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TYPES OF QUESTIONS EMPLOYED IN EDUCATION: A CLOSER LOOK AT THE FOREIGN LANGUAGE TEACHING CLASSROOM DISCOURSE

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Abstract

Questions that take place in an instructional context may vary according to their topicality, agent, preponderance of answers, authenticity, source, and syntax. This study aims to investigate the distribution of different question types employed in a foreign language setting at tertiary level through a typology-based checklist prepared by the researcher. The findings, based upon the video recordings of 3 consecutive sessions, show that teacher-directed node questions play an important role in the construction of classroom discourse, as demonstrated by their quantitative predominance. Moreover, closed, referential, and factual questions seem to be preferred over open, display, and inferential or experience-based questions, respectively. It is indicated on account of these results that classroom discourse may be shaped by factors that are intrinsically different from that of daily communication. In addition to the prevalence of node questions, authenticity and dependence upon sources other than factual information are discussed as key points that could render a foreign language classroom more communicative.

Keywords: classroom discourse; question types; display/referential questions; closed/open questions

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1. Introduction

Language classrooms differ from most pedagogical settings in that content matter, the target language, is also used as a vehicle for instruction. In a typical classroom, discourse is jointly constructed by teachers and learners, where questions tend to comprise nearly 20 to 40 per cent of total oral discourse time (Chaudron, 1988). Given their extensive use in formal education, kinds of questions and how frequently they are utilised could be viewed as an important factor that may affect the success of foreign language teaching. Sometimes referred to as coral gardens due to their contextual diversity (Breen, 2001), foreign language classrooms demonstrate a few characteristics in terms of their routine interactive practices, one of which is the use of questions as a means of scaffolding. In this regard, it is plausible to assume that a particular question asked at the right frame of time could increase purposeful participation and encourage learners to contribute to oral discourse.

It has been one of the endeavours of related research to examine the effectiveness of specific question types. To cite a seminal example, Long and Sato (1983) observed that teachers direct substantially more display questions to learners, in which the mean length of responses is likely to be shorter than that of answers provided to referential questions. This was argued to be inauthentic by Long and Sato (*ibid.*), as the use of referential questions is much more common in informal conversation settings (Brock, 1986). Despite arguments favouring such types of questions as referential ones, Cullen (1998) mindfully points out that ‘attempts to define communicative talk in the classroom must be based primarily on what is or is not communicative in the context of the classroom itself’ (p. 180). Likewise, the use of a particular question type might not necessarily cause a sample of teacher talk to become unproductive or inauthentic; communicative classroom discourse requires a variety of questions, with a wider perspective on how they take place within interaction sequences as well as a distributional balance that is carefully established in accordance with contextual needs.

1.1. Problem statement and research question

Despite the fact that there are examples of studies quantifying specific types of questions used by teachers, there seems to be a lack of systematic methodology that seeks for investigating the foreign language teaching classroom discourse in Turkish English as a Foreign Language (EFL) context as regards the distribution of different question types. In order to offer plausible insights as to how the dynamics of a foreign language teaching setting could shape classroom discourse, it is of great importance that a wider perspective on the types of questions is adopted. The current study accordingly aims to investigate which types of questions are preferred in oral classroom discourse through a typological quantification. In this line, six variables have been identified, and the following research questions have been formulated so as to provide an example of how a sample of classroom discourse could be

analysed from the perspective of questions used as pedagogical devices within interaction sequences.

Research question 1: What is the distribution of the types of questions according to variables of topicality, agent, preponderance, authenticity, source, and syntax in the collected data set?

Research question 2: In which ways can a set of node questions complement a root question with respect to the variable of topicality?

2. A typology of questions used in formal education

This section will consider six major variables (i.e. topicality, agent, preponderance, authenticity, source, and syntax) that determine the type of a question likely to be used in a foreign language classroom, as well as other institutional settings of formal education.

2.1. Topicality: Root and node questions

In classroom discourse, questions employed by language teachers and learners are rarely used in a way detached from one another; they mostly demonstrate a hierarchical organisation, in which there are likely to be differing roles assigned to them. One of the variables that has a profound impact on this interplay is topicality, engendering a tacit hierarchical organisation between root and node questions. According to their relative topicality within given interaction sequences, root and node questions are linked to one another in an order of importance as a means of promoting communicative context. This could bring about a quantitative increase and some qualitative variation in responses elicited with such questions.

Sequencing as a result of relative topicality leads to ‘question trees’, which can be defined as a series of interactional instances where several interrogatives are tethered to one another through a sort of topical unity and the same pedagogical goal. Constituted with a root question and possibly several node questions, question trees are a common feature of communicative classroom discourse. It is amongst plausible assumptions that the hierarchical organisation established via question trees is likely to maximise purposeful participation on the part of learners, providing them more interactional space in which they can find more chances to contribute to classroom discussions and activities. Hence, the use of relative topicality in order to enhance classroom interaction is attributed to be one of the defining features of facilitative teacher talk.

2.1.1. Root questions

Root questions are formulated to fulfil the main pedagogical task of question trees. There is normally one root question per topical focus, aiming to elicit the most important piece of information from the interlocutor, optionally with the scaffolding of node questions. The place

of root questions may not necessarily be predetermined, since they can dynamically be relocated in consonance with the needs of a questioning sequence or perceived readiness on the part of the interlocutor. Communicative classroom discourse is usually structured around the placement of root questions, each instance moving the topical locus of interaction one step forwards. It is, hence, an important feature of facilitative teacher talk to be in the search of ways to increase the effectiveness of root questions.

2.1.2. *Node questions*

Node questions, preceding or following a root question, aim to help the root question reach its pedagogical goal via prior scaffolding or complementary follow-up work. Preceding node questions mostly function as a warm-up stage, activating the background knowledge and related concepts that are necessary for purposeful participation in the ongoing interaction. Following node questions, on the other hand, could be used by interacts to review an important point, extend an engaging conversation, or possibly change the direction of communication if the root question has failed to reach its goal. A frequent use of node questions is to remedy an ongoing interaction that has diverged from its ultimate purpose. As a common strategy resorted to by teachers, using responses elicited with node questions may give learners some clues to find the correct answer for a root question. It is worth underlining that uses of preceding and following node questions could extend what is described in this section. As long as they serve the purpose of a tethered root question and help it fulfil its pedagogical goal, any type of question can act as a node question in a given circumstance.

2.2. *Agent: Teacher-directed and learner-directed questions*

In pedagogical terms, there are two identifiable agents in most classrooms: a teacher (or teachers) and learners. A variable according to which questions can be classified is by whom they are formulated. *Teacher-directed questions* stem from the teacher. Traditionally, they are considered to be the backbone of classroom interaction, often observed in the first pair part of such patterns as Initiation-Response-Feedback (IRF) sequences (Long, 2018). In cases where making an enquiry is not exclusive to teachers, learners may also ask various questions to their teacher(s) or peers, which are named *learner-directed questions*. There is a complex relationship between the roles of teachers and learners in an instructional setting because ‘the classroom is not a world unto itself’ (Van Lier, 1988, p. 179). Teachers and learners, apart from undertaking some institutional responsibilities, arrive at this instructional setting with their own social identities. An increase in learner-directed instances observed in the distribution of question types could be a crude indicator of learner-oriented instruction. This conceivably shifts the focus of research from teacher-directed questions to learner-directed ones and examining their effectiveness so as to promote purposeful participation on the part of learners (Lynch, 1991). In communicative classroom discourse, learner-directed questions are just as important as teacher-directed ones in terms of their pedagogical value.

2.3. Preponderance: Open and closed questions

Another variable is the preponderance of answers exhibited by questions. There are a range of acceptable responses for *open questions*. Thanks to the plurality of available answers, open questions tend to be more inferential and depend upon differing opinions. *Closed questions*, however, is only sensitive to one single answer. There is a single correct answer that may be given to a well-constructed closed question. By and large, open and closed questions tend to be reasoning-based and factual, respectively (Hall, 2011). In a further comparison with one another, open questions, akin to referential ones, are likely to exert deeper cognitive processing (Nunan, 1987), ideally resulting in greater learner production thanks to a multitude of acceptable answers at one's hand. Closed questions, on the other hand, are usually about recalling something mentioned or instructed beforehand. It is, therefore, relatively more challenging to extend a conversational exchange based upon a closed question.

2.4. Authenticity: Referential and display questions

Authenticity, as a typological variable, can be defined as the quality of being real, which refers to a sort of information gap between speaker-hearers in the scope of this study. With the advent of Communicative Language Teaching in the 1980s, the intrinsic goal of English Language Teaching (ELT) became to turn language classrooms into a common ground for communication practice, aiming at authentic communication taking place in the real world. This desire, in consequence, led researchers to examine the features of informal conversation settings, one of which is posited to be the excessive use of referential questions in opposition to display questions (Thornbury, 1996). Also named as genuine or communicative questions (Thompson, 1997), *referential questions* denote an existing information gap between speakers-hearers. They are asked when a person wants to learn a piece of knowledge that they do not possess at the time. Answers provided to a referential question are expected to satisfy an intellectual need, as often observed in daily communication. *Display questions*, on the other hand, seek for an explicit display of knowledge already possessed by the questioner, which is acknowledged as a rarity outside of classrooms (Nunan & Lamb, 1996). The answerer just needs to prove that they know what is being asked with a display question because the piece of knowledge requested is already known by the questioner. Outside of classrooms, a general area of use for display questions is by mothers and caretakers towards little children. In general, referential questions are favoured by many (Long & Sato, 1983) because they supposedly encourage learners to produce longer and syntactically more complex responses, in which an increase in the use of sentence connectives is observed (Brock, 1986).

2.5. Source: Factual, inferential, and experience-based questions

Certain question types are very specific about the source of information they demand. *Factual questions* are reliant upon objective facts existing in the real world, often observable

and accessible by everyone. Conversely, *inferential questions* cannot directly be answered by an interlocutor, as what is required is a reasoning practice in which the answerer needs to analyse contextual clues and synthesise relevant information to reach an acceptable answer. *Experience-based questions* aim at the interlocutor's personal experiences and idiosyncratic background knowledge. In this case, the response is usually about something personally experienced in the past, such as a childhood memory. A similar classification of sources of information can also be found in Thompson (1997), who divides questions into three categories according to their content (i.e. outside fact, opinion, and personal fact). For a terminological unity, 'factual', 'inferential', and 'experience-based' will refer to such types of questions in the current study.

2.6. Syntax: *Wh-*, *yes/no*, and *intonation questions*

A robust discriminator between question types is the word order of the surface structure. *Wh- questions* are interrogatives that are syntactically formulated with such question words as what, when, where, who, whom, which, whose, why, or how. And, *yes/no questions* are formed through fronting the auxiliary verb in a given sentence. Generally, *wh-* questions are claimed to be more challenging for learners, as they elicit more detailed information; as opposed to *yes/no* questions, which are expected to be easier to answer (Thompson, 1997). As for *intonation questions*, they resemble regular statements in their word order, but they function as an interrogative with a rising pitch placed at the end. It is for this reason that intonation questions are only found in the spoken language; it is not virtually possible to spot them in writing without any special markers or punctuation. Despite being such a common type in daily communication, intonation questions may sometimes be neglected in foreign language teaching due to some grammatical concerns over formal syntax.

Table 1.

Typology of questions employed in formal education

Variable	Explanation	Types of questions		
Topicality	Hierarchy of questions.	Root	Node	
Agent	Who asks the question?	Teacher-directed	Learner-directed	
Preponderance	Range of possible responses.	Open	Closed	
Authenticity	Information gap between speakers.	Referential	Display	
Source	Means of providing the response.	Factual	Inferential	Experience-based
Syntax	Word order of the surface structure.	Wh-	Yes/No	Intonation

3. Method

3.1. Participants

The participants that contributed to the audio-visual data of this study are 11 Master of Arts (MA) students, as well as 1 instructor, in the department of ELT at a state university located in Turkey. Consisting of 9 females and 3 males in total, all the participants in the group signed a consent form and were naïve to the purpose of the study. It is operationally defined that the participants are highly proficient English users, most of whom claimed to work at an educational institution at the time of data collection. They were instructed to act naturally throughout the data collection sessions so that the recordings represented naturally occurring data, without any manipulations or interventions made by the researcher.

3.2. Recording sessions

Classes that were selected to be video recorded are of an elective course, offered in the corresponding MA programme, in which the participants are enrolled as regular MA students, in addition to one instructor. Setting is a general classroom environment where the instructor faces students and face-to-face instruction takes place. The data collection was conducted in three consecutive sessions, lasting from November 19, 2019 to December 3, 2019. The first 40-minute of each session were sampled to be analysed for the distribution of question types they demonstrated, resulting in 120 minutes of video recordings that constituted the total data set. The camera was placed at the same position in each recording session, at a sufficient distance to capture both the instructor and the students lest any audio-visual cues that are informative of ongoing interaction sequences may be lost.

3.3. Instrument and data analysis

The instrument used for data analysis is a checklist that was prepared by the researcher for the purpose of this study. The checklist is divided into six categories according to variables of (1) topicality, (2) agent, (3) preponderance, (4) authenticity, (5) source, and (6) syntax. These categories, in turn, are subdivided into two or three types of questions, culminating in 14 distinct classifications (see Appendix A). The data set was coded by the researcher through careful listening, and question types stated in the checklist were quantified within their respective category. The analysis was carried out in two steps: first, the quantitative data obtained from checklists were analysed in respect of the session with which they were associated; second, the mean was calculated from the pooled results of three consecutive sessions. Then, an excerpt containing a typical question tree was transcribed orthographically, and its content was analysed from an emic perspective.

As the scope of this research concerns the distribution of question types in classroom discourse, data analysis was conducted to the exclusion of responses provided to them.

Classifications made on regarding categories adopted a general assumption about the predisposition of questions towards a specific category. It is for this reason that, for example, an instance that was intended to seek for information from an inferential source might have been interpreted as an experience-based question by one of interactants. In the analysis, classifications were made on the basis of the first pair part that initiated the questioning sequence to such avoid ambiguity. This general assumption was also followed in cases where there was no response to the question.

3.4. Limitations

The audio-visual data were coded by one researcher, which might be subject to slight changes in figures and percentages presented in Table 2 if there were multiple coders. As an alleviation of this limitation, however, the procedure of codification through careful listening was repeated twice to enhance intra-coder reliability.

3.5. Intra-coder reliability

Intra-coder reliability refers to the process of the analysis of collected data multiple times by the same coder so that a higher rate of agreement is reached. In this study, the pooled data were coded twice at different times by the same researcher. Calculated with the formula ‘number of agreements divided by number of agreements plus number of disagreements’, the intra-coder reliability of the first research question was found to be significantly high, which is 0.96 for the pooled data.

4. Findings and discussion

This section will first present the longitudinal findings from three consecutive sessions of data collection, along with their mean scores calculated from the pooled data, then exemplify how root and node questions could interactionally function in an instructional context with an excerpt taken from one of the recording sessions.

4.1. What is the distribution of the types of questions according to variables of topicality, agent, preponderance, authenticity, source, and syntax in the collected data set?

It is shown by the distribution in the pooled data that node questions (79.4%) are used substantially more frequently than root questions (20.6%). This finding is not surprising as to how topicality is managed; most of the interaction occurring in a classroom are somehow complemented with various strategies, one of which is an extensive use of node questions to increase purposeful participation. In similar fashion, the variable of agent could be claimed to be a crude indicator of the orientation of instruction, and is revealed to exhibit more teacher-directed questions (85.1%) than learner-directed ones (14.9%) in all the sessions. The predominance of teacher-directed questions found in this study confirms a prior finding on

classroom interaction analysis that demonstrated teacher-initiated interaction patterns to govern Turkish EFL classes (Khan & Tas, 2019), which overall indicates the presence of a sort of teacher-oriented instruction in the current context.

As for the variable of preponderance, contradictory results have been reached. Whilst Session 1 showed a moderate inclination towards open questions (60.8%), in Session 2 and Session 3, closed questions seemed to be preferred (58.3% and 54.8%, respectively). In the pooled data, the distribution of open questions (49.6%) and closed questions (50.4%) have been found to be very close to each other. Although there is a slight preference in favour of the latter, using as many open questions as closed ones could imply an attempt made towards addressing higher-order thinking skills, which might, in turn, contrast with research reporting the dominance lower-order questions in pedagogical settings (Kerry, 1998).

Another contradictory finding of this study relates to the authenticity of questions. Somewhat surprisingly, it has been found that in Session 1 and Session 3, referential questions are in the majority (66.7% and 52.4%, respectively). In Session 2, however, display questions (54.2%) take the precedence over referential ones. In the pooled data, the distribution of referential questions (55.3%) supersedes display questions (44.7%). This finding is important in its own right that it contradicts most of the prior research that reported display questions to occur much more frequently in classrooms (e.g. Brock, 1986; Long & Sato, 1983). Nonetheless, it must be borne in mind that the results presented in the current study are liable to be affected by the participants' high level of English proficiency and matured cognitive abilities, which may show a significant difference when compared with foreign language classrooms in primary and secondary education.

Regarding the variable of source of information, factual questions (55.3%) seem to be generally preferred to inferential (30.5%) and experience-based questions (14.2%) in the pooled data. This finding is in alignment with the assumption that outside facts constitute a major part of the content pertaining to questions asked by teachers and learners (Thompson, 1997). Moreover, the fact that the results demonstrate a proportional succession in order of factual, inferential, and experience-based questions in each session could possibly imply a classroom routine in which a similar set of questioning behaviours observed, as also discussed by Kerry (1998) with respect to teachers' repertoire of questioning skills.

The last variable is the syntactic formulation, namely the word order exhibited on the surface structure. In this regard, wh- questions (47.5%) are used more frequently than yes/no (41.9%) and intonation (10.6%) questions as indicated in the pooled results. One irregularity about this syntactic choice is that in Session 2, yes/no questions (52.1%) occurred significantly more than wh- questions (35.4%). The fluctuating distribution could perhaps be attributed to the increase of closed (58.3%) and display (54.2%) questions in the regarding session; however, further correlation analysis is needed to reach more conclusive implications.

Table 2.

Distribution of question types: Longitudinal and pooled results

Variable	Type	Session 1		Session 2		Session 3		Pooled	
		n	%	n	%	n	%	n	%
Topicality	Root	9	17.6	13	27.1	7	16.7	29	20.6
	Node	42	82.4	35	72.9	35	83.3	112	79.4
Agent	T-directed	40	78.4	44	91.7	36	85.7	120	85.1
	L-directed	11	21.6	4	8.3	6	14.3	21	14.9
Preponderance	Open	31	60.8	20	41.7	19	45.2	70	49.6
	Closed	20	39.2	28	58.3	23	54.8	71	50.4
Authenticity	Referential	34	66.7	22	45.8	22	52.4	78	55.3
	Display	17	33.3	26	54.2	20	47.6	63	44.7
Source	Factual	25	49	32	66.7	21	50	78	55.3
	Inferential	19	37.3	12	25	12	28.6	43	30.5
	Experience-based	7	13.7	4	8.3	9	21.4	20	14.2
Syntax	Wh-	28	54.9	17	35.4	22	52.4	67	47.5
	Yes/no	17	33.3	25	52.1	17	40.5	59	41.9
	Intonation	6	11.8	6	12.5	3	7.1	15	10.6

4.2. In which ways can a set of node questions complement a root question with respect to the variable of topicality?

Root and node questions are attached to one another with the same pedagogical goal within a series of interaction sequences. Hierarchically, the root question is placed at the top, denoting the topical focus. Node questions could occur around the place of a root question to complement it in a number of different ways. Whether a root question accomplishes its ultimate pedagogical goal may, indeed, depend upon neighbouring node questions. The complementary role of node questions notwithstanding, it is not guaranteed that every question tree will interactionally function as intended. There is still a need for a principled understanding of how to treat root and node questions with respect to the variable of topicality. Below is an orthographic transcription of an example extracted from Session 1, where a

number of node questions are directed with a view to accentuating the pedagogical function of the root question:

(Pointing at the picture next to a quotation.)

T: Do you know this guy? Who is he?

S: A Turkish scientist.

T: To have earned?

S: A Nobel Prize.

T: Yeah, in the field of?

S: Chemistry.

T: Yes, in 2015. What does he say about intelligence?

S: In one way, he says that intelligence is better, but effort is the distinctive feature.

T: Mm-hm. So, what could be the relation between this quotation and today's topic?

S: Fixed mindsets are predetermined.

T: Exactly! Does he believe in fixed mindsets or growth mindsets?

S: Growth mindsets.

This example shows how a teacher can build their way through the first few minutes of a lesson, a brief period of time that determines how class atmosphere will be likely to go on. Instead of abruptly announcing the topic of that day, the teacher decides to make use of a quotation by a well-known scientist. First, in order to ensure that students are familiar with who the scientist is, the teacher tries to activate their background knowledge by directing several preceding node questions. These node questions clarify who the person is (e.g. Do you know this guy?), then shift the focus on to his field (e.g. In the field of?). After these node questions have established the scientist's general identity and touched upon what his accomplishments are, the teacher uses another node question about the quotation to make students infer the scientist's interpretation of the concept of intelligence (e.g. What does he say about intelligence?). Upon this groundwork comes a root question that seeks for a plausible connection between the scientist's interpretation of intelligence and the main topic of the ongoing lesson, which is about mindsets (e.g. What could be the relation between this quotation and today's topic?). This root question, in a way, represents the reason why the regarding interaction takes place and aims at preparing students to upcoming content and discussions. The teacher, rather than directly asking a root question in this case, tries to increase the likelihood of eliciting a correct answer by complementing it with several node questions. Once a desired response is received for the root question, there is also a following node question that serves the purpose of concept-checking (e.g. Does he believe in fixed mindsets or growth mindsets?). The preceding and following node questions in this excerpt

clearly exemplify how they can pave the way for a root question and also verify whether it has reached its intended pedagogical purpose.

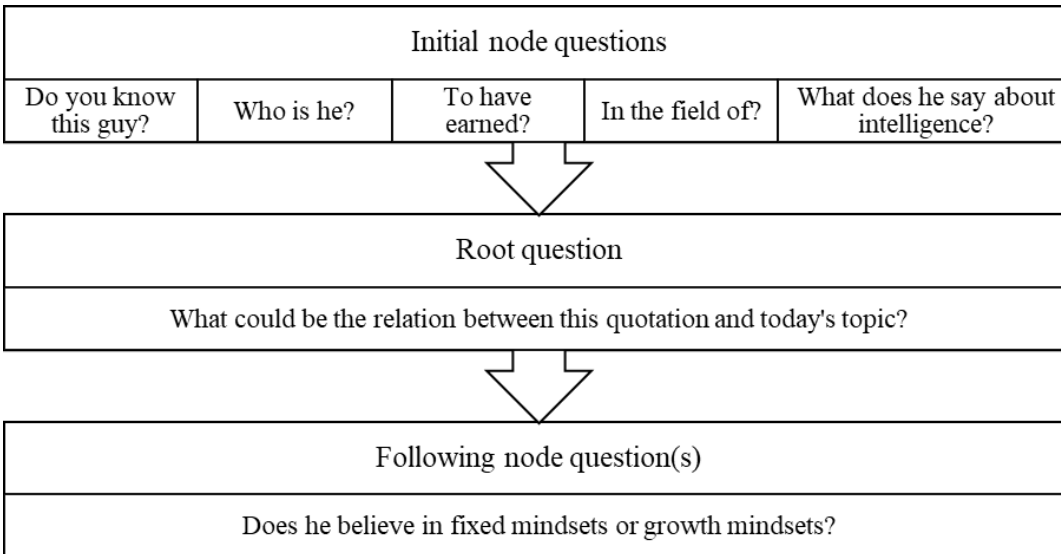


Figure 1. An exemplification of the use of node questions to complement a root question (excerpt taken from Session 1).

5. Conclusion

This study has examined the distribution of different question types in classroom environment and showed that node, teacher-directed, closed, referential, factual, and wh-questions, as stated by six predetermined variables, occurred more frequently than their counterparts. A typological classification (see Table 1) is proposed so that a wider perspective could be adopted to observe how questions shape the foreign language classroom discourse. Furthermore, a sample of interaction was taken from one of the sessions to exemplify an array of distinct ways that node questions can be used to complement a root question.

Communicative classroom discourse is largely reliant upon facilitative teacher talk, characterised with a hierarchical organisation of questions, authenticity, and dependence upon such sources of information as inferences and personal experiences in addition to outside facts. It is, hence, suggested teachers expand their repertoire of questioning skills to provide learners more interactional space in which there could be higher purposeful participation. Considering that questions take up a significant amount of oral discourse time in classrooms, there is a need for a principled choice as to which type of question could be useful under particular circumstances. Just as asking more questions does not guarantee a greater interactional space and a higher rate of purposeful participation, what is facilitative or communicative is bound to contextual factors present at the time.

In conclusion, it is presented in this study that the foreign language classroom discourse is shaped by factors that are intrinsically different from that of daily communication. Therefore, whether a question serves communicative purposes should be evaluated in the context of the respective classroom. This can be done by reaching a better understanding of the roles played by questions in classroom discourse and the variables underlying their configuration. A useful strategy for teachers on this point could simply be possessing a wider repertoire of questioning skills and understanding the variables that differentiate those questions from one another, as each type might have a certain pedagogical value in the right context.

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Appendix A. Sample checklist

This is a shortened version of the checklist that was prepared for the analysis of audio-visual data. Numbers on the first column correspond to six variables (see Table 1), and numbers on the first row indicate individual instances of questions asked.

		Session: ____ Date: __/__/____																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Sum
1	Root																					
	Node																					
2	T-directed																					
	L-directed																					
3	Open																					
	Closed																					
4	Referential																					
	Display																					
5	Factual																					
	Inferential																					
	Experience																					
6	Wh-																					
	Yes/no																					
	Intonation																					

Coder's name:

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