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Levels of interaction and proximity: Content analysis of video-based classroom cases

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ABSTRACT

This study employed content analysis techniques to examine video-based cases of two websites that exemplify learner-centered pedagogies for pre-service teachers to carry out in their teaching practices. The study focused on interaction types and physical proximity levels between students and teachers observed in the videos. The findings regarding interaction demonstrated that video cases were more focused on teacher-centered interactions than learner-centered interactions. In terms of proximity, the analysis revealed that reciprocal interaction between students and teacher was most likely to happen if their physical distance from each other was the greatest. Findings and directions for future research are discussed in terms of the content of online video-based classroom cases.

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1. Introduction

While Internet technologies continue to proliferate in teacher education, their effective use in enhancing learning for pre-service teachers is open to discussion. Although the online format has the potential to bring about resource based learning in teacher education, its effectiveness particularly for field experiences becomes questionable; observing and participating in actual classroom settings may not be feasible online.

In face-to-face settings, field experience provides opportunities for preparing pre-service teachers to both understand and effectively apply pedagogical concepts in actual teaching situations. By being able to collaborate with in-service teachers and interact with students during field experience, pre-service teachers have opportunities to bridge the gap between their theoretical knowledge and actual classroom implementations.

Nonetheless, the administrative issues of teacher education programs such as difficulty in finding a sufficient number of placements schools that provide the best practices relevant to preservice teachers' content of expertise may hinder pre-service teachers learning through field experience in face-to face-format. Such issues have led teacher education researchers to focus on online alternatives, one of which is to develop online video-based classroom cases that exemplify real classroom implementations (Brush & Saye, 2007; Chaney-Cullen & Duffy, 1998; Hewitt, Pedretti, Bencze, Vaillancourt, & Yoon, 2003; Stirling, Williams, & Padgett, 2004). The existing number of online video-based classroom cases developed to supplement field experiences reflects the increased emphasis on research and development in this emerging area (Inquiry Learning Forum, 2006, Persistent Issues in History Nework, 2006; Schrader et al., 2003; Stirling et al., 2004; Teale, Leu, Labbo, & Kinzer, 2002).

The growing number of online video-based cases, on the other hand, may not necessarily ensure their effectiveness in enhancing pre-service teachers' learning. Although existing research examined pre-service teachers' reflection on the presented cases (Lampert & Ball, 1998; Pape & McIntyre, 1993; Santagata, Zannoni, & Stigler, 2007), the online video case content that illustrates the critical components of teaching has yet to be examined. Without ensuring the video content regarding various components of effective pedagogies exemplified, it would be unrealistic to expect future teachers to make sense of these online resources. The current paper focuses on two such components of the online video case content: interaction and proximity.

First, the learner-centered instruction in education suggests students learn in a collaborative structure (Duffy, Dueber, & Hawley, 1998) where teachers provide them with opportunities to interact with each other. If pre-service teachers are expected to learn and understand such learner-centered approaches from the content of online video-based cases then the videos should actually exemplify various learner-centered interactions to pre-service teachers. Second, good teachers are expected to provide punctual guidance to individual students. This means teachers are likely to wander in the classroom from group-to-group and student-to-student to guide their dynamic learning instead of standing by the board to lecture. Such interactions in classroom consequently entail variable and closer physical proximities between students and teachers. If

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pre-service teachers are expected to observe and understand such flexible physical distances from the content of online video-based cases then the videos should be able to demonstrate such variable proximities.

This study employed content analysis techniques to examine video-based cases of two websites that exemplify social constructivist pedagogies in classroom settings. By adopting existing frameworks from literature, the current study identified the types and the amount of various interactions and physical proximity levels between students and teachers exemplified in the videos. The findings regarding interaction demonstrated that video cases mainly focused on teacher-centered interactions, suggesting that the websites intended to exemplify pedagogical assistance teachers can provide to students and thus, ignored especially learnercentered interactions. In terms of physical distance, the analysis showed that a reciprocal interaction between students and teacher was most likely to happen when their proximity from each other was the greatest. In the end, findings are discussed and future research directions are described regarding the content of online video-based classroom cases.

2. Literature review

2.1. Internet in teacher education

Like in many fields, the rapid development in technology and the growing enthusiasm with using the Internet continue to proliferate the incorporation of Internet technologies in teacher education (King, 2002). By providing "anytime- anywhere" learning opportunities and enabling the delivery and the dynamic creation of variety of video, text, hyperlinks, and audio based content (McCurry, 2002), the consequent hybrid format has the potential to bring about a resource-based as opposed to lecture based learning to future teachers (Egbert & Thomas, 2001).

As pre-service teachers are prepared to be successful professionals who can appropriately apply their understanding of pedagogy and skills to actual classrooms, providing them with both theory and practical teaching experience is critical to their meaningful learning. While such an approach seems vital to their preparation, it also raises the question whether providing online resources can bring their understanding of theories closer to actual applications in teaching context. Particularly, the effectiveness of the online format for field experiences becomes questionable as observing and participating in actual classroom settings, which provide practical experiences to future teachers, may not be feasible online.

2.2. Field experiences

Field experiences in teacher education programs have the potential to enable pre-service teachers to bridge their pedagogical understandings with actual teaching practices (Allsopp, Demarie, Alvarez-Mchatton, & Doone, 2006). Existing research has demonstrated that teacher education programs that incorporated field experience increased pre-service teachers' teaching self efficacy (Ledoux & McHenry, 2004), provided them with more classroom management skills (Watzke, 2003), enhanced their empathy toward students, positively contributed to the content of their subsequent teaching practices (Willard-Holt, 2001), and extend their understanding of teaching profession (Kroll et al., 1990). By observing and getting involved in actual classroom implementations during field experience, pre-service teachers likely acquire various teaching strategies and gain practical experiences that contribute to the preparation of their future career.

Despite their potential in teacher education programs, field experiences bring about serious challenges that may hinder preservice teachers' effective learning and preparation for their future careers. Administrative issues in teacher education programs regarding finding a sufficient number of placement schools that offer quality and relevant teaching practices may hinder pre-service teachers' effective learning and preparation for their future careers (Brush & Saye, 2007; Simpson, 2006). First, it may be financially challenging to contact and persuade sufficient number of schools to serve as host placement schools. Second, it is not always possible to select schools that can provide pedagogical practices that are most relevant to preservice teachers' content area of expertise. This could even become more problematic for many teacher education programs whose students are geographically diverse.

2.3. Online alternative for field experiences

The online format may offer variety of alternatives that have the potential to overcome such issues encountered in providing field experiences face-to-face. Computer mediated communication technologies, for instance, may provide in-service teachers, teacher educators, and pre-service teachers with flexible "anytime-anywhere" opportunities to interact and share teaching experiences and pedagogical understanding with each other (Phillion, Chamness Miller, & Lehman, 2005; Simpson, 2006). Text-based asynchronous CMC technologies can create a virtual space for such interaction and information sharing that can effectively contribute to future teachers' understanding from experts' point of view.

Although textual interactions cannot be a substitute for actual classroom observation, video conferencing system, another CMC technology, may provides an alternative. Video conferencing provide pre-service teachers with the opportunity to view and be exposed to different pedagogies that can be employed in various teaching moments (McDevitt, 1996; Phillion et al., 2005). Nonetheless, technical and logistic problems frequently encountered in real time communication (Phillion et al., 2005) may prevent pre-service teachers from clearly viewing best practices, and consequently, from gaining meaningful insights on effective pedagogies (McDevitt, 1996).

A better online alternative, however, may be video cases. Many researchers suggest the use of online video cases as an effective way to supplement pre-service teachers' observation of actual classroom implementations (Brush & Saye, 2007; Chaney-Cullen & Duffy, 1998, Hewitt et al., 2003; Stirling et al., 2004). The potentials of online video cases to overcome both the technical issues encountered in real timebased technologies and the challenges in providing observable pedagogies make their use more desirable in teacher education. The existing online databases of video based cases focusing on classroom activities in different subject matter (Inquiry Learning Forum, 2006, Persistent Issues in History Network, 2006; Schrader et al., 2003; Stirling et al., 2004; Teale et al., 2002) reflects the growing recognition of the importance of providing pre-service teachers with anytimeanywhere accessible classroom cases.

2.4. Video case studies

Case studies have been incorporated in teacher education as a means to provide pre-service teachers with opportunities to explore and focus on critical issues encountered in real classroom scenarios (McCurry, 2002). In this strategy, pre-service teachers are usually presented cases that illustrate various teaching moments that they later are asked to discuss critically. Although cases can be presented through printed text or video/audio cassettes, the developing technology makes it possible to display them in digital formats that enable higher quality presentation, easier access, and smaller storage of the cases. The proliferating use of Internet technologies made these digital "anytime–anywhere" resources accessible to pre-service teachers. Such growing abundance of online resources, on the other hand, may not necessarily ensure their effectiveness in enhancing preservice teachers' learning. There is existing research examining pre-service teachers' reflection on (Lampert & Ball, 1998; Santagata et al., 2007) and reactions toward (Pape & McIntyre, 1993) the presented cases. Even though such studies may be important to identifying the benefits of presenting cases online, it is equally important to examine the case content regarding what critical components of teaching it illustrates. Without making sure whether video content actually exemplifies the components of effective pedagogies, it would be unrealistic to expect preservice teachers to make sense of the videos. Research that does not address the content validity is not likely to bring valid explanations either. As such, in order to better understand the functions of online video cases in teacher education, there is a need to examine their content regarding the critical pedagogical components they intend to illustrate. The current paper focuses on two such components of online video cases: interaction and proximity.

2.5. Interaction

Interaction is a vital component of one's learning; "mind is located in social interaction settings" (Bonk & Cunningham, 1998, p.34). While interacting, learners can share, articulate, and negotiate views that help them acquire additional perspectives (Driscoll, 2000). This view of learning suggests teachers scaffold students and steer the classroom discourse by providing them with opportunities to interact with each other (Chin, 2006). It also reflects the ongoing strong movement of learner-centered instruction in education where students learn in a collaborative structure (Duffy et al., 1998).

Reigeluth and Moore (1999) categorized various types of interaction that can be observed in general classroom settings: Teacherstudent, student-student, student-information, and student-tool/ environment. If pre-service teachers are expected to make sense of learner-centered approaches and collaborative learning from online video-based cases then they should be provided mainly with video scenes where students interact with each other. While online videobased cases are expected to exemplify more student-student interactions, there has been no empirical research conducted to validate such an important assumption. Thus, the relevant research question and hypothesis to investigate are as follows:

 RQ1. What kinds and levels of interaction for learning are represented in online video-based cases?

H1. Overall, video cases will demonstrate more "student-student interaction" than other types of interaction; learner-center approach favors more student-student interaction.

2.6. Proximity

Teaching and learning is an inherent communication process where teachers and students engage in both verbal and non-verbal relations (Mottet, Richmond, & McCroskey, 2006, p.12). Taking nonverbal aspects of classroom interaction into account and recognizing its possible influence on verbal interaction seems critical to students' effective communication. A meta-analysis, for instance, found that excessive non-verbal behaviors can be distracting and thus reduce the amount and the quality of verbal message communicated (Philpott, 1983).

An important aspect of non-verbal behaviors is the concept of immediacy. Immediacy is referred to as behaviors that enhance physical and psychological closeness between individuals (Mehrabain, 1969). People tend to approach what they like and avoid what they don't like (Miller, 1988). Teacher may also tend to be closer to the students they like (Miller, 1981); by the physical distance teachers maintain in classrooms, they may easily communicate to students the feeling of rejection or acceptance (Miller, 2005). Thus, it is important for them to make cognizant efforts to have variable physical proximities with students in order to foster effective communication in classrooms (Miller, 2005).

Miller (1981) developed a framework that lays out the levels of informal spaces established by middle class American society: Intimate (0 to 1.5 ft), personal (1.5 to 4 ft), social (4 to 12 ft), and public (12 to 25 ft). He argued that most of the interactions between student and teachers in classrooms happen at a "public" level, indicating a large physical distance in teacher–student interaction. In effective instruction, however, teachers assist students' learning and interaction instead of standing by the board to present them the course content only. Such dynamic assistance is likely to entail variable physical proximities between teachers and students, while preventing students from mistakenly getting the feeling of rejection or acceptance. Teachers probably need to move back and forth between groups of students to effectively support their interaction and learning.

If pre-service teachers should be able to observe such variable proximities that support student interaction from the content of online video-based cases then the videos should be able to demonstrate variable physical distances. There are very few research studies that examined physical proximity in educational settings (Anguiano, 2001; Oberman, 2000; Sills-Briegel, 1996). While Oberman (2000) examined the physical proximities among student groups, Sills-Briegel (1996) compared physical proximities in different learning environments (classroom versus lab setting). Anguiano's work (2001), on the other hand, approached proximity from classroom management perspective. Nevertheless, none of these studies addressed the proximity in relation to particular teaching pedagogies such as learner-centered approach, nor did they focus on proximity in online video-based settings. Thus, the second research question and the relevant hypothesis of the current study are posed as follows:

• RQ2. What kinds and levels of physical proximity between teacher and students are evident in online video-based cases?

H2. Overall, there will be a closer proximity between teacher and students in video cases; teachers do not only present information but move closer to students and groups frequently in order to assist their learning effectively.

As teachers may keep different proximities for supporting various types of interactions, it is possible to observe a relation between the two concepts in video-based cases. Thus, the third research question and the hypothesis of the current study are as follows:

• RQ3. What is the relation between proximity and interaction observed in the online video-based cases?

H3. The distance between the teacher and the students will vary depending on interaction type observed.

3. Methodology

3.1. Data

Data were collected from two websites that include video-based classroom cases exemplifying learning-centered pedagogies for K-12. The first website was PIH net (Persistent Issues in History Network, 2006), part of an online teacher professional program that promotes a problem-based learning approach. The video-based resources in PIH net aim at assisting both pre-service and in-service teachers in applying problem-based historical inquiry in their teaching practices. By the time when the current research was conducted, the website had 11 video-based fully developed classroom cases, each of which included around 8 video clips. The second website was ILF (Inquiry Learning Forum, 2006), which contained 50 fully developed video-based classroom cases. ILF promotes inquiry-based learning approach to be applied mainly in mathematics and science. Like in PIH, each video case in ILF contained 8 to 9 video clips.

There were a total of 18 video-based cases from both websites that were included in the analysis (9 from PIH and 9 from ILF). Out of 11 fully developed video-based cases of PIH, only 9 were selected as two cases were unsuitable for the purpose of this study. The first case was dropped because it showed a classroom case where a guest speaker presented

Table 1

Number of classroom cases and video clips for analysis

Websites:	PIH	ILF	TOTAI
# Of vide-based cases:	9	9	18
# Of video clips:	27	27	54

information most of the time. The teacher's role in this case was just to announce the guest speaker. The second case was dropped because it consisted of only one video clip that focused on a particular pedagogical assistance where the teacher was interacting with two students only. Of the 9 selected cases, two were eleventh grade level, three were tenth grade level, two were ninth grade level, one was sixth grade level, and one was fifth grade level.

To have an equal number of cases from each website, 9 video-based cases were randomly sampled from ILF. Of these cases, one was eleventh grade level, one was tenth grade level, three were ninth grade level, one was eight grade level, one was seventh grade level, and one was fifth grade level. Then, from each video-based classroom case, a total of 3 clips (first, middle, and last clips) were selected in order to represent the cases comprehensively. Table 1 shows the total number of video cases and the clips selected from each website for analysis.

3.2. Analysis

In order to identify different types of interaction and physical proximity, this study employed content analysis techniques. Content analysis is a systematic technique that allows for inferring "from a focal text to its social context" (Bauer, 2000, p.133). Content analysis is a methodology in social science to objectively and systematically examine the quantitative description of a given content of communication (Herring, 2004). In the current study, for the concept of interaction, an existing framework (Reigeluth & Moore, 1999) was initially used, which encompasses the general interaction types that are most commonly observed in classroom settings. These included teacher–student, student–student, student–information, and student–tool/environment. However, the preliminary analysis of the current suggested more elaborated additional interaction types. Below is the complete list of interaction types and their brief identifiers resulted from the analysis (See Appendix A for the detailed codebook of interaction).

3.2.1. Interaction types

• Teacher–Class → Presenting: The teacher presents and introduces information to the whole class.

- Teacher–Class → Requesting: The teacher requests, asks, or encourages students to answer questions or provide ideas.
- Teacher–Student \rightarrow Reciprocating: A particular student responds to the teacher's question or asks questions to the teacher.
- Teacher–Group: The teacher interacts with student(s) in individual groups.
- Student-Student: Two or more students are in a conversation.
- Student–Information: Student(s) work on information in the given documents or handouts.
- Student–Tool/Environment: Student(s) use tools such as computer, laptops, or present information on the board in classroom environments.

The unit of analysis was an interaction scene and the unit of context was a video clip within a video classroom case. Interaction, in the study, was defined as discourse between any two or more entities in a classroom setting (e.g., teacher–student or student–information), which was mainly focused within a meaningful interval. A meaningful interval started with an interaction scene and ended when there was a new interaction observed among different entities (e.g., Teacher–Student A interaction finished when Teacher–Student B interaction started).

In order to identify the levels of physical proximity between teacher and students, another framework was used (Miller, 1981) that lays out the levels of informal spaces established by middle class American society (See Appendix B for the detailed codebook of proximity):

3.2.2. Proximity levels-informal spaces

- Intimate (0 to 1.5 ft=0 m to 0.5 m)
- Personal (1.5 to 4 ft=0.5 m to 1.5 m)
- Social (4 to 12 ft=1.5 m to 3.5 m)
- Public (12 to 25 ft=3.5 m to 7.5 m)

The unit of analysis was again a scene in a video clip for analyzing proximity. However, only the scenes that exemplified either (1) teacher–student \rightarrow reciprocating or (2) teacher–group interactions were considered for analysis. It was not possible to determine the proximity between the teacher and a student in other interaction scenes where the teacher actually presented information to everybody in the class but did not necessarily interact with a particular student.

Regarding the inter-coder reliability for both interaction and proximity, the researcher and a doctoral student in education field coded a sample of data. As part of coder training session, the researcher explained the categories and their identifiers to the doctoral student and then showed examples of video cases. He also clarified the questions



Fig. 1. Amount and types of interaction.



Fig. 2. Interaction by video clip order.

that the doctoral student had regarding the categories. After a 30 minlong session, the doctoral student and the researcher individually coded randomly selected 64 interaction scenes on computers, which constituted around 10% of the all interaction scenes (N=599) identified in all of the video-based cases. The inter-coder reliability for the concept of interaction was acceptable (Cohen kappa (N=64)=.84, p<.001). Out of 64 interaction scenes, only 22 were qualified for proximity measure, which also comprised around 10% of the all proximity data (N=217) (interaction scenes of both teacher–student \rightarrow reciprocating and teacher–group). The coders reached a very high reliability score for proximity level (Cohen kappa (N=22)=.93, p<.001)

4. Results

4.1. RQ1. What kinds and levels of interaction for learning are represented in the online video-based cases?

The analysis revealed a total of 599 interaction scenes identified in the video cases, which were classified into seven interaction categories (See Fig. 1). Of all the interaction scenes, Teacher–Student \rightarrow Reciprocating was most commonly observed (36%, *N*=216), which was followed by Teacher–Class \rightarrow Requesting (32%, *N*=194), and Teacher–Class \rightarrow Presenting (20%, *N*=121). Very few interaction scenes were identified as Teacher–Group (5%, *N*=28), Student–Student (3%, *N*=17), Student–Tool_environment (2%, *N*=13), and Student–Information (1%, *N*=10) respectively. The first research hypothesis that predicted high level of student–student interaction in video cases, thus, was not supported.

Fig. 2 above shows the amount of interaction types by the chronological order of the clips within video cases.

As seen in the figure above, the final clips presented the highest number of interaction scenes (N=273) whereas the first clips contained 226 and the middle clip had only 100 scenes. Regarding the types of interaction, the first and the final clips showed a similar pattern; the reciprocal type of interaction between teacher and students was most commonly observed, which was followed by those interaction scenes that exemplified the teacher requesting responses from and presenting information to the class respectively.



Fig. 3. Interaction by websites.



Any other interaction type, constituted less than 5% of the all scenes in these clips. The middle clips, however, contained the highest proportion of Teacher–Group interaction scenes (16%), compared to the first and the final clips.

Between the two websites, there was a difference observed in terms of types and frequency of interaction (See Fig. 3).

In general, ILF exemplified higher number of interaction scenes (N=351) than PIH (N=248), though both of the sites included very few student–student interaction scenes. ILF included more student–information (N=10) and teacher–group (N=25) interaction types than PIH, which had only 3 teacher–group interaction scenes and no scenes of student–information interaction. On the other hand, PIH exemplified approximately the same student–student (N=9) interaction as ILF (N=8).

4.2. RQ.2 What kinds and levels of physical proximity between teacher and students were observed in the online video-based cases?

The results demonstrated a total of 217 interaction scenes for which the proximity could be measured; these were the scenes that exemplified either (1) Teacher–Student \rightarrow Reciprocating or (2) Teacher–Group interactions. Approximately in half of these scenes, the physical distance between the teacher and students was observed as a "Public" level (12 to 25 ft) (41%, N=89), which was followed by "Intimate" (0 to 1.5 ft) (23%, N=49), "Personal" (1.5 to 4 ft) (20%, N=44), and "Social" (4 to 12 ft) (16%, N=35) proximity levels (see Fig. 4).

The second research hypothesis that predicts frequently observed closer proximity between student and teachers was partially supported; the total number of interaction scenes that show "Intimate" and



Fig. 5. Proximity by video clip order.

"Personal" levels of proximity (N=93) is slightly higher than the number of clips that exemplified "Public" level of proximity (N=89).

Fig. 5 below shows the proximity levels observed in the video clips. While most of the interaction scenes in the first (44%, N=36) and the final clips (45%, N=44) showed a "Public" proximity level, the middle clips included mainly scenes of a very close proximity, "Intimate" (55%, N=21). Regarding the websites, the video clips in ILF demonstrated closer proximity than those in PIH (see Fig. 6). While more than a half of the interaction scenes in PIH (56%, N=49) exemplified a greater distance (Public), only one third of the scenes in ILF (31%, N=40) showed "Public" level proximity. On the other hand, another one third of the scenes in ILF (33%, N=43) presented a very close proximity level, "Intimate" between students and the teacher.

4.3. RQ3. What is the relation between proximity and interaction observed in the online video-based cases?

Analysis results indicated a pattern among the types of interaction in relation to the proximity level observed between teacher and students. Overall, the greater the distance between the teacher and students, the more often reciprocal teacher–student interaction was observed (See Fig. 7). The highest number of reciprocal interaction between teachers and students was observed when the distance was the greatest (Public). It was also found that most of the Teacher–Group interaction occurred at the closest level of proximity, "Intimate" (79%, N=22).

5. Discussion

The main purpose of the current study was to examine the types of classroom interaction and proximity levels between student and teachers observed in the online video-based classroom cases. Regarding the concept of interaction, the current study revealed three new interaction types between students and the teacher, which were not addressed in the interaction framework (Reigeluth & Moore, 1999) that was initially used; Teacher–Class \rightarrow Presenting, Teacher–Class \rightarrow Requesting, and Teacher–Student \rightarrow Reciprocating. The most frequently observed interaction type, the Teacher–Class \rightarrow Requesting, indicated the great emphasis placed upon the importance of encouraging students' articulation in the video-based classroom cases. The video clips that contained scenes of teachers requesting or asking students to answer questions or to provide ideas actually reflected the pedagogies for encouraging students' thinking. These most frequently observed clips provided pre-service teachers with examples of how to encourage students' thinking and learning in constructivist settings.

Unlike hypothesized at the beginning of the study, however, there were very few instances of student-student interactions in the videos. Video-based classroom cases that lacked student-to-student interaction may seem to contradict with the learner-centered pedagogy, which promotes social interactions of students in collaborative framework.



Fig. 6. Proximity by websites.



Fig. 7. Interaction by proximity.

Nonetheless, such scarcity of student-student interaction in the video cases may not necessarily indicate less learner-centered approach.

First, not all of the student–student interaction scenes actually occurring in the classroom cases can be viewed in the videos. During Teacher–Group interaction, for instance, video cases were just focused on the interaction between the teacher and a particular group. This means that students in other groups might also be interacting with one another, even though they were not seen in the videos. By compiling the frequencies of Teacher–Group and Student–Student interaction types, a higher number of "student–student" interaction would be assumed; in Fig. 2, around a quarter of the interaction scenes in the middle clips (21%, N=21) actually presented Teacher–Group and Student–Student interaction observed in the first and the final clips may just indicate an overall pedagogy flow in classrooms; teachers introducing topics in the first and summarizing the ideas in the final clips.

Second, the websites of video cases may have intentionally focused on types of pedagogies and assistance that teachers can provide to students in learner-centered settings. Thus, the video recording could be biased toward exemplifying more teacher–student based interactions although student–student interactions might be still occurring at "the back stage." For instance, a video case clip from PIH contained only one type of interaction: Teacher–Student \rightarrow Reciprocating, between the teacher and a particular student. The whole clip was focused on the teacher assisting his students in understanding a historical concept, not showing other possible interaction types that might be occurring at the same time in the classroom setting.

In terms of proximity level, the video cases exemplified a reasonable amount of interaction scenes in which a very close distance between students and the teacher was observed. In almost half of the scenes for proximity measure, teacher kept an "Intimate" or a "Personal" level of distance between students and themselves. Thus, the second research hypothesis that predicted a closer proximity between teacher and students was moderately supported. As expected, this finding suggested that teachers in the videos were not represented as just information providers standing by the board but as guides that assisted students' interaction and learning at a closer distance.

The finding also indicated that more than a half (55%) of the teacher– student interaction scenes in the middle clips occurred at an "Intimate" level of proximity. This is probably due to the highest proportion of Teacher–Group interaction (16%), which was also observed in the middle clips. The finding across the two websites showed the same pattern; the ILF exemplified higher number of closer proximity (Intimate) than PIH while it also had higher number of Teacher–Group interaction scenes than PIH. These findings, in fact, are not surprising as teachers might need to keep closer distance with their students when directing and assisting them in individual groups at different locations of the classroom.

On the other hand, the relation between proximity level and Teacher–Class \rightarrow Reciprocating interaction type showed an interesting result; the highest number of reciprocal interaction between the teacher and students was observed when the distance was the greatest. This finding looks peculiar as literature points out the opposite; students whose teachers maintain distant proximity with them may be communicated the feeling of rejection (Miller, 1981), and thus, may less likely to interact with their teachers.

A possible explanation could be that although students who are farther from teachers may have less immediacy with them, they might still feel more comfortable to speak to and interact with their teachers. Students could feel intimated as teachers got closer to them, and thus might hesitate to participate verbally in the class. Another reason may be that the presence of video cameras in classrooms might intimidate students. Those closer to the teacher may have had the impression that they would likely to be videotaped as the cameras would be focusing on the teacher most of the time; the farther from the teacher and the camera, the less worried the student may have been to speak.

6. Conclusion and implications

This study employed content analysis techniques to examine video-based cases of two websites that exemplify learner-centered pedagogies in classroom settings. It was focused on interactions and physical proximity levels between students and teachers. The findings regarding interaction demonstrated that video cases more focused on teacher-centered interactions, suggesting that the websites intended to exemplify pedagogical helps teachers should provide to students and thus, ignored especially learner-centered interactions. As preservice teachers view the classroom through the camera angles, not being able to observe these "back-stage" interactions, however, may lead to misunderstandings regarding learner-centered pedagogies. Pre-service teachers may take away a more teacher-centered

approach than a learner-centered one as they are provided more with such examples in videos. Thus, it is essential from a video case development point of view to provide more comprehensive scenes that contain student-student interaction types as well. Another practical implication related to the concept of interaction is the use of a more comprehensive framework for examining classroom interaction. The final framework developed in this study does not only provide more categories but also defines the nature of different interaction types in classroom settings. With its extended categories and elaborated definitions, thus, the framework has the potential to be easily adopted in future research that examines classroom interactions in online and face-to-face settings.

In terms of proximity, the findings revealed that teachers kept a closer distance between students in almost half of the time. However, the further analysis showed that a reciprocal interaction between students and teacher was most likely to happen if their proximity from each other was the greatest. The possibility of students being intimidated by closer proximity of their teachers or the presence of the video cameras in this regard may suggest two practical implications. First, teachers may need to have better caring and sensitive relations with their students and be aware that their proximity can interfere with the students' participation. Second, projects that produce online video-based classroom should be more careful in video recording process. They should take into account the fact that students could be intimidated by their presence in classrooms.

Appendix A. Codebook for interaction

Collaboration and formal interactions with teachers and students prior to actual video recording may alleviate such possible problems.

7. Future studies

As this study focused on only two websites, the findings may be specific to their video cases only. A larger sample of online video-based classroom cases may be of interest to examine for broader explanations. This will make it possible to statistically compare cases at different grade levels. Also, instead of focusing on three video clips of each video case, prospective analyses should include the full video data to provide more comprehensive view for each classroom case. Lastly, in addition to the concepts of interaction and proximity, future research should also focus on pedagogies such as different types of assistance teachers provide to students. As it is very important for pre-service teachers to understand when and how to assist students learning and interaction in learner centered instructional settings, such research will also contribute to validating the content of online video-based classroom cases.

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Interactions for Learning

Explanation: Interaction is a mainly a verbal discourse between any two or more entities in a classroom setting which is the focus of the clip within a meaningful interval. A meaningful interval starts with an interaction at a time and ends when there is a new interaction observed among different entities (e.g. Teacher-Student A interaction finishes when Teacher –Student B starts). **Instruction**: Identify and count the type of interaction within a meaningful interval scene. For each identified interaction, assign a value (from 1 to 7) based on the categories below:

(1) Teacher-Class→ Presenting

It starts with the teacher presenting information by introducing, explaining, providing, or showing topics, ideas, resources, and etc. Student(s) listen to the teacher. It goes until the teacher starts requesting or questioning students or students request verbal response from the teacher.

(2) Teacher-Class→ Requesting

It starts with teacher requesting, asking, or encouraging **any students** to answer a question, provide ideas for a topic, or start doing a task in the class. It goes on until student responds (verbally/in action), teacher interacts with another student, or teacher starts "presenting".

(3) Teacher-Student→ Reciprocating

-It starts with student responding (verbally or in action) to teacher's question/request. It goes on until teacher interacts with another student or starts "presenting.

-It starts with a particular student requesting verbal response from teacher and teacher responding to the questions posed. It goes until teacher interacts with another student or starts "presenting".

-It starts with the teacher giving permission to a student to speak.

-It starts with the teacher and a particular student being in a conversation. Reciprocation between students and teacher can also happen while students are working with

computers or presenting on the board.

(4) Teacher-Group

Teacher interacts (request /question) with any students in individual groups that are working separately from other groups. This is not the only interaction going on at the same time. Students in other groups may be interacting during this period but the focus of the camera is only this interaction. It goes until teacher interacts with another student outside of the group.

(5) Student-Student

It starts with two or more students working together. Students are in a conversation. It starts with a student is asking a question to another one. It goes until a different interaction is observed.

(6) Student-Information

It starts with student(s) are working individually or as a group reading a given handout/ or a document. There is no conversation between students.

(7) Student-Tool/Environment

-Students(s) are working on computers -Student(s) are presenting on the board

Appendix B- Codebook for proximity



(1) Intimate

If teacher happens to stretch her arms, she can have a physical contact with students

(2) Personal Teacher and student interaction occurs in 1.5 to 4-foot zone (0.5 meter to 1.5 meter).

(3) Social

Teacher and student interaction occurs in 4 to 12-foot zone (1.5 meter to 3.5 meter)

(4) Public

Teacher and student interaction occurs in 12 to 25 feet zone (3.5 meter to 7.5 meter)

Illustrations



* For "public", student and teacher may not be seen in the same scene.

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