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Chinese business students' changes in beliefs and strategy use in a constructively aligned PBL course

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ABSTRACT

This study adopted a longitudinal retrospective case study approach to investigate Chinese business students' transitional learning experience in a problem-based learning (PBL) course with innovative assessment practices. The study focused on students' beliefs and strategy use in a constructively aligned PBL course for business communication. Eight students who had made notable progress were chosen for retrospective analysis. The data included 48 journal entries, interviews, and writing samples collected at different stages of the course. This study identified taxonomies of participants' beliefs about learning and writing, their perceptions of assessment, and their strategy use for learning. It also examined changes in beliefs, perceptions, and strategy use to determine the nature of the students' learning experience in this PBL course. Findings suggest a recognised need to design PBL courses that align social constructivist learning principles with students' beliefs and strategies. The results also highlight the importance of developing appropriate assessment rubrics to enhance student engagement with PBL learning for improved outcomes.

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problem-based learning;
assessment rubric; student
experience; sino-foreign joint
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Introduction

Problem-based learning (PBL) has been advanced as one of the most promising instructional approaches to promoting deep and meaningful learning (Hmelo-Silver 2004) and for integrating content, thinking, and communication, particularly in business education (Allen and Rooney 1998; Esteban and Canado 2004). In light of increased enrolment of Asian students in business programmes globally, researchers have also explored the efficacy of problem-based learning in Asian contexts (Hmelo-Silver 2012; Hussain et al. 2007; Jackson 1998). These studies have produced disagreeing findings regarding PBL's effectiveness in Asian classrooms (Hunter, Vickery, and Smyth 2010; Hussain et al. 2007; Lee, Shen, and Tsai 2010). Although studies have examined the impact of PBL on students' motivation and critical thinking skills, more research should be conducted to identify deep changes in student beliefs and strategy use in PBL business courses.

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In addition, research is needed to explore the impact of assessment on PBL implementation in the classroom (Biggs and Tang 2011; Dochy et al. 2003; Savin-Baden 2004), particularly in China, where deeply entrenched conceptions of assessment and traditional institutional practices have posed great challenges (Song et al. 2005). Given that PBL pedagogy is constructivist in nature, conventional summative tests or assessments of the mastery of knowledge and effects of learning prevalent in Chinese tertiary education settings may not be congruent with PBL learning objectives. Central to pedagogic innovation is the notion of constructive alignment (Biggs 1996, 2003); that is, the alignment between learning outcomes, assessments, and teaching and learning activities. Despite increasing evidence supporting the use of constructive alignment in higher education across disciplines (Marais 2013; Walsh 2007), few classroom-based studies have examined the role of constructively aligned PBL instruction to promote learning, collaborative inquiry, and communication, particularly in business education in Asia. Even fewer studies have focused on Chinese students' experiences with and their changes in these pedagogical innovations.

For these reasons, this study aims to bridge the above-mentioned gaps by investigating Chinese business students' learning experiences in a PBL environment featuring constructive alignment in a business communication course. More specifically, it examines students' beliefs about learning and business writing, perceptions of innovative assessments, and reported learning strategy use in the group problem-solving process, along with the resulting changes in adjusting to teaching and learning innovations throughout the semester. The research was located in Sino-foreign joint programmes at a Chinese university specialising in finance and economics; the course was meant to provide supportive learning experiences to students transitioning from joint programme studies in China to PBL courses in China or other places across the world. Considering the increasing number of co-operative education programmes between China and other parts of the world, understanding Chinese students' transition into and experiences with innovative instructional environments has paramount relevance to educators in the West as well as in China.

Pbl and social constructivism

PBL is defined as 'an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem' (Savery 2006, 9).

From a social constructivist perspective, PBL emphasises that knowledge is socially constructed and learning is primarily a social, cultural, and interpersonal process (Dewey 1916). Learning takes place during the meaningful interactions between and among individuals in a certain sociocultural context (Vygotsky 1978). The goal of learning is not only to acquire a certain amount of knowledge (i.e. mastery of a language by structure), but, more importantly, to participate in self-directed and social learning to co-construct knowledge (Hmelo-Silver 2004). Problems (i.e. in the forms of cases) can be employed as useful tools to facilitate meaningful learning, allowing learners to construct meanings through concrete practice in the group solving process (Zhao and Zheng 2014). As Dewey (1938) suggested, students should be engaged in meaningful activities for which they need to work with others to solve problems. This way of understanding

learning in a PBL setting focuses on learners' engagement in activities and the construction of interactive understanding based on the belief that cognition is intertwined with other people, tools, symbols, and processes (Lave and Wenger 1991; Vygosky 1978; Wersch 1991).

Student learning in problem-based learning in international business education

Problem-based learning has been advanced in higher education as a powerful instructional approach to promoting deep and meaningful learning (Allen and Rooney 1998; Esteban and Canado 2004; Strobel and Barneveld 2009). Previous studies have documented evidence of its effects on promoting deep learning (Huang and Wang 2012), self-directed learning (Hmelo-Silver 2004), and higher-order thinking skills (Zabit 2010), as well as on language use embedded in certain domain areas where English is used as a second or foreign language (Hunter, Vickery, and Smyth 2010; Wood and Head 2004). The PBL approach provides authentic business contexts and opportunities for students to work in small groups to analyse and solve real problems (Haines 1989; Lee 2002), which enables the co-construction of business knowledge through the use of English as a foreign language (Grosse 1988). In this way, it serves the purpose of enhancing both professional communication competence (Allen and Rooney 1998; Graves 1999) and higher-order cognitive processes along with social learning (Jackson 1998; Pennell and Miles 2009).

However, a review of previous studies reveals key challenges in using PBL in these contexts, including students' deeply-entrenched epistemological beliefs contradicting the underlying philosophy of PBL (which emphasises deep understanding and knowledge construction (Strobel and Barneveld 2009), students' surface approaches to learning (Biggs and Tang 2011), their limited use of metacognitive and social strategies (Hussain et al. 2007; Kanaoka 2005), and dysfunctional group work (Chang 2008).

Previous studies of epistemological beliefs in higher education have identified the complex, specific, and contextual nature of student beliefs about learning and about knowledge across cultures, disciplines, and pedagogical practices (Chan and Elliot 2004; Hofer 2004). For example, Asian students' epistemological beliefs about PBL have drawn increasing research attention (Gram et al. 2013; Hussain et al. 2007). While previous research has characterised its complex nature, a paucity of studies has so far examined Asian business students' belief change interacted with the innovative pedagogical practices of PBL. More qualitative studies are therefore needed to explore the belief changes of Asian students in their first PBL encounters.

Successful classroom PBL innovation, particularly for students from Asian contexts, demands profound understanding of student transition process and the challenges they experienced in epistemology and learning experiences (Gram et al. 2013) in interplay with local institutional and cultural specificities, including students' beliefs, perceptions, and actual strategy use (Zhao and Zheng 2014; Hussain et al. 2007). However, a majority of previous studies have examined the efficacy of PBL as an innovative instruction approach rather than the processes that Asian students, particularly Chinese business students, have experienced. Even fewer studies have explored how students perceive and adapt to learning differently in PBL and how their cognition changes in a specific learning context.

Constructive alignment in PBL

Of primary concern in successful instructional innovation is how assessment is designed and implemented. Assessment plays a central role in engaging students in the learning process and in shaping their learning experiences (Biggs 2003; Boud and Falchikov 2006; Macfarlane 2016). The notion of constructive alignment highlights congruence among intended learning outcomes, assessment practices, and student learning processes (Biggs 1996; 2003), thus accentuating the mediating role of assessment in the system of learning and teaching (Biggs 2003; Biggs and Tang 2011), facilitating deep learning, and, subsequently, promoting higher-level learning outcomes.

Indeed, due to being intrinsically learning-centred and outcome-focused, Biggs' model of constructive alignment has been influential across various disciplines in higher education (Marais 2013; Meyers and Nulty 2009; Pedrosa de Jesus and Moreira 2009; Walsh 2007; Wang et al. 2013). However, too few studies have explored the actual implementation of constructive alignment in problem-based instruction from a social constructivist perspective (Biggs and Tang 2011; Walsh 2007). Such an investigation would be worthwhile and important, especially in a context where active learning and collaboration have been problematised, as in Asian countries such as China (Gram et al. 2013). There is a recognised need to examine whether the social constructivist model of constructive alignment in PBL is likely to enhance group learning and achieve the intended learning goals in Chinese tertiary settings.

Another notable feature of innovative assessment practices in PBL instruction is the engaging of students in peer assessment to develop critical thinking, self-directed learning, and social metacognition (Matheson, Wilkinson, and Gilhooly 2012). Some claim that employing assessment rubrics and criteria as learning guidance is useful in enhancing students' engagement (Carless 2006; Norton 2004). However, it remains unclear whether peer assessment with well-designed rubrics in PBL can really enhance students' engagement and produce deep learning, as opposed to simply increasing the use of surface learning to meet the assessment criteria (Biggs 1996; Boud 1990; Segers, Gijbels, and Thurlings 2008).

Previous studies have suggested that the implementation of PBL cannot be taken for granted: students' understanding of the rationale behind the pedagogical innovation can be limited and varied (Du et al. 2016; Prosser and Sze 2014). In particular, Prosser and Sze report that beginning medical students have varied levels of awareness of the emphasis on contextual learning and collaborative learning in a clinical problem-solving setting (Prosser and Sze 2014). Therefore, students' conceptions of and beliefs concerning the new pedagogy must be considered, and educational activities aiming to prepare for PBL as well as research aiming to understand how students experience the transition to PBL are essential (Du et al. 2016).

The present study investigated a social constructivist problem-based learning environment using constructive alignment to promote higher-order learning, collaboration, and business communication competence among Chinese business students. More specifically, it examined student experiences with the learning innovation (i.e. PBL with aligned innovative assessment practices) and their beliefs about learning and business writing, perceptions of innovative assessment, and emergent strategies for learning, collaborating, and writing. It addressed the following four questions:

- (1) What were students' beliefs about learning and business writing in the designed constructively aligned PBL environment?
- (2) How did they perceive the alternative assessment practices?
- (3) How did they learn and write in this PBL innovation?
- (4) How did students change in terms of their beliefs, perceptions, and strategy use throughout the semester?

Research methodology

The research context and study design

In 2012, a PBL curriculum reform project was launched in an English for Business Communication (EBC) course at a prestigious university in China. The project aimed to implement a PBL instructional approach with aligned assessment practices in the EBC course for all the Year II students in Sino-foreign joint undergraduate programmes.

English for Business Communication was a newly developed, compulsory core course for Year II students, lasting seventeen weeks, with three hours of class room instruction per week. To address the objectives of cultivating higher-order cognitive processes and business-related written communication competence, a problem-based instructional approach supplemented with rubric-informed formative and peer assessment tasks was designed and used. The teaching and learning activities consisted mainly of lectures, workshops, in-class group discussion, and after-class reading and business writing. Lectures provided useful knowledge input and the skill training necessary for case-study analyses. Writing workshops were organised to provide scaffolding for problem-solving-oriented writing tasks in various genres, such as memos, emails, letters, and business reports.

Drawing on relevant theories in learning and assessment, the constructively aligned PBL instruction practices were designed to:

- (1) Create a collaborative learning culture in an authentic business environment, emphasising collective problem solving and co-construction of contextual knowledge.
- (2) Design problem-solving-oriented business communication activities and writing tasks in alignment with target learning objectives. All writing tasks were to be situated in business scenarios taken from case studies and should demand extensive reading, analytical thinking, group discussion, and problem solving.
- (3) Align assessment and teaching/learning activities with learning objectives. Multi-faceted assessment tasks were designed to facilitate both individual and collective learning processes as well as oral and written business communication competencies. The assessment practices included formative assessments on various writing tasks, emphasising English business communication skills and collective problem solving. Peer assessment was also used in writing tasks for a formative assessment. Drawing on the literature, marking rubrics informed by criteria adapted from the CLASS rubric (Fraser et al. 2005) were provided as students' writing and peer-assessment guidelines. Students were asked to address the feedback they received when revising their earlier drafts.

The participants in this overall PBL reform project were 324 students (223 female and 101 male) in total and seven teachers (6 female and 1 male). The project was rated as generally successful based on student-reported survey data and course evaluations (Zhao and Wang 2015). While over 80% of students reported that PBL was effective in enhancing understanding of business knowledge, problem solving, and business writing skills, the degree of improvement varied, as evidenced by teachers' observations and students' writing performance.

Participants and data collection

Qualitative data were obtained, including the informants' learning reflections, in-depth interview data, and their business writing samples at different time points; these were taken as sources of evidence of students' changes in beliefs, perceptions, and learning strategies.

Learning reflections

To investigate students' experiences and their changes in an innovative learning environment, participants were asked to write reflections in English about their writing tasks and learning experiences. Details on the reflection topics are provided in [Appendix 1](#). Altogether, 48 learning reflections (6 from each participant) were collected, documenting their epistemological interpretations and their changes in beliefs. These reflections also covered their perceptions of the assessments and documented their accounts of the strategies they used in the course.

Interviews

Eight students were invited to participate in thirty-minute individual interviews at three points (the beginning, middle, and end of the semester), and were asked to share their PBL learning and writing experiences, perceptions of the assessments in the course, and preparation for and processes of writing. The sample interview protocol is provided in [Appendix 2](#).

Business writing samples

The selected informants' multiple drafts of business writings on various topics were collected and rated as a triangulating data source by which to contextualise how the new design might affect writing quality and learning. These samples were also sought as indicators of students' learning progress, in order to corroborate students' self-reported changes in their learning. Their writings were rated by two independent scorers (the first author of this article and a well-trained research assistant) following rubrics informed by competence-based criteria adapted from the CLASS rubric (Fraser et al. 2005); these criteria included content, literacy, audience, strategy, and style. Inter-scorer reliability was obtained by Pearson correlations. All of the correlation coefficients were greater than 0.75.

Analysis of learning reflections and interview data

This study employed a 'quantifying qualitative data' approach widely adopted in the cognitive sciences (Zhao and Zheng 2014; Chi 1997). Qualitative data from student reflections

and interviews were examined and analysed in a bottom-up manner, and were then quantified to characterise students' changing trajectory in the learning innovation. Qualitative data were coded for content analysis. Student reflections and interviews at the three points were read iteratively to generate a coding scheme with three dimensions: students' beliefs about writing and learning, perceptions of assessment, and reported strategy use in PBL learning and writing, each of which incorporated a taxonomy of sub-categories (see Tables 1 and 2).

We constantly compared and contrasted the participants' beliefs, perceptions, and strategy use at different stages to capture their change trajectory. To ensure the validity of the rating scheme, an inter-scorer reliability check was conducted. Two scorers (the first author and the trained research assistant) independently coded and scored all the learning reflections, following the coding scheme developed by the first author. Pearson correlations between the two scorers were conducted measuring the inter-scorer agreement: $r = 0.78$ for beliefs, $r = 0.82$ for perceptions of assessment, and $r = 0.84$ for strategy use.

Analyses were also conducted after the recorded interview data were transcribed. Students' responses to interview questions at different points were grouped together under the above-mentioned three dimensions (*beliefs, perceptions of assessment, strategy use*) to discern possible patterns. Interview findings were used to provide additional evidence for triangulation along with analyses of student reflections and business writing samples.

Findings

Analyses of the data from multiple sources identified three themes that emerged from students' epistemological accounts of their experiences and changes, including beliefs about PBL learning and writing in EBC, perceptions of alternative assessment, and strategies for PBL learning and writing.

Table 1. Beliefs about learning and writing and perceptions of assessment.

Themes	Categories	Example
Beliefs about learning and business writing	<i>Acquiring fixed declarative knowledge of phraseology, communication, and genre</i>	[I]'s better to learn business vocabulary and expressions in class. (<i>Linda, Reflection #1</i>)
	<i>Acculturating into genre practices</i>	What we learned most is how to write various forms of business writings. ... [W]e need to be aware of and adapted to the conventions of different writings (<i>Sam, Interview #2</i>)
	<i>Co-constructing knowledge and problem solving</i>	We all valued the collective processes of both generating good solutions with new knowledge or understanding inspired (utilising subject knowledge and communication skills) and producing more professional writing [artefacts]. (<i>Kitty, Reflection #5</i>)
Perceptions of assessment	<i>Assessment of mastery of linguistic knowledge and skills</i>	We had two major exams ... [There was] no need to prepare as my English is good enough [to cope with conventional language tests]. (<i>Sally, Reflection #2</i>)
	<i>Assessment of monitoring and completing the instructional tasks</i>	For each writing task, we have to rewrite till her satisfaction. (<i>Zoe, Reflection #3</i>)
	<i>Assessment as a method for active engagement in peer learning and reflection</i>	[M]y understanding of rubrics was substantially deepened in the revising process ... I had to use it as a checklist before re-submission (<i>Kitty, Reflection #5</i>)

Table 2. Characterisation of strategy use in PBL learning and writing.

PBL learning	<i>Linguistic</i>	Low-level strategy use Using Chinese in discussion; Over-reliance on Chinese materials for information; Memorising business vocabulary	High-level strategy use Preparing linguistically; Understanding business terminology; Discerning specified use; Acquiring business jargon from autonomous reading
	<i>Cognitive</i>	Limited use of information; Regurgitating information without deep processing	Analysing; Identifying inconsistencies/gaps; Searching for relevant information; Constructive use of information from different sources
	<i>Metacognitive</i>		Setting goals; Activating prior knowledge, monitoring understanding and learning; Evaluating processes
	<i>Collaborative</i>	Leaders evenly distributing the work; Leader-dominated discussions; Lack of comments or building on others' opinions	Sharing different perspectives; Identifying different perspectives; Asking questions or providing comments to deepen discussions for in-depth understanding
Problem-oriented business writing	<i>Translation and copy-and-paste writing</i>	Literally translating Chinese writing; Copying and pasting	
	<i>Sample-analysis and genre-based writing</i>		Analysing; Using compare and contrast; Executing strategic awareness; Thinking reflectively
	<i>Situational analysis and writing as knowledge co-construction</i>		Comparing and contrasting samples from different disciplinary/professional backgrounds for meaning clarification, meaning seeking and collaborative inquiry; Co-constructing knowledge

Beliefs about PBL learning and writing in EBC

One salient theme identified was students' beliefs about PBL learning and business writing at different stages of coursework. Compared to traditional college English courses focused on linguistic knowledge and skills, the EBC course emphasised authentic use of language and problem solving in business scenarios. These new learning objectives presented a great challenge to students' deeply rooted beliefs about learning.

Acquiring fixed declarative knowledge of business terminology

The analysis of students' reflections at the early stage of the course revealed the informants' strong conflicts with and confusion about the learning objectives in EBC. The analysis showed that all the selected participants experienced an initial change in objectives from obtaining general English knowledge to learning terminology specific to business. For example, Carol reported such a change in her first reflection.

This course is different from the previous college English courses that focused more on grammar and vocabulary in general English. We [now] need to read business case studies in English and write up corresponding solutions in various forms. Therefore, we should learn specific business terminologies and various expressions for writing. (*Carol, Reflection #1*)

This is a typical example of the participants' initial beliefs. Confronted with the challenges associated with problem-centred activities in the EBC course, students felt perplexed due to their previous learning objective of language acquisition. Such recurring tensions

between old, deep-rooted conceptions and new observations can result in adjusted objectives for mastering knowledge. As further elaborated in Linda's reflection, this process led to increased reliance on lectures on declarative business terminology.

I feel stressed during problem-centred discussions and quite worried about my English. But I don't know how to improve business English. Maybe in class it's better to be taught business vocabulary and standard expressions in writing. (*Linda, Reflection #1*)

Although only minor changes were observed in case informants' beliefs at the early stage of the course, qualitatively different beliefs about learning and writing were observed at later stages of the EBC course.

Acculturating to genre practices

One change in students' beliefs was that the students came to view PBL learning and business writing from a genre perspective. A typical case is Sam, whose verbal reports, learning reflections, and writing tasks all provided interwoven evidence of his evolving beliefs about PBL learning and writing surrounding the conventions and genres of the business discourse community. For example, he reported the following in an interview:

What we learnt most is how to write various forms of business writings. Very useful and practical! Business vocabulary, grammar, structure are all essential for business communication. ... More importantly, we need to be aware of and adapted to *the conventions of different writings for varying purposes*. (*Sam, Interview #2*)

As Sam pointed out in the interview, his learning objectives in EBC changed from acquiring specialised vocabulary to adjusting to genre practices by following conventions accepted in the discourse community and deliberately using business jargon. Subsequent analysis of multiple writing sample drafts and reflections suggests that he began to see the importance of using appropriate knowledge (of genre and domain) with the goal of solving problems as he was engaged in PBL activities and was given comments by peers. For example, due to limited genre knowledge, his first draft of an English application letter was framed in a typical Chinese manner. He began his letter with 'Dear Leaders' and proceeded with: 'Hello! First of all, thank you very much for spending time reading my letter. I am going to graduate from ...'. However, his second draft reflected his awareness of genre differences and appropriate genre practices in the English business community. His revised letter began with the professional salutation, 'Dear Hiring Manager' and a more formal opening statement: 'I am writing to apply for the position of accountant in your company posted on the Zhilian website'.

Evidence from multiple data sources suggests that with the students' participation in business communication rhetoric and formative assessments, they tended to adapt their learning objectives from acquiring fixed lexical knowledge to socialising into the discourse community through applying lexical, communication, and genre knowledge.

Co-constructing knowledge and solving problems through writing

While all the participants acculturated to genre practices, only one, Kitty, showed more sophisticated social constructivist beliefs about learning and writing towards the end of the term. Kitty reflected upon her group-based PBL learning and writing experience as follows:

We were asked to write on the basis of case study discussion. ... We all valued the collective processes of both generating useful solutions with deep understanding inspired [by subject knowledge and communication skills] and producing more professional writing [artefacts] ... (Kitty, Reflection #5)

Unlike her counterparts, Kitty viewed PBL not simply as socialising into a professional discourse community by applying linguistic and genre knowledge but also as a collective process of pursuing innovative solutions mediated by the use of language. Kitty's views of business writing were also manifested in her interview responses. When asked about the most striking difference between the EBC course and the other language course, she replied:

We are not merely learning business writing in this course. Well beyond writing skills, we have received sufficient training in critical reading and analytical thinking, working together for better solutions in well-accepted [professional] English. (Kitty, Interview #2)

Qualitative data were then quantitatively analysed and scored on a three-point scale, with one point indicating a simplistic view and three points representing a sophisticated view. The distribution of students' beliefs about learning and writing at three main time points (see Figure 1 below) suggested a developmental trajectory from acquiring business terminology to acculturating into genre practices, and further towards collective problem-solving and co-construction of knowledge by appropriate use of English. However, it is also noted that despite the three-stage changing trajectory detected, the changes were mainly concentrated at the first and second levels, with only one case informant indicating social constructivist beliefs in line with the underlying design principle.

Perceptions of alternative assessment

The second distinct theme identified from the qualitative analysis is students' changing perceptions of assessment, from assessing mastery of knowledge and skills to monitoring

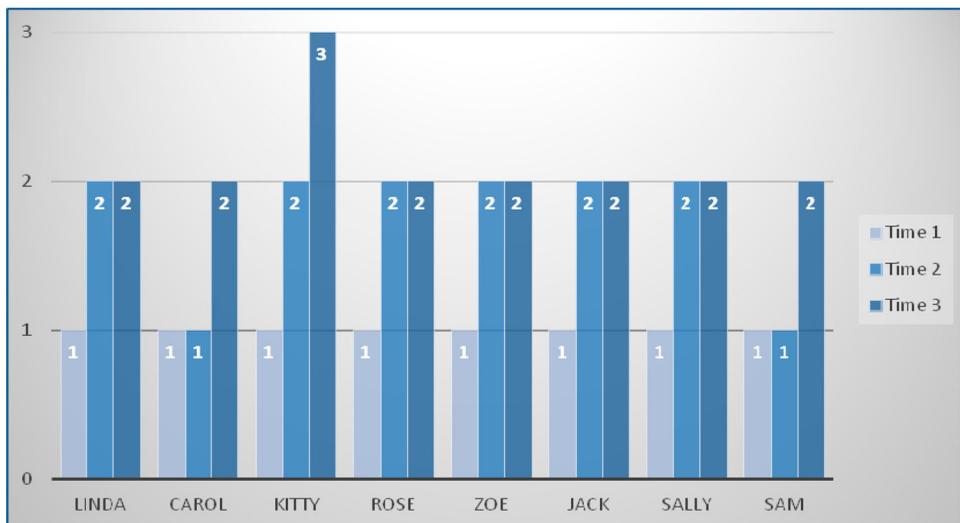


Figure 1. Changes in beliefs about PBL learning and writing over time.

Note: 1–3 in vertical axis indicate different levels of students' beliefs about PBL learning and writing.

and completing an instructional task to being a useful tool for active engagement in peer learning and reflection.

Assessment for mastery of knowledge

Qualitative analysis revealed that students' initial views of assessment were significantly influenced by summative college English tests on mastery of linguistic knowledge and skills. One typical example is taken from Sally's learning reflections.

We had two major exams in the college English course: a mid-term and a final. [There was] no need to prepare as my English is good enough [to cope with conventional language tests] ... However, now it becomes troublesome with so many assessed tasks. (*Sally, Reflection #2*)

In the excerpt above, it should be noted that Sally felt overwhelmed by the alternative formative assessments in EBC to which she was not accustomed. Her concerns with the validity of using case-writing tasks for testing language knowledge and skills also revealed her deep-seated conceptions about the ultimate goal of assessment: assessing mastery of linguistic knowledge.

Assessment as fulfilling the instructional tasks

Qualitative analysis of the data collected at the later stage provided evidence of the participants' changing views of assessment. They tended to view assessments as teachers' powerful tools to drive them to complete an array of instructional tasks. Zoe's reflection indicates a passive perception of assessment.

Assessments are different in EBC as they are designed and assigned by the tutor in order to teach us business writing. For each writing, we [have to] rewrite till her satisfaction ... However, this time I didn't refer to the rubric when writing, as teachers will provide revision comments. (*Zoe, Reflection #3*)

Zoe's reflection was quite common among the participants, which suggests students' passive and receptive attitude to formative writing assessments. Rather than viewing the assessment of multiple writing tasks as a progressive meaning-seeking or problem-solving vehicle, they mainly viewed them as compulsory tasks without clear individual learning objectives. Such instrumental views of assessment for mere task completion may impede students' constructive use of a rubric as a way to guide learning and writing, as well as impeding their active engagement in peer assessment. Linda and Carol reflected upon their peer assessment activities.

To be honest, I couldn't afford too much time [doing peer review/assessment]. I try to finish it as quickly as I can. I pointed out the grammatical and lexical errors as well as inappropriate use of expressions and sentence structure ... I simply follow what language tutors had previously done to our writings. (*Linda, Reflection #3*)

I don't take my peer's comments too seriously as they are too shallow. Their focus is on grammar and inappropriate use of words, or such general comments as "Well done" or "Good". They seldom provide meaningful and constructive comments as required. (*Carol, Interview #3*)

Analysis of multiple data sources reveals that students' views of assessment as compulsory tasks and surface-level approaches to peer assessment still dominate.

Assessment as a method of active engagement in peer learning and reflection

Although the majority of informants (up to six out of eight) indicated their naïve or instrumental perceptions of assessment, four of them, towards the end of the course, demonstrated a growing awareness that alternative assessment featuring the use of rubrics and feedback enhanced their engagement in learning. For example, in Kitty's reflection on the report-writing process, she reflected on her growing awareness of the role of the rubric.

I had thought rubrics were merely detailed criteria against which writing tasks were assessed. At first, I glanced over the rubric our tutor had provided before completing the first draft. However, my understanding of rubrics was substantially deepened in the revising process when I had to address the problems identified in teachers' written feedback ... I had to use it as a checklist before re-submission. (*Kitty, Reflection #5*)

Thus, pre-writing use of rubrics may not guarantee students' deep understanding of writing requirements in relation to learning objectives. Kitty's reflection shows that the idea of simply using assessment rubrics before writing as guidance can be challenged. Instead, peer assessment, together with teacher assessment with feedback, may provide possibilities for contextual understanding of the prescribed rubrics, thus enhancing the quality of revisions.

As above, the reflection data at different stages were then quantitatively analysed and scored on a three-point scale (1 = simplistic; 3 = sophisticated). [Figure 2](#) presents the changing trajectory of students' perception of assessment throughout the semester.

Strategies for PBL learning and business writing

The analysis also categorised students' strategy use in PBL learning and business writing as either low- or high-level strategies (see [Table 2](#)). PBL learning strategy use in EBC courses

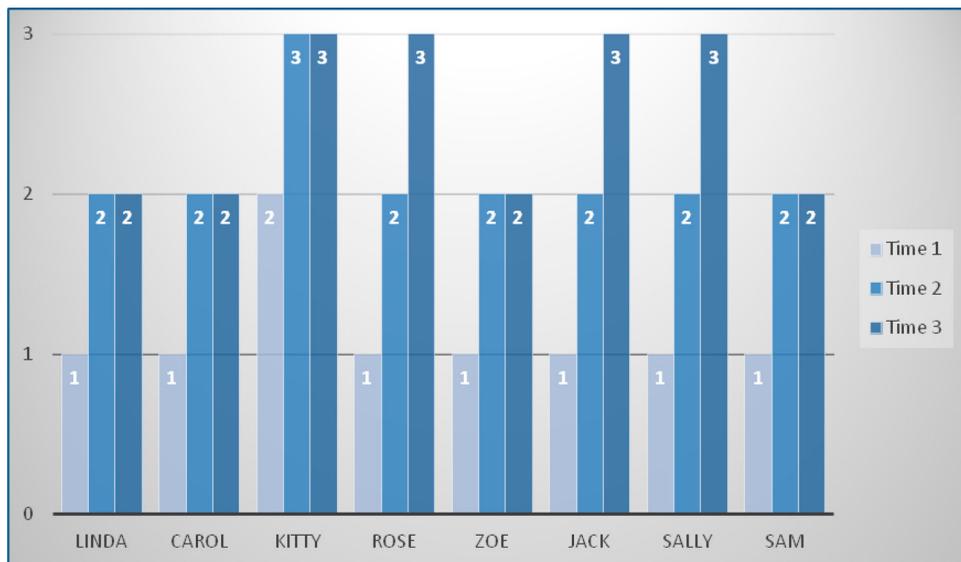


Figure 2. Changes in perceptions of alternative assessment over time.

Note: 1–3 on vertical axis indicate different levels of students' perceptions of assessment.

can be categorised into four groups: linguistic, cognitive, meta-cognitive, and collaborative strategies.

Each subcategory of learning strategy use was observed at a lower and a higher level. For instance, as illustrated in Table 2, low-level linguistic strategies included over-reliance on Chinese materials in problem-solving discussions and rote memorisation, while high-level strategies were preparing linguistically for in-class discussion, understanding terminology, and discerning the features of business English through comparisons and acquiring phraseology in context. Low-level cognitive strategy use refers to limited use of the information provided; by contrast, higher-level cognitive strategies include analysing information, identifying inconsistencies, searching online, and constructively using information from different sources. In addition, seven out of eight informants indicated using a meta-cognitive strategy, such as planning with a clear goal, activating prior relevant knowledge in problem solving, monitoring understanding and learning processes, and evaluating learning. Their collaborative strategies, deployed in group work, were easily recognisable in the data. Lower-level strategies included leaders evenly distributing the work among individuals and leader-dominated discussions, lack of comments, and failure to build on others' ideas. By contrast, higher-level collaborative strategies included sharing different perspectives, identifying differences and inconsistencies among perspectives, and asking questions or providing comments to deepen discussions and generate new understanding.

Students' business writing strategies were also categorised into lower (i.e. translation and copy-and-paste writing) and higher levels (i.e. sample analysis and genre-based writing, and even situative analysis and writing as knowledge co-construction).

Translation and copy-and-paste writing

Participants' initial strategy in business writing was recorded in their verbal report in interviews and was supplemented by evidence from their first writing drafts. The textual analysis of the participants' first drafts of early writing assignments (application, resume, and memo) corroborated the findings from the interviews. Six out of eight participants demonstrated at least three instances of literally translating Chinese business writing. Five of eight used almost the same ending one would use in Chinese in the first draft of application letter writing. Students' lack of contextual understanding of English business communication led to a surface approach to writing through translating the Chinese 'equivalent' or copying and pasting sample writings.

Sample analysis and genre-based writing

Changes in strategy use were gradually seen among participants. As the course went on, they tended to analyse the samples provided in relation to the specific writing scenario and to confirm their hypotheses by analysing more samples in the same genre collected from other sources. For example, Carol once reflected upon how she drew on sample analysis of cultural variation in genre writing to improve her application letter.

Unlike their initial surface-level strategies, sample analysis stimulated students' strategic awareness of cultural variation in business communication and led them to execute cognitive and meta-cognitive strategies in organising and shaping business writings to professional conventions.

Situative analysis and writing as knowledge co-construction

While most participants demonstrated their conscious use of samples in genre-based writing, Kitty mentioned her group's inquiry into contextually appropriate professional writing conventions through situative analysis. She reflected on how her group's discussion on executive summary writing in a report helped improve the clarity and completeness of the writing.

Through the lecture, I learnt that the executive summary is a summary of a long report. ... However, we were confused by other samples online with different components. Our group discussed what should be included in our writing, considering its nature, a report on the feasibility of innovative products. (*Kitty, Reflection #6*)

Thus, this group used high-level strategies such as social cognition by comparing and contrasting samples from different professional backgrounds for meaning clarification, meaning-seeking, and collaborative inquiry. Their engagement in situative analysis and knowledge construction through collective and active learning may have enhanced their writing output.

Drawing on the coding scheme of high- and low-level learning and writing strategies identified at different stages of learning (see [Table 2](#)), student reflections pertaining to learning and writing processes were quantitatively analysed and the frequency of high- and low-level strategies was recorded to capture changes in strategy use. For example, at the initial stage, Sam indicated his use of Chinese in in-class PBL discussions with reference to Chinese materials he had prepared before class. He recited materials in oral presentations with limited understanding of the business terminologies he used. His report indicated lower-level strategy use at this stage of PBL learning. In contrast, Carol reported that she prepared for in-class PBL discussions by reading the materials thoroughly and looking up new words or business terminology in reference books. In addition, she would analyse the case and search for more information to solve problems. Furthermore, she applied information from this autonomous reading in discussions. She always asked for others' opinions, made comments, and contributed her own opinion. In just one of Carol's excerpts, we identified the strategies of linguistic preparation, understanding business terminology, autonomous reading, searching for relevant information, asking questions, and providing comments to deepen discussion.

The learning strategies that informants reported at different stages were coded and frequencies of use were counted. Students' uses of high-level learning and writing strategies at different time points are presented in [Figures 3](#) and [4](#), respectively.

Discussion

In this study we strove to extend the state-of-the-art model of constructive alignment (Biggs 1996) from a social constructive perspective into an under-investigated context. While previous studies on PBL or constructive alignment have claimed to find a positive impact on higher-order thinking and literacy development (Barell 2007; Biggs 1996; Dochy et al. 2003; Esteban and Canado 2004; Hmelo-Silver 2004), this study provides important evidence for the potential role of PBL-aligned courses with innovative assessment in changing students' beliefs, perceptions of assessment, and learning processes.

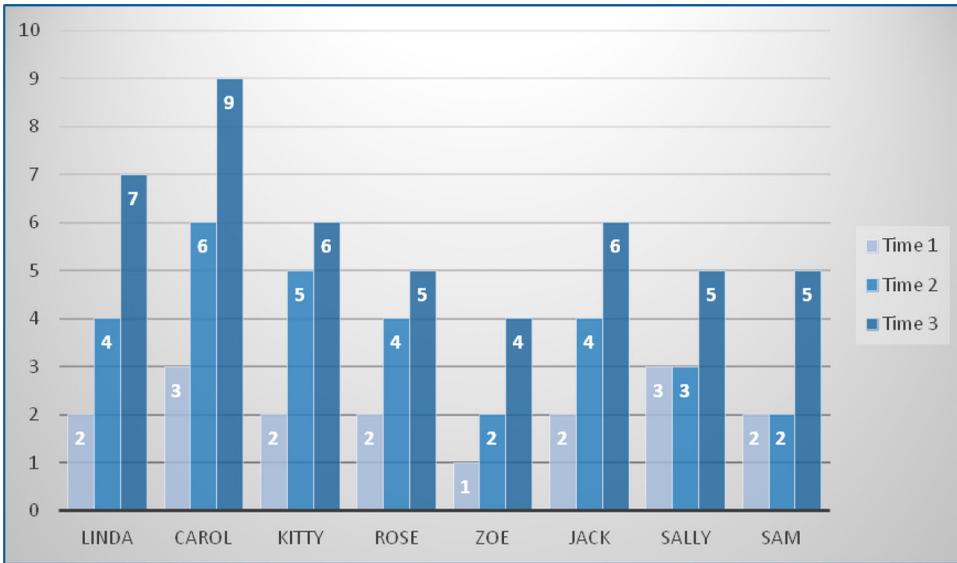


Figure 3. Changes in use of higher-level learning strategies.

Note: 1–10 on vertical axis indicate total frequency of students' higher-level strategy use.

Just as Biggs (2003) has contended, students will adopt learning strategies to achieve success in ways they believe will meet assessment requirements.

Unlike previous evaluative studies or quasi-experimental studies using pre- and post-quantitative measures of effectiveness, the current study investigated Chinese tertiary students' experiences and the changes in their learning throughout a PBL course. Drawing on

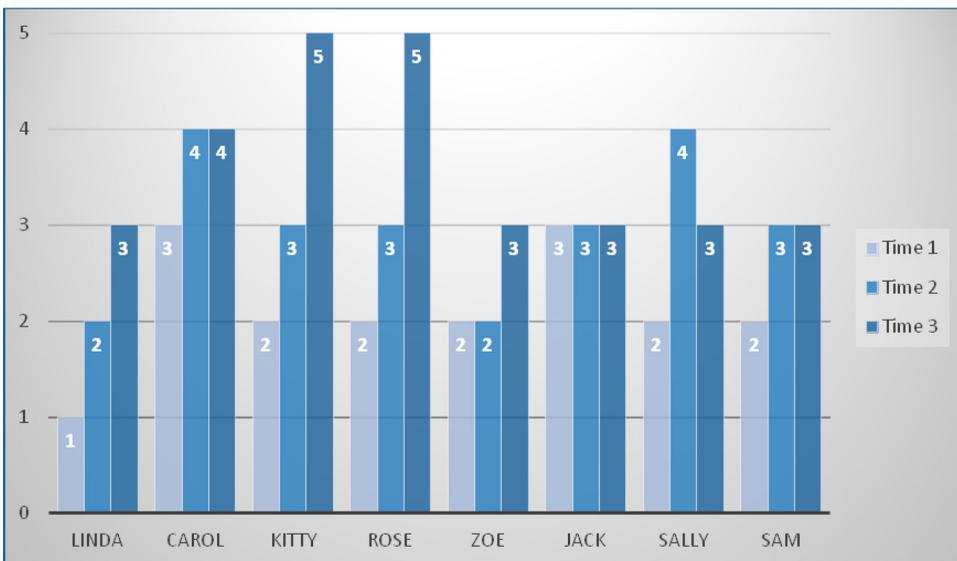


Figure 4. Changes in use of higher-level writing strategies.

Note: 1–5 on vertical axis indicate total frequencies of students' higher-level writing strategy use.

data from multiple sources, it explored how students' beliefs, perceptions, and strategies evolved throughout the course as they coped with emergent epistemological challenges. Despite identifying a pattern of students moving towards more sophisticated beliefs about learning and about peer assessment with social metacognitive strategy use, variations in student changes were also observed, even among informants who made remarkable progress in business writing. Only a few informants showed evidence of social constructivist beliefs about EBC learning and used social metacognitive strategies in learning and writing, but all informants experienced changes in beliefs up to the middle level of sophistication, meaning they regarded learning and business writing as acquisition of business genre and rubrics-informed writing practice. This shows that a social constructivist learning innovation may slowly change Asian students' deeply rooted epistemological beliefs and strategy use (Zhao and Zheng 2014; Kanaoka 2005) due to its profound mediation of institutional and local social cultural practices.

Findings on the variation in students' changes in learning strategy use within constructively aligned PBL learning also problematise the implementation of constructive alignment in practice. Simply aligning learning outcomes, assessment practices, and teaching and learning activities cannot guarantee that students' learning processes will align with the intentions of the course designers. Thus, this finding carries significant practical implications for educators or designers, particularly the need for consistency between students' beliefs and strategies with social constructivist design principles. Future design efforts, therefore, should both implicitly and explicitly focus on student training regarding their awareness of and strategies for collective problem solving and collaborative writing for deep inquiry in a professional domain.

Despite slowness in changes in beliefs and social metacognitive strategy use in PBL and peer assessment, this study did identify the potential role of rubric-guided peer feedback activities in formative assessment to enhance students' understanding of assessment criteria and learning objectives and to promote higher-level learning processes, leading in turn to a gradual improvement in learning outcomes (i.e. writing quality). This finding supports the use of peer feedback in PBL course settings (Carless 2006; Schelfhout, Dochy, and Janssens 2004), and also highlights the salient role of students' emerging understanding of rubrics. In particular, the use of rubric-informed feedback was found in the study to have been effective in increasing students' understanding of rubrics and improving their learning outcomes. Future research could examine how to make better use of embedded rubrics in peer assessment and social learning. Quasi-experimental studies could be conducted to evaluate and investigate the effects of such a design on students' metacognitive awareness of strategy use and learning outcomes. The finding may have pedagogical implications for implementing the constructively aligned PBL approach in Chinese tertiary classrooms, where the use of rubrics for facilitating peer learning remains a new practice.

Conclusion

This present study, drawing on longitudinal qualitative data from multiple sources, characterised the contextual nature of and the changing trajectory of student learning in a PBL environment in the three key areas of epistemology, assessment, and strategy. The study indicated the potential pedagogical value of aligning collective PBL learning

and writing activities, rubric-informed formative peer assessment, and intended learning outcomes.

Because of the exploratory nature of this study, the findings must be interpreted with caution. Although this study provides rich data with a focus on investigating how change and improvement in learning could occur with the introduction of new pedagogical approaches, findings derived from the retrospective study design method cannot be generalised. Moreover, future studies could focus on students who are resistant to new approaches and wedded to preconceived ways of learning, and how they have fared under the new pedagogy. In addition, while multiple sources of data (journals, writing samples, and interviews) corroborated evidence on contextual factors leading to changes in students' learning, a future study could include observational data that assess the students' problem-solving, collaborative writing, and peer assessment processes.

Despite its limitations, the present study builds on recent literature in social constructivist learning and assessment theories, constructive alignment in higher education, and English business communication education by investigating the interactions between a theory-informed pedagogical innovation and student learning experiences using a PBL instructional model. It also extends Biggs' model of constructive alignment from a social constructivist perspective and into the less-explored area of English for business communication education among Chinese learners. Pedagogically, it serves as a useful example for educators, researchers and teachers who wish to implement Western social constructivist learning theories and assessment strategies in Chinese tertiary classrooms with the aim of enhancing learning and collaboration, business communication competence, and domain understanding.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix 1. List of Student Learning Reflections

1. Reflection on survey on business communication skills and action plan
2. Reflection on application letter writing and peer review (Scenario One)
3. Reflection on business letter writing and peer review (Case Two)
4. Reflection on memo writing and peer review (Case Three)
5. Reflection on business report writing (Case Four)
6. Reflection on problem-based learning, assessment, and business writing

Appendix 2. Sample Interview Protocol

1. Can you say something about the key features of this course? How is it different from other courses? How do you like these differences?
2. What are your major learning objectives in this course? What do you perceive as the major challenges in this course? How do you cope with these challenges?
3. How do you like the assessments? How are they different from those in other courses? How do you prepare for the assessments?
4. How do you like peer comments on your written work? Could you communicate to me your most meaningful learning experience in this course?