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Seven Motivating Conceptions of Learning of Tertiary Students

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Abstract. Of the various ways of defining learning, few use students' own terms as the foundation for the definition of factors. Based on data derived from student's descriptions of concepts of learning a questionnaire was developed. Responses from 252 tertiary students were used to evaluate and validate the conceptions of learning. Exploratory and confirmatory analysis showed that the seven concepts of Interest, Performance, Effort, Understanding, Ease, Natural Ability, and Preoccupation were acceptable as were levels of reliability. The consistency of the factors was tested over the duration of a semester with no significant differences between times 1 and 2 and no significant gender differences. The implications for further development and application are discussed as is the similarity of the seven factors with previous explanations of learning.

Keyword: metacognitive skills; conceptions of learning; motivation to learn; characteristics of learning; approaches to learning; prompts to learning.

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Introduction

There have been three main approaches to describing how students conceive learning, and this paper explores a fourth. First, there are approaches that describe the conceptual steps students pass through to achieve learning – for example Piaget's (1977) developmental stage approach or Von Glaserfeld's (1995) research on stages of learning. The second approach focuses on tasks in the process required to scaffold learning (Simon's et al.; 2010). Third, there are hybrid approaches based on elements of the two previous approaches, for example, Harel and Koichi (2010, p. 118) argued that "learning is a continuum of disequilibrium–equilibrium phases manifested by (a) intellectual and psychological needs that instigate or result from these phases and (b) ways of understanding or ways of thinking that are utilized and newly constructed during these phases". This results in a constant framing and reframing of what is learned and how to behave with such knowledge towards socialization into ways of behaving in institutions such as schools. In this research we consider a fourth approach, developed by asking students to elaborate on their conceptions of learning. The aim of this research is to investigate a new way of conceiving learning based on adult responses to learning in both academic and other activities.

Understanding students conceptions of learning is important as they provide a means of understanding how students conceive of learning and how these concepts might be carefully applied to teaching in contexts (Lonka & Lindblom-Ylanne 1996; Richardson 1999) and importantly to develop a set of factors to use in dialogue with students about personal learning experiences, within a range of context (Richardson 1999; Lin, Tsai, & Liang, 2012; Vermunt & Vanrijswijk 1988; Vermunt & Vermetten 2004). Recognizing and referring to student's Concepts of Learning (CoLs) may assist teachers to understand the implicit learning theories in the formal class context and informally (Lonka & Lindblom-Ylanne 1996; Vermunt & Vanrijswijk 1988; Vermunt & Vermetten 2004). The problem addressed in this research was whether CoLs associated with active learning experiences of young adults systematically form constructs in line with previous work of Bowles (2004) in developing the CoLs.

Much of this type of research into learning began with Marton and Säljö (1976) on learning as surface or deep, each applying a different strategy. Biggs (1985) expanded the definition to include a third style of "achieving" and argued that each could be subdivided into strategies and motives, leading to six categories of approaches: Surface Motives, Deep Motives and Achieving Motives, and Surface Strategies, Deep Strategies and Achieving Strategies. These methods are based on various strategies when learning whereas other researchers have employed styles which are more related to beliefs about what people do when they learn. For example, Armstrong identified 54 styles such as reflective-impulsive, splitters-lumpers, serialists-holist, and spatial-verbal (see also Zhang & Sternberg, 2006). These styles have been criticized in reference to their efficacy, lack of consistency in measurement and multiple definitions of the styles (Cuthbert, 2005; Reynolds, 1997). Further, most of these styles were not reflective of the ways students conceive of learning.

Other ways of describing student learning refer to types of student thinking, and includes models such as DeBono's (1986) lateral and parallel thinking tools, and Ennis' (1987) taxonomy of thinking dispositions, and various abilities exemplified by Gardner (1999) multiple intelligences. These models have support in the literature, but they are scholastically focused and primarily relevant for adolescent learners. In this research the focus is on adult learners referring to concepts of learning relevant

to a broad range of activities and contexts including but not focused exclusively on scholastic learning, in their own terms.

Learning is not a general phenomenon but is a construct dependent on experience, context, domain, motivations, and socially and culturally established conventions usually associated with school learning – a view, to varying degrees shared by others (Confrey, 1990; Purdie & Hattie, 2002; Reynolds, 1997; Sadler-Smith, 2001; Säljö, 1987). The complexity of the explanation of learning is shown in Ainley (1993) clustering of students' scores on Bigg's Surface, Deep and Achieving motives and strategies which identified six clusters of how students engaged with learning; which were labelled Detached, Committed, Hopeful, Engaged, Disengaged, and Keen-to-do-well. Similarly, Entwistle and McCune (2013) investigated tertiary students' approaches to learning integrating learning processes, motivational factors and metacognitive factors. Entwistle and McCune found that the first cluster of students related to a disposition to understand. Other clusters related to a deep approach to learning and varied on factors such as organized effort and monitoring.

The factors defining the constructs above are very school-based, however learning can be conceived of differently outside school environments and these are becoming more important for general learning (Vernon 2014) and engagement from the perspective of the individual (Bowles, 2004; Vermunt, & Vermetten, 2004). Importantly, as the contexts of learning change, through the transition from adolescent to adult, the complexities of the school learning give way to a new set of situations. The ways learning is conceived in workplaces and self-directed contexts (Wong, Yong, & Gerber, 2001), recreational contexts (González-Haro, Calleja-González, & Escanero, 2010) and different social settings (Johnson & Johnson, 2002) may vary considerably and be accompanied by a high degree of experimentation. The CoLs in this research were originally developed by asking adults how they thought learning occurred when people were competent in a range of activities and contexts (Bowles, 2004). Given this systematic method of development it is expected that the CoLs will be relatively independent of the previous scholastically focused factors.

Previous research has defined CoLs as thoughts, understandings, knowledge and experiences, arising from the social and personal contexts determining the experience of learning, from the point of view of the participant (Billett, 2009; Olsson, 2011; Richardson, 1999). While there is no theory of CoLs research has shown that a student's CoLs (e.g. understanding) is predicted by epistemological beliefs (e.g. fixed ability) and, in turn predicts specific approaches to learning (surface approaches; Zhu , Valcke, & Schellens, 2008). There is considerable diversity in the combinations in which such learning occurs. For example, Bowles (2004) asked respondents how individual's that were observed to be proficient in nine different talents gained and maintained their competence. The structured interviews resulted in a range of responses which were systematically summarized into the seven CoLs of adults: Effort, Understanding, Interest, Natural Ability, Performance, Pre-occupation, and Ease. In Bowles (2004) research a constructivist approach was used to establish adults' CoLs. Constructivism has become a common theoretical frame to explain how people learn (Semerci, & Batdi, 2015) and lends itself to the development of research questions less constrained by extant theories and more privileging of the construction of the idea construed by the respondent (Johnson, & Onwuegbuzie, 2004) through interactions, observations and reflection on real life experiences

associated with learning and how learning occurs (Brooks & Brooks, 1993; Butler, Miller, Lee, & Pierce, 2001; Jaleel, & Verghis, 2015).

The seven CoLs have association with previous research in which Interest means learning by focusing on enjoyment, interest, and liking the subject and process. Interest is dependent on the interaction with the activity (Chen, Darst, & Pangrazi, 1999: Krapp, Hidi, & Renniger, 1992). Understanding means thinking, reflecting and seeking knowledge. Reflective learning for understanding is an important feature of effective teaching and learning (Diaz-Lefebvre, 2004). Ease is learning comfortably, suitably and calmly. It has become a major means of imagining learning and is associated with flow, to facilitate engagement and optimizing effort across a range of contexts and media (Davis & Lang, 2012). In essence Ease reflects accessibility and efficiency in an unaroused, paced state of learning (Stevens, Anderson, O'Dwyer & Williams, 2012). Natural Ability is defined as believing in and having natural ability. Performance means focusing on the process effectively by training, performing and exercising skills. Usually, performance is associated with the outcome of the learning process whereas Concepts of Learning Questionnaire (CLQ) situates performance at the micro skill level as well as associating it with the longer term outcome, mastery, and goals(Lam, et. al., 2012;). Performance goals are strong predictors of academic achievement (Richardson, Abraham, & Bond, 2012). Pre-occupation means having a love for it, having to have it and approaching with a thirst. It is little researched but it is a powerful factor for both proficient athletes and people who need an intense focus to learn. An overly engaged response and extreme commitment is usually associated with extreme performance. Effort means approaching with motivation, persistence, and commitment and is very commonly examined in the literature and is a strong predictor of grades (Richardson, Abraham, & Bond).

Each CoL described above is conceptually independent of other Cols and are relatively independent of factors from existing explanations of learning (see Table 1). The seven Cols share little similarity with Saljo's five factors (1979) of increase of knowledge, memorizing, acquisition of facts or procedures, abstraction of meaning, and an interpretative process aimed at understanding reality. They are also dissimilar to Marton, Dall'Alba, and Beaty six CoLs (1993) and the models of Purdie and Hattie (2002) and Lee, Johanson, and Tsai (20080. It is because of this independence from previous research that more research into CoLs is warranted. The one common factor across the five models was understanding.

Previous research involving CoLs showed a small but statistically significant gender differences with females higher on natural ability and males higher than females claiming to acquire and maintain their proficiency via understanding and performance (Bowles, 2004). This is consistent with previous research showing no significant or relatively small differences in magnitude by gender (Dey, Shruti, Kaundinya, & Sinha, (015).

Finally, there has been little investigation of the influence of non-cognitive factors in tertiary settings, such as CoLs and motivational factors (Chamorro-Premuzic & Furnham, 2008) but such factors have been proposed as salient (Bowles, Hattie, Dinham, Scull & Clinton, 2014; Sautelle, Bowles, Hattie, Arifin, 2015; Kennedy, 2013). What has been shown is that many factors such as personality, , learning approaches, self-regulation, and preferred modality do not predict gains in GPA directly, whereas

Table 1. List of factors of five Conceptions of Learning.

Bowles (2004)	Säljö (1979)	Marton, Dall'Alba, and Beaty (1993)	Purdie and Hattie (2002)	Lee, Johanson, & Tsai, (2008)
Interest				
Performance				
Effort				
Ease				
Natural Ability				
Preoccupation				
Understanding	An Interpretative Process Aimed at Understanding Reality	Understanding	(Using and) Understanding	Understanding
	Memorizing	Memorizing And Reproducing	Remembering	Memorizing
	Knowledge	Increase of Knowledge		Increasing One's Knowledge
	Acquisition of Facts or Procedures		Acquiring Information	
	Abstraction of Meaning			
		Applying Information	Using (and Understanding)	Applying
		Changing as a Person	Personal Change	
		Seeing Something in a Different Way		Seeing In A New Way
			Duty	
			A Process Not Bound by Time or Place	
			Social Competence.	
				Calculating And Practicing Tests

motivation, a deep learning approach, and (younger) age have been correlated with GPA (Cassidy, 2004; 2012) and learning approaches and personality have been shown to be influential in longitudinal studies (Chamorro-Premuzic & Furnham, 2008). Many of these factors interact and form complex interplays over time (Ning, & Downing, 2010). So, the evidence about the benefits of factors such as CoLs is mixed and deserves further consideration. This research aims to provide some evidence of the utility of CoLs to learning for adults learners.

The problem under investigation in this research was whether CoLs associated with adult learning experiences form constructs, suggesting an alternative pattern of CoLs. This is tested first by operationalizing terms used by students to describe their observation of learning across a range of activities. The second aim is to establish whether the structure of the questionnaire can be validated. The specific research questions relevant to this study are:

1. Do the previously defined CoLs (Bowles, 2004) form a pattern seven factors when responses form adults are analyzed?
2. Is the factor structure of the CoLs replicated and validated by a confirmatory factor analysis using a cross-validated sample?
3. How stable are these CoLs over time and do they change even though there is no teaching related to their application?
4. Are there gender differences reflected in the scores?

Method

Participants

A convenience sample of 236 tertiary students (mean age: 22.90; *SD* = 6.77) participated in this research. Of these 152 were female with a mean age of 22.47 (*SD* = 6.94) and 84 were males with a mean age of 23.47 (*SD* = 6.13). The respondents were students studying either Arts or Sciences in the second and third year of their degrees, at a metropolitan, English speaking university in Australia.

Questionnaire

The 56 items describing the CoLs were derived from the items associated with the seven factors that were previously defined (Appendix 1; Bowles, 2004). Each item was rated in regard to the stem, "Please think of a time when you have had to actively learn a new skill. How frequently did you…? The list of 56 items were then listed to be rated against a Likert-type scale: (1) = 'Never', (2) 'Almost Never', (3) 'Infrequently', (4) 'Sometimes', (5) 'Frequently', (6) Almost Always, to (7) = 'Always'. Examples of the items are, 'Show interest', 'Take the opportunity', 'Practice'.

Procedure

The students were invited to participate in the research on the first week (t1) of the semester and the twelfth week of the semester (t2). The response rate for returning data from t1 to t2 was 52.72%.

An exploratory maximum likelihood with oblique rotation (Hair, Black, Babin, Anderson, & Tatham, 2006; Tabachnick & Fidell, 2007) was used to

investigate the factor structure using the time 1 data (t1). Items contributing to each factor were then specified into a confirmatory factor analysis (CFA) to validate and further refine the structure of the factors (with AMOS 6) using time 2 data (t2). The application and procedure for CFA has been described previously (e.g., Arbuckle, 2003; Byrne, 1998; 2001; Joreskog & Sorborm, 1993). The goodness of fit of the proposed models were evaluated in line with the recommendations of previous researchers (Byrne, 2001; Marsh, Balla, & Hau, 1996; Hooper, Coughlan, & Mullen, 2008). A range of fit-indices were chosen to assess the overall fit of the proposed models, including the ratio of chi-square to degrees of freedom (χ^2/df < 2.0 indicating a good fit (Hooper, Coughlan, & Mullen, 2008), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), and the Tucker and Lewis index (TLI) were selected to comprehensively evaluate the fit of the model (Tanaka, 1987; Tucker & Lewis, 1973). For GFI, AGFI, CFI and TLI, acceptable levels of fit are above 0.90 (Marsh, Balla & McDonald, 1988). For root mean square error approximation (RMSEA), evidence of good fit is shown by values less than 0.05 with values of 0.05 to 0.08 indicating a moderate fit (Browne & Cudeck, 1993).

Results

The best fitting exploratory factor model that made most sense was a seven-factor solution which also corresponded to the factors expected from the analysis. The seven factors explained 61% of the total variance and each item loaded on its expected factor (Table 2). An aim was to have three items per factor so items that were closest in, or repeated word meaning were deleted (Items 23, 7, 14, and 52). A confirmatory factor analysis was then performed on the data from the second time period and this led to very good fit. The CFA fitted the data well relatively ($\chi^2_{(185,\ N\ =\ 253)}$ = 380.91, p = .001), χ^2 /df = 1.93, GFI = .873, AGFI = .829; CFI = .920, TLI = .902; RMSEA = .066 indicating a relatively good model fit. The coefficients of the CLQ are shown in Figure 1.

Table 2: Items and Loading on Factors of the CLQ Questionnaire.

			Factor							
		Item	1	2	3	4	5	6	7	C^2
1	Interest									
	22	Enjoy doing it.	**.993**	-.072	.015	-.041	-.026	.072	-.047	.99
	15	Like doing it.	**.811**	.027	.006	.055	-.009	-.018	.035	.70
	1	Show interest.	**.504**	.071	.078	.045	.162	-.092	.136	.52
2	Understanding									
	32	Reflect on it.	.040	**.894**	-.027	.022	.025	-.049	-.037	.55
	25	Think about it.	-.061	**.630**	.074	-.006	-.035	.140	.031	.72
	39	Gain knowledge.	.053	**.392**	-.086	.015	.098	-.116	.365	.49
3	Ease									
	23	Stay relaxed.	.076	-.049	**.862**	.012	.009	-.013	-.006	.68
	51	Stay calm.	-.012	.056	**.819**	-.057	.121	-.015	-.052	.70
	30	Stay comfortable.	.038	-.001	**.626**	.090	-.000	-.121	.179	.63
	37	Do what suits me.	.048	.026	**.254**	.106	-.180	.159	.035	.22
4	Natural Ability									
	7	Show natural ability.	.032	-.039	.019	**.892**	.037	-.121	-.107	.76

	14	Show I am born with it.	-.030	-.008	.010	**.809**	-.058	.062	.-004	.65
	35	Show a natural disposition.	.021	.000	.047	**.783**	-.051	.126	-.004	.70
	21	Show talent.	.068	.089	-.032	**.629**	.074	.015	.062	.59
	42	Show ability.	.001	.033	-.037	**.605**	.127	.010	.157	.65
5	Performance									
	54	Exercise the skill.	.055	.070	.103	.008	**.721**	.131	.083	.65
	12	Perform the skill.	.030	-.014	.156	.222	**.541**	-.061	.075	.50
	5	Train.	.067	.083	-.066	.038	**.429**	.228	.105	.52
6	Preoccupation									
	55	Become compulsive.	.023	.138	-.017	.059	.090	**.527**	-.077	.44
	41	Having to have it.	-.032	-.025	-.019	.006	.117	**.515**	.270	.37
	34	Having to love it.	.215	.064	-.058	.117	-.071	**.506**	.054	.56
7	Effort									
	45	Stay committed.	.042	-.023	.004	-.005	-.065	.065	**.761**	66
	38	Show persistence.	-.005	.056	.068	.011	-.024	.067	**.707**	.61
	52	Show determination.	.119	.036	.016	.072	-.067	.015	**.600**	.64
	31	Stay motivated.	.171	.159	.151	.063	.016	-.068	**.557**	.64

Correlations between the factors

		1	2	3	4	5	6	7	8
1	Interest	.26**	.31**	.14*	.19**	.33**	.19**	.27**	.33**
2	Understanding	.39**	.43**	.15*	.26**	.43**	.24**	.31**	.38**
3	Ease	.35**	.23**	.39**	.19**	.20**	.05	.19**	.25**
4	Natural Ability	.51**	.30**	.35**	.41**	.29**	.19**	.20**	.32**
5	Performance	.54**	.51**	.20**	.53**	.54**	.21**	.35**	.36**
6	Preoccupation	.37**	.43**	.09	.41**	.45**	.55**	.23**	.38**
7	Effort	.51**	.56**	.24**	.41**	.62**	.57**	.37**	.39**
8	Average of Conceptions	.74**	.70	.48**	.72**	.78*	.70**	.79**	.49**

Note: Below the diagonal is t1, above is t2; significance level ** = .001, * =.05.
Underlined are test-retest correlations

The estimates of internal consistency reliability (coefficient alpha) for the t2 final measures are all sufficiently high to provide confidence in using total scores from these scales: Interest was .86, Understanding .74, Ease .76, Natural Ability .83, Performance .79, Preoccupation .67, and Effort .81 and the Average of Conceptions was .92 (Table 2), whereas the test retest reliability ranged from .26 to .55.

Table 3 shows the factor means from t1 and t2. A MANOVA was used to investigate the likelihood of group differences in a 7 (approach by time t1/t2, within) and 2 (gender, between) analysis. The multivariate between subjects tests for gender and time (t1/t2; one semester) were not significant and the interaction was not significant. Hence, only main effects are shown in Table 3. There was strong consistency (little difference) in the CoLs over time and Cohen's *d* also indicating the absence of change.

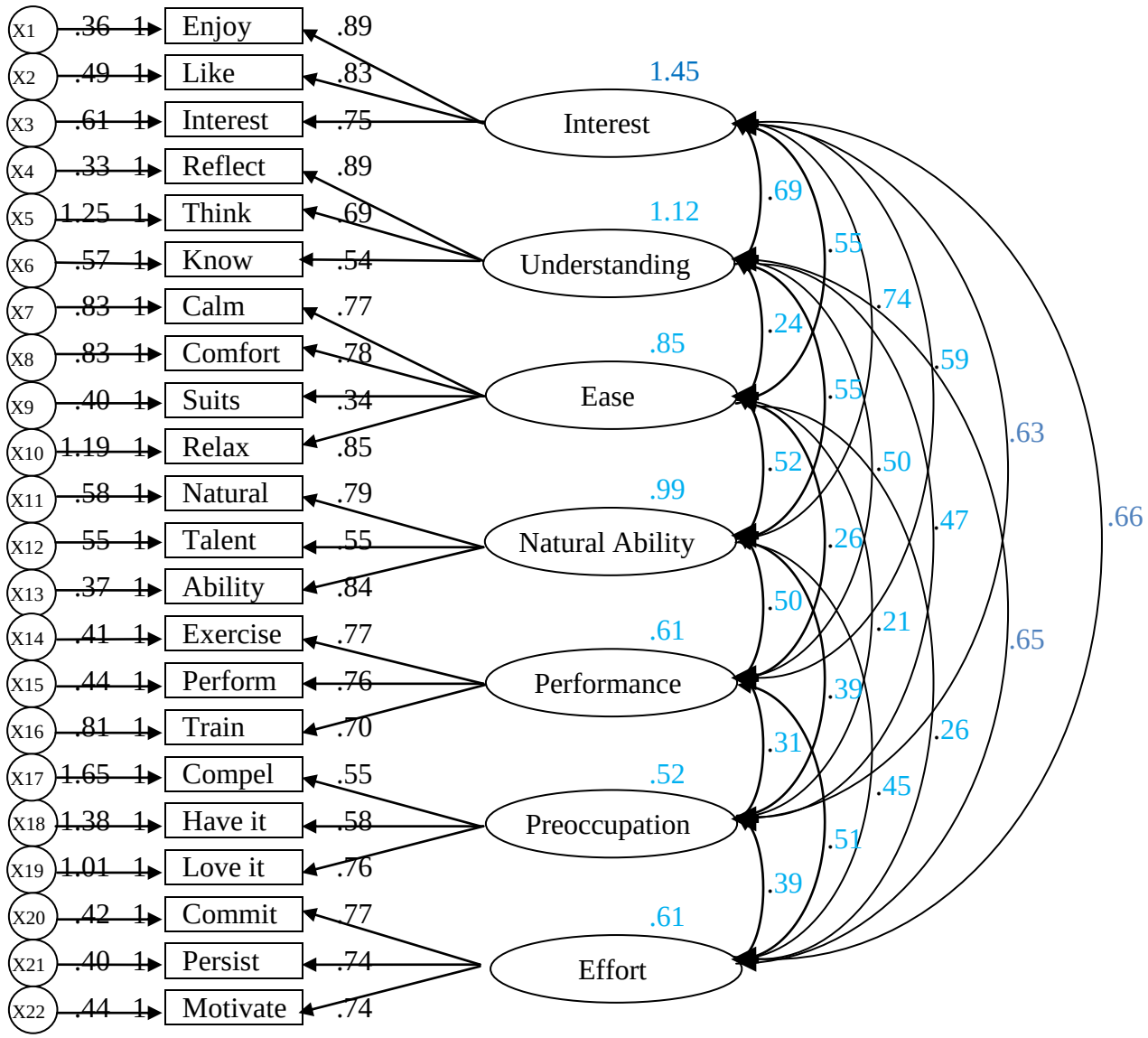

Figure 1: Path Diagram of the Items Contributing to the CLQ Factors.

Table 3: Means, and Standard Deviations for Conceptions of Learning Compared at 2 Time Points and With the Average of Conceptions of Learning.

	Time 1		Time 2					
					F	*p*	$\square_p\square$	*d*
	Mean	SD	Mean	SD				
Interest	5.53	1.00	5.47[3]	1.10	.32	.57	.002	.06
Performance	5.31	.89	5.36	.89	.73	.39	.003	-.06
Effort	5.26	.90	5.35	.88	1.76	.19	.008	-.10
Understanding	5.07	.97	5.16	.99	1.65	.20	.008	-.09
Ease	4.89	.89	4.83	.92	.01	.92	.001	.04
Natural Ability	4.71	.97	4.64	1.03	.32	.57	.002	.07
Preoccupation	4.14	1.11	4.16	1.13	.11	.74	.001	-.02
Average of Conceptions	4.99	.68	5.01	.73	.22	.66	.001	-.02

Note: [1] Indicates the statistics for the between time 1 and time 2 comparison (df = 1, 217). N = 136 females and n = 75 males.

Discussion

The findings of the analyses showed that the expected seven factors emerged with high face validity, high internal reliability and stability over time as there were no differences between mean between the two time periods and no differences between the genders.

The terms in each factor were derived from the previous research (Bowles, 2004) and used to develop the factors that defined the seven CoLs. The terms and factors provide a broad array of CoLs which conforms to Olson's (2003) and Hattie's (2012) view that adult learners bring to the learning process their own ways of making meaning which is different to the previous conceptualizations based on adolescent research. The factors form a new, alternate approach to considering the CoLs of adult and contribute to the debate by broadening the definition of learning. The CoLs are important as they represent personal learning experiences including but exclusive to formal learning settings (Bowles, 2004; Richardson 1999). The CoLs indicate the learner's frame of reference (Lin, Tsai, & Liang, 2012) within a context that reflects the implicit learning theory/ies held by the learner (Lonka & Lindblom-Ylanne 1996; Vermunt & Vanrijswijk 1988; Vermunt & Vermetten 2004) and affirm the original set of seven concepts derived from the constructivist approach explaining how people learn from their own experience (Semerci, & Batdi, 2015).

The statistical analysis also showed that there was no significant difference between t1 and t2 means indicating no change in the frequency of use of the concepts when learning. The test-retest correlations ranged from .26 to .55 and showed that while valid the factors were influenced by *transient error* (Fleeson, 2001; Schmitt, 1996; Sijtsma, 2009) in which the timeframe or changes within the test retest period and state based nature of the construct renders them less consistent over time. The plausibility of this explanation rests with the nature of learning, how we go about doing it and how we conceive of doing it. The absence of changes from t1 to t2 suggests that there is relative stability in the ways adult learners conceive of their learning. It is most possible that concepts of learning are used and re-applied consistently as self-guides from a relatively early age and that without direct intervention students will continue to apply the same concepts about the way they learn. Gently challenging these perceptions and practicing alternatives ways of thinking about learning is likely to be beneficial. The statistical analysis also showed that the CoLs had a high internal consistency (validity) with Cronbach alphas ranging from .74 to .82 with an average of all concepts being .92.

Despite the statistical reliability, the consistency or variability of the factor scores over time is likely to be advantageous as it is indicates an absence of rigidity and a flexible approach to learning contexts. Over time effortful learning usually becomes easier, an interest may become a preoccupation and move the learner into a high level of mastery, similarly the focus on micro skills such as, learning a golf swing or plucking a musical instrument may

give way to automaticity with practice and result in entirely different ways of thinking about further learning. This means that as learning occurs so will the processes that scaffold that learning change and our understanding of them, after reflection. Providing a broad array of concepts of learning and prompting experimentation with the concepts and their application could enhance self-directed learning. The CoLs could be useful in facilitating reflection, exploration and adjustment to implicit learning theories to refine how students conceive learning within contexts and between contexts. CoLs have many combinations and may be applied sequentially and/or concurrently, and bringing to consciousness how adult learners think about their learning in various situations can be an important beginning to enhancing their learning, engagement and outcomes.

For learning to occur a number of factors need to be applied individually or concurrently (Hattie, 2009), however the student has control over only some of these pertinent factors. Given that most students receive a similar learning experiences (classes/groups), those who achieve best make the best choices to apply the most appropriate CoLs when required to demonstrate proficiency (Bowles, 2004). By applying appropriate conceptions more frequently, more effectively, and with greater potential diversity, in response to the demand characteristics of the learning task, optimal learning is more likely to occur. Broadening of the repertoire of CoLs may allow students to facilitate more self-directed learning (Hattie, 2009).

Together, the seven factors form an array of CoLs fit for application in a range of contexts and applications related to three principles of learning. The first general principle of learning issuggested by Harel and Koichi's (2010). They associate understanding and natural ability with the principle of thinking and understanding. The second principle of intellectual needs for learning new knowledge may be related most to the conceptions of interest and pre-occupation. Finally, repeated reasoning and internalization are most likely associated with ease, performance, and effort. Despite this similarity only one of the seven factors, understanding, is consistently found in the four models from Table 1. This illustrates the relative independence of the factors in this model. The independence of the seven factors in comparison with previously published models is most likely the result of the systematic method used to derive the factors of the CoL. In the previous research (Bowles, 2004, 2008) the seven factors emerged from an open coding and systematic reduction of terms freely expressed by respondents. This means that the language and terms used were noted in the language of the respondents and the resulting factors retained these common speech terms.

The application of the factors is mainly in identifying which concepts a respondent may score high and which low and coaching them about how to interpret and use the information to advantage. Comparison of high and low scores from a single respondent may be used to expand a repertoire of ways of approaching learning. Discussion with a respondent about a new learning experience may consider which concept provides the best approach to imagine learning within that learning context (Richardson 1999; Lin, Tsai, & Liang, 2012; Vermunt & Vanrijswijk 1988; Vermunt & Vermetten 2004). Profiles that are inappropriately, consistently low or high will require

validation and further work on how to imagine capabilities, task difficulty and how to imagine learning occurring to benefit the learner. At the most general level, the relevance of the COLs to adult learners and those who teach them is to take account of the rank of the CoLs, which was: Interest, Performance, Effort, Understanding, Ease, Natural Ability and Preoccupation.

The two most important contributions this research makes is identifying the seven CoLs for adult learners and thereby advancing the definition of CoLs for young adults learning through work and self-directed activities (Wong, Yong, & Gerber, 2001), tertiary study, social settings (Johnson & Johnson, 2002), and recreational pursuits (González-Haro, Calleja-González, & Escanero, 2010). This research broadens the definition of CoLs and adds to the debate about the constructs used to conceptualize learning. Further clarifying research will be necessary to establish the utility of these constructs against factors defined in the previous models, such as those listed in Table 2. The second important contribution is in the utility and accessibility of the factors as tools within various learning contexts. The seven factors make the process of learning more inclusive of activities that are associated with learning within and outside formal learning. In tertiary study these terms may be used to explore and develop the range of ways that students and teachers can engage in learning and discuss their engagement. Further, raising awareness of, and future research into the utility and impact of CoLs from the perspective of teachers and students is important and how such perspectives relate with and may change in reference to current and future technologies and advances in neuroscience (Peterson, Rayner & Armstrong, 2009).

There are a number of caveats to this research. First, it was self-report and this has inherent limitations associated with self-knowledge, integrity and bias. Despite these limitations self-report is appropriate given that the aim was to gain a perspective into how adult students report CoLs. These conceptions should not be confused with the actual strategies students use (such as Biggs LPI, 1985). Further, the research was completed on tertiary students within an educational setting and may not generalize to primary and high school or to adults in non-educational settings.

Conclusion

The implications and applications of the findings deserve further exploration to establish the utility of and links between the conceptions. Does understanding come through effort or through interest or both? Why is the correlation of effort with other conceptions higher at time 1 than at time 2 when effort would usually be associated with a strong finish at the end of the semester? Is there a model of learning that may be derived from the seven concepts and are they specific to subjects as suggested by the previous talent research? Should CoLs be incorporated into teaching plans or profiles of scores be provided to students to encourage broadening of use of conceptions of learning? Future research into the utility of the approaches and the selective use of approaches within specific contexts would provide evidence that context bound and selective application facilitates learning and possibly learning outcomes. Comparing the factors to outcomes, such as grades and

other work and recreational performance indicators will further demonstrates the utility of the measure. Validating the measure and the profile with other measures learning and learning outcomes would build confidence in the fidelity and validity of the constructs. While transition error is a likely explanation for the low to moderate test-retest coefficients further measurement of the error accounted for in test-retest score is required. The CLQ may also provide information when screening students at entry to programs to moderate their beliefs, attitudes and observations. Investigating the precursors of CoLs such as values and perceptions of self (Lietz & Matthews, 2010; Matthews, Lietz, & Darmawan, 2007) would also assist in expanding understanding of the development and utility of such concepts. Finally, as learning is both a general phenomenon and specific activity, tasks, contexts and mood associated research with the CLQ could be completed to establish when and which CLQ factors are worth applying and in which situations (Confrey, 1990; Purdie & Hattie; 2002; Säljö, 1987).

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Appendix 1. Terms Most Frequently Contributing to the Seven Categories Explaining Learning.

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