males. The distribution of frequencies for each talent is shown in Figure 1. Seven naturally occurring categories were constructed from the terms and are represented as percentages of responses from male and female respondents. Each category (column) was further sub-categorized by the order of nomination of the word or term (first, second). Of the 1974 responses 8.4% were allocated to the ‘No Response’ category, as respondents did not have a second response and 2.4% were allocated to an ‘Other’ category as these responses did not fit into the seven categories and were not included in any further analysis. The eight most frequent words or terms contributing to each approach to learning are listed in Table 2. The data was used to test the relationship between sex, talents, and approach to learning. To complete this three-way frequency analysis a crosstabulation with cells weighted by frequency using SPSS version 11.5 and a hierarchical loglinear analysis was completed. Stepwise selection by simple deletion rendered the best model with generating class, containing two second-order effects with a likelihood ratio of $\chi^2(56, N=1810) = 57.91$, $p = 0.41$. The two second order effects are talent by approach to learning and sex of respondent by approach to learning. This ratio indicates a good fit between the observed and expected frequencies in the cells. So

further exploration of the relationship between the factors selected by the model, that is the two second-order effects, can be analyzed by using two separate general loglinear analyses.

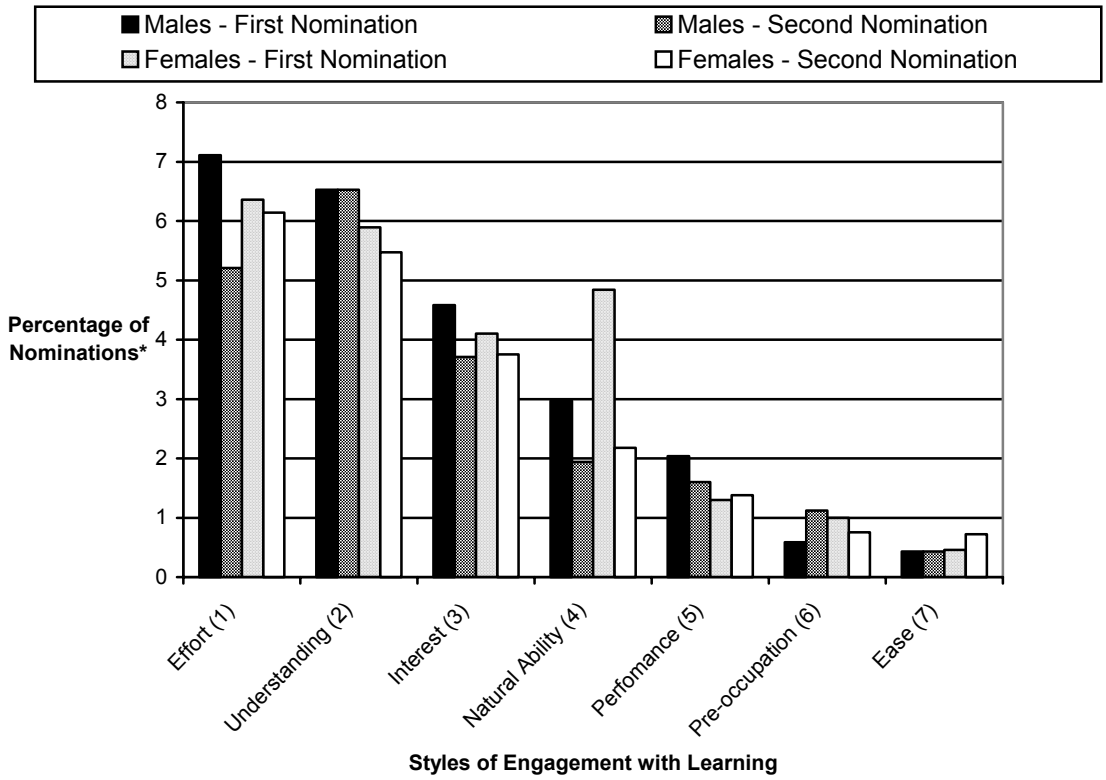

Figure 1: Distribution of responses according to the Approach to Learning.
Note: * 100% is equivalent to total of all female and male, first and second nominations.

The first loglinear analysis showed that the observed and expected frequencies describing the relationship between the talents and the approach to learning indicated considerable variation, (Table 3) with a goodness of fit statistic revealing a $\chi^2(48, N=1810) = 523.537$, $p < 0.001$.

Examination of the standardized residuals with a value $^{+}$/-2, indicates a complex relationship between the approaches to learning and talents. In twenty-one cells under-representation was indicated, whereas in only 12 cells was an over-representation shown (observed cell frequency more frequent than the expected cell frequency). Effort was the most frequently associated approach to learning with a match to eight of nine talents. It was most associated with language, logical, bodily-kinaesthetic, and musical talents and least related with interpersonal, intrapersonal, nature, and spiritual talents. Natural ability was the next most frequently associated approach, positively with logical, musical, and interpersonal but not with intrapersonal, nature and environment, and spiritual and religious domains. Language, logical, intrapersonal, nature and environment, and spiritual and religious talents were not related to the learning approach of performance. Performance was associated with proficiency and maintenance of bodily-kinaesthetic activities. Less associated with the talents, than the learning approaches above, are interest, understanding, and pre-occupation. Approaching the talents with interest was most relevant for nature and the environment and least

Table 2: Most frequent terms contributing to the Approaches to Learning.

Approaches to Learning						
Effort (1) [1]	Understanding (2)	Interest (3)	Natural Ability (4)	Performance (5)	Pre-occupation (6)	Ease (7)
Practice	Understanding	Being interested	Natural ability	Training	Pre-occupied	Comes easily
Do it	Experience	Involvement	Born with it	Performance	Passion	Opportunity
Effort	Learning	Like it	Talent	Skill development	Need	Content
Study	Reflection	Enjoy it	Creative	Achievement	Drive	Relaxed
Motivation	Thinking	Listening	Natural disposition	Competitive	Love it	Comfortable
Persistence	Knowledge	Curiosity	Ability	Challenge	Have to have it	Suits them
Committed	Awareness	Open minded	Aptitude	Competence	Really focused	As they are
Determination	Imagination	Participate	Inherit skills	Exercise it	Compulsion	Calm

Note: [1] the terms contributing to the individual approaches of Engagement with Learning are in order of magnitude, greatest at the top of each column.

Table 3: Observed and Expected Frequency of Approaches to Learning by Talents.

Talents	Approaches to Learning						
	Effort	Understanding	Interest	Natural Ability	Performance	Pre-occupation	Ease
Language and Communication	75 (57)	50 (55)	38 (37)	27 (27)	6 (14)	3 (8)	5 (4)
Logical and Mathematical	76 (59)	53 (57)	21 (38)	40 (27)	8 (15)	7 (9)	6 (5)
Visual and Spatial	62 (58)	69 (57)	23 (38)	40 (28)	20 (15)	3 (9)	3 (5)
Bodily-Kinaesthetic	85 (61)	10 (60)	24 (40)	28 (29)	59 (16)	14 (9)	0 (4)
Musical and Rhythmic	84 (59)	26 (57)	35 (38)	40 (28)	11 (15)	12 (9)	3 (5)
Interpersonal	35 (51)	38 (50)	39 (33)	43 (24)	20 (13)	4 (7)	4 (4)
Intrapersonal	29 (51)	103 (50)	30 (33)	9 (24)	4 (13)	1 (8)	9 (4)
Nature and Environmental	27 (55)	56 (53)	74 (36)	12 (26)	2 (14)	20 (8)	6 (4)
Spiritual and Religious	30 (52)	86 (51)	46 (34)	10 (25)	2 (14)	10 (8)	5 (5)

Note: Figures in parentheses are expected.

associated with logical, visual and spatial, and bodily-kinaesthetic. Understanding was associated with intrapersonal and spiritual and religious talent but not associated in developing and maintaining proficiency in bodily-kinaesthetic and musical talents. Pre-occupation was associated with nature and the environment but was not an approach used to acquire language, visual and intrapersonal talents. The least associated with any of the talent areas was ease with a negative association with bodily-kinaesthetic and positive association with acquiring and maintaining the intrapersonal talent area.

Table 4: Frequency of Approaches to Learning by Sex of Respondent.

	Females		Males	
Engagement with Learning	Observed Count	Expected Count	Observed Count	Expected Count
Interest	160	163	170	167
Ease	23	20	18	21
Effort	250	249	253	254
Understanding	223	243	268	247
Performance	57	65	75	66
Pre-occupation	40	36	34	37
Natural Ability	143	118	96	120

The second loglinear analysis, in contrast with the above, showed that the standardized residuals representing the association between sex and talent areas, were not as extreme with a $\chi^2(6, N=1810) = 17.14$, $p = 0.009$ (Table 4). The observed and expected frequencies of the relationship between sex of respondent and the approach to learning show that there was no difference between the sexes on the association with the acquisition and maintenance of talent areas, for interest, ease, effort, and pre-occupation. The maintenance and acquisition of the talents, for females, was associated with natural ability and not understanding and performance, correspondingly, the reverse was true for males.

DISCUSSION

The first aim of the research was to describe the approaches to learning used to acquire and maintain talents. A meaningful set of factors defining approaches to learning has been defined. The categories have face validity and were the product of a series of iterations to separate, edit, and create a comprehensive set of distinct categories. The categories of interest, effort, and pre-occupation were by degrees different and appear more similar to each other than to the other approaches. That is, to be interested one is involved. To use the styles of effort, involvement is not sufficient and motivation and related activities are necessary. Similarly passion, need, and drive characterize the category of pre-occupation best. This may be sequential progression conceptually; however, practically the use of such approaches is likely to remain separate. This distinction is reflected in the frequency of the use of the terms, with the most frequently nominated terms being associated with effort and understanding. The least frequently nominated terms were related to performance, pre-occupation, and learning easily.

These seven approaches have a coherence as a set of approaches to learning and are different to other operational representations of learning styles from Biggs, Lai, Tang and Lavelle, (1999) Canfield's (1980), Rezler and French (1975), Schmeck (1977), Dunn, Dunn and Price, (1982) Gregorc's (1984), and Kolb (Kolb, 1976, 1984; Smith and Kolb, 1986). The approaches to learning derived from this research share some similarity with the six clustered terms derived from Ainley (1993) and like the previous findings of Purdue and Hattie (2002), suggest a departure from the explanation of learning styles as deep and surface. The terms of committed and engaged described by Ainley are similar to the approaches of effort, and pre-occupation. Keen-to-do-well may be associated

with the approach of a focus on performance. There appears no match for the clustered terms of detached, disengaged and hopeful as described by Ainley as these terms are not likely to explain the acquisition and maintenance of proficiency. Correspondingly there appears no parallel clustered term corresponding to the styles of understanding, interest, natural ability, and ease. The factors defined in this research as the learning approaches are broader in context and focus less on scholastically related processes than factors defined in previous research. This represents an advance in the description of learning approaches and reflects recent thinking that beliefs about learning and study, such as are described in this research (Hadwin, Winne, Stockley, Nesbit & Woszczyna, 2001) are relevant in describing students' learning (Brownlee, Boulton-Lewis & Purdie, 2002) and adult learning processes.

The second aim of the research was to test a model of the relationship between the approach to learning, the talent areas and the sex of the respondents. The best explanation of the relationship of these variables did not involve a single three-way explanation but comprised two, two-way associations that included the learning approach by talents and the learning approach by sex of respondent. The third aim of this research was to investigate of the features of the model in greater depth. The two-way associations between the learning approaches and the talents indicate that the approaches operate independently of each other and were associated variously with the talents. As would be expected it was by the specific application of some of the approaches, and the absence of other approaches, that the talents were acquired and maintained. For example, the acquisition and maintenance of language and communication skills was mainly through the application of effort and an absence of focus on performance and pre-occupation with the subject. By contrast, the development and maintenance of a talent in the spiritual and religious domain was mainly dependent on the presence of understanding and the absence of focus on effort, performance and natural ability.

The learning approach by sex association shows that females acquired and maintained their proficiency in the talents through natural ability, whereas males did not. By contrast males acquired and maintained their proficiency through understanding and performance and females were not inclined to do so. Interest, ease, effort, and pre-occupation did not differentially contribute to the acquisition and maintenance of proficiency for females or males. Sex differences have not been consistently found in previous research, however the difference between the sexes in this research appears large but will require replication in future research.

In summary, for adults, very different approaches to learning have been associated with a variety of areas in which adults are seen to maintain and express their talents. It is not sufficient to say that one approach to learning and maintaining proficiency is appropriate for all adult activities. Regardless of the type of activity, whether working or recreating these differences need to be acknowledged and highlighted to assist the efficiency and personal satisfaction of the adult learner. Likewise, but to a lesser degree differences between the sex of the respondents with the approaches used to gain and maintain talents were found. In this research females focused mainly on natural ability and males focused on understanding and performance. Understanding one's preferred use and non-use of particular learning approaches, whether generalized or specific to particular learning opportunities will provide greater self-regulation and choice.

Various caveats need to be applied to these findings and the findings above. Mainly, these results are the analysis of responses that are perceptions and observations of respondents about third parties. The analysis of the sex factor was based on the sex of the respondent and not the sex of the third party being considered by the respondent. Further research would assist to clarify these potential confounds. Investigation of the characteristics of the third parties being recollected needs to be completed further in reference to their sex, age grouping, and the particular details of the activity and person in the respondent's ideation. Consideration of the effectiveness and frequency of use of each of the approaches would develop our understanding of adult learning. Further research into the self-reported approaches with specific groups and self-reported nominations of proficiency would assist to clarify the potential bias that may be present as a function of the use of recollection and perception in this research. Further development of the approaches to learning into constructs defined through factor analytic techniques would validate these findings and allow for further comparison and validation of the similarities and differences found between talents and approaches. The application of

these constructs to other groups, such as students and others engaged in learning in the workplace would also validate these constructs once they are defined.

One other positive outcome of this research is the operationalization of the talents in the manner defined in this research is a slight departure from the typical use of Gardner's talents. Gardner's talents have been associated with gifted children in the past. As talents they appropriately represent relevant, general domains of activity of adults and give some support for the claims of the generalizable relevance of the approaches to learning (Doolan & Honigsfeld, 2000). Further, it is important to note that few previous descriptions of learning experiences have provided such a comprehensive set of the factors from which to define the approaches to learning. This may be because the research to date has not sufficiently focused on adults nor compared the approaches to learning between children, adolescents, and adults. Clearly there is a need for further research involving such comparisons and research into adult learning and whether this learning is situation specific (for example work or home) and related to different motivations (for example, extrinsic or intrinsic).

In conclusion, it is worthwhile returning to the complaint from Stellwagen (2001) and the suggestion that the findings from the research on learning styles has not had a sufficiently positive impact on the teaching-learning dynamic and outcomes of learning. The profiling of individuals on the basis of their preferred learning to assist them to gain proficiency requires very judicious care on behalf of the teacher, trainer, or coach supervisor or work colleague. Emphasising a continual review of a limited range of preferred learning approaches is likely to lead to loss of interest and fatigue. Knowing when and how to prompt the development of new approaches to deal with the acquisition of new skills and the maintenance or expansion of old skills is a field of future research that is of exceptional importance. Better understanding the link between talents and learning approaches and learning styles is progress toward that end.

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