Commitment in academic contexts: First year Education students' beliefs about the aspects of self, the lecturer and instruction

S. Human-Vogel
Department of Educational Psychology
University of Pretoria
South Africa
e-mail:salome.humanvogel@up.ac.za

P. P. Mahlangu
Department of Educational Psychology
University of Pretoria
South Africa

Abstract

An analysis of commitment in academic contexts is presented by examining evaluative beliefs related to the self, the lecturer and instruction. The conceptual framework adopted draws on a philosophical analysis of commitment (Lieberman 1998) in which commitment is presented as a cognitive state that requires the presence of evaluative beliefs beyond mere affective states such as the desire to achieve a goal. A complexity perspective (Cilliers 1998) was taken to conceptualise the research design which included Northcutt and McCoy's (2004) Interactional Qualitative Analysis (IQA). Results provide support for the requirement that evaluative beliefs related to the self, lecturer and instruction can play an important role in regulating students' intentions and planful behaviour. The primary conclusion is that commitment is self-regulatory in nature and that a salient positive learning identity may play a role in fostering beliefs and behaviours consistent with such an identity.

INTRODUCTION

The transition from school to university remains a difficult transition that affects students on a personal, emotional and social level. The learning environment at a university is structured differently to that of school as some writers have noted (Cassidy and Trew 2004; Berzonsky and Kuk 2005). More freedom to choose courses and classes, and more perceived flexibility generally means more responsibility to set learning goals and monitor the attainment of those goals independently of the direct supervision of a parent or teacher. Such increased self-responsibility calls for a responsible attitude towards education and requires the ability to make substantial commitments to achieving one's goals.

To study the development of commitment, we draw on Lieberman's (1998) philosophical analysis of commitment. Lieberman (1998, 86) demonstrates that commitments have a structuring and orienting role in people's lives because commitments implicate self-understanding and identity. As such, commitments are not the same as intentions (although they share some similarities) because their relationship to identity make them stable and more resistant to revision than intentions. Furthermore, Lieberman (1998, 115) argues for a cognitive component to commitment in the sense that commitment requires the presence of evaluative beliefs, thus implying that commitment is not purely an affective state. At this point, it is also important to note the distinction between commitment and desire. While desires are insensitive to the demands of consistency and coherence, commitments are not, and so the evaluative beliefs attached to one's commitments also tend to have internal consistency and coherence (Lieberman 1998, 89). The consistency and coherence of beliefs related to commitments suggest that the study of beliefs may provide useful insights into the development of commitment.

In terms of the possible content of the beliefs related to commitments in an academic context, we draw on arguments emphasising the dynamic and reciprocal nature of the interaction of person in context from a complex systems perspective (Cilliers 1998) as well as from a developmental psychopathology perspective (Cummings et al. 2000). Thus, we conceptualise the study of the development of commitment in an academic context as requiring a consideration of the interrelationship among beliefs related to intraindividual, interindividual and contextual factors. In this study, we conceptualised these interrelationships in terms of students' beliefs about three essential interacting relationships in an academic context, namely beliefs about the self, the lecturer as educator and instruction of the learning content. It is hard to imagine an educational situation without these three components present, and so the primary underlying assumption is that students have a degree of self-knowledge and –understanding that shapes and interacts with their beliefs and attitudes towards the lecturer as educator and towards the instruction of learning content that they receive. Consistent with the notion that human system are complex (Cilliers 1998), the interrelationships between these roleplayers are assumed to be non-linear and dynamic.

CORE THEORETICAL CONCEPTS

The constructs associated with *Self-related factors* include self-efficacy, motivation, self-regulation, personality, and academic success. These constructs were specifically chosen because of their association with academic performance and because it would be reasonable to assume that students' would have enough experience of these constructs to reflect on their relationships with other constructs. Beliefs about *lecturer-related* factors centred on feedback and degree of social interaction as teaching behaviours that are controlled by the lecturer and can be reasonably expected to be present to varying degrees in a learning environment. *Instruction-related* factors emphasised constructs such as learning content, student participation and language of instruction.

SELF-RELATED FACTORS

In terms of self-related factors, *self-efficacy* was conceptualised as individuals' beliefs about their ability to perform in a certain area with the understanding that it involves judgments about task-specific capabilities (Aronson 2002). *Motivation* was considered to reflect an individual's personal interest in pursuing an activity with the understanding that people have extrinsic and intrinsic reasons for engaging in activities. In higher education, demonstrated support exists for the argument that internal attributions is related to positive self-image and that both provide the conditions necessary for the development of learning-oriented motivation (Valle, Cabanach, Nunez, Gonzalez-Pienda, Rodriguez and Pineiro 2003, 557). *Self-regulation* was conceptualised as the self-generated thoughts, feelings and actions that affects one's learning of knowledge and skills and which includes attending to and concentrating on instructions; organising, coding and rehearsing information to be remembered, establishing a productive work environment, using resources effectively and holding positive beliefs about one's capabilities and the value of learning (Schunk and Zimmerman 1998, 140; Boekaerts and Corno 2005, 201).

Personality was framed as the totality of qualities or traits of character or behaviour (Wortman and Loftus 1992, 385). *Academic success* was conceptualised as academic performance that resulted in attainment of high grades and the ability to do well enough in core academic courses while meeting the general requirements of a course of study (Wigfield and Eccles 2002, 51).

LECTURER-RELATED FACTORS

The two constructs that were conceptualised as being related to the lecturer, include *feedback*, defined as a clear indication of the nature of a perfect answer, including giving information about the standard of answering achieved and advice about how the gap might be closed and monitoring the student's response in relation to feedback (Tanner and Jones 2003) and *social interaction* as indicative of opportunities that allow students to provide explanations, ask appropriate questions, exchange ideas, speculate and make inferences (Kumpulainen and Wray 2002, 14).

INSTRUCTION-RELATED FACTORS

Learning content reflects the curriculum in a particular course of study which the student is expected to master. *Student participation* was defined as small group activities and opportunities for peer support where students participate in knowledge construction (Boekaerts and Corno 2005, 201). Although it can correctly be argued that student participation can more correctly be related to the student, we chose to view it as related to the degree that lecturers create opportunities that allow student participation in class. *Language of instruction* considers language as the cultural tool through which students

learn, communicate and participate and specifically relates to the medium through which students and lecturers interact during class.

STUDY

Research design

The study utilised an Interactional Qualitative Analysis (IQA) research design (North-cutt and McCoy 2004, 38) which was modified to include a larger sample than would have been possible with the focus group approach in IQA. Requiring participants to judge the existence of relationships between constructs is supported by current theories of human causal judgment (Griffiths and Tenenbaum 2006, 767) in which it is argued that people use intuitive theories which contain abstract concepts used to construct causal explanations using sparse data (Tenenbaum, Griffiths and Niyogi 2007, 2) and demonstrated that inferring causal relationship is not limited to conscious, high level cognition, but it also takes place effortlessly in perception (Körding, Beierholm, Ma, Quartz, Tenenbaum and Shams 2007, e943). These theories of human causal inference provide the rationale for the assumption that participants' causal inferences about the constructs in the study can be expected to provide a valid representation of the participants' mental models of a particular phenomenon. Results are analysed on group-level to determine the group's composite beliefs about the phenomenon and individual distribution of responses is not taken into account.

Method

Participants

The sample in this study consisted of 40 first year students registered for a second semester module in Educational Psychology in the Faculty of Education at a South African University. The sample consisted of 31 female and 9 male students who completed the instrument in the language of instruction they prefer (English or Afrikaans). Racial data were not collected as our main unit of analysis was considered to be the group of novice students adapting to the University's learning environment and it was assumed that the ability to make causal inferences is a human characteristic not determined by race. In addition, as was the case in a related study (Human-Vogel 2006, 613), data on individual variables were not collected as the analysis of the sample was directed at group level. At the time of data collection the students had already written tests and an examination so they were deemed suitable informants for a study on factors related to the university learning environment. The study gained ethical clearance from the institution where it was conducted and all ethical requirements were met.

Instrument and procedure

Participants were presented with a construct-pair table that included a list of defined constructs related to self-, lecturer- and instruction-related factors in the learning environment. They were asked to indicate the direction of the relationships between all possible iterations of the constructs. Theoretical constructs were rewritten in more accessible language to maximise participants' comprehension.

Dimension	Affinity name	Description presented to the participants
Self-Related	Self-efficacy (SE)	This theme can be described as the confidence you have in your abilities. If you are very confident that you can do something, then you have a high sense of self-efficacy. If you have little confidence in your ability to be successful in something, then you have a low sense of self-efficacy. It is possible and considered normal to have confidence in your ability to do certain things, but have less confidence in your ability to do other things.
	Motivation (Mot)	This theme describes the intrinsic and/ or extrinsic reasons you may have for engaging in particular activities. It also reflects your personal interest in pursuing an activity and the tendency to invest energy into achieving goals, whether these goals are your own or imposed on you by others (such as a parent, teacher, or lecturer). It reflects the tendency to persevere in the face of adversity.
	Student personality (Per)	This theme describes a student's typical behaviour in general. Personality is about the typical ways in which we interact with the world and how we approach situations and other people. Some personality traits include being an extravert, or an introvert, or being someone who prefers social interaction or individual activities
	Self-regulation (SR)	This theme can be described broadly as setting goals or standards of performance for yourself, evaluating and monitoring your responses in attaining your goals and the belief that you are able to attain your goals. In terms of goal-setting this theme specifically relates to the tendency to regulate your thoughts, emotions and actions to achieve the outcomes you desire. The ability to envision desired future events allows you to create incentives that motivate and guide your actions. This theme also describes your tendency to adopt personal standards. Self-evaluation refers to your beliefs about your progress that also determines your emotional reactions during goal directed activities.
	Academic success (AS)	This theme can be described as achieving high marks in academic studies. It is associated with good grades on semester tests and in examinations. It includes performing well on assignments and receiving positive feedback from the lecturer. It also reflects the student's mastery of the learning content

Lecturer-related	Lecturer-feedback (LF)	This theme describes what the lecturer tells students about their progress in class and during the semester. It includes the presence as well as the absence of feedback. It is also about different kinds of feedback. Some feedback from lecturers may be positive and inspiring, and some feedback may be negative and discouraging
	Social Interaction (SI)	This theme describes the amount of social interaction that occurs among students in class during learning activities. It includes class discussions, group work, completing assignments in a group. People differ in the amount of social interaction that they require as part of their studies. Lecturers also differ in the amount of social interaction they allow in class or as part of assignments
Instruction-related	Learning content (LC)	This theme describes the learning material that has to be mastered. Learning materials vary in terms of their difficulty and complexity. Some learning materials may be interesting while others may be boring. Learning materials in your module may also be too easy or too difficult.
	Student participation (SP)	The affinity describes the extent to which a student asks questions in class, feels free to participate in discussions and to enter into debates with the lecturer and other students.
	Language of Instruction (LoI)	This theme describes the language that is used in class to communicate to students. It is also the language in which textbooks, tests, assignments and examinations are presented. The language that the lecturer uses may correspond to the home language of the students, or it may be a second or third language. Not all students may be equally competent in the language of instruction.

Figure 1

The construct descriptions were read to the participants, as well as the instructions for completing the relationships and sufficient time was allowed for questions. As data collection occurred during a formal lecture, students who elected not to participate were given the opportunity to leave the lecture hall before data collection began. Participants then had to indicate one of three different kinds of relationships between two constructs indicated by a letter. Participants had the list of 10 constructs available to refer to. If a participant felt that A leads to B, it was indicated as (A→B); if a participant felt that B leads to A, it was indicated as (A←B); if a participant felt that there was no relationship, it was indicated as (A < > B).

Data analysis

After participants had indicated the relationships between all the construct pairs, the frequencies of each relationship was recorded on a spread sheet and cumulative frequencies were calculated in accordance with Northcutt and McCoy's (2004) pareto analysis method. The power analysis is conducted to decide the least number of relationships (as indicated by the cumulative percentage of the votes) that can be selected to construct the most parsimonious presentation of the data while still representing the variability of the

group's responses. For a complete description of this procedure, the reader is referred to Human-Vogel (2006) and Human-Vogel and Van Petegem (2008). In essence, the selection of relationships is based on the principle that only a minimum number of relationships need to be selected to give a complete description of the group's beliefs.

RESULTS

A total of 1 434 votes were cast for all possible combinations of the construct-pairs. Table 1 shows the frequencies for relationships between different construct pairs arranged in descending order.

Table 1: Frequencies of relationships in descending order with Pareto and Power analysis

Affinity Pair Relationship	Frequency Sorted (Descending)	Cumulative Frequency	Cumulative Percent (Relation)	Cumulative Percent (Frequency)	Power
2 → 4	32	32	1.1	2.2	1.1
4 ←10	31	63	2.2	4.4	2.2
1 → 4	29	92	3.3	6.4	3.1
1 → 5	29	121	4.4	8.4	4.0
4 ← 6	28	149	5.6	10.4	4.8
5 ←10	28	177	6.7	12.3	5.7
4 ← 8	27	204	7.8	14.2	6.4
2 ← 8	27	231	8.9	16.1	7.2
1 → 3	27	258	10.0	18.0	8.0
1 → 2	26	284	11.1	19.8	8.7
7 ← 9	26	310	12.2	21.6	9.4
1←10	25	335	13.3	23.4	10.0
5 ← 9	25	360	14.4	25.1	10.7
1 ← 8	24	384	15.6	26.8	11.2
3 ← 9	24	408	16.7	28.5	11.8
3 ←10	24	432	17.8	30.1	12.3
4 ← 9	23	455	18.9	31.7	12.8
2 → 5	23	478	20.0	33.3	13.3
5 ← 8	23	501	21.1	34.9	13.8
4 ← 7	23	524	22.2	36.5	14.3
2 → 7	22	546	23.3	38.1	14.7
6 ←10	22	568	24.4	39.6	15.2
3 → 5	21	589	25.6	41.1	15.5
2 ←10	21	610	26.7	42.5	15.9
2 →3	20	630	27.8	43.9	16.2
1 ← 6	20	650	28.9	45.3	16.4
3 → 4	19	669	30.0	46.7	16.7
2 → 6	19	688	31.1	48.0	16.9
2 ← 9	19	707	32.2	49.3	17.1
1 → 7	18	725	33.3	50.6	17.2
1 → 9	18	743	34.4	51.8	17.4
7 ← 10	18	761	35.6	53.1	17.5

Affinity Pair Relationship	Frequency Sorted (Descending)	Cumulative Frequency	Cumulative Percent (Relation)	Cumulative Percent (Frequency)	Power
3 ← 8	18	779	36.7	54.3	17.7
4 ← 5	17	796	37.8	55.5	17.7
6 ← 7	17	813	38.9	56.7	17.8
3 ← 7	17	830	40.0	57.9	17.9
8 ← 0	16	846	41.1	59.0	17.9
7 ← 8	15	861	42.2	60.0	17.8
1 → 6	15	876	43.3	61.1	17.8
3 → 6	15	891	44.4	62.1	17.7
9 → 10	15	906	45.6	63.2	17.6
6 → 8	15	921	46.7	64.2	17.6
8 ← 9	15	936	47.8	65.3	17.5
2 ← 7	15	951	48.9	66.3	17.4
8 → 9	14	965	50.0	67.3	17.3
1 ← 2	14	979	51.1	68.3	17.2
1 ← 9	14	993	52.2	69.2	17.0
2 ← 3	14	1007	53.3	70.2	16.9
2 ← 6	14	1021	54.4	71.2	16.8
1 ← 7	14	1035	55.6	72.2	16.6
5 → 7	13	1048	56.7	73.1	16.4
2 → 9	13	1061	57.8	74.0	16.2
6 ← 8	13	1074	58.9	74.9	16.0
4 → 5	13	1087	60.0	75.8	15.8
5 → 6	13	1100	61.1	76.7	15.6
3 → 9	13	1113	62.2	77.6	15.4
5 ← 6	13	1126	63.3	78.5	15.2
6 ← 9	13	1139	64.4	79.4	15.0
7 → 8	13	1152	65.6	80.3	14.8
6 → 7	12	1164	66.7	81.2	14.5
4 → 7	12	1176	67.8	82.0	14.2
9 ← 10	12	1188	68.9	82.8	14.0
5 ← 7	12	1200	70.0	83.7	13.7
5 → 8	11	1211	71.1	84.4	13.3
8 → 10	11	1222	72.2	85.2	13.0
2 → 10	11	1233	73.3	86.0	12.6
1 ← 4	11	1244	74.4	86.8	12.3
2 ← 5	11	1255	75.6	87.5	12.0
1 ← 3	10	1265	76.7	88.2	11.5
7 → 9	10	1275	77.8	88.9	11.1
3 ← 6	10	1285	78.9	89.6	10.7
3 ← 5	10	1295	80.0	90.3	10.3
3 → 8	9	1304	81.1	90.9	9.8
6 → 9	9	1313	82.2	91.6	9.3
5 → 9	9	1322	83.3	92.2	8.9
3 → 7	9	1331	84.4	92.8	8.4
4 → 8	9	1340	85.6	93.4	7.9
1 → 10	9	1349	86.7	94.1	7.4

Affinity Pair Relationship	Frequency Sorted (Descending)	Cumulative Frequency	Cumulative Percent (Relation)	Cumulative Percent (Frequency)	Power
7 → 10	9	1358	87.8	94.7	6.9
2 → 8	8	1366	88.9	95.3	6.4
6 → 10	8	1374	90.0	95.8	5.8
3 ← 4	8	1382	91.1	96.4	5.3
1 → 8	8	1390	92.2	96.9	4.7
2 ← 4	8	1398	93.3	97.5	4.2
1← 5	7	1405	94.4	98.0	3.5
4 → 6	7	1412	95.6	98.5	2.9
4 → 9	6	1418	96.7	98.9	2.2
3 →10	6	1424	97.8	99.3	1.5
5 →10	5	1429	98.9	99.7	0.8
4 →10	5	1434	100.0	100.0	0.0
Total Frequency	1434	Equal Total Frequency	Equals 100%	Equals 100%	Power = E-D

As is evident from Table 1, two thirds (the first 60 relationships) of the possible 91 construct pairs explain 80.3 per cent of the variance (expressed as cumulative percent) of relationships and these are the relationships that are selected to construct the group's representation of the relationships between phenomena. Of course, construct pairs can attract votes for relationships in opposite directions if different participants in the group think differently about the direction of causality. In such cases, a conflict analysis is conducted to determine which conflicting construct pair has the highest frequency of votes (Table 2).

Table 2: Construct pairs with conflicting votes

Affinity Pair Relationship	Frequency	Conflict
1← 10	25	
1← 2	14	?
1← 6	22	?
1← 7	13	?
1← 8	24	
1← 9	14	?
1→ 2	26	?
1→ 3	27	
1→ 4	29	
1→ 5	30	
1→ 6	13	?
1 → 7	19	?
1 → 9	19	?
2 ← 10	21	
2 ← 3	14	?
2 ← 6	14	?
2 ← 7	15	?
2 ← 8	27	

Affinity Pair Relationship	Frequency	Conflict
2 ← 9	19	?
2 → 3	20	?
2 → 4	32	
2 → 5	23	
2 → 6	19	?
2 → 7	22	?
2 → 9	13	?
3 ← 10	24	
3 ← 7	18	
3 ← 8	18	?
3 ← 9	24	?
3 → 4	19	
3 → 5	21	
3 → 6	15	
3 → 8	19	?
3 → 9	13	?
4 ← 10	30	
4 ← 5	16	?
4 ← 6	29	?
4 ← 7	26	
4 ← 8	27	
4 ← 9	25	
4 → 5	13	?
4 → 6	17	?
5 ← 10	28	
5 ← 6	14	?
5 ← 7	15	
5 ← 8	23	
5 ← 9	25	
5 → 6	13	?
6 ← 10	23	
6 ← 7	17	
6 ← 8	13	?
6 ← 9	13	
6 → 8	15	?
7 ← 10	17	
7 ← 8	15	?
7 ← 9	26	
7 → 8	13	?
8 ← 10	17	?
8 ← 9	15	?
8 → 10	13	?
8 → 9	13	?
9 → 10	14	

The construct-pairs with the highest frequency are selected for the next step in the analysis, which involves the identification of drivers, pivots and outcomes in the visual

representation of the constructs. To calculate drivers, pivots and outcomes, the delta value is calculated by subtracting the number of out-arrows from the number of in-arrows. Thus calculated, a driver is a construct which contains more outgoing arrows than incoming arrows and is therefore regarded as a strong causal factor in relation to other constructs. If a driver contains only outgoing arrows and no incoming arrows, it is regarded as a primary driver, regardless if its delta value is less than that of another construct. Pivots have equal numbers of in- and out-arrows and are thus placed in the middle of the visual system, whereas outcomes have more incoming arrows than outgoing arrows and are therefore regarded as effects. Similarly, outcomes with no outgoing arrows are regarded as primary outcomes.

The construct-pairs with the lesser frequencies are ignored in the grid until they are returned to later to be reconciled. The relationships which participants voted for are placed in a grid so that the drivers, pivots and outcomes can be calculated. The table has been rearranged to show the affinity pairs in descending order of delta. This is shown in Table 3.

Table 3: Interrelationship diagram with drivers, pivots and outcomes in descending order of delta

Tabular IRD													
	1	2	3	4	5	6	7	8	9	10	OUT	IN	Δ
9	←	↑	↑	↑	↑	↑	↑	↑		↑	8	1	7
10	↑	↑	↑	↑	↑	↑	↑	↑	←		8	1	7
1		↑	↑	↑	↑	←	↑	←	↑	←	6	3	3
2	←		↑	↑	↑	↑	↑	←	←	←	5	4	1
8	↑	↑	←	↑	↑	←	↑		←	←	5	4	1
3	←	←		↑	↑	↑	←	↑	←	←	4	5	-1
6	↑	←	←	↑	↑		←	↑	←	←	4	5	-1
7	←	←	↑	↑	↑	↑		←	←	←	4	5	-1
5	←	←	←	↑		←	←	←	←	←	1	8	-7
4	←	←	←		←	←	←	←	←	←	0	9	-9

From Table 3 we can see that two drivers of equal importance emerged from the analysis, namely *Student Personality* [Δ = 7] (Self-related) and *Language of Instruction* [Δ = 7] (Instruction-related). The primary outcome in the study is *Academic Success* [Δ = -9] (Self-related). The relationships above are now used to draw a visual representation of the constructs with their relationships with the drivers (highest delta value) on the left and placing constructs to the right in order of descending delta values. The result is recorded in Figure 2.
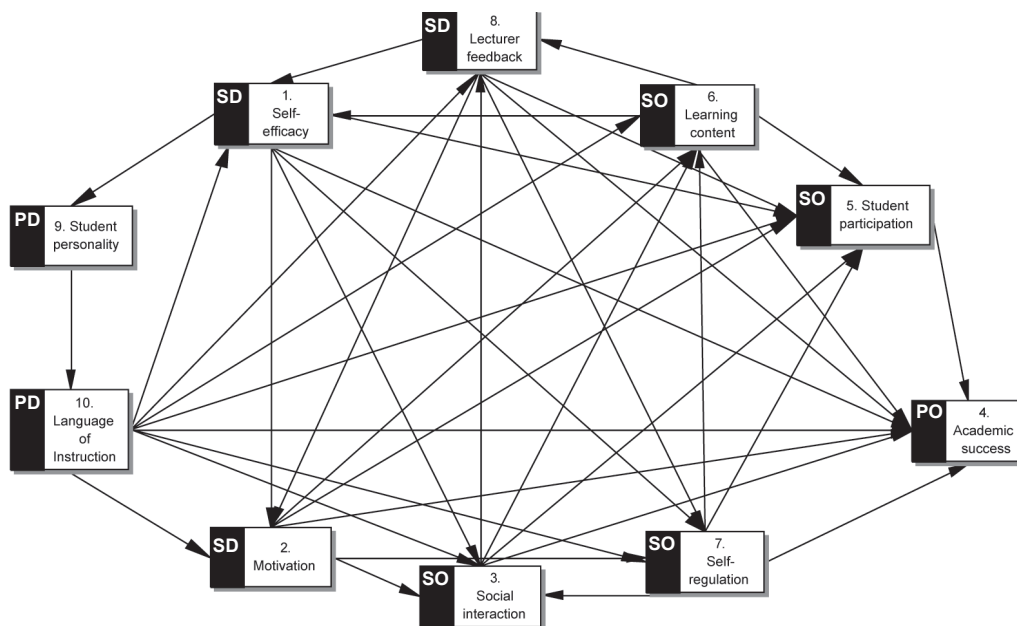
Figure 2: Complex visual representation of the system

Of course, the visual representation is too dense to make sense of, so a process is started to eliminate unnecessary links in order to streamline the representation without losing the essence of its meaning. The underlying principle in the elimination of links is to inspect whether a direct link between two constructs is also expressed as an indirect link, in the same direction, via a moderating construct. If a moderating construct links the two constructs, the direct link can be removed without losing the association between the two constructs. However, the elimination of links is done in a specific order which entails inspecting the links that the primary driver (with the highest delta value) has with the primary outcome (with the lowest delta) and then moving to the left in an ascending order of delta. The process of elimination is set out in Table 4.
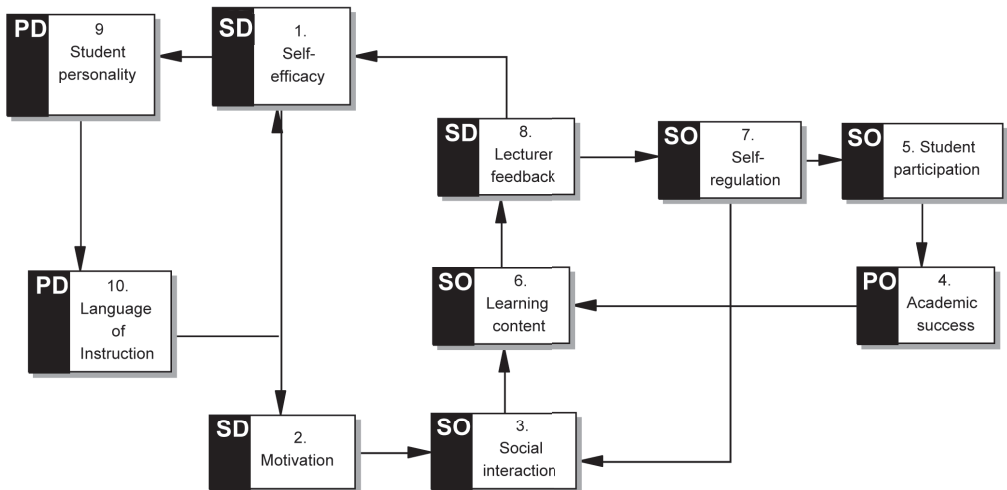
Table 4: Elimination of redundant links

Examine	Action	Rationale
9-4	Delete	9-6-5-4
9-5	Delete	9-6-5
9-7	Delete	9-2-7
9-6	Delete	9-10-6
9-3	Delete	9-2-3
9-8	Delete	9-10-8
9-2	Delete	9-10-2

Examine	Action	Rationale
9-1	Retain	Backward link
9-10	Retain	Direct link
10-4	Delete	10-7-4
10-5	Delete	10-6-5
10-7	Delete	10-2-7
10-6	Delete	10-2-6
10-3	Delete	10-2-3
10-8	Delete	10-1-2-3-8
10-2	Delete	10-1-2
10-1	Retain	No alternative path
1-4	Delete	1-7-4
1-5	Delete	1-2-5
1-7	Delete	1-2-7
1-6	Retain	Backward link
1-3	Delete	1-2-3
1-8	Retain	Backward link
1-2	Retain	Direct link
2-4	Delete	2-7-4
2-5	Delete	2-6-5
2-7	Delete	2-8-7
2-6	Delete	2-3-6
2-3	Retain	Direct link
2-8	Delete	8-1-2
8-4	Delete	8-5-4
8-5	Delete	8-7-5
8-7	Retain	No alternative path
8-6	Retain	Backward link
8-3	Retain	Backward link
RECONCILING CONFLICTS		
2-1	Present	2-3-6-8-1
7-1	Present	7-3-6-8-1
9-1	Present	9-10-1
1-6	Present	1-2-3-6
3-2	Present	3-6-8-1-2
6-2	Present	6-8-1-2
7-2	Present	7-3-6-8-1-2
2-9	Present	2-3-6-8-1-9
8-3	Present	8-7-3
3-9	Present	3-6-8-9-1
4-5	Add	Not present
4-6	Add	Not present
4-5	Delete	4-6-8-7-5
5-6	Present	5-4-6

Examine	Action	Rationale
7-8	Present	7-3-6-8
8-10	Present	8-1-9-10
8-9	Present	8-1-9
3-4	Delete	3-5-4
3-5	Delete	3-6-5
3-7	Retain	Backward link
3-6	Retain	Direct link
6-4	Delete	6-5-4
6-5	Delete	6-7-5
6-7	Retain	Direct link
7-4	Delete	7-5-4
7-5	Retain	Direct link
LOOKING AT RECURSIVE LINKS		
7-6	Delete	7-3-6
7-3	Retain	No alternative path
6-8	Retain	No alternative path
6-1	Delete	6-8-1
3-8	Retain	3-6-8
8-1	Retain	No alternative path
1-9	Retain	No alternative path

After having eliminated the unneccessary links, a more streamlined visual representa-

tion, one that is interpretable, can now be presented in Figure 3.

Figure 3: Clean visual representation of the system

Drivers and outcomes

Immediately evident, is the position of *Student Personality* and *Language of Instruction* as the primary drivers in a system which has as the primary outcome *Academic Success*. Thus, students felt that the engagement of the Self as expressed by their personalities, with Instruction-related factors, specifically *Language of Instruction* is essentially what determines their potential for academic success. How this process unfolds, can be understood by doing a qualitative causal pathway analysis (Human-Vogel and Van Petegem 2008), thus isolating the subsystems in the visual representation to understand their meaning.

Feedback systems

Using the classification system previously reported (Human-Vogel and Van Petegem 2008), four feedback systems can be identified depending on whether recursive systems contain balanced, divergent or convergent feedback points. Conceptualising the system in terms of a chaos paradigm, convergent feedback points are assumed to concentrate the effects of more than one construct from different feedback loops, whereas divergent feedback points serve to diffuse (or spread) the effects of one construct through more than one feedback system and as such they are hypothesised to contribute to the disequilibrium characteristic of complex systems. Conceptually, balanced feedback systems act as agents for equilibrium in the system.

The first system [SP x LoI x SE] is a neighbouring feedback system created by a balanced feedback point (two inward and two outward arrows). This feedback system is named the *Personal Competency* system because it illustrates students' thoughts about the way in which they engage with learning through the language of instruction influence feelings of self-efficacy which influence how they perceive themselves. If all of these constructs are positively present, it can create a positive feedback cycle that will lead to feelings of personal competency.

The second is an enmeshed feedback system [SE x Mot x SI x LC x LF] which neighbours the *Personal Competency* feedback system. It is named the *Motivated Engagement* system because it reflects students' understanding that feelings of self-efficaciousness and competency is motivating in and of itself and can exert an influence on their interaction with classmates (*Social Interaction)*, engagement with the work (*Learning* content), and that the feedback they get as a result (*Lecturer-feedback)* can further strengthen feelings of self-efficacy and consequently, motivation. The *Motivated Engagement* construct consists of one convergent feedback point (SI: two inward and one outward arrow) and one divergent feedback point (two outward arrows and one inward arrow).

The third feedback system [SIxLCxLFxSR] is enmeshed with the *Motivated Engagement* system and consists of one convergent feedback point [SI: two inward and one outward arrow] and one divergent feedback point [LF: two outward and one inward

arrow]. This system is named the *Self-directed learning* system as causal relationships between the constructs indicate that lecturer- and instruction-related constructs lead the students towards self-regulation, an important aspect of self-directed learning. The fourth feedback system [LCxLFxSRxSPxAS] is enmeshed with the *Self-directed learning* system through one convergent feedback point [LC: two inward and one outward arrow] and one divergent feedback point [LF: two outward and one inward arrow]. This system is called the *Goal-directed behaviour* system because it reflects relationships that draw on the students' self-regulatory efforts towards participation (*Student participation*) and performance (*Academic success*) based on their interaction with the learning environment (*Learning content, Lecturer feedback*). Thus, if one steps back from the system so to speak, we see the systems interacting with one another as shown in Figure 4.
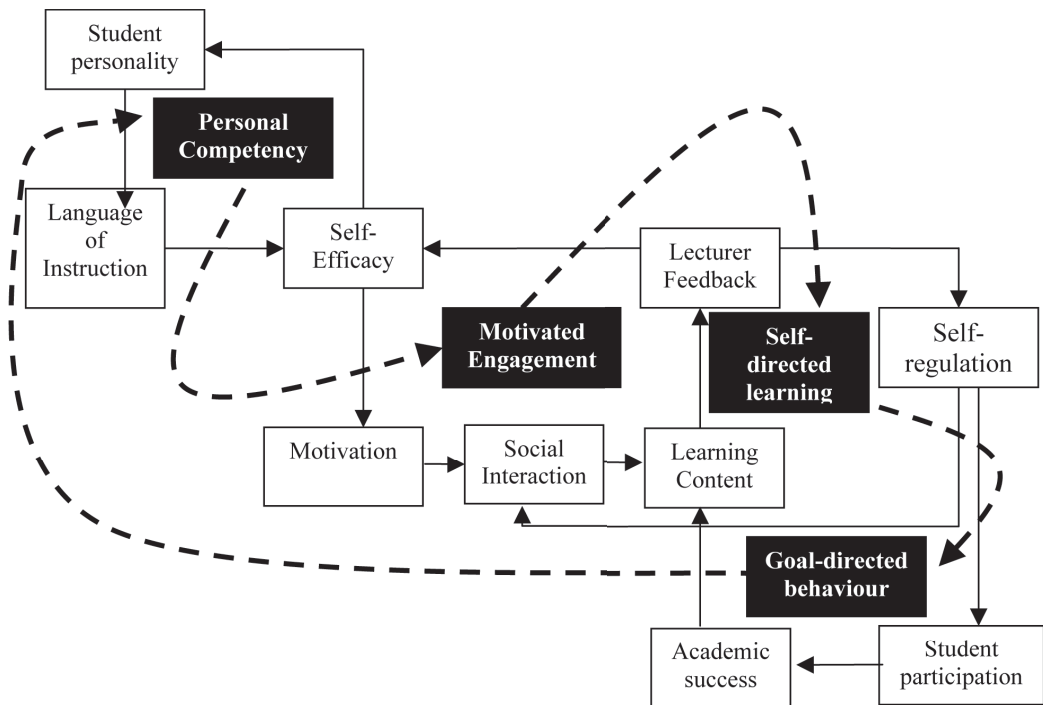
Figure 4: Relationships between four feedback systems and their associated constructs

Figure 4 presents a summary of the causal relationships between the four feedback systems and their related constructs. We will now turn our attention towards a discussion of the system and its implications for the development of commitment in a higher education setting.

DISCUSSION

The statement that commitment is an essentially self-regulatory mechanism (Human-Vogel 2008) seems to be a reasonable conclusion in the light of Lieberman's (1998) analysis of commitment as providing a structuring and orienting role in behaviour. Self-regulatory processes can be conceptualised as monitoring, appraisal and coping activities that turn attitudes and subjective norms into the intentions that lead to behaviour (Bagozzi 1992, 179). If we further accept Lieberman's (1998, 115) assertion that beliefs represent the cognitive component of commitment, then we can accept that students' beliefs about the causal relationships between self-related, lecturer-related and instruction-related factors as indicated in the results will permit us to draw some conclusions about the underlying structure of commitment in an academic context. From this perspective, we can now risk the conclusion that commitment in an academic context can develop as a result of the dynamic and reciprocal interaction between beliefs about *Personal Competency, Motivated Engagement, Self-Directed learning* and *Goal-directed behaviour.*

To be certain that the results do in fact permit us to draw conclusions about the development of commitment, we have to be able to demonstrate beyond a reasonable doubt by presenting an argument that (i) the themes and feedback systems provide for the identity-related beliefs that provide for the consistency and coherence aspect of commitment, and that (ii) the systems do not provide an illustration of desires or intentions, which can be distinguished from commitment. Both requirements are easily met. The beliefs related to *Personal competence* directly involve and invoke identity-related constructs about the self that will provide consistency and coherence not usually associated with intentions and desires. Students' beliefs about their personalities as indicative of behaviours typical of them, is a driver in the system, indicating the strength of its influence on other themes in the system. Of course, it also invokes the possibility that people are committed to their identities and choose courses of action (goals) consistent with their identities, rather than being committed to goals. Thus, it may not be completely accurate to state that relinquishment of a particular goal implies relinquishing one's commitment to the goal. Rather we may state that the person is relinquishing their desire to attain the goal because the goal is no longer consistent with their identity. If we accept as true that we commit to an identity and that our goals reflect the intentions or planned behaviours (courses of action) through which we express identity consistently and coherently, then goals can be no more as chosen courses of action, or planned behaviours (Bagozzi 1992). Thus, we do not commit to intentions or plans, because they are merely the tools through which we shape our commitment to an identity. Bagozzi (1992) correctly states that commitment requires more than planned behaviour, so commitment as a self-regulatory mechanism for identity expression should therefore allow for a self that is responsive and intentionally engaged in changing itself (Baumeister and Vohs 2003). Thus, commitment as a self-regulatory mechanism regulates identity rather than intentions or actions. Finding

meaning in a particular identity invokes beliefs consistent with that identity that influences our intentions to act. As such, Lieberman (1998) is correct when he states that commitments contain many intentions to act, but there is great variability in the extent to which intentions associated with commitments will be realised.

In terms of the possible implications of the results for the development of commitment in an academic context, the analysis draws attention to the extent to which academic environments can serve to foster the development of positive learning identities that will strengthen commitment to intentions and planned behaviours that will lead to academic success. A notable example involves language of instruction as an instruction-related factor. The extent to which language of instruction can influence students' ability to participate meaningfully and to perform academically is evident from the results through its direct influence on beliefs about self-efficacy that feeds the *Motivated Engagement, Self-directed learning* and *Goal-directed behaviour* systems. Thus, it may be reasonable to suggest that learning environments designed to foster the development of commitment cannot permit language to create a barrier.

It was also previously suggested that commitment as a self-regulatory mechanism is different from coping (Human-Vogel 2008) primarily because of the role of emotion regulation in commitment. It was suggested that coping processes primarily focus on down-regulation of negative emotion, while commitment focus on up-regulation. Of course, John and Gross (2007) remind us that emotion regulation processes are complex and most contexts, with academic learning environments being no different, are likely to give rise to conflicting emotions that will require both up- and down-regulation of emotions. The nature of the themes that were included in this study focused on positive constructs and therefore make it relatively simple to conclude that commitment is about maximising positive emotions, a limitation that may be addressed by adding negatively worded themes for participants to reflect on to investigate the role of emotion regulation when conflicting emotions or states are involved.

What does seem clear though, is that it is reasonable to expect the development of commitment in academic contexts to entail dynamic and reciprocal interactions between various intrapersonal, interpersonal and environmental factors. Commitment is therefore not an individual construct, although identity or self-descriptions determine the kinds of commitments that are made. The feedback loops in the system at least require tentative acceptance and a closer examination of the extent to which learning environments can shape the development of self-related descriptions that make up identity. Such a study would be consistent with current discourses that afford a much more active role to the environment in shaping individual potential.

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