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Exploring Higher-Order Thinking in Higher Education Seminar Talk

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ABSTRACT

A key purpose of higher education seminars is to support higher-order thinking, yet empirical evidence of how this is evidenced and scaffolded in higher education remains scarce. Building on previous work on identifying rhetorical and linguistic devices for argumentation, we found that higher-order thinking can be evidenced through using metaphors, linking ideas to personal experiences and emotional connections. Findings also suggest that the types of tutor questioning can support (or not) how students evidence their claims and demonstrate higher-order thinking. We conclude with recommendations for practice including greater teacher and student metacognitive awareness of the features of quality seminar discourse.

Introduction

In this paper, we look at how classroom discourse can support the objectives of the university seminar. Seminars aim to "foster criticality and promote individualized thinking" (Walsh and O'Keeffe 2010, p. 154) through discussion, argumentation and verbal reasoning. Higher-order thinking refers to activities such as analyzing, synthesizing or evaluating ideas (Krathwohl 2002) and is often mentioned in association with *integrative learning* (Nelson Laird et al. 2014).

Higher-order thinking skills are critical to developing conceptual and disciplinary understanding. In a school context, studies have demonstrated that exploratory talk and accountable talk in which students make their thinking visible, such as supporting claims and defending ideas, result in greater achievement in English and science (Alexander, Hardman, and Hardman 2017; Mercer and Howe 2012). In a higher education context, research has shown that higher-order thinking is linked to academic achievement in disciplines such as Accounting (Kealey, Holland, and Watson 2005) and English literature, English teaching and Translation (Ghanizadeh 2017).

Whilst research on the quality of classroom discourse is a well-established field of study in the compulsory school sector, and despite the importance of seminars for developing disciplinary understanding, research on the quality of classroom discourse in the higher education context is scant. Furthermore, how students justify their claims and how the questioning (either teachers or students) might support (or not) the quality of classroom discourse remains under-researched. The contribution of this paper is to identify rhetorical and linguistic features of quality seminar discourse which reflects and supports higher-order thinking. It is hoped that recognition of quality educational talk can raise teacher and students' metacognitive awareness of the role of dialogic seminar talk in developing disciplinary understanding (Howe et al. 2019).

Literature review

From a sociocultural perspective, thought emerges through talk, with talk moves *constituting* thinking Vygotsky (1986). In terms of classroom practice, Alexander's (2005) *dialogic teaching approach* describes both the classroom dynamics and types of talk necessary for dialogic interaction. In Mercer and Howe's (2012) *exploratory talk*, children make their reasoning visible through justification, challenge and explanations. Relatedly, *accountable talk* (Michaels, O'Connor, and Resnick 2008) describes classroom talk in which all participants listen to each other respectfully, explain and justify their ideas and support their ideas with evidence.

At a micro-level, certain linguistic features have been found to mark higher-order thinking (Boyd

and Kong 2017; Michaels, O'Connor, and Resnick 2008). These features include reasoning words such as *so, might, could, because, think* and *agree* (Boyd and Kong 2017). Boyd and Kong (2017) also highlight that the teacher's use of such reasoning words can *prompt* higher-order thinking amongst students. Similarly, a number of rhetorical moves have been identified as evidencing higher-order thinking. For example, Reznitskaya et al. (2009) highlighted five types of justification which indicate higher-order thinking: metadiscursive links to text and references to feelings; hypothesizing; reference to abstract principles and application to a new context. Although their study explored argumentation in writing, we contend that these argumentation skills are highly relevant for a seminar discussion in which students are expected to support and provide evidence for claims.

Rhetorical moves in the form of questions have received considerable attention as a tool for fostering (or not) higher-order thinking. The much-maligned closed question, 'known answer' or display question (requiring a predetermined answer) has generally been described as a ubiquitous feature of the classroom interaction (Walsh 2002) and critiqued for closing down the interaction. However, a counter-perspective argues that closed questions or display questions can function as a support by encouraging students to build on prior knowledge (Myhill and Dunkin 2005) and contribute to a trajectory of classroom talk that guides the students to construct new understandings. Specifically, closed questions can function to probe deeper thinking (Boyd and Markarian 2015). Given the debate in the literature on types of questions, arguably then, we should consider *how* teachers use questions in the wider context of the interaction (Henning 2005).

As well as classroom discourse which fosters higher-order thinking, studies have identified that an artifact, such as a worksheet, can support classroom discourse required for higher-order thinking by providing a clear purpose for the interaction (Hennessy et al. 2021; Heron 2019).

In this paper we put to work a framework of rhetorical moves for justification (Reznitskaya et al. 2009) and linguistic devices for reasoning (Boyd and Kong 2017) to explore how teachers and students scaffold and evidence higher-order thinking in an HE seminar context in which students are all L2 speakers of English. This paper contributes to the emerging field of literature on higher-order thinking in an HE context by offering a fine-grained analysis of how higher-order thinking is constituted *in* and *through* seminar talk and the role of metadiscursive references and artifacts in this process. A further contribution is to provide a framework with which tutors can monitor their classroom talk and develop their questioning and other rhetorical moves to support higher-order thinking.

The study

Research contexts and participants

The institutions in this study were the respective workplaces of the two researchers. Both institutions are English as a medium of instruction (EMI) contexts, one in the UK (University A) and the other in the UAE (University B). They share several features of multiculturalism and multilingualism due to the linguistically diverse backgrounds of students and tutors, and the wider environment including the university campus.

The participants in University A were a group of international post-graduate students on a one-year taught MA TESOL program. The group comprised three female students from Turkey, Czech Republic and China – all English L2 speakers. The tutor is also female, an English L1 speaker from the UK. The group met once a week for two hours for the module and the style of the seminar was interactive with all students and tutor sitting around a table together.

The participants in University B were a group of 12 BA Education students studying to be teachers in the UAE public school system, and the female tutor was from Ireland and was an L1 English speaker. The students were all female, Arabic L1, English L2 speakers. The group met in total three hours a week. The module under study in both universities was Second Language Acquisition.

Research questions

The study aimed to answer the following questions:

1. What evidence of higher-order thinking can be seen in seminar interaction?
2. How can tutors scaffold higher-order thinking in the seminar interaction?

Based on the findings, we hope to draw some tentative conclusions about how higher-order thinking discourse can be fostered in university seminars through interaction and the joint pursuit of educational goals.

Table 1. Coding frameworks for analysis.

Level of analysis	Framework	Coding
Rhetorical moves	Argument justifications (Reznitskaya et al. 2009)	• Textual • Affective • Hypothetical • Abstract
	Additional inductive codes	• Contextualizing • Using metaphors • Experiential • Exemplification • Comparing & contrasting • Closed question (asks for a pre-determined answer) • Open question (no pre-determined answer)
Linguistic features	Questioning Reasoning words (Boyd and Kong 2017)	*might; maybe; could; would; think; so; because; but; how; why; agree; if*

Data

Data were gathered from audio recordings of one seminar event in each context. The audio recordings were transcribed verbatim noting the words and indicating sections which were inaudible.

Ethical approval was granted by the Ethics committees of both institutions. Permission was sought from all participants in the study and an opportunity to withdraw was granted as part of the universities' ethics procedures. The researchers were known to the teacher participants in their own contexts, and both researchers had taught on the respective modules at the center of this research. Despite possible bias in the analysis and interpretation, we believe our familiarity with the context and the participants provided a valuable resource (Holliday 2007) to enrich the data. To mitigate any possible bias in the data analysis and interpretation, we account for our analytical 'workings' (Holliday 2007) below.

Analysis

This study drew on the methodology of sociocultural discourse analysis (SDA) (Mercer 2010), a set of methods and procedures which aims to examine "how people pursue joint educational activities" (Mercer 2004, p. 138), with the researchers maintaining "crucial involvement with the contextualized, dynamic nature of talk" (p. 146) through an iterative analysis procedure.

Following SDA methodology, our coding focused on the word choices and structure of the interaction in order to explore both the process and the outcomes of the interaction. In particular, we were interested in examining how higher-order thinking discourse can be fostered through interaction and the joint pursuit of educational goals (Walsh, Morton, and O'Keeffe 2011).

The data were analyzed by both authors separately using the qualitative data analysis software NVivo 11. We used a staged approach applying both deductive and inductive thematic analysis (Fereday and Muir-Cochrane 2006). We started with a priori codes based on our review of the relevant literature and our research questions. We adopted Reznitskaya et al. (2009) typology of argument justifications, a distinction of open vs. closed questions and Boyd and Kong (2017) typology of reasoning words to enable a nuanced and detailed analysis. Reznitskaya et al. (2009) typology identifies argument justifications as: metadiscursive references such as links to text and reference to emotions; hypothesizing; reference to abstract principles; and application to a new context. Reasoning words (Boyd and Kong 2017) include *so*, *might*, *could*, *because*, *think*, and *agree*, which have been identified as indicative of higher-order thinking. We first used short extracts to agree on the coding, and once we had reached agreement we then coded each transcript, followed by checking for inter-rater reliability. During the checking we raised questions and disagreements which were then discussed until agreement was reached. The data analysis was iterative, and as a result we found new emerging themes to which we applied inductive coding. These codes expanded on the initial a priori coding and were the following: links to experiential evidence, use of metaphors, exemplification and comparing and contrasting. These were incorporated into the coding framework below (Table 1).

Findings

In this section we present and comment on a number of extracts from the two research sites. We contextualize the exchanges and provide commentaries with

reference to the scaffolding and evidencing of higher-order thinking.

In extract 1, the tutor and S1 are discussing motivation as a variable in second language acquisition (SLA). Of particular significance in this extract are the tutor's questioning strategy which involves open questions encouraging reflections on personal experiences, and the student's metadiscursive references to text.

Extract 1 (university A)

T: So what's that got to do with second language acquisition then? Because his research is very much in this area. So do you think that that is helpful to the language teacher, to know that this might be happening?

S1: I think it's talking about some conflict that has to occur, in the article that we've read, between what you know and what you are about to find out about second language acquisition. So if you have that conflict then that will take your development further.

T: Mmm.

S1: Because then there is obviously something that you are lacking.

T: Mmm. And as a teacher?

S1: It, also as a teacher in your methodology.

T: When you teach, so when you're teaching English to someone, what about their motivations?

S1 Well, if you're not able to motivate them then maybe you start doing some soul searching. You know, what's happening, why isn't this lesson clicking with the students? Or, you know, that's what I mean by the conflict, that you have certain expectations maybe and you're hoping that the students will be engaged enough, but it's, for some reason it's not happening. Then you go back and you say, okay, because I do that a lot as a teacher and see how I can make some adjustments and then try it again and test it. And, so that's what I mean when I talk about that conflict.

The tutor asks a number of open questions in this extract which promote higher-order thinking. She supports application of theory to practice with the question "*is it helpful to the language teacher?*" and orients the student to the disciplinary concept (motivation) with the question "*When you teach, so when you're teaching English to someone, what about their motivations*?" In terms of evidencing higher-order thinking, S1 makes reference to the text to support her argument, e.g., "*it's talking about,*" "*in the article*" and justifies her points through reference to her personal experiences, e.g., "*because I do that a lot as a teacher.*" To further evidence higher-order thinking she draws on a number of linguistic devices: "*if, so, because,*" as well as a hedging marker "*maybe.*"

Extract 2 below is part of the continuing discussion on individual variables, motivation in SLA. The trajectory of the tutor's questions guides students toward higher-order thinking through probing and encouraging links between theory and practice.

Extract 2 (university A)

T: But is it all taking into account all the theories you've been thinking about?

S1: Yes.

T: So is it always what the teacher does in the classroom that affects an individual's motivation to learn? What else could it be that's causing them to feel demotivated? it might be nothing to do with the teacher.

S1: Oh, yes, it could be their own inner conflicts as well, yes. Or…

S2: Yes, there are many factors.

S1: Many factors, yes.

S2: Like, maybe the parents, the family play a very important role. If the child was born in a family where the parents just don't think highly of education, you just grow up and earn money. Okay, let's do business together. What's the point of going into a university?

S1: Yes, I agree with Tracy, it's very much the family pressures.

The tutor's first question elicits a short response, so she asks a number of probing questions as a follow up. These follow up questions aim to guide students to explore other factors which impact on motivation, other than the teacher. The tutor asks an open question "*what else could it be?*" immediately followed by a prompt "*it might be nothing to do with the teacher.*" This line of questioning encourages an exchange between both S1 and S2 in which they provide elaborate responses.

S1 and S2 evidence higher-order thinking through a number of linguistic devices, mostly "*if*" and "*could*" to discuss hypothetical situations and generate alternative theories. The use of exemplification is seen in S2's response where she discusses a family context and links this to sources of motivation. These examples of higher-order thinking are supported by the tutor's questioning strategy.

In extract 3, the tutor and students are discussing sample statements from an attitude/motivation test battery developed by educational psychologists MacIntyre and Gardner (1991, p. 61). They are discussing the statements "I wish I were fluent in French" and "I would really like to learn French." In this extract we can see the key role a text can play in orienting discussion and supporting arguments.

Extract 3 (university A)

T: And just interest in foreign languages and interest in people who speak other languages. What about number three then, Tracy? What do you think they were after when they asked, I wish I were fluent in French [unclear]?

S1: They were, they were talking, like, the motivation of learning one's, of learning this language. But just now I was thinking, like, number eight is quite similar, I would really like to learn French.

S2: Yes.

S1: Yes, it's similar.

T: Mmm yes

S1: But number three is just, like, thinking about it. I don't mind being fluent in French, I want it, but number eight is really taking action.

T: Yes, I think that's the point, isn't it? Number eight…

Although the tutor's question "*what do you think they were after*" is a closed question, reference to the authors ("they") or text elicits an elaborate answer from S1. S1 supports her argument through textual references "*They were talking about…*," comparison "*number eight is quite similar*" and the use of "*but*" as a linguistic device. There are a number of meta-discursive references by both tutor and S1 demonstrating how talk around the text can support and evidence higher-order thinking.

In extract 4, the tutor and students are discussing their feelings about learning English. This extract demonstrates the use of metaphors as argument justification and teacher questioning through probing.

Extract 4 (university B)

T: But the emotion isn't there? Does English make you feel happy?

S1: What do you think?

S2: It does for me, but I don't know.

T: It makes you feel happy?

S2: Yes, it makes me feel happy, like I like music… It's a new world, so we're just, like, going to a new world. So music, books, like for me, I like young adult books, so…

T: In English?

S1: Yes, I don't have that much in Arabic about younger adults, so that's like a new door. Self-improvement, I like don't find a lot, there's not much material on self-improvement, like, in Arabic. I can find them. It's not like…

The tutor's probing questions "*It makes you feel happy*?" and "*In English*" seem to strike an emotional

chord with S2, prompting elaborated responses in which she uses a number of metaphors: "*it's a new world,*" "*like going to a new world,*" "*like a new door.*" S2 draws on the linguistic devices "*but,*" "*so,*" "*like*" to evidence reasoning. Although the tutor uses closed questions (yes/no questions), these are arguably "in service of" higher-order thinking as they prompt students' emotional connection to the topic and use of metaphors.

Extract 5 is a continuation of the discussion on learning English and demonstrates tutor questioning which aims to encourage students to contribute to the group discussion and build on each other's ideas.

Extract 5 (university B)

T: So can you relate to what she's saying?

S1: Yes, she said it improves her knowledge.

S2: It's easier, like, you don't know, sometimes it's easier.

S1: It's like an achievement, I think, that I know how to speak English. Because it makes me capable of doing things that others can't do, like in situations where there are English speakers and there are no Arabic speakers, I can speak. Like, if I have someone with me who doesn't speak Arabic, I can translate.

T: Exactly, you can do it. That's interesting.

The tutor invites the class to respond to an earlier student contribution "*So can you relate to what she's saying*?" This metadiscursive question prompts a number of exchanges between S1 and S2 in which they build on the earlier contribution. S1 provides her own argument and justifies why she feels learning English is an achievement. She does this through exemplification, e.g., "*like in situations where there are.*" Higher-order thinking is evidenced through S1's use of the linguistic devices "*I think*" and "*because.*" We see in this exchange how the open question inviting students to build on earlier student ideas can scaffold group thinking in which the class builds knowledge together.

Discussion

The aim of this study was to explore how higher-order thinking can come about through the trajectory of tutor and student talk in seminar interaction. The skills of argumentation, justification and reasoning are required for students to make sense of the content and of their own experiences, and to engage with their disciplinary concepts at a higher cognitive and discursive level. As research has identified, high quality educational dialogue (Michaels, O'Connor, and

Resnick 2008) and metacognitive awareness (Howe et al. 2019) are linked to academic success (Henning 2005). Key to the development of disciplinary understanding is the ability of tutors and students to use appropriate questioning and to support claims with evidence from both scholarship and experience. In this section we discuss key findings and make suggestions for teaching practice.

Evidencing higher-order thinking

Within a context of exploratory talk and accountable talk, in which students justify opinions and use evidence from experience and theory, and in a classroom atmosphere of collective and cumulative teaching in which students and tutor work together to develop a chain of thinking, the data points to a number of rhetorical and linguistic features of higher-order thinking. Drawing on an extended framework of argument justification developed by Reznitskaya et al. (2009), we found that students integrated their personal experiences and internal discourses into justification, using this as evidence for thinking. We suggest that in the two teacher education contexts, use of experience as evidence, and as exemplification, reflects integrative, meaningful learning (DeWaelsche 2015). In addition, students made use of metaphors, evidencing higher-order thinking through creativity. We therefore suggest that argument justification moves be extended to include the use of experience as evidence and use of metaphor which evidences creativity, a higher-order thinking skill (DeWaelsche (2015). In terms of linguistic devices, students drew on a number of reasoning words as identified by Boyd and Kong (2017).

Supporting higher-order thinking

In the context of seminars with their inherent constraints, such as the planned curriculum, students' language proficiency in English and reluctance of students to participate, we suggest that there are features of student and teacher talk which may more directly support higher-order thinking. We suggest that in the way that closed questions may be 'in service of' a dialogic classroom (Boyd and Markarian 2015), certain rhetorical moves may also operate 'in service of' higher-order thinking.

Tutors' questioning was key to encouraging and scaffolding higher-order thinking. Tutors used both open questions (e.g., "what about.") and display questions (e.g., "what do you think they were after"), but more significantly, asked metadiscursive questions

which made reference to texts and personal experiences, both in the context of the classroom and beyond. Furthermore, tutors invited students to build on each others' ideas (e.g., "can you relate to what she is saying"). This co-creation of meaning and elaboration of ideas has been found to support curriculum understanding in a school context (Vrikki et al. 2019) and there is no reason to doubt the same association in higher education.

Teaching implications

Whilst we identified additional argument justifications, the data demonstrated that students in general drew on a limited range of rhetorical moves and reasoning words.

Based on the empirical data, we make a number of suggestions for teaching practice.

Firstly, tutors can encourage students to broaden their use of argument justifications through raising awareness of rhetorical and linguistic devices as well as through tutor modeling and questioning. For example, tutors can encourage students to use metaphors, personal experiences and examples when supporting and justifying claims or points of view. Tutors can also explicitly ask students to use reasoning words such as *might* and *because* through worksheets, sentence stems and other teaching scaffolds. This can support all students, including those who have English as a second language.

Secondly, tutors can monitor their classroom talk, in particular their questioning strategies. For example, they can record their seminars, an activity easily accessible in current online teaching contexts. Using these recordings and transcripts, they can analyze their use of the different types of questioning (open vs display) as well as the responses which these elicit from students.

Thirdly, seminar preparation and choice of topics can scaffold students in making personal, scholarly and experiential links with the content of the seminar. This will encourage students to make textual connections and references which may be further supported through the use of artifacts. Tutors can choose topics to which students can make meaningful and personal references. This may avoid stress and anxiety, providing students with the opportunity to "try out their voices in the new discourse in non-threatening environments" (Wilson 2016, p. 264).

Fourthly, tutors can ask more metadiscursive questions such as referencing texts and encouraging students to reflect on their personal experiences. Using

artifacts, such as texts, can scaffold students' argumentation through comparing and contrasting (Hennessy et al. 2021).

Finally, students themselves can develop their classroom talk by planning their argument justifications and consciously choosing which strategy to use. Metacognitive awareness of classroom talk has been shown to support academic achievement in a school context (Howe et al. 2019) and we believe such linguistic and metacognitive awareness would be relevant in a higher education context.

Conclusion

In this study we set out to explore how students and tutors scaffold and evidence higher-order thinking in a seminar context. We recognize that our study is somewhat limited due to the small sample size and the limited contexts. All participants were female, studying the same subject (SLA) in a TESOL module, with similar linguistic backgrounds (both teachers were L1 speakers of English, all students were L2 speakers of English). These limitations notwithstanding, our exploratory study has highlighted some key rhetorical and linguistic features of quality educational discourse in a HE seminar context. We build on Reznitskaya et al. (2009) framework of argument justifications and add further justifications such as using metaphors and metadiscursive references. How students and tutors use language to scaffold, probe and evidence higher-order thinking is fundamental to the thinking process itself. The development of disciplinary understanding rests on exploratory and accountable talk, as identified in this study, and thus is of relevance to seminars in any disciplinary context. By using a full range of rhetorical and linguistic devices students can both embody higher-order thinking and develop as critical thinkers (Davies and Barnett 2015).

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