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From reproduction to construction: Bhutanese higher education students' attitudes towards learning

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Abstract: The rationale for the study is the developing state of Bhutanese higher education, and Bhutanese students' current tendency to employ reproductive learning strategies. This research therefore aims to determine whether using non-linear, semi-autonomous learning activities encourages Bhutanese students to adopt constructivist attitudes towards learning. It does so by measuring Bhutanese students' attitudes towards their own learning, and by collecting qualitative and quantitative data about their behaviours and attitudes towards completing research assignments. The study used a mixed-methods design to examine the attitudes and approaches of students at Royal Thimphu College and Gaeddu College of Business Studies towards completing multi-stage written coursework assignments. Iterative pre- and post-tests of both sub-samples attempted to isolate effects of the two independent, yet similar, implementations of learning activities that required students to work semi-autonomously through non-linear research and writing processes. Since both subsamples were undergraduate students with similar demographics,

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PUBLIC INTEREST STATEMENT

This research project examines the attitudes of university students in Bhutan towards their own learning. Higher education in Bhutan is at an early stage of its development, so the students' attitudes and expectations are somewhat different to those of students from other backgrounds. Specifically, this project aimed to find out whether Bhutanese students could be persuaded to move towards more "constructive" attitudes in their studies, and particularly in multi-stage research assignments.

Current educational theory emphasises "constructive" learning, in which students are encouraged to develop their own ideas and arguments about a given issue. Constructing such ideas requires high-level critical thinking skills, including the ability to select, paraphrase and synthesise information from a number of different sources. Constructive learning is often presented favourably in contrast to "reproductive" learning, in which students simply learn and reproduce knowledge without necessarily adapting it or putting it to use. Some Bhutanese scholars have demonstrated that reproduction-oriented attitudes in students may provide conceptual comfort requisite for more advanced learning activities.

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equivalency of groups was presumed. However, statistical analysis did not support this assumption; controlling more for this factor may be an improvement for future scholars in this context. In addition to the pre- and post-test survey, a smaller number of students were interviewed in order to gain a more in-depth understanding of their attitudes. The results revealed that some students shifted towards constructive behaviours and attitudes after the learning activities, but that many continued to exhibit reproductive behaviours. Of particular interest were students' focus on micro-level error correction and enjoyment of autonomy in research assignments.

Subjects: South Asia - Regional Development; Educational Research; Teaching & Learning; Education & Development; Theories of Learning

Keywords: Bhutan; pedagogy; approaches to learning; constructive learning; reproductive learning; autonomy; higher education

1. Introduction

Higher education in Bhutan is at a nascent but pivotal stage in its development. Sherubtse College, founded in 1966, is the oldest higher education institution in the country. The Royal University of Bhutan (RUB) was established in 2003 by royal decree, and Bhutanese higher education is now organised under its umbrella, with ten member colleges spread across the country, as well as the private Royal Thimphu College (RTC) as an affiliate college.

As these dates indicate, higher education is still in its development, with post-secondary study now an option for the first time to relatively large numbers of students within the country.[1] Given that higher education in Bhutan is in its early stages of development, and that many higher education students are of the first generation to be presented with the opportunity to study at post-secondary level within Bhutan, a number of pedagogical challenges exist. Although progress is underway for educational innovation in Bhutan, and notwithstanding the contributions to this development discussed below, pedagogy is still largely dependent either on traditional approaches, or on scholarship conducted elsewhere without adaptation to local culture to inform best practice. As such, practices being applied in Bhutanese higher education may not be optimal.

The challenge addressed by this article is the culture of reproductive learning currently present in Bhutanese higher education, which means that attitudes and practices do not accord with the constructivist models of teaching and learning. The present research therefore aims to determine whether using non-linear and semi-autonomous learning activities will encourage Bhutanese students to adopt constructivist approaches to learning, and attempts to do so through research conducted at Royal Thimphu College (RTC) and Gaeddu College of Business Studies (GCBS). Within this research question, the present research also aims to achieve the following: (1) evaluate Bhutanese students' attitudes towards learning in terms of existing educational theories of reproductive and constructive learning; (2) conduct culturally-embedded evaluations of the efficacy of educational theory as a means of guiding students towards "constructive" knowledge, in the local context; and (3) propose potentially culturally-embedded adaptations to existing scholarship in order to encourage students to see themselves as constructors rather than as reproducers of knowledge.

2. Literature review

The present research measures Bhutanese students' attitudes towards their learning in terms of the opposition "constructive" vs. "reproductive". Constructive learning has its basis in the wider philosophy of constructivism, which has arguably been the dominant paradigm in educational theory over the last twenty years (Tobias & Duffy, 2009, p. 3). Although a number of different definitions of constructivist philosophy have been offered, these all share certain characteristics, namely: (1) the idea that knowledge is not discovered, but created; (2) knowledge is created through connections to existing knowledge; (3) knowledge is constructed subjectively; (4) learning involves learners actively

re-structuring their thinking; (5) knowledge construction involves personal experience an social interaction; and (6) learning takes place when learners face contextualised problems (Pelech & Pieper, 2010, p. 8). Pelech and Pieper note that the term "constructivism" has been used in educational theory since 1977, but that ideas which would now be considered constructivist have been present in educational thinking since antiquity; they cite Confucius and Plato as examples of thinkers who exhibited constructivist tendencies (2010, p. 9–10). Adherents of a constructivist educational philosophy regard it as being a more engaging form of learning and of fostering critical and independent thought (Marlowe & Page, 2005, p. x) and as an approach that characterises students with active learning strategies, who employ deep learning strategies, and who generally achieve a greater level of academic success as a result of these attitudes (Marton & Säljö, 1997; Vermunt, 2005).

This is not to say that the constructivist philosophy is unanimously endorsed. From a cognitive perspective, Kirschner, Sweller and Clark have argued that the types of "minimally guided instruction" typically used in constructivist learning environments "ignore both the structures that constitute human cognitive architecture and evidence from empirical studies over the last half-century" (2006, p. 75).[2] From a cultural perspective, Bowers has argued that constructivist approaches have ignored the cultural specificities of locations into which they have been imported by the West, to the point "constructivist-based educational reforms represent the Trojan horse of Western imperialism" (2005, p. ix). While these debates continue, the present research holds to a belief that constructive learning is a desirable goal in general for reasons outlined below. Moreover, the present research also holds that constructive learning is a desirable goal specifically in the context of Bhutanese higher education for the reason that Bhutan's educational culture emphasises memorisation (and hence reproduction) at the expense of the construction of knowledge. These characteristics of Bhutanese education are also discussed in more detail below.

For the purposes of the present research, "reproductive" learning is defined as learning that involves seeking to memorise and increase factual knowledge; in contrast, "constructive" learning, is defined as learning in which students seek to abstract, infer, and interpret (Säljö, 1979). Jonassen favours the terms "constructivist" and "objectivist" to describe a similar opposition, with objectivist conceptions of learning holding that knowledge can be "transmitted" to the learner while constructivist learning assumes "that knowledge is individually constructed and socially coconstructed by learners based on their interpretations of experiences in the world" (Jonassen, 1999, p. 217), but for the purposes of the present research, the terms "reproduction" and "construction" are used.

Despite the documented benefits of constructive approaches to teaching and learning, efforts to encourage a constructive attitude towards learning may encounter resistance from students and within institutions as a result of cultural norms and assessment practices. A number of factors, including motivation, are factors in students' success. Internal motivation tends to produce better results than external factors (Deci & Ryan, 2008). Moreover, external motivational factors, such as rewards and punishments, are often detrimental to students' cultivation of autonomous motivation. Autonomous learning goals support autonomous motivation (Schunk, 2012), so any interventions which promote goals of this kind possess the potential to modify students' behaviours towards learning. Alongside these arguments, and on a fundamental level, even the notion of learning as a "transfer" of knowledge has been attacked, with researchers advocating a shift in view towards learning as a process (see Hager & Hodkinson, 2009). It may, therefore, be hypothesised that tapping into internal motivational factors may help to move students away from reproductive to constructive learning. However, Joughin (2008) summarises research into attempts to encourage students to move from "surface" to "deep" learning by means of altering methods of assessment, noting that achieving such a movement has proven to be very difficult.

With these foundational comments on constructive learning in mind, it should be noted that relatively little research into pedagogy in Bhutan exists at present. Education in Bhutan is influenced by the overarching national agenda of Gross National Happiness (GNH). Education is one of the nine pillars of GNH, and as such it is considered to be a factor in determining happiness (The Centre for Bhutan Studies & GNH Research, 2016). Moreover, the Ministry of Education has sought, through the

mechanism of successive Five Year Plans, to support holistic pedagogy and curriculum, albeit with mixed results.[3]

Existing research into Bhutanese education suggests that a "culture of reproduction" is a potential barrier to Bhutanese higher education students adopting a constructive approach to learning (Dorji, Phuntsho, & Nima, 2013). Pommaret (2000, 2012) notes that there exists in Bhutan a culture of memorisation,[4] while Gyamtso and Maxwell (2012) assert that teacher-centred approaches are heavily relied upon within RUB even after faculty have undergone training to aid the transition away from reproduction towards construction of knowledge. Moreover, as Maxwell (2012) notes, there is a relationship between the process of research and a culture of enquiry, but RUB does not at present possess a strong research culture (Maxwell & Choeden, 2012).[5] The pedagogical approaches employed in the colleges of RUB are, of course, partly influenced by the situation in Bhutan's schools. LaPrairie (2014) notes that though policy initiatives have attempted to move teaching and learning away from didactic, teacher-centred methods, these still persist.

2.1. Research questions/hypotheses

2.1.1. Central research question

Against the background outlined above, this study seeks to answer the following question: "will using non-linear and semi-autonomous learning activities encourage Bhutanese students to adopt constructivist approaches to learning?" Here, "non-linear" refers in general to the iterative cycles required to identify and organise emergent themes as well as the ability of writers to produce or edit sections of a written work in a variety of successions: end to beginning, one paragraph at a time, or first writing body paragraphs and perhaps then addressing the conclusion or introduction. In terms of the present research, "non-linear" refers more specifically to written assignments that involve independent research and a number of iterations and drafts. The term implies that students may hold the erroneous perception that when writing, one begins by writing the opening sentence, then the introduction, and thesis, followed in clear, rapid-succession by body paragraphs, and a conclusion; in reality, the process of writing in academia is complex, cyclical, and often begins with drafts with many errors, organised around central themes that emerge only as source material is analysed and patterns are identified. Written research assignments were therefore used because the non-linear process encourages two features of constructive learning as identified by Jonassen (1999, p. 216): firstly, working towards goals that are ill-defined, and secondly, learners taking ownership of the goals and the problems that arise in achieving them. "Semi-autonomous" means that, for the majority of these learning activities, students were required to work independently, including making decisions regarding the direction and goals of their own projects. The students were given some guidance in the form of modelling by the authors, in their roles as lecturers. Here "modelling" refers to the process of demonstrating a technique by actively working through an example or case where, ideally, the person demonstrating or acting as the "model" shares enough in common with those observing that they are receptive to the technique.

The anticipated outcome of modelling the procedure of academic, research writing for students is to normalise their perception that their own academic writing can begin as an unpolished, messy draft peppered with errors, and they can still make valid contributions to knowledge-creation, or the concept of "constructive approaches to learning." Jonassen argues that "when people experience a problem or situation that they do not understand, they should be told stories about similar situations that function as lessons for the current problem" (1999, p. 224). In these learning activities, the authors' modelling of the processes of writing and research acted as "stories" of a similar process to those that the students were expected to carry out. The specifics of the learning activities used at RTC and GCBS will be described in more detail below.

In addition to the primary aim outlined above, the research proposes to evaluate Bhutanese students' attitudes towards learning in terms of existing educational theories of reproductive and constructive learning; to conduct culturally-embedded evaluations of the efficacy of educational theory

as a means of guiding students towards "constructive" knowledge, in the local context; and to propose potentially culturally-embedded adaptations to existing scholarship in order to encourage students to see themselves as constructors rather than as reproducers of knowledge.

3. Method

The data is comprised from a sample of undergraduate students at two college campuses in Bhutan and is grounded in non-equivalent groups design. A quasi-experimental hybrid design with alternating repetitions, one at RTC followed by one at GCBS, is particularly suited to this research because it tests the causal hypothesis proposed, does not require equivalency of groups by randomisation, supports a pre-test post-test design, and is ethically-sound because both groups receive the intervention (Trochim, Donnelly, & Arora, 2016). Randomisation in collecting data from students in different geographic locations was not possible due to time and geographic constraints. Therefore, group assignment was determined according to the campus location of the participants. Despite lacking randomisation of groups, the sample is determined to be adequately representative of the larger population of undergraduate students in Bhutan at the time. Additionally, since both groups received the treatment at different times, non-equivalency of groups is less of a threat to internal validity.

The design has 3 main components:

(1) pre- and post-test surveys,
(2) the non-linear, semi-autonomous learning activity, conducted independently at both locations, and
(3) semi-structured interviews.

Mixed methods of surveys and interviews are incorporated to support triangulation and complementarity. Quasi-experimental design is susceptible to internal threats of validity selection and potentially erroneous false positives in analysing purely quantitative data (Trochim et al., 2016), but replicating the intervention with both groups addresses these threats. Interviews are also incorporated to address validity threats and discover deeper layers of meaning from the participants.

The non-linear, semi-autonomous learning activities require students to grapple with complex learning opportunities, consult source material to delve more deeply into their understanding of the content, and synthesise the information they discover or create into a cohesive piece of writing communicating their ideas. The participants in both segments of the sample receive the same treatment. The authors, in their roles as lecturers, model the procedure of academic research that begins with searching for and identifying relevant ideas in source material, continues with writing rough drafts with paragraphs and sections organised around themes in the sources and then revising these, and concludes with refinements and micro-editing.

Modelling these stages is intended to demonstrate the iterative nature of scholarly writing and the types of decisions that a writer is required to make during this process. Details of these procedures are expounded upon in the following sections; at its core, though, the learning activity aims to orient students to the essential elements of scholarly writing which does not require a linear process from developing a thesis to producing a perfect draft. Moreover, and more importantly, modelling the iterative process of academic writing is intended to demonstrate that the learning activity requires constructive learning behaviours if it is to be completed successfully, and it is intended to elicit these behaviours in the students.

3.1. Context: Population and sample

Despite the geographic and domain distribution of Bhutan's higher education institutions, the student body of each is relatively diverse, with representation of almost all 20 of the country's Dzongkhags at each campus.[6] The full population of this study consists of 107 respondents who

were second- or third-year undergraduates in Bhutan in 2015, mirroring the same diversity found throughout Bhutan's population of students availing higher education. Of these, 35 are students of Gaeddu College of Business Studies (GCBS) and 72 are from Royal Thimphu College (RTC). Despite the groups comprising the sample not being randomised due to geographic and time constraints, the composition of undergraduates' attributes would tend towards equivalency in this case because of Bhutanese students' unique, yet consistent-across-campuses traits.

Students from GCBS complete a research investigation of their own design, with guidance from the faculty, in their final semester; that GCBS students receive information and instruction on conducting research from many faculty may pose an external validity threat in analysing the findings. For example, the purpose of the present research is to reinforce constructive approaches to learning, yet reproduction may have been reinforced from other faculty members. Preliminary research writing, specifically literature reviews, is incorporated with the GCBS intervention. Students from RTC write paper on one of the set literary texts from the second-year American Literature course. Students are expected to submit a full essay, which should include a coherent argument about the chosen text, and supporting information and critical arguments from secondary sources. Guidance on the process of research and writing was given to the students over the course of the assignment.

The segments of the sample are from two different campuses in Bhutan and two different course content areas; however, the unifying attribute of the learning activity carried out by both groups is scholarly research and writing at the undergraduate level, which, as noted above, requires the adoption of constructive behaviours of working towards ill-defined goals and taking ownership of the learning process. Therefore, regardless of the pretext or domain, the form and function of the learning activity are the same with regard to constructive and reproductive learning in both cases.

Not all students in the sample respond to the pre- and post-test survey, so some cases are incomplete. These incomplete responses are not included in the final sample. The remaining valid and complete cases ($N = 77$) include participants from GCBS ($n = 27$) and from RTC ($n = 50$).

3.2. Measures

Data are comprised from iterative pre- and post-test surveys and semi-structured interviews.

The survey scale is adapted from Biggs', Kember's, and Leung's (2001) "The revised two factor study process questionnaire: R-SPQ-2F". These scholars use a two stage refinement process starting from 43 survey items narrowed to 16 after a series of testing with university students in Hong Kong ($N = 495$). The questionnaire aids teachers in identifying what approaches to learning their students use in a given context, environment, or lesson. The paradigmatic basis of learning styles exploration of this questionnaire supports its use in investigating of approaches to research activities of higher education students in Bhutan.

The revised two factor study process questionnaire: R-SPQ-2F is tailored to the present research by validity testing using Cronbach's alpha. Items are adapted from a generic survey of learning approaches to specifically address learning approaches to research and writing within the present study. Of an original 24 survey items, 16 valid items remain in the final version; these have the most consistent reliability by item and in aggregate. Of the 16 items, 8 each address the two factors of this investigation. The survey items used in the pre- and post-tests are included as Appendix 1.

3.3. Procedure

Data collection started in May, 2015 and concluded in August, 2015. Surveys were administered to both samples in May, one before and one after the non-linear, semi-autonomous learning activity. Interviews were also conducted in June with a small student sample to add nuance to the survey data. Follow-up interviews clarified the original interviewees' responses and concluded the data collection in August, 2015. Preliminary results were presented to a panel of educationalists in Thimphu in August, 2015.

Pre-tests at both campuses establish students' preliminary attitudes towards approaches to learning specific to research and writing. The non-linear, semi-autonomous learning activities follow the pre-test and are intended to shape students' experience with an ideal outcome being an increase in preferences for construction-related thinking and behaviour when involved in research writing. Following the learning activity, students re-report their attitudes using the same survey from the pre-test phase to identify any changes following the learning activity. The treatment is first conducted with RTC students, and then the GCBS sample received a repetition of a similar learning activity. Finally, interviews add nuance to the numerical data.

3.3.1. RTC campus modelling intervention

The study at Royal Thimphu College examined a cohort of fourth-semester students taking the American Literature module. These students were split across three sections, with two sections being English-Environmental Studies majors, and one section being English-Dzongkha majors.[7,8] The English-Environmental Studies sections both contained 33 students, while the English-Dzongkha section contained 13 students.

The intervention was based around the essay component of their continuous assessment. The essay was 800–1,000 words, and was to be based on one of the texts studied during the course. The assignment was designed to elicit constructive approaches to learning through the instructions and grading for this assignment emphasising the construction of argument rather than the reproduction of knowledge. As such, topics were set so as to be explicitly argumentative; that is, the questions required students to take a specific position. They did so by being formulated as a statement, followed by the question "do you agree?" Examples of questions include: "Although Hester Prynne is the heroine of *The Scarlet Letter*, it is impossible to fully identify or sympathise with her. Do you agree?" and "Walt Whitman's view of democracy is idealistic and unrealistic. Do you agree?"

The process of writing the essay was non-linear in that students were required to go through a two-draft process, undertaking an extensive process of peer-review after the first draft had been submitted. The peer-review process focused on three elements of students' drafts, these being: (1) use of examples from the texts; (2) argument and the thesis statement; and (3) cohesion at paragraph- and essay-level. The author modelled the process of giving feedback, and also the type of changes that might be made to an essay as a result of such feedback. An example of how feedback on use of examples was modelled is given in Appendix 3. This learning activity was semi-autonomous in that students were allowed to select their own essay question from a list, and they were expected to conduct research, write, give peer feedback and revise independently. They received guidance in the form of the modelling described above.

3.3.2. GCBS campus modelling intervention

The non-linear, semi-autonomous learning activity at RTC preceded the treatment for GCBS. The intervention at GCBS included final-semester students and examined participants' preferred approaches to learning during the process of writing a literature review. The intervention spanned four days and contained two components: (1) modelling of the procedural progression of sample literature reviews from early- to late-stage drafts, and (2) student reflection and engagement with their own and their peers' literature reviews.

Positive and counter-example literature reviews demonstrated the intermediary phases of writing from disorganised, note-covered preliminary drafts to the intermediate stage of emergent themes, headings, and rough organisation and finally to complete, model drafts. Themes included multifaceted, complex procedures inherent in research and writing. Inclusion of disparate topics in the modelling portion was intended to highlight the complex and non-linear nature of developing writing and research skills. In some examples, the thesis statement was clearly articulated before other sections of the draft while in others, the body paragraphs clustered around themes from the source material were well-developed first.

The first component of the intervention combined modelling both early and late stage drafts within the writing process via interactive lecture and small group discussion. Students' prior knowledge and questions regarding literature reviews were welcomed. Preliminary, rough drafts from the researcher's own work were used as models and were intended to build trust and to foster an environment of acceptance of uncertainties. Students identified poor organisation choices, vague theses, irrelevant supporting details, and illogical paragraph ordering in the early drafts; furthermore students discussed how they would improve these weak points in the first drafts.

When engaging with the late stage drafts, students identified high-quality thesis statements, inclusion of relevant supporting details, and logical organisation and paragraph ordering. Students talked in pairs and then with the larger group about the attributes that supported clear, concise research writing. The researcher asked open-ended questions to encourage students in adapting these discussions to their own research and writing.

The second component of the learning activity was principally autonomous as students engaged with their own literature reviews and their peers'. Pairs collaboratively identified a focus area to review and provided feedback from the following options: (1) thesis statement and supporting details, (2) overall organisation and ordering of thematic areas, or (3) one thematic areas' organisation and supporting details. Students provided verbal and written feedback to their peers and endeavoured to provide specific suggestions for how improvements could be made on the focus area.

The learning activity concluded with a reflection on the participant-selected forms of thinking, writing, or pair sharing. Students were encouraged to minimise emphasis on surface-level mechanics such as spelling and grammar. They were instead encouraged to highlight skills learnt and which could be taught to someone else, or to draw connections between their learning and other courses or contexts. They considered the goal they set with their peer reviewer, to what extent they felt they met or did not meet this goal, and whether the goal related to the information shared and knowledge developed about literature reviews in the first component of the learning activity.

4. Data analysis

The following sections address the primary research question: "will using non-linear and semi-autonomous learning activities encourage Bhutanese students to adopt constructivist approaches to learning?"

4.1. Validity and reliability

Cronbach's Alpha was used to measure the reliability of the scale, which is especially important in quasi-experimental design, because of an inherent weakness in terms of threats to internal validity. Measuring and confirming a high validity level was essential to ensure that the results of inferential statistics do not show false positives.

The survey used in this study was based upon and adapted to the Bhutanese context from "The revised two factor study process questionnaire: R-SPQ-2F" from Biggs, Kember, and Leung (2001). These scholars promote the adaptation of their survey for use in other contexts, stating: "We believe that the most effective way of ensuring high quality teaching and learning is for teachers to take responsibility for ensuring that assessment and other contextual elements in the teaching and learning system are constructively aligned to promote deep approaches to learning" (p. 11). Use of these scholars' survey may empower teachers in Bhutan to better understand and respond to their students' approaches to learning.

4.2. Variables

Two observed, dichotomous variables were hypothesised: *Reproduction* and *Construction*, which are closely related with the constructs deep and surface learning developed in Biggs' 2 factor questionnaire (2001). The variable *Reproduction* for this study is defined as a preference for traditional (Phuntsho, 2000) learning methods with a reliance on passive behaviours and methods for engaging

with and producing research writing. The variable *Construction* is defined as a preference for modern (Phuntsho, 2000) learning methods with a reliance on active or creative behaviours and methods for engaging with and producing research writing. Confirmatory factor analysis and Pearson's r were calculated to confirm the two-factor model, *Reproduction* or *Construction*, which was the expected result given the research design and the existing body of findings related to the instrument adapted for this study.

These variables, and their related behaviours and methods, are not categorically or generally applied to students at all times, but rather are evaluated and understood in relation to their context which, in this research, includes the activity of Bhutanese college students learning about and conducting undergraduate research and writing. Because teachers in this intervention are the educational actors who set the tone of learning environments and model behaviours, they are also relevant to treating the application of these variables.

The relationship of these variables with traditional and modern traditions of schooling is additionally relevant and potentially influential. However the authors' use of these variables is not intended to imply a normative view of education that honours academic research to the detriment of traditional varieties of education. Rather, the authors acknowledge that the paradigm of constructive learning is presently dominant, and hence is regarded as the optimal mode of learning in most cases by modern scholars; yet they also acknowledge that the implementation of any mode of learning is multi-faceted and must respond to the socio-cultural experiences of students in disparate contexts. Additionally relevant is the interaction among students, teachers, and their shared environment, which influences students' preferences for learning styles, e.g. reproduction or construction, and which changes over time, with different instructors, and in different environments.

4.3. Interview coding schema

Interview questions, listed in Appendix 2, sought to elucidate respondents' attitudes towards the non-linear, semi-autonomous learning activity relative to four categories which also informed the coding schema: (1) behaviours, (2) opinions or values, (3) feelings and (4) background, e.g. students' prior experiences and knowledge. The interviews were semi-structured to allow room for students' experiences and stories to be told. Questions were prepared to cover each of the four categories. An example behaviour question is, "what information did you have to find out for yourself during the assignment?" An example opinion question is, "how useful or not did you find giving and receiving peer feedback during the assignment?" These questions opened dialogue with the researchers and added continuity to the quantitative data from the pre- and post-tests. Iterative design was used to analyse the interviews. Interview transcripts were provided to the participants for review and elaboration. Finally codes were applied and refined in several cycles.

5. Results

5.1. Quantitative

5.1.1. Descriptives

The normality of the final data set was assessed using a combined visual-numeric method. By analysing a histogram of the data-set with a super-imposed normal curve, preliminary visual analysis suggested the data set does not follow a normal distribution. This was confirmed with skewness and kurtosis measures, shown in Table 1.

Cronbach's Alpha, also shown in Table 2, was calculated to determine reliability of the scale overall as well as the alpha for the scale if an item were deleted; determinations of acceptability were based on George and Mallery (2010). The alpha coefficient for the finalised 16 items of the survey was acceptable ($\alpha = 0.82$, $N = 77$) suggesting high internal validity. The alpha coefficient for the sub-scales *Reproduction* ($\alpha = 0.78$, $N = 77$) and *Construction* ($\alpha = 0.79$, $N = 77$) were also acceptable with 8 items each. Acceptable validity of this scale was confirmed based on pre- and post-test measures.

Table 1. Descriptives including measures of skewness and kurtosis by sub-sample group

Factor	Sub-sample	Test score	*n*		*M*	SD	Variance	Min	Max	Median	Kurtosis		Skewness	
			Valid	Missing							Statistic	Std. error	Statistic	Std. error
Reproduction	GCBS	Pre	27	0	22.90	3.95	15.64	14.00	31.00	24.00	0.20	0.87	−0.45	0.45
		Post	27	0	21.40	4.02	16.18	12.00	28.00	22.00	0.06	0.87	−0.58	0.45
	RTC	Pre	50	0	22.10	2.93	8.61	13.00	28.00	22.00	0.57	0.66	−0.36	0.34
		Post	50	0	23.70	3.61	13.00	17.00	33.00	23.00	−0.13	0.66	0.39	0.34
Construction	GCBS	Pre	27	0	25.20	5.66	32.03	15.00	34.00	26.00	−0.99	0.87	−0.09	0.45
		Post	27	0	25.00	5.59	31.27	18.00	37.00	24.00	−0.69	0.87	0.62	0.45
	RTC	Pre	50	0	27.70	4.76	22.70	18.00	37.00	28.00	−0.79	0.66	0.02	0.34
		Post	50	0	29.80	5.19	26.92	20.00	39.00	30.00	−1.07	0.66	−0.03	0.34

Table 2. Reliability of the scale and item analysis by factor

	N	**α**		
Scale statistics	16	0.82		
Item statistics	*n*	α		
Reproduction	8	0.78		
Construction	8	0.79		
Item total statistics	Scale *M* if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's **α** if item deleted
Reproduction				
Item 1	45.08	86.76	0.35	0.82
Item 3	45.62	88.62	0.26	0.82
Item 5	45.41	86.41	0.36	0.82
Item 7	45.50	93.25	−0.01	0.84
Item 9	44.44	82.59	0.44	0.81
Item 11	44.50	78.99	0.60	0.80
Item 13	45.84	86.53	0.37	0.82
Item 15	43.39	84.86	0.38	0.82
Construction				
Item 2	44.72	81.96	0.49	0.81
Item 4	45.31	83.31	0.45	0.81
Item 6	44.31	81.33	0.52	0.81
Item 8	43.91	81.88	0.53	0.81
Item 10	44.26	80.38	0.56	0.81
Item 12	44.70	82.55	0.50	0.81
Item 14	44.26	82.21	0.55	0.81
Item 16	43.98	82.11	0.51	0.81

Confirmatory factor analysis and Pearson's r were calculated to disconfirm unidimensionality of the scale, and visual Scree Plot analysis shown in Figure 1 supported the two-factor model. The first factor accounted for 30.91% of the variance with an eigenvalue of 6.59, with the second factor accounting for 8.50% of the variance with an eigenvalue of 1.81. To confirm this proposed model, the Pearson Correlation Coefficient was calculated at 0.45 ($N = 77$) and indicates the two factors are not closely related, supporting the two variable's separateness.

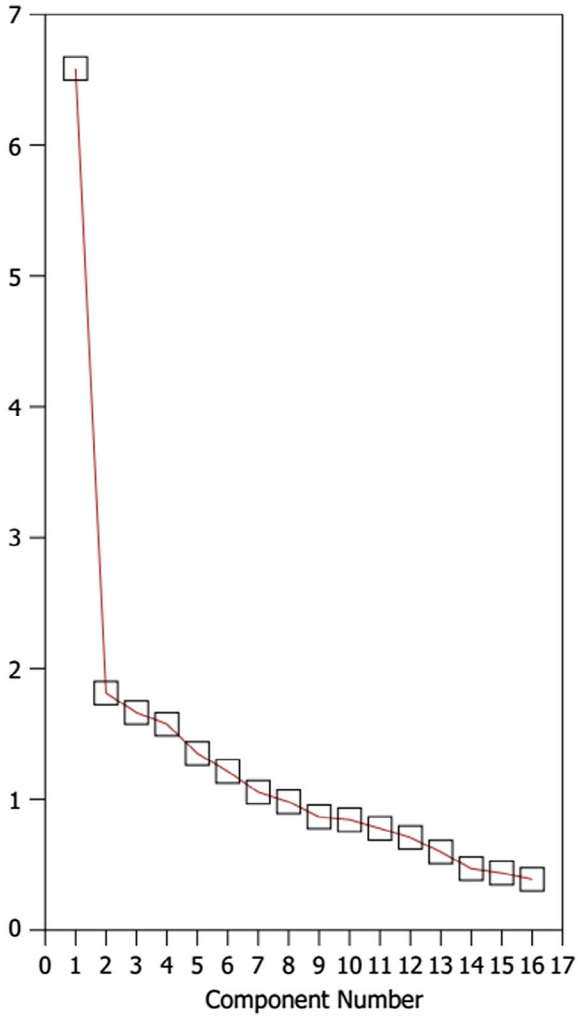

Figure 1. Confirmatory two-factor analysis.

Note: Combined numerical-visual analysis confirms the anticipated two-factor loadings.

Both skewness and standard deviation are important measures to note for this data-set because of the ways they interact with and influence measures of central tendency, such as the mean scores of the summative scales. The intended outcome of the intervention was a decrease in the summative scale score for the variable *Reproduction;* participants from GCBS demonstrated a decrease in *Reproduction* post-intervention. This outcome was not uniform for both subsets of the sample. The participants from GCBS demonstrated a decrease pre- (M = 22.90, SD = 3.95) to post-test (M = 21.40, SD = 4.02) of 1.50 accompanied by a moderate change in the skewness of the data-set. The participants from RTC demonstrated an increase pre- (M = 22.10, SD = 2.93) to post-test (M = 23.70, SD = 3.61) of 1.60 accompanied by a large change in the skewness of the data-set. For both sample groups, the standard deviation indicates large variation among the participants.

The intended outcome of the intervention was an increase in the summative scale score for the variable *Construction;* participants from RTC demonstrated an increase in *Construction* post-intervention. The participants from GCBS demonstrated a decrease pre- (M = 25.20, SD = 5.66) to post-test (M = 25.00, SD = 5.59) of 0.20 accompanied by a moderate change in the skewness of the data-set. The participants from RTC demonstrated an increase pre- (M = 27.70, SD = 4.76) to post-test (M = 29.80, SD = 5.19) of 2.10 accompanied by a change in the skewness of the data-set. For both sample groups, the standard deviation indicates large variation among the participants.

Table 3. Pre-post paired sign test by sub-sample

	N	*M*	SD	Sig.	Pos.	Neg.	Tie	Sign
Reproduction								
GCBS	27			0.15	9	15	3	-
RTC	50			0.19	28	19	3	+
All	77	22.90	3.88	0.50	37	34	6	+
Construction								
GCBS	27			0.50	14	13	0	+
RTC	50			0.03*	28	15	7	+
All	77	28.08	5.78	0.06	42	28	7	+

**p* is significant at the <0.05 level.

5.1.2. Inferential statistics

Non-parametric tests were used for means comparison since the data is not normally distributed, most likely attributable to the small sample size. The statistical test Wilcoxon could have been used for comparing the pre- and post-test means, as it is the non-parametric corollary to dependent t-test, which is most common for comparing pre- and post-test data that does not violate normality principles. However, Wilcoxon has a required assumption of symmetry, which this research's data-set did not meet; this distribution has a slight negative tail, so Wilcoxon could not be used.

Instead, the Sign test measured differences from pre- to post-tests within groups, shown in Table 3, since the distribution is neither normal nor symmetrical. Scores for the two variables *Reproduction* and *Construction* were calculated and compared before and after the two repetitions of the intervention. Preferences for *Reproduction* overall decreased for 34 respondents ($M = 22.90$, $SD = 3.88$) following the learning activities, from GCBS ($n = 15$) and from RTC ($n = 19$), $p = 0.50$. For *Construction* overall, 42 respondents ($M = 28.08$, $SD = 5.78$) demonstrated an increase in this attitude after the learning activity ($N = 77$), from GCBS ($n = 15$) and from RTC ($n = 28$), $p = 0.06$. The positive increase from RTC participants ($n = 28$) was significant at the $p < 0.05$ level. Some students from RTC showed no change ($n = 7$).

Since the results were not significant at the $p = 0.05$ level, the null hypothesis, that the samples are from the same population, must be rejected. This indicates there are differences between results from GCBS and RTC that may have influenced students' experience of the learning activity and subsequently their responses related to the variables *Reproduction* and *Construction*. Differences in post-test scores from RTC were not compared with GCBS due to the possibility of non-equivalency of the groups or variables extraneous to the research's variables influencing outcomes (Heiman, 1999; Trochim et al., 2016). However these two group results imply that non-linear, semi-autonomous learning activities may promote constructive approaches to learning research and writing for other Bhutanese students and do not violate the assumptions of the sign test which allow for differences in the two samples.

In the case of the GCBS subsample, scores for *Reproduction* most decreased ($n = 15$), but there were also some increases post-intervention ($n = 9$). Subsequently further research is necessary to isolate why some students respond positively to the non-linear, semi-autonomous learning activity while others do not. A confirmatory factor analysis, perhaps using structural equation modelling, would be a useful extension of this research's findings.

6. Discussion

This research project was premised on the hypothesis that a non-linear, semi-autonomous learning activity could encourage students to adopt constructive attitudes and behaviours towards learning. Specifically, the research attempted to address the question, "will using non-linear and

semi-autonomous learning activities encourage Bhutanese students to adopt constructivist approaches to learning?"

In general, the results indicate mixed results in moving students towards constructive approaches to their learning. Some students reported enjoyment of autonomy, a sense that they were learning through processes of writing and thinking, and connecting the knowledge and skills acquired to other contexts. However, the commonly reported focus among students on error correction and on finding information from secondary sources as well as the mixed quantitative results where some participants showed increases in *Construction* (GCBS, $n = 14$; RTC, $n = 28$) but also some showed increases in *Reproduction* (GCBS, $n = 9$; RTC, $n = 28$) indicate that deeply-held reproductive attitudes persisted. For the variable *Reproduction,* the skewness of the data-set changed for both the participants from RTC and GCBS, indicating that perhaps some individual participant's reported results influenced the results overall.

Anticipated results of the study were that students' preferences for *Reproduction* would decrease and preferences for *Construction* would increase following the learning activity. Although a decrease in *Reproduction* preferences after participation in the learning activity was the case among GCBS participants, the result was not significant at the $p < 0.05$ level. Students' preferences for *Construction* increased in both sub-samples; however only the results from the RTC sub-sample were significant at the $p < 0.05$ level ($p = 0.03$).

Paradigms of educational change management and the compounding factor of the idiosyncratic approach to change in Bhutan may illuminate the quantitative results of the study. Fullan (2007) describes educational change as a progression from an innovation, in this case the intervention, to a dip in acceptance or proficiency, and then only after time has passed and beliefs have changed, to acceptance and use of the innovation. Because people are complex and values are deeply-held, Fullan does not describe a time span for this progression, but indicates it differs from system to system, group to group. The visual representation of Fullan's model is a U shape where the bottom of the U indicates when acceptance of the innovation is at its lowest. The impetus for transition from the lowest point to full acceptance of an innovation involves the necessity of changes in attitudes and beliefs, which are the hardest to accomplish. Given the relatively recent increased access to higher education in Bhutan and Bhutanese culture's deeply-rooted connections with the traditions of Buddhism, it may be the case that change in attitudes towards education takes more than a single learning activity, and that the students whose *Construction* scores decreased, of whose *Reproduction* scores increased, may be on the "dip" section of the curve described by Fullan. Given additional time and iterations of exposure to the concepts in the intervention, increasing acceptance of construction-based approaches to learning may be possible. Specifically with respect to this research, students may become increasingly receptive to the techniques and approaches presented by the authors in the modelling phase of the learning activity, given adequate time to consider and assimilate them.

Furthermore, Fullan (2007) describes the disconnect between adults and students in educational change processes when he states that adults "rarely think of students as participants in a process of change and organizational life" (p. 170) which may be a complicating factor in this research. Perhaps if students were more closely-involved in the planning of the learning activity they may have more readily accepted the change proposed for approaching scholarly writing. Additionally, it may be the case that because the learning activity involved only one instance of exposure to a relatively remarkable change in paradigm in terms of learning, students were initially resistant, hence the unexpected quantitative results. Also, though, that the qualitative results indicate students were open to changing their mode of learning is a positive indicator that additional exposures to similar learning activities upholding constructing knowledge may translate to reduced scores in *Reproduction* and increased scores in *Construction.*

6.1. RTC intervention

The qualitative data collected through interviews after the end of semester revealed three main trends. These were: (1) a focus on micro-level error correction; (2) the difficulty of research and (3) enjoyment of autonomy. These three areas will be discussed below.

6.1.1. Error correction

In response to being asked about what they found useful about the peer-feedback process, each of the six students interviewed mentioned error correction as one of the main benefits. This was somewhat surprising, as the guidance given on the peer-feedback process directed students to focus on two macro-level areas (argument and cohesion), with the only micro-level feedback focusing on use of examples from the texts. However, the students' responses clearly indicate that they gave feedback to each other on micro-level errors with spelling and grammar.

Given that students were not directed to address errors of this nature during the peer-feedback process, the students exercised some autonomy in terms of what sort of feedback to give. It may be inferred that this focus reveals something of students' priorities and expectations regarding a written assignment: a focus on micro-level error correction would seem to indicate that their goal is to produce an assignment that might be regarded as "perfect" in the sense that it is error free. This attitude is implicitly at odds with a *Construction* approach to learning, because the construction of knowledge or argument can always be continued or developed, and hence never reaches a "perfect" state. However, it should also be noted that such attention to detail does not necessarily preclude *Construction* attitudes and behaviours, but can exist alongside them.

These behaviours were not, however, what the intervention was intended to elicit. While accuracy is certainly important, the author's intention in the guidance given on first draft feedback was to encourage students to examine the "big picture" issues in their essay which were related to the construction of argument: namely, whether or not their essay possessed a cogent argument, and whether this argument was well-supported by textual evidence. Thus, the author's expectation is that a skilled writer would prioritise error correction later in the writing process, or would see error correction at an early stage as being of lesser importance than the "big picture" issues which give the assignment its *Construction* character.

This is not to say that the students ignored "big picture" questions, and several of the interviewees mentioned re-drafting the thesis statement. Most found writing the thesis statement difficult: one student reported that "We have to argue … I have no idea how to do this", while another noted that "everything is contained in that single sentence". These responses indicate that macro-level thinking and revisions were taking place, and that students were shifting towards *Construction* attitudes, but perhaps while still regarding surface-level errors as a priority. Encouragingly, however, one student did report a change in attitude towards her assignment (and hence towards her learning) as a result of the peer-review process, stating that she looked much more closely at her assignment. Therefore, even if this attention was directed towards micro-level changes, this indicates that a shift in attitude towards *Construction*, in the form of attention to the process of learning, did take place as a result of the peer-review section of the learning activity.

6.1.2. Research

Essays in the field of literature generally involve close reading of the primary text or texts (the literary texts themselves), supplemented by secondary research which can be grouped broadly into contextual information (i.e. the historical, social, and political background against which the text was written), theory, and criticism. Being able to successfully synthesise this variety of sources into a single, coherent argument requires students to adopt a *Construction* approach to the assignment. The author had introduced the students to these three strands of secondary research in skills session which took place in the library. However, students' responses in the interviews revealed that, while they had a strong sense that they should use secondary sources, they were very vague on how or why information from those sources should be used.

One student stated simply that she "didn't get" secondary sources. When pushed on what kind of information she had sought, she stated that she had searched for "background", but what information she found had been of only a little use, and did not use much of this information in her essay. This uncertainty was echoed by the other students, and was present both in those who did well and did poorly in terms of their final grade, with another student stating that she had searched for "background", and another stating that she had searched for information "related to our assignment" without being able to further elaborate on how the source was related to her writing. The students' vagueness in these responses make them difficult to interpret, but they do perhaps account of some of *Reproduction* scores of RTC students either remaining consistent or increasing following the learning activity: if, by "background", students meant factual information, this would indicate *Reproduction* behaviour in that they felt the need to demonstrate their grasp of factual knowledge by reproducing it in the assignment.

The students' uncertainty in terms of what to research was exacerbated by uncertainty in the method of searching for information. All of students stated that a web search was their initial means of looking for information, and few went beyond this stage. The interviews thus revealed significant uncertainty regarding the purpose of using secondary sources in a literature assignment, and this uncertainty was exacerbated by the lack of a coherent or systematic approach to conducting this research. In the introduction to this article, the authors cited Maxwell and Choeden's (2012) assertion that RUB lacks a culture of research; certainly, and despite taking common introductory modules that cover issues such as research and referencing, the students were still ingenuous in these areas at this stage of their studies. It may therefore be speculated that the unfamiliarity of research assignments is a contributory factor in students' resistance to moving away from *Reproduction* and towards *Construction* attitudes and behaviours.

6.1.3. Autonomy

A number of students interviewed commented that they enjoyed the autonomy offered by the assignment. While the learning activity was designed to be semi-autonomous, the fact that students identified their choice of assignment as the area in which they enjoyed the autonomy offered by the assignment was somewhat surprising to the author, given that the students were offered a choice from a list of set questions designed (as noted above) to elicit clearly stated argument. However, while from the author's perspective the students may have appeared to be fairly constrained, their responses indicate that they actually felt that the questions offered a significant degree of autonomy. The students mentioned enjoying having a choice of topic, but in particular being able to arrive at and elucidate their own stance on the question. In addition, several stated that they enjoyed the autonomy offered by the research process: despite the difficulties discussed above, several of the students felt that they learnt from their research, and found this rewarding. In fact, one student specifically acknowledged the way that research and writing helped her to learn, contrasting favourably with her normal process of pre-exam revision in which she would generally "copy from others' knowledge". In this case, the student's comments indicate a movement towards, and enjoyment of, constructive learning behaviour.

From these responses it seems that, although the set list of essay questions appeared to the author to be relatively prescriptive, they offered a greater degree of autonomy to the students than that to which they have been accustomed in higher-education assessments. In addition, their enjoyment of this autonomy suggests that offering students' the freedom to make their own choices in their work may stimulate intrinsic motivation.

6.2. GCBS intervention

Interviews revealed a student focus on error correction and a reliance on outside sources. This indicated that students' thinking tended towards a *Reproduction* approach to research writing. They gave especial attention to details and the micro level rather than a big picture orientation that would indicate a preference for *Construction* approaches. Nonetheless, interviewed participants also discussed their perceived usefulness of the intervention, which may indicate that the intervention was

a foundational, preliminary experience that may lead to later *Construction* approaches to research. However, students' preference for first addressing mechanics of their writing may have allowed students to transition towards higher-order construction-related approaches such as connecting and creating new ideas.

6.2.1. Error correction

Participants from GCBS indicated a strong focus on editing for mechanics such as spelling and grammar. Interviews revealed a twofold emphasis in this area: (1) Students indicated their belief that their semi-final literature review drafts must be tidy. They perceived these edits as within achievable range, so they spent significant time and effort on these areas; (2) those few students who felt they had a good grasp on the stylistics of their semi-final drafts also stated they felt comfortable and adequately prepared to approach their peers, the researcher, and other professors to address their theoretically-oriented questions, such as the strength of their thesis statement and the logical progression of the document. Students who pursued these types of inquiries indicated that, for them and from their past experiences, having first edited for mechanics was a prerequisite to sharing their work with others, a learning approach associated with construction.

Presentation of a clean draft with polished mechanics for feedback from others created a sense of security and safety that was a prerequisite for students to pursue more nebulous concepts, such as connecting ideas and synthesising sources. However, conventional approaches to scholarly writing would place organisation and cohesion of an argument first, with error correction one of the last activities in revision. Students seemed to order their approach in the opposite order with mechanics correction preceding organisational and cohesion edits. They wanted to make sure that all of the corrections they could do on their own with relative comfort were addressed before confronting areas of their writing that were more uncertain. In this sense editing for spelling and grammar enabled and empowered some students to move on to higher order revisions, their confidence in reproductive techniques allowed them conceptual room to start the transition towards construction.

At the time these students attended compulsory school, English language curriculum and pedagogy emphasised learning grammar by rote over communicating, connecting, and synthesising ideas. However, efforts are underway by the Ministry of Education to facilitate a transition away from didactic approaches to knowledge creation. Even so, this phenomenon may have been an unintended consequence of the interventions modelling of a sequence of sample literature reviews. While the learning activity intended to demonstrate the cohesion of ideas unified under a cogent thesis, not a reduction in spelling or grammar errors, students may have perceived these examples differently. More specifically, the drafts did demonstrate an improvement in those areas from the rough to final versions; while the researcher intended to emphasise a process of constructing ideas, using clear language as the medium of such, it is exceptionally difficult to disentangle the two or retrospectively identify which predominated in the students' minds.

6.2.2. Indirect communication

Participants in the interviews communicated a preference for indirect communication regarding their research writing; more specifically students stated that they were only interested in discussing their research writing with persons not directly related to their research project or its assessment. For example, participants discussed their literature reviews with anonymous users on the Internet, classmates, and professors not responsible for their research instruction or assessment. However, students indicated their unequivocal discomfort in discussing their literature reviews with their research advisors and any professors involved in teaching them research methodology, including the researcher who conducted their intervention. Almost all interviewed participants indicated a near-exclusive reliance on outside sources, specifically the Internet and other lecturers, in learning how to approach the literature review.

Bhutan is a high-context society where interactions are guided by deep cultural understandings of each individual's place within hierarchical ecologies of relations. Similar to the Tibetan context

where teachers, both religious and secular, are revered as almost godlike in their ability to impart wisdom (Zhang, Fu, & Jiao, 2008), Bhutan has an equally long and abiding tradition of students regarding teachers with a level of respect determined by the conceptual, hierarchical distance separating them. This perceived distance between teacher and student may have prevented participants in the study from feeling comfortable communicating directly with the researcher, their advisors, and professors of research methodology.

However, another consideration is their potential fear of publicly making a mistake with someone who holds control over their grade and ultimately their performance and assessment on a project required for completing the undergraduate degree. Consulting outside sources and communicating with those tangential to their performance may have also empowered some of them to move beyond *Reproduction*. This behaviour seemed to provide a sense of safety, despite students also indicating it was confusing to receive guidance from different sources that was sometimes contradictory to the concepts presented in the intervention.

6.2.3. Perceived usefulness

Despite some unintended outcomes of the learning activity, interviewed students also indicated their perceived usefulness of the task. They discussed the intervention as a "learning opportunity" with low stakes to make a first foray into research writing. With the incorporation of peer feedback in the second stage of the learning activity, students stated they felt relieved to not have to present their work to the whole class or the researcher out of fear of embarrassment. In providing peer review, students said they saw "classmates' major mistakes" and felt more comfortable with their own limited understandings as novice researchers. Furthermore they examined their perceived usefulness of the task based on their expectation of using research writing in future careers. Given the students' receptiveness to the intervention, students may rely more on construction behaviours in subsequent research writing.

7. Limitations

Several issues may have limited the results of this research. Firstly, because time and geographical constraints restricted the samples to those students taught by the lecturers, these samples were necessarily small, and there was no statistically supported equivalency of groups despite the researchers' best efforts to control for consistency. It is therefore difficult to determine the influence of other variables, such as age, gender, and socio-economic background, as is a quandary in much social sciences research. Moreover, other variables which may more directly impact attitudes towards education, such as educational background and programme of study, may also have had an influence.

A major threat to validity is also the influence of other educators at the RUB colleges discussed here. The majority of faculty in RUB are Bhutanese, while there is also a significant minority of Indian nationals teaching at the colleges. Given the different educational and cultural background of the faculty to which students are exposed, the students may receive different messages—both implicit and explicit—about the nature of academic work and writing as well as the disparate methods of approaching them.

A related threat is the authors' cultural backgrounds. Bhutan's strict restrictions on immigration mean that relatively few non-Bhutanese faculty teach in the country.[9] The authors' different backgrounds may, therefore, have been perceived as threatening by students, and may have skewed the results negatively if the students did not have trust in their methods. Alternatively, students may have attempted to second-guess the researchers' aims, and may have skewed the results positively by giving answers intended to satisfy the researchers.

8. Conclusion

This research project sought to address the question "will using non-linear and semi-autonomous learning activities encourage Bhutanese students to adopt constructivist approaches to learning?"

Students in the sample from GCBS demonstrated incremental transitions from *Reproduction* to *Construction* in some students' attitudes, although reproductive habits were prevalent.

This challenge resulted in mostly Reproductive behaviour and thinking when conducting research activities, but a transition towards Constructive behaviour from some students. The results for RTC students were similarly mixed, with some movement towards Constructive behaviour, but with many students also retaining Reproductive traits.

The main challenge in interpreting the results of this study stems from unexpected reproductive behaviours following the intervention at both RTC and GCBS. Specifically, further research could address why students were so focused on error correction despite the researchers giving instructions to focus on other areas during the process of writing and research. In the discussion section, the authors have surmised that this focus is indicative of Reproductive attitudes, with students striving for an unblemished product rather than embracing the uncertainties and messiness of these processes. However, these are suppositions, and further research could further illuminate the attitudes underlying these behaviours. Similarly, students reported being concerned to find secondary sources to supplement their work, but when questioned in interviews, seemed to have little idea as to why such research might be needed and what role it would play in a completed assignment. In this case, students seem to be reproducing behaviours and imitating models, but the specific reasons for their doing so could be further investigated by researching their beliefs about the requirements of academic work in their eyes. As noted under the "limitations" heading, students at RTC and GCBS are taught by faculty from a number of different backgrounds, so identifying the expectations and methods of this mixture of faculty—and the effects that this has on the students—would be a useful next step.

The qualitative aspect of the research revealed that two related factors—enjoyment and autonomy—seem to be the most powerful proponents of students' transitions towards Constructive thinking and behaviour when engaging with research learning. Further research could therefore aim to identify the extent of the influence of these factors on students' behaviour. In addition, the perceived usefulness of a given task could be explored more deeply in the future through interviews with students. As a preliminary outcome, when students feel the task engages with them with the larger world, and specifically their professional prospects for the future, they experience greater enjoyment. This enjoyment in learning is a powerful way to encourage the transition from a *Reproduction* to a *Construction* oriented attitude for research learning.

One of the aims of this project was to examine the relevance of existing educational theory in the context of the unique situation and challenges of higher education in Bhutan. Clearly, the notions of *Reproduction* and *Construction* are applicable to Bhutanese students' beliefs about and behaviours in their learning. However, unpacking the "why"—the underlying reasons—for these is a greater challenge given the evolving situation in higher education, the mixture of traditional and contemporary influences on education, as well as the role of education within the wider political agenda of GNH. In order to identify the influence of specific educational interventions, greater longitude in research projects, resulting in greater depth of understanding with regard to the beliefs underpinning students' behaviours could be conducted. Given these myriad shifting factors in higher education in Bhutan, a future investigation with confirmed equivalency of groups would provide a more controlled environment conducive to isolating the efficacy or otherwise the results of a modelling intervention intended to support students' use and comfort with construction related thinking and behaviour as student scholars.

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Notes
1. As an indication of this trend, the percentage of class twelve students entering RUB increased from 26.4% in 2007 to 42.3% in 2012 (Royal University of Bhutan, 2012, p. 14). These statistics exclude Royal Thimphu College.
2. Kirscher, Sweller and Clark's paper sparked a lively debate, the results of which can be found in Tobias and Duffy (2009), *Constructive Instruction: Success or Failure*.
3. One of the researchers, Cathryn Bennett, was an investigator on the Participatory Action Research for Gross National Happiness Pedagogy project, led by Professor Dr Deborah Young of Naropa University, the baseline results for which were published in 2012. Despite encouraging results, the programme struggled due to a lack of full institutional support from RUB. However, the project did contain some notable successes: for example, the College of Science and Technology (CST) in Phuentsholing showed particularly robust investment in developing participatory action protocols that resulted in a highly nuanced set of results demonstrating the faculty's propensity and flexibility for holistic educational practices.
4. Pommaret (2012) argument is more nuanced than regarding this culture of memorization simply as an impoverished pedagogical approach: she notes that the Buddhist monastic tradition has long involved maintaining a living tradition of scholarship, even if these activities were not conceived in the same terms as modern university research. However, as LaPrairie's (2014) research cited above indicates, memorization in schools is typically closer to rote learning than the deep scholarship discussed by Pommaret.
5. The authors' experiences at Royal Thimphu College and Gaeddu College of Business Studies bear out Maxwell and Choeden's (2012) assertion that a culture of research is lacking at RUB colleges. This is not, however, intended as criticism, and the authors acknowledge teaching and learning have necessarily been prioritised as a result of the constraints within which colleges are working. The authors also acknowledge that that a culture of research is beginning to emerge: RUB-wide faculty research meets are held regularly, and individual faculty members undertake their own research projects.
6. Dzongkhags are the administrative regions of Bhutan.
7. Dzongkha is the national language of Bhutan.
8. Many students at RTC were double-majors when the research was conducted. The use of double-majors was under review at RTC at that time, and the college has since moved to implement single major paths of study as the norm as it was felt that these would better equip students to enter the workforce in their chosen field. From the author's observations, double majors may also have had a significant impact on students' motivation: for example, an English-Environmental Students double-major student whose interest is primarily in environmental science would likely have less interest in the English courses offered.
9. As noted above, there are significant numbers of Indian teachers. This is the result of preferential visa terms and India's proximity.

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Appendix 1

Survey Instrument

Adapted from "The revised two factor study process questionnaire: R-SPQ-2F"

Biggs et al. (2001)

The following questions relate to how you approach and think about writing assignments. There are many ways to approach writing and no one way is correct.

(1) this item is **never or very rarely** true for me
(2) this item is **sometimes** true for me
(3) this item is true for me **about half of the time**
(4) this item is **frequently** true for me
(5) this item is **always or almost always** true for me

Please choose the answer that best describes you on a scale of 1–5. Answer "1" means this never applies to you and "5" means this always applies to you.

Your answers will not influence your grades. Any information provided here will be kept strictly ***confidential***. Thank you!

(1) I collect facts and other information to be reused word-for-word later in written assignments.
(2) I am happiest about an assignment when it requires me to struggle to learn something new or difficult.
(3) Writing assignments require that I memorise information taught in class.
(4) I tend to revise written assignments for my own enjoyment.
(5) The writing methods I learn in this class are not related to what I learn in other classes.
(6) When writing, I focus more on gaining understanding than earning a high mark.
(7) After writing assignments are graded, what I have learned is no longer important.
(8) When writing, I focus on understanding concepts until I can make connections among them.
(9) When preparing a paper, I write and re-write until it is tidy and free of errors.
(10) Even after writing assignments are graded what I have learned is important for my life.
(11) Writing and re-writing information to prepare for a final paper ensures I will get a high mark.
(12) The writing methods I learn in this class are related to what I learn in other classes.
(13) I tend to revise written assignments to increase the happiness of my friends or family.
(14) Writing requires that I comprehend and understand information taught in class.
(15) I am happiest when I earn high marks on writing assignments.
(16) I create my own understandings based on the facts and other information presented during class and in readings.

Appendix 2

Interview questions
The questions are designed to gather information on the following aspects:

- Behaviours (Be)
- Opinions/values (Op)
- Feelings (Fe)
- Background (i.e. students' previous experiences) (Bg)

Initial questions are numbered, with possible follow-up questions given in bullets below.

(1) What did you find difficult about the assignment? (Op)
    (a) How did you feel about these difficulties (during and after)? (Fe)
    (b) Did you feel uncomfortable or uncertain about any part of the assignment? (Fe)
    (c) What aspects of the assignment did you enjoy? (Fe)

(2) What information did you have to find out for yourself during the assignment? (Be)
    (a) And how did you go about finding that information? (Be)
    (b) How important do you think that information was for the assignment? (Op)
    (c) Was there any information you found that you felt strongly about? (Fe)

(3) In previous written assignments, have you been asked to find out information independently? (Bg)
    (a) How did you go about finding that information? (Be)

(4) Have you ever given or received peer feedback as part of an assignment? (Bg)
  (a) What did you have to do when giving/receiving peer feedback in the previous assignment? (Bg)
  (b) How useful did you find giving/receiving peer feedback in the previous assignment? (Op)
  (c) How useful did you find giving/receiving peer feedback in this assignment? (Op)
  (d) Did you show your assignment to anyone while you were working on it (other than the people giving peer feedback)? (Be)
    (i) If so, why did you show it to other people? (Op)

(5) How much time did you spend revising the assignment? (Be)
  (a) Which aspects of the assignment did you spend most time revising? (Be)
  (b) Why did you spend the most time on those things? (Op)
  (c) Do you think that revising the assignment increased your understanding of the topic? (Op)

(6) What skills, if any, do you think you developed during this assignment? (Op)
  (a) What was it that you did which allowed you to improve these skills? (Be)
  (b) Will you use any skills that you developed in this assignment in future assignments? (Be)
  (c) Do you think these skills will be useful in other areas of your life? (Op)

(7) How well did you feel you understood what to do to receive a good grade in this assignment? (Op)
  (a) Do you think you will receive a good grade in this assignment? Why/why not? (Op)

(8) While working on the assignment, did you use any knowledge from other subjects, or from outside college? (Be)
  (a) And did you use any skills that you have learnt from elsewhere? (Be)
  (b) How did you use this knowledge/these skills? (Be)

(9) Do you have anything else you would like to say about the assignment?

Appendix 3

Examples of models for using examples (RTC sample)
Stage 1:

Students are instructed to highlight examples from the literary text in the example paragraph.

> The central moral decision of the play is Joe Keller's decision to send faulty airplane parts to the military. It is an unethical decision which he makes for financial reasons. Despite this, morality is important for Joe, and so is the idea of individual choice. When he talks about his motivations, he emphasizes the importance his family: "Chris, I did it for you, it was a chance and I took it for you" (p. 70). Moreover, his justification for the decision when he talks about the day of the decision (at that time still pretending it was Steve Deever's decision) further emphasizes the theme of morality.

Stage 2:

Students are instructed to identify points in the paragraph where further examples from the literary text would strengthen the argument.

> The central moral decision of the play is Joe Keller's decision to send faulty airplane parts to the military. It is an unethical decision which he makes for financial reasons. Despite this, morality is important for Joe, and so is the idea of individual choice. When he talks about his motivations, he emphasizes the importance his family: "Chris, I did it for you, it was a chance and I took it for you" (p. 70). Moreover, his justification for the decision when he talks about the day of the decision (at that time still pretending it was Steve Deever's decision) further emphasizes the theme of morality.

Stage 3:

Students are instructed to find examples to use at these points, and to add them to the paragraph, re-writing where necessary. An example of a revised paragraph is then shown to the students.

> The central moral decision of the play is Joe Keller's decision to send faulty airplane parts to the military. It is an unethical decision which he makes for financial reasons. His motivation is revealed in his justification to Chris, when he states that "you lay forty years into a business and they knock you out in five minutes" (p. 69) and adds that his decision was for the benefit of his family: "Chris, I did it for you, it was a chance and I took it for you" (p. 70). By describing the decision as a "chance", Joe presents his decision as one taken actively and willingly, in which he weighed risk against reward, and with the financial security of his family as his primary motivation. Moreover, his justification for the decision, earlier given indirectly when he claims to be talking about Steve Deever's actions, is to "see it human", in other words, to see the decision as a product of free will and understandable weakness.

Stage 4:

Students are instructed to repeat the process, reviewing body paragraphs from their peers' assignments.