Abstract—This study employs Critical Discourse Analysis (CDA) to investigate the complexities of interactive classroom discourse within the context of College-level English education in Chinese media colleges. Specifically, the study focuses on a reading session that took place in a freshman English class, with the aim of evaluating classroom interactions. The primary objective is to interpret the recurring patterns of interactive feedback exchanged between teachers and students during these sessions. The investigation draws insights from the tape-recorded and closely examined lessons of two English teachers, revealing the dynamics of language use within the educational context. By applying CDA, this study seeks to reveal the underlying structures and power relations embedded in classroom discourse, shedding light on how language functions as a tool for both teaching and learning. The significance of this research lies in its potential to enhance our understanding of effective pedagogical strategies and the importance of language in shaping cognitive structures. The findings aim to contribute valuable insights to educators, curriculum developers, and researchers, promoting a more informed, innovative and thorough approach to language instruction in the college context.

Keywords—Critical Discourse Analysis (CDA), interactive classroom, teacher talk

I. INTRODUCTION

Critical Discourse Analysis (CDA) explores how language, power, and social structures are connected. It discovers how language can shape and show the norms in society and aims to unveil the hidden ideas and power differences in how people talk or write [1]. In English teaching, CDA is important for making students think critically about how language is used. Teachers can use CDA to study power relationships between them and students, check if textbooks have certain beliefs, and get students to think deeply about language. When teachers use CDA, English classes become not just about language but also about making sure everyone feels included, questioning unfair language, and helping students learn how to think about the social parts of language [2].

Textbooks hold a vital role in English as a Foreign Language (EFL) learning, offering a structured and comprehensive approach to language acquisition. These educational resources provide a carefully designed curriculum that guides learners through a logical progression of language skills, encompassing grammar, vocabulary, reading, writing, listening, and speaking. The importance of classroom language for English as a Foreign Language (EFL) learners is also significant, as it plays a crucial role in facilitating effective communication, comprehension, and language acquisition. Interaction among classrooms could effectively enhance Language Input. Exposure to rich and varied language input is essential for language development. Classroom language serves as a primary source of input for EFL learners [3]. Therefore, related research on textbooks and classroom language in EFL classrooms is very important and necessary for EFL teaching. This research uses a critical perspective to conduct a critical analysis of the English textbooks and teacher talks at a media university in China.

II. LITERATURE REVIEW

Teachers can enhance their teaching methods by contemplating and analysing classroom conversations. This approach allows for a thorough assessment of communication trends, student participation, and overall classroom atmosphere. By introspecting, teachers can recognize successful techniques, cover areas for enhancement, and customize instruction to fit various student requirements. This active involvement with discussion not only elevates the quality of instruction but also encourages continuous professional development. The existing Literature review establishes a ground, highlighting a gap in research.

Majdedin et al. [4] employed Fairclough’s model for critical discourse analysis to scrutinize subject positions, interpersonal connections, and substance in English Language Teaching (ELT) coursebooks in Iran. By focusing on course books from Bahar and Navid Language Institutes in Shiraz, the researchers found that educational and friendly subject positions were predominant in Navid and Bahar, respectively. Interpersonal connections were found to be reasonably well-balanced across both series, while substance analysis highlighted primary themes of friendship, sports, and travel. A thorough analysis of audio, conversation settings, tone, and intonation exposed a clear alignment with Western culture and ideology in the language used in these course books. The study concludes that the selected course books display a characteristic Western ideological discourse, which challenges the notion of course books being neutral. The researchers recommend increasing critical language awareness among language educators to understand the significant role language plays in shaping cognitive structures.

Amerian and Esmaili [5] explored how gender is portrayed in international English Language Teaching (ELT) series, specifically in American Headway Student Textbooks, using
Fairclough’s three-dimensional model to analyze the materials. The study systematically examined various aspects of the textbooks, including characters, social and domestic roles, semantic roles, titles, order of appearance, generic language, and activities undertaken by females and males. The research findings revealed the existence of both explicit and implicit sexism in the series, with explicit discrimination against females and implicit exploitation of women for advertising purposes, ultimately contributing to increased sales. The investigation suggests that the series promotes capitalism as an underlying ideology. Amerian and Esma’li’s study sheds light on the complicated ways in which gender is represented in ELT materials and highlights the potential impact of educational resources in perpetuating societal ideologies.

Xiong and Qian [6] carried out a critical examination of the ideologies of English in a Chinese high school English as a Foreign Language (EFL) textbook. The study was established on critical theories on language and education and focused on the discourse of the textbook to encounter the dominant ideologies in present-day China. Using critical discourse analysis as a methodology, which is characterized by its socially committed stance in analysing and explaining text, the study identified three significant issues: biased representation of the history of English, superficial sociolinguistic explanations, and rigid grammatical rules. These findings revealed the Anglo-centric language ideologies that were deeply embedded in the textbook, assuming that English was sociolinguistically neutral and grammatically uniform. In response, the authors suggested a multicultural and worldly perspective in curriculum development, emphasizing intercultural understanding and embracing both global and local contexts. The study thus contributes to an understanding of language ideologies in Chinese EFL education.

Sadeghi et al. [7] examine Interaction Analysis in the context of classroom research, which emerged from the need to investigate the teaching and learning process in the socio-cultural context. Recognizing the weaknesses of relying solely on quantitative methods, the study employs a qualitative approach by utilizing Critical Classroom Discourse Analysis (CCDA), a perspective that draws on Post-structuralism and postcolonialism ideas. The ethnographic study, carried out in an EFL classroom at a university in Iran, utilizes CCDA to critically reflect on the discourse differences between males and females. The analysis focuses on power dynamics and dominance, exposing hidden male dominance in discourse control, question types, and turn-taking. The qualitative understanding of transcripts underlines male participants’ tendency to exert more power through the use of frank language, negative face, and fewer politeness phenomena, shedding light on the subtle aspects of social processes in the classroom. The findings stress the significance of using qualitative discourse analysis to uncover concealed power dynamics in educational settings.

Al-Zahrani and Al-Bargi [8] centered their research on examining the effects of inquiries on promoting communication in English as a Second Language (ESL) classrooms, with a particular emphasis on identifying the qualities of questions that lead to increased involvement in classroom activities. The investigation utilized video recordings of ESL classrooms, which featured students with an intermediate level of English at the English Language Institute (ELI) of a university in Saudi Arabia. By utilising techniques of Discourse Analysis, the study transcribed the data gathered from the video recordings, categorizing the questions into two groups based on their effectiveness in promoting classroom interaction. The analysis revealed a connection between the characteristics of the questions and their ability to stimulate classroom engagement. Certain types of questions were discovered to significantly enhance interaction, while others were less successful in achieving this outcome. The study provides valuable insights into the role of questioning techniques in enabling communication within ESL classrooms, highlighting the importance of tailoring questions to optimize student involvement and participation.

Many scholars have discussed the importance and research approaches of applying CDA to English reading, but few scholars have conducted case studies. Moreover, there is a gap in CDA research on classroom language. Therefore, this article will fill the research gap in this aspect of Chinese college English education.

III. METHODOLOGY

One of the fundamental disciplines in education, Critical Discourse Analysis (CDA), offers answers to inquiries concerning the connections between language, society, power, identity, ideology, politics, and culture. A pioneer in this field, Van Dijk described CDA as a new multidisciplinary discipline for the study of discourse and text in the social sciences and humanities [9]. It looks at the dominant culture in society to identify and understand the factors that have shaped and maintained that culture’s dominance. By focusing on particular aspects of injustice, inequality, racism, pain, and prejudice, CDA seeks to offer a comprehensive analysis, justification, and critique of the literary devices authors employ to normalize their discourses.

This discipline has attracted many scholars, and Fairclough has provided guidelines for CDA research in different territories including textbook evaluation [10]. The primary instructional medium that provides students with access to English teaching resources is thought to be ELT textbooks. As a result, it is important to critically evaluate ELT textbooks since they can influence, legitimate, and naturalize ideologies for language learners. As stated by Rashidi et al. [11] “due to the prominent roles of ELT textbooks in language education, they have been subject to investigation for their content, especially at discourse level.

A. Critical Discourse Analysis of Textbook Article

This article is selected from Unit 5 of the course College English 1, it discusses the important topic of water conservation and uses various strategies and language techniques to convey its message. It combines personal stories, scientific information, and references to authorities to emotionally engage readers and emphasize the urgency of global water challenges. The effectiveness of these strategies is examined through a critical discourse analysis, considering their strengths, potential drawbacks, and overall impact.

In employing discursive strategies, the article uses
personalization with a touching story to make the issue relatable. It follows a problem-solving framework, presenting challenges and suggesting conservation as a solution. References to authorities like Nobel Laureate Richard Smalley and President John F. Kennedy enhance credibility. Repetition and metaphorical language serve rhetorical purposes, emphasizing key points and creating intense images. Crisis rhetoric intensifies the sense of urgency. However, a critical view might question whether these strategies oversimplify complex global issues and suggest the need for more diverse perspectives.

Linguistically, the article balances formal and narrative language to convey seriousness while engaging readers emotionally. Technical language provides precision but may challenge less scientifically inclined readers. Repetition and restating the thesis emphasize key points but could be seen as redundant. Quotations from authoritative figures add credibility, but a critical perspective might call for more diverse viewpoints. The logical structure aids coherence, but exploring certain sections and counterarguments in more depth could enhance the article. Balancing formality with accessibility and diversifying language use might address potential limitations.

While the article effectively uses personalization, problem-solution framing, appeals to authority, repetition, metaphorical language, and crisis rhetoric, a critical analysis reveals potential drawbacks. Depending heavily on certain strategies and language features may oversimplify complex global challenges in water conservation. A more thorough exploration of diverse perspectives, nuanced language use, and consideration of counterarguments could lead to a more critically engaging discourse. Balancing rhetorical appeal with in-depth analysis is essential for a comprehensive understanding of the multifaceted issue.

**B. Participants**

The present study was conducted at the Sichuan University of Media and Communications in Chengdu, Sichuan, China. It involved 2 classes, including 83 students and two teachers as research participants. Students are freshmen between 18–19 years old. According to their college entrance examination English scores, the classes of the two research subjects belong to Class B, that is, students with college entrance examination scores between 60 and 90 points (out of 150). These students have at least 6 years of English as EFL learning experience and their first language is Mandarin.

**C. Data Collection**

The data were taken from non-participant observation and tape-recording. After collecting the data, they were categorized into some patterns. In this study, the patterns of interaction used were from Ur (1996). The patterns were: (1) group work; (2) closed-ended teacher questioning (IRF); (3) individual work; (4) choral responses; (5) collaboration; (6) student initiates, teacher answers; (7) full-class e-mail; (8) teacher talk; (9) self-access; and (10) open-ended teacher questioning. The explanation is in Table 1:

<table>
<thead>
<tr>
<th>No</th>
<th>Patterns of Interaction</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group work</td>
<td>Students work in small groups on tasks that entail interaction: conveying information, for example, or group decision-making. The teacher walks around listening, and intervenes little if at all.</td>
</tr>
<tr>
<td>2</td>
<td>Closed-ended teacher questioning (IRF)</td>
<td>Only one “right” response gets approved. Sometimes cynically called the “Guess what the teacher wants you to say” game.</td>
</tr>
<tr>
<td>3</td>
<td>Individual work</td>
<td>The teacher gives a task or set of tasks, and students work on them independently; the teacher walks around monitoring and assisting where necessary.</td>
</tr>
<tr>
<td>4</td>
<td>Choral responses</td>
<td>The teacher gives a model, which is repeated by all the class in chorus; or gives a cue, which is responded to in chorus.</td>
</tr>
<tr>
<td>5</td>
<td>Collaboration</td>
<td>Students do the same sort of tasks as in “Individual work”, but work together, usually in pairs, to try to achieve the best results they can. The teacher may or may not intervene. (Note that this is different from “Group work”, where the task itself necessitates interaction.)</td>
</tr>
<tr>
<td>6</td>
<td>Student initiates, teacher answers</td>
<td>For example, in a guessing game: the students think of questions and the teacher responds, but the teacher decides who asks.</td>
</tr>
<tr>
<td>7</td>
<td>Full-class interaction</td>
<td>The students debate a topic or do a language task as a class; the teacher may intervene occasionally, to stimulate participation or to monitor.</td>
</tr>
<tr>
<td>8</td>
<td>Teacher talk</td>
<td>This may involve some kind of silent student response, such as writing from dictation, but there is no initiative on the part of the student.</td>
</tr>
<tr>
<td>9</td>
<td>Self-access</td>
<td>Students choose their own learning tasks and work autonomously.</td>
</tr>
<tr>
<td>10</td>
<td>Open-ended teacher questioning</td>
<td>There are a number of possible “right” answers so that more students answer</td>
</tr>
</tbody>
</table>

**IV. DISCUSSION**

This section discusses the findings of teaching-learning interaction patterns in the classroom. In the first class, the teacher delivered the teaching material expressing the problem of water shortage which is going to be one of the greatest problems for the first half of this century.

The patterns of interaction shaped the patterns of choral responses, closed-ended teacher questioning (IRF), and full-class interaction. The teacher regularly provided instructions and asked questions. Despite the teacher maintaining control of the class, this did not imply passivity among the students. The students appeared engaged, as the teacher incorporated interactive and communicative activities like games, exercises, and discussions to encourage student interaction and participation. The questions might be answered individually or as a whole class, so the class could be referred to as a student-centered class since students were forced to get involved actively.

At the beginning of the class, choral responses occurred when T1 explained the introduction of the article one sentence by one sentence. The choral response pattern occurred, for example, when T1 asked the students to review the use of “like”. The following excerpts are one of the examples of choral responses pattern:

T1: Let’s review the use of “like”. What does like
Next, T1 explained the introduction and the first paragraph and choral responses occurred to give further explanation on some important words and phrases in this part.

Secondly, closed-ended teacher questioning, also known as Initiation Response Feedback (IRF) occurred when the teacher used the teaching assistance system to randomly select students to answer questions to help them strengthen their memory of key words in this part. The following excerpt is one of the examples of this pattern:

T1: In this part, there are three words you guys need to memorize. The first one is aggressive, which means invasive. The second one is converse or conservation, which means to protect or save. The third one is ‘to come up with’ which means to think of something. Now, after memorizing all three words, I am going to select someone. OK, the first one, Kongshijie, please.

Ss: OK, I’m ready.
T1: Do you remember the phrase we learnt in this part?
S(Kongshijie): Come up with.
T1: Yes. For the second one let’s welcome Xuqing. Which word contains the meaning of ‘save’?
S(Xuqing): Conversation.
T1: You said it was the other way around. You should say: conservation. Conversation means dialogue, right?
S(Xuqing): Yes, it’s conservation.
T1: That’s right. You should practice and read it more smoothly yourself.

After learning each paragraph, the Teacher will summarize the key point of the paragraph and play this sort of game with students to help them strengthen their understanding of words and expressions.

Then the full-class interaction pattern is used in grammar explanations to identify clauses. It occurred when after the teacher pointed out a complex sentence and asked students to analyze the type of this sentence after explaining the keywords in the paragraph. Students gave different ideas freely. The following excerpt is one of the examples of this pattern:

T1: Now look at this sentence. ‘But with the right solutions, it could be the one that brings us all together’ What kind of clause do you think this is?
S1: I think this is an attributive clause.
S2: Attributive clause.
S3: I think it’s a predicative clause.
S4: It’s an object clause.
T1: It seems that each one of you have your own ideas. Let’s look at this sentence together. What is the subject in this sentence?
Ss: It
T1: Yes, it serves as a formal subject here. So where is the verb in this sentence?

Ss: Could be
T1: Yes, it’s a be verb. So, this sentence follows a subject-predicate-complement structure. We cannot find an object in this sentence it’s not an objective clause.

The second observation occurred in another class with the same learning content. The pattern of interaction in the second class includes teacher talk, close-ended teacher questioning (IRF), individual work, choral responses. During the teaching and learning sessions, T2 primarily engaged in asking questions, delivering lectures providing information, and giving directions. The students exhibited lower levels of activity when the teacher took control of the classroom. Despite T2 incorporating activities such as games, exercises, and other resources, it appears that these efforts were not successful in increasing student participation and interaction. Additionally, T2 assigned activities that required individual, pair, or group completion by the students.

The first pattern is teacher talk. At the beginning of the class, T2 introduced two reading methods: skimming and scanning. In this part of the classroom, the teacher occupied a completely dominant position, and students were mainly responsible for understanding and absorbing these two reading methods. In this section, T2 introduced scanning and skimming carefully with diagrams on slides. After that students need to practice under T2’s guidance. The following excerpt is one of the examples of this pattern:

T2: We need to analyze this text and learn to understand this text. This text has a total of 10 paragraphs, but what do I mainly ask everyone to do in the first and second units? Please recall carefully what method I have been using. In previous units, you followed me to learn segment sentences. We learn words, analyze each sentence, and cut each sentence into small pieces to understand it. But today I want you guys to learn it differently.

T2: Do you recognize the two words above? Can you read? We’re going to learn about a kind of reading strategy for fast reading. It’s called scanning. So firstly, what does scan mean? Scanning is a reading strategy that specifically refers to the fact that we must not only be fast during the reading process but also be able to capture the key points while being fast.

The second pattern of individual work occurred when students were asked to underline the key information in each paragraph, putting the theory into practice. The following excerpt is one of the examples of this pattern:

Next, I will give you one minute to read the first paragraph and tell me what are the key phrases or the main points in this paragraph.

T2: Don’t be afraid that you will make a mistake.

After highlighting the keywords and phrases, choral responses occurred when students gave their answers. The following excerpt is one of the examples of this pattern:

Ss: water
Ss: Conserve water
T2: Yes, but what else? How to understand ‘scientist’? What’s the relationship between conserving water and scientists? That’s what you need to think about.

The next pattern is close-ended teacher questioning (IRF),
this pattern occurs when students give feedback on tasks. The following excerpt is one of the examples of this pattern:

T2: Let’s move on to paragraph 3. This paragraph is short.
T2: Ok, what have you got?
Ss: most important and most contentious
Ss: Strategic resources.
T2: Yes. So here comes another question: why water is on track to be the most important and contentious resource, what does strategic mean here?

The patterns of interaction which occurred in the first class were closed-ended teacher questioning (IRF), choral responses, and full-class interaction. Meanwhile, the patterns of interaction in the second observation are choral responses, individual work, teacher talk, and closed-ended teacher questioning (IRF).

The research findings show that the patterns of interaction during the teaching and learning process that emerged from the first class and the second class were not fully dominated by the teacher because the students also actively participated in the teaching and learning process. Two teachers emphasized the student-centred, relying heavily on hands-on activities, individual work, and discussion to engage students and encourage active participation. The patterns of interaction during the teaching and learning process in this research occur between teacher and student or student and student. These findings align with Yu’s discovery that interaction involves a cooperative exchange of thoughts, emotions, or ideas among two or more individuals, leading to a mutual impact [12]. The concept of interaction suggests a dynamic exchange or a mutual influence, occurring either between individuals (such as student-student or teacher-student) between an individual and a group (for example, teacher-audience), or even between materials and individuals.

To determine the characteristics of those dimensions of meaning that emphasize or deemphasize a specific ideological stance in the classroom languages, the contents, social relations, and subject positions of the transcript of classroom language were analyzed using Fairclough’s framework [13]. More specifically, the frequency of each constraint—content, social interactions, and subject positions—was tallied across the transcripts. Each category’s frequency and percentage were determined and tallied. The idea was to use patterns of those meaning aspects that have been emphasized or deemphasized to determine the ideological orientation that teachers had chosen.

According to the following table, content is defined as the information and opinions of the text producer or, in Fairclough’s words, as their experiences in the social or natural environment, such as through interaction, education, or entertainment. Relation describes the interpersonal connections made through conversation, such as those with friends, coworkers, or classmates. The social identities of interactions such as businessmen, employees, or employers are referred to as subject positions. In summary, subject position refers to the positions that individuals hold in discourse, relation refers to the social relations people assume in the discourse, and content is what is said or done in a dialogue. Table 2 that follows, which is taken from Fairclough, illustrates the relationship between linguistic traits and structural effect and meaning dimensions and this article will focus on the frequency and percentage of contents that appeared in the transcript [13].

### Table 2. Experiential, relational, expressive values [13]

<table>
<thead>
<tr>
<th>Dimensions of meaning</th>
<th>Values of features</th>
<th>Structural effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contents</td>
<td>Experiential</td>
<td>Knowledge/beliefs</td>
</tr>
<tr>
<td>Relations</td>
<td>Relational</td>
<td>Social relations</td>
</tr>
<tr>
<td>Subjects</td>
<td>Expressive</td>
<td>Social identities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>First Classroom</th>
<th>Second Classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giving and asking for information</td>
<td>18</td>
<td>100</td>
</tr>
<tr>
<td>Interaction</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Social problem</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Cultural and customs</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Entertainment</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>34</td>
</tr>
</tbody>
</table>

Two raters looked at the frequency of each feature once the data was collected, and they collaborated to decide which group to assign the items to. If there were disagreements, they were settled through negotiation, bringing inter-rater reliability to a unity.

As the above Table 3 shows, in the first classroom, giving and asking for information content takes the first position, followed by interaction and social problems. Both cultural and customs and entertainment content appear once in classroom language. In the second classroom, giving and asking for information takes the first rank, followed by interaction and social problems. While culture, customs and entertainment are absent.

### V. CONCLUSION

The analysis of teaching-learning interaction practices in two college English classes has provided a practical understanding of the dynamics of classroom language. The first class focused on the topic of water shortage, and demonstrated a diverse collection of interaction patterns, including chorus responses, closed-ended teacher questioning (IRF), and full-class interaction. The instructor engaged students through interactive activities like games and discussions, promoting a learner-centered environment. This method allowed for active participation and critical thinking among the learners.

On the other hand, the second class, also addressing the issue of water shortage, displayed a different set of interaction patterns. Despite integrating activities such as games and exercises, the teacher’s predominantly lecturing style led to lower levels of student involvement. The class relied heavily on independent work, with limited opportunities for interactive discussions.

The study findings emphasize the significance of enabling a learner-centered approach in language classrooms. The first class, with its focus on interactive and communicative activities, facilitated a more profound understanding of cultural and societal issues related to water scarcity. The interaction patterns observed in both classes involved a
cooperative exchange between teachers and students, aligning with the idea that interaction is a vigorous exchange of thoughts and ideas.

The analysis revealed the frequency and proportion of various dimensions, including content, social relations, and subject positions. The emphasis on giving and requesting for information was visible in both classrooms, while social problems received considerable attention. However, cultural and customary practices, as well as entertainment, were given limited focus.

The comparison of the two classrooms highlighted differences in content emphasis. The first classroom demonstrated a more equitable distribution, while the second classroom was more focused on giving and requesting for information. These differences suggest that teachers play a crucial role in shaping the ideological orientation of classroom language.

This study advocates for a comprehensive and learner-centered approach to language instruction, emphasizing the importance of addressing social problems, cultural variety, and entertainment. The findings provide valuable insights for educators to reflect on their teaching techniques and strive for a more inclusive and engaging language learning environment.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Y. Chen played a pivotal role in conceptualization and methodology, contributing significantly to the initial framework and overall structure of the paper. K. Yu undertook the responsibility of data collection, conducted thorough analyses, and provided valuable insights during the review process. Z. Shen, on the other hand, contributed extensively to the editing, visualization of data, and gave final approval for publication. Together, their complementary skills and efforts ensured the comprehensive and high-quality nature of this work; all authors approved the final version.

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REFERENCES


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