Purposeful Interpersonal Interaction in Online Learning: What is it and How is it Measured?

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Abstract
Despite extensive studies surrounding the topic of interaction in online learning, faculty are often still relegated to an attempt at replicating their face-to-face course interactions in the online environment. Interpersonal interaction is a necessary yet nebulous concept in online learning. This paper attempts to build a quality lens to view interpersonal interaction in online learning through, called purposeful interpersonal interaction (PII) by exploring types of interpersonal interaction demonstrated in the literature to lead to better student outcomes. PII encompasses three main types of interaction: purposeful interpersonal instructional interaction, purposeful social interaction, and supportive interaction. These interaction types have been associated with important student outcomes like perceived learning, satisfaction, and academic achievement. Robyler and Wiencke's (2003) rubric for assessing interactive qualities of distance courses (RAIQDC) includes many of the concepts identified as important to PII and has been established as a valid and reliable tool for assessing the amount of quality interpersonal interaction that occurs in an online course.

Keywords: online learning, interaction, instructional design, online pedagogy

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Interaction has long been a popular topic of research in online learning. Since the beginning of cyber education, many have been skeptical of its potential to devolve into an electronic form of correspondence education, lacking sufficient interaction between faculty and students. Moore's (1989) seminal work on interaction in online learning identified how interpersonal interaction can decrease transactional distance and thus provide a more robust educational experience for the learner. Moore's three types of interaction included student-content interaction, student-student interaction, and student-faculty interaction. Interpersonal interaction includes both student-student and student-faculty interaction (York & Richardson, 2012) and is generally accepted as a critical element for all educational settings.

The use of social constructivist (Vygotsky, 1997) based online course designs has been leveraged in order to promote greater interpersonal interaction. Educators often seek to replicate the dialogue that is easily achievable in their face-to-face courses in the online setting by utilizing discussion boards and similar technologies. Despite this quest for sufficient interpersonal interaction, educators still lack consensus on which interpersonal interaction strategies best promote effective student learning and satisfaction. Often, faculty are pressured to increase the quality of their online courses but are not aware of strategies to encourage students to interact (Paquette, 2016). In other cases, faculty have been teaching in the face-to-face environment for years and are being asked to convert their courses into the online format without pedagogical and technical support (Lane, 2009).

Additionally, many of the studies on interaction in the online environment do not consider the qualitative aspects of interaction and instead only measure the number of interactions, which typically occurs through methods like counting discussion board posts or course updates.

This lack of clarity of what types of interpersonal interaction are most effective warrants exploration into the types of interpersonal interaction that have been demonstrated to lead to better student outcomes. A comprehensive review of the pertinent literature related to interpersonal interaction in online learning as it relates to important student outcomes follows. This review allows for a qualitative view of interpersonal interaction, called Purposeful Interpersonal Interaction (PII). Lastly, recommendations for evaluating existing courses for PII using an established rubric are given.

Review of Related Literature

Interpersonal Interaction is Beneficial

Since interaction in online learning has been extensively studied in the last few decades, studies demonstrating the positive benefits of interpersonal interaction are plentiful. Interpersonal interaction in online environments has been associated with increased perceived learning (Richardson & Swan, 2003; Sher, 2009; Swan, 2002), higher levels of student satisfaction with the course (Cole, Shelley, & Swartz, 2014; Fedynich, Bradley, & Bradley, 2015; Khalid & Quick, 2016; Richardson & Swan, 2003; Sher, 2009; Swan, 2002), higher levels of faculty satisfaction with the course (Su et al., 2005), and improved student academic achievement (Long et al., 2011).

Open-ended responses in Sher's (2009) study determined that students valued opportunities to interact meaningfully with their faculty and their peers. Berge (1999) elaborates on the reason behind the benefits of interpersonal interaction: "When students have the opportunity to interact with one another and their instructors about the content, they have the opportunity to build within themselves, and to communicate, a shared meaning to 'make sense' of what they are learning" (p. 8). In a study conducted by Northrup, Lee, and Burgess (2002) that investigated the interactions students perceived to be important in online environments using the online learning interaction inventory (OLLI), students strongly expressed that prompt feedback from faculty and their peers was essential. Clearly, learners value interpersonal interaction opportunities and feel they are important to their successful outcomes in online courses.

Chickering and Gamson's (1987) widely cited Seven Principles for Good Practice in Undergraduate Education was designed to improve undergraduate education and endorse concepts that incorporate the different types of interaction. Four of Chickering and Gamson's principles

correspond to the critical student-faculty interpersonal interaction types in the online environment: (a) "Encourages contact between students and faculty," (b) "Develops reciprocity and cooperation among students, (c) "Gives prompt feedback," and (d) "Communicates high expectations" (p. 2).

Lack of Interpersonal Interaction

Not only have studies shown the interpersonal interaction generally leads to better outcomes, but they have shown that a lack of interpersonal can be detrimental. A three-year study by Cole, Shelley, and Swartz (2014) that examined graduate and undergraduate student satisfaction with online instruction at a university discovered lack of interaction with faculty and with classmates as the main source of student dissatisfaction. This is supported in a study of higher education students in Kenya conducted by Muuro, Wagacha, Oboko, and Kihoro (2014), who identified lack of feedback from faculty and lack of feedback from peers as major perceived challenges by the students. From students' perspectives, interpersonal interaction can not only lead to a more satisfying online course, but a lack of appropriate levels of interpersonal interaction has a negative perceived impact on the learner. Faculty and students alike see value in interpersonal interaction, yet both are frustrated with the barriers to achieving sufficient levels of this type of interaction in online environments.

Point of Diminishing Returns

Although interpersonal interaction has generally been demonstrated to lead to better student outcomes, more interaction may not always be better. Castano-Munoz, Sancho-Vinuesa, and Duart (2013) found evidence of a point of diminishing returns on academic achievement as a result of interpersonal interaction that existed in the online environment but did not exist in the face-to-face environment. This may be due to students becoming overwhelmed with the interactions, whether written or otherwise, in the online environment. Picciano (2002) mentions an example where students must monitor comments in an online discussion, and states that the nature of these comments makes monitoring them more extensive than discussions in face-to-face settings, which may lead to information overload. Northrup, Lee, and Burgess (2002) support this idea by stating that there seems to be an ideal range of appropriate interaction with an upper and lower limit. In Northrup, Lee, and Burgess' (2002) study, some participants reported being frustrated with an overwhelming amount of interactive assignments within a weekly module. Downing, Lam, Kwong, Downing, and Chan (2007) recommend that interaction in online environments be sustained only as long as there is an educational benefit in doing so. Based on the results of their study, the group theorized that students may disengage from interaction once they have the information they need to complete tasks. These studies give some evidence that increasing interpersonal interaction beyond a saturation point may not only not add any benefit to students but may actually be detrimental to their educational experience.

What is Purposeful Interaction?

One technique for promoting engaging learning activities is to provide opportunities for students to interact with one another and with faculty purposefully. Garrison and Cleveland-Innes (2005) give support that the quality of interaction, not the quantity, is important to fostering deep learning, stating that high levels of interaction do not necessarily facilitate meaningful learning. According to Garrison and Cleveland-Innes, "There must be a qualitative dimension characterized by interaction that takes the form of purposeful and systematic discourse" (p. 135) and "simple interaction, absent of structure and leadership, is not enough. We need to have a qualitatively richer view of interaction" (p. 145).

There is little research specifically referring to purposeful interaction in online environments. In one instance, Abrami et al. (2011) mention purposeful interaction: "Guided, focused, and purposeful interaction goes beyond whether opportunities exist to consider especially why and how interaction occurs" (p. 88). This statement again speaks to the qualitative component of interaction over simply measuring the volume of interaction.

Unfortunately, not all instances of interpersonal interaction in any learning environment directly impact or facilitate intellectual growth. In a face-to-face setting, interactions can be off-topic, redundant, or even distracting for students. In a similar way, interactions in the online environment (e.g., an "I agree" response to a discussion post) may not always be purposeful, valuable, or contributory to student learning. Conversely, not all interactions that do not directly relate to course content or learning objectives are without purpose and/or student benefit. For example, a case where students form social bonds with faculty or their fellow students can be a purposeful interaction. Research has shown that social presence can be an important characteristic in learning (Gilbert & Moore, 1998; Richardson & Swan, 2003; Tu & McIsaac, 2002; Pacquette, 2016). Abrami et al. (2011) believe the next generation of online education should be designed to facilitate more purposeful interaction by promoting targeted, intentional, and engaging interactions. In order for online interaction to fulfill its objectives and advance the learning process, interaction opportunities should be designed in a way that allow students to interact with content, faculty, and other students in a manner that is not fake or forced but meaningful and purposeful.

Purposeful Interpersonal Interaction

Purposeful interpersonal interaction (PII) is any high quality, organic, and valid communication exchange between two or more participants of the learning process that directly relates to the achievement of established learning outcomes or to the building of social relationships. As shown in Section 2, a seemingly endless number of studies have attempted to look at interpersonal interaction from a quantity perspective. Fewer studies have examined the quality of interpersonal interaction in OL and even fewer studies have examined interaction through the lens of measuring the amount of quality interpersonal interaction, defined here as PII.

Quality Interaction

An important aspect of PII is quality. Berge (1999) argues that just because interaction opportunities may increase in quantity, this does not automatically lead to increased quality of interaction in the course. Clearly, not all interactions in online learning are created equal; interactions may have differing levels of value to learners. Although interactions in the online environment can be easily structured by utilizing the robust features of many of today's widely used learning management systems (LMS), it is vital that many of these interactions are purposeful. According to Woo & Reeves (2007), an interaction is viewed as meaningful when it has a direct influence on intellectual growth for the student.

Social and instructional interactions among students and between student and faculty are common elements of a face-to-face classroom (Picciano, 2002). According to Picciano (2002), "The ability to ask a question, to share an opinion with a fellow student, or to disagree with the point of view in a reading assignment are all fundamental learning activities" (p. 1). In the face-to-face classroom, many interactions among students and between students and faculty occur spontaneously and organically (Hirumi, 2002), and the interactions help advance the learning process. Face-to-face learning provides many opportunities for informal learning where an interaction is not planned, but class discussions, reflections, debates, or group projects lead to the

stimulation of learning. This process is allowed to happen organically, as faculty member may notice verbal and nonverbal cues from students and feel the need to elaborate on a topic, for example (Hirumi, 2002). In the online environment, this informal learning and the ability to adapt in real-time to fill the gap in understanding may be decreased if students are not given the opportunity and appropriate tools to interact with their peers and faculty. For that reason, quality instructional and social interaction opportunities in online environments need to be deliberately designed into the course (Berge 1999; Bernard et al., 2009; Hirumi, 2002; Northrup, Lee, & Burgess, 2002).

Robyler and Wiencke (2003) highlight the importance of structuring these opportunities, stating, "Highly interactive learning environments are rarely serendipitous; activities must be designed to encourage, support, and even require interaction" (p. 87). The success of online courses often directly relates to the quantity and quality of these interactions (Picciano, 2002). These types of interactions in the online environment must occur in a purposeful way if learning is to effectively occur. According to Martin, Parker, and Deale (2012), "Effectively designed courses should impact students in such a way that there is an increased and spontaneous use of opportunities for interaction within the course" (p. 231).

Three Components of PII

PII can be broken into three main categories: instructional interaction, social interaction, and support interaction, as displayed in Figure 1. The first two types of interaction that make up PII directly relate to two types of interaction theorized by Gilbert and Moore (1998) to categorize interaction. The two categories identified are content interaction and social interaction. Gilbert and Moore (1998) state that many skeptics of online learning are concerned mostly with a lack of ability to foster two categories of interaction that are routinely found in face-to-face instruction: social activity and instructional activity. Courses with high levels of quality interaction will have components of content and social interaction designed in them (Northrup, 2002). When referring to content interaction in this context, it is not meant to be confused with Moore's (1989) student-content interaction, but rather it refers to interpersonal interaction that focuses on the content (relevant topics) of the course. These two categories seem to mirror two important categories of interaction that Berge (1999) identifies as task/content interaction and social interaction, and two categories of interaction Gilbert and Moore (1998) describe as social instructional interactivity and social interactivity. As a component of PII, the term instructional interaction will be used in place of content interaction or task interaction to avoid confusion. The third and final category of PII deals with providing online learners with appropriate support. Therefore, the three types of PII are instructional interaction (PIII), purposeful social interaction (PSI), and supportive interaction (SI).

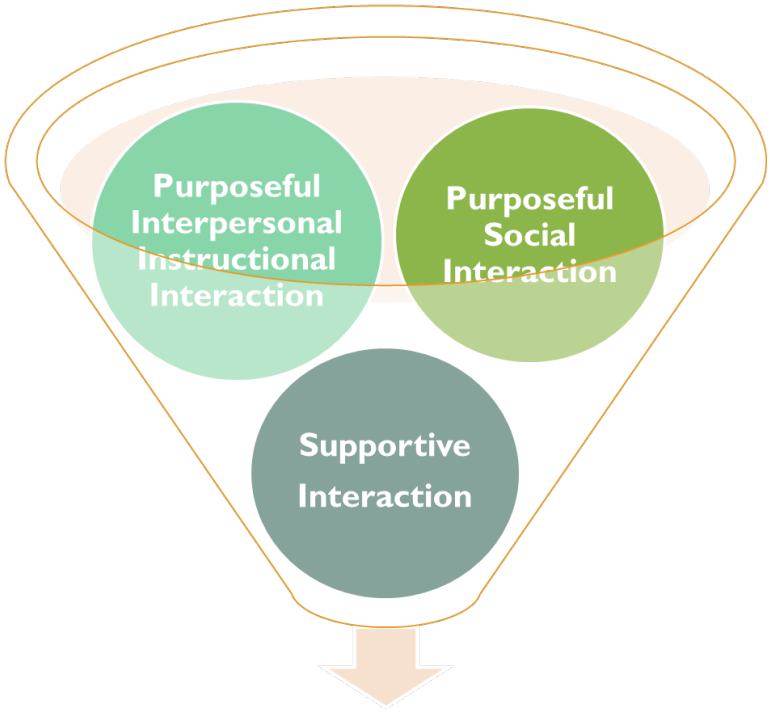

Figure 1. Three components of purposeful interpersonal interaction in online learning.

Purposeful Interpersonal Instructional Interaction (PIII)

A major part of all educational ventures are interactions directly associated with the instructional content of the course. Northrup (2002) states that "Content interaction is always directed at attaining the specific learning outcomes or goal of the instruction" (p. 220). In this sense, PIII is any interaction between participants in the learning process that directly relate to completing learning objectives. Although admittedly a very broad category at surface, this interaction category omits any instances of extraneous (nonpurposeful) interaction. Woo and Reeves (2008) explain that when students post to a discussion board simply to meet assignment requirements, it is not likely to lead to meaningful learning. This is an example of extraneous interaction that would not reflect a purposeful approach, especially in the event that the posting does not relate in any direct way to course objectives. A student posting an "I agree" or "me too" type of response in a discussion board would not be considered a PIII. Berge (1999) lists some examples of interpersonal interaction that faculty might employ:

- disseminating information not readily available from texts or workbooks in appropriately-sized pieces according to a teacher-determined structure;
- arousing or heightening student interest;
- reviewing previously learned skills and knowledge; and
- giving feedback and corrective guidance. (p. 7–8)

All of the items on Berge's list are consistent with PIII. These faculty interactions can be utilized as a strategy to increase instructor presence in online courses. Dennen, Darabi, and Smith (2007) state:

> Perceptions of instructor presence are based on learners' psychological reactions to an online instructor's actions in both public (whole class) and private correspondence. Further, presence is not only confined to the amount of instructor-learner interaction, but also to the content of those interactions. (p. 67)

Clearly, the items on Berge's list would all be interpersonal interaction occurrences that could be classified as leading to enhanced instructor presence in the online environment.

Timely feedback. The last item on Berge's list for instructional interactions, giving feedback and corrective guidance, has also been identified as an essential component of any learning environment (Berge, 1999; Hirumi, 2005; Lewis & Abdul-Hamid, 2006; Woo & Reeves, 2008). Students perceiving that they have access to faculty and receive timely, valuable feedback from faculty is essential to their educational experience (Croxton, 2014). According to Kranzow (2013), "When students receive feedback promptly, they can either have reassurance that they understand the content sufficiently, or conversely, students can request assistance to guide them in the right direction" (p. 132). Students are often frustrated when they do not receive timely feedback (Woo & Reeves, 2008), so it is essential for faculty to "close the loop" on student work in a timely manner by providing students with a grading rationale, confirmation, and corrective feedback. Dennen et al. (2007) found that learners find receiving timely feedback is more important than receiving extensive feedback.

Northrup (2002) also demonstrated that students rate regular feedback from faculty as important. Although feedback can occur in both nonverbal and verbal ways in the face-to-face environment, it is arguably even more important in the online environment as it can be imperative to student satisfaction and performance (Dennen et al., 2007; Northrup, Lee, & Burgess, 2002; Thurmond, Wambach, Connors, & Frey, 2002; Vrasidas & McIsaac, 1999). Two major types of feedback, corrective feedback and confirmatory feedback, are differentiated in the literature. Corrective feedback allows students to make improvements to their work as faculty stress key areas for improvement and confirmatory feedback allows students to gain approval from faculty that their work is correct (Hirumi, 2005). Studies have demonstrated that feedback can improve course satisfaction as well as academic performance in the online environment (Espasa & Meneses, 2009).

Feedback is also not limited to faculty, as other students can be a source of feedback as well. As stated previously, lack of feedback from faculty and from peers is a major perceived challenge for online students (Muuro et al., 2014). Tu and Corry (2003) state, "when students are allowed and encouraged to obtain support from peers, assignments become social exercises while maintaining original objectives. This may enhance assignment performance and will permit the addition of peer evaluation activities" (p. 55).

The timeliness of feedback is a vital characteristic of PII in the online environment. Faculty must ensure that learners are receiving prompt corrective and confirmatory feedback in order to allow them to progress through the learning process and achieve key course goals. Without feedback, students cannot identify their errors or gain understanding of what they are doing well, and in that regard, feedback is important for students to identify their weaknesses and recognize their strengths.

Collaborative learning. Today's modern LMS features enable learners to collaborate in the online environment in better ways than ever before. Group assignments and projects are common in many online courses, as online instructors recognize that collaborative learning is

important to cognitive development (Garrison et al., 2000). Graduate students especially can benefit from collaborative learning through the completion of authentic learning tasks and projects that will prepare them for similar assignments they will encounter in their professional lives.

In writing about the conceptual approach to collaboration, Krejins, Kirschner, and Jochems (2003) summarize the set of conditions that enhance collaboration:

- Positive interdependence: team members are linked to each other in such a way that each team member cannot succeed unless the others succeed and/or that each member's work benefits the others (and vice versa).
- Promotive interaction: individuals encourage and help each other's efforts so as to in order to reach the group's goals.
- Individual accountability: all group members are held accountable for doing their share of the work and for mastery of all of the material to be learned.
- Interpersonal and small-group skills: specific skills are needed when learners are learning within a group; students who have not been taught how to work effectively with others cannot be expected to do so must be developed.
- Group processing: the group determines which behaviors should continue or change for maximizing success based upon reflection of how the group has performed so far. (p. 339)

Kreijns, Kirschner, and Jochems (2003) state that ensuring these conditions exist for collaborative learning promotes the positive benefits of this type of learning while also reducing negative aspects of collaborative learning (e.g., social loafing, free-riders, and the "sucker" effect). In this respect, creating these conditions in collaborative learning can be viewed as PIII. The key to unlocking quality collaborative learning that enables students to achieve specific learning objectives in online environments while interacting as a group is social interaction (Kreijns, Kirschner, & Jochems, 2003); this is the bridge to the next category of purposeful interpersonal interaction.

Purposeful Social Interaction (PSI)

Purposeful social interaction (PSI) is the second main component of PII. According to Powell and Kaline (2009), "Vygotsky would say that social interaction and culturally organized activities are necessary in the classroom for proper psychological development" (p. 246). Although social interaction often may not deal directly with the instructional goals of the course, this sort of interaction can help shape the learning environment (Gilbert & Moore, 1998). Muilenburg and Berge (2005) found lack of social interaction as the most significant barrier to online learning perceived by students. Administrative/faculty issues was the second most reported barrier, which incorporates student-faculty interaction instances. Tu & McIsaac (2002) found that social presence positively impacts online interaction and recommend that faculty promote informal relationships to achieve greater interactivity in their courses. In a study conducted by Jung, Choi, Lim, and Leem (2002), the group receiving high levels of social interaction had higher levels of learning and greater participation than groups receiving only academic forms of interaction. Finally, in a study of 97 students enrolled in online courses, Richardson and Swan (2003) found that students reporting high levels of social presence also had high levels of perceived learning and satisfaction.

In light of this research, it is recognized that social interactions that are in some ways separate from the learning outcomes of the course are purposeful as well. Berge (1999) supports

this sentiment by stating, "Much of learning inevitability takes place within a social context, and the process includes the mutual construction of understanding" (p. 8).

An important consideration of PSI is the concept of social presence. Garrison et al. (2000) describe social presence as the ability of participants of the online environment to come across to others as real people and state that its primary importance is to indirectly facilitate the process of critical thinking and support cognitive presence. Garrison (2009) later updates this definition to include the ability of participants to "communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities" (p. 352). Social presence is defined by Tu and McIsaac (2002) as "the degree of feeling, perception, and reaction of being connected by CMC to another intellectual entity" (p. 140). These definitions demonstrate that social presence is understood as a perception that directly results from interpersonal interaction and has influence on the learning process.

Social presence among participants in the learning process is often viewed as a prerequisite that must be established in order for instructional interaction and purposeful learning to occur (Garrison et al., 2000; Garrison & Cleveland-Innes, 2005; Tu, 2000; Woods & Baker, 2004). This precondition allows learners to create relationships and recognize the course as a safe setting where purposeful interpersonal interaction can occur.

Social presence is not always measured by the amount of social interaction that takes place in the online environment or improved by additional social interaction. For example, in Tu's (2000) study, social presence decreased when a group member participated too much or dominated the conversation. In a different study, Tu and McIsaac (2002) found that social presence positively impacts interaction, yet a high amount of participation does not necessarily equal a high level of social presence.

Northrup (2002) distinguishes social interaction from content (instructional) interaction by stating, "Social interaction, on the other hand, provides opportunities for peers to connect in non-task specific conversation" (p. 220). A key difference between instructional and social interaction is that social interaction is more flexible and mutual than instructional interaction (Gilbert and Moore, 1998). Gilbert and Moore (1998) confirm that social interaction can improve instructional interaction: "Social interaction between students and teachers and between students and students can sometimes have little to do with instructional learning, but can still help to create a positive (or negative) learning environment…" (p. 30). Social interaction can have real, measurable impacts on student outcomes in the online environment. Quality and intensity of social interaction has been associated with increased academic achievement (Kozuh et al., 2015).

Tu and McIsaac (2002) elaborate on how social interaction relates to overall interpersonal interaction, stating, "By incorporating concepts such as building trust online, providing 'hand-holding' technical support, and promoting informal relationships, instructors can help provide greater interactivity within the online community of learners" (p. 147). The results of Swan's (2003) study of 97 students in online courses demonstrated that students who reported higher levels of social presence in their online course also reported higher levels of perceived learning and satisfaction with faculty than students who reported lower levels of social presence.

Social interaction must be designed into the beginning of courses, and when designed correctly, it can continue on its own without faculty stimulus (Northrup, 2002). Garrison (2009) states that social presence incrementally develops in the online environment and warns faculty not to overstress this interaction early in the course. An overabundance of social interaction early in a

course may become a source of frustration for students and some may be unwilling to build deep social relationships early on. For that reason, it is essential that faculty determine the appropriate level of social interaction (not too little and not too much) when beginning a course. Downing et al. (2007) identified a pattern of engagement for discussions in an online course that is characterized by a socially active phase (where promotion of social interactions by faculty is key to developing relationships), an instrumental phase (characterized by the assignments in the course), and then a gradual disengagement from the discussion, which may be similar to the process of social engagement and then disengagement that occurs in a face-to-face course.

Kreijns, Kirschner, and Jochems (2003) describe two pitfalls many faculty make pertaining to social interaction. The first is assuming social interaction will occur just because the online environment provides tools (LMS or external) for it to occur. Kreijns, Kirschner, and Jochems (2003) give an example: "Just putting a forum in a group and labeling it 'café' or 'lobby' does not increase interaction" (p. 347). The second pitfall is restricting social interaction among students to strictly task contexts without consideration to nontask, socioemotional interactions. Both academic and personal social interaction appear to be important to learning in the online environment. It is therefore essential that faculty facilitate social interaction opportunities that allow students to develop trust, a sense of belonging, and social relationships, especially early in an online course.

Immediacy. Immediacy in the online environment refers to "expressiveness, stimulation, and the conveying of feelings and emotions through online language" (Tu, 2000, p. 1665). Swan (2002) reports that one of the ways faculty and students attempt to develop social presence in an asynchronous online course where face-to-face interaction is limited or nonexistent is by deploying verbal immediacy behaviors (e.g., paralanguage, self-disclosure, greetings, agreement, etc.) through text-based communication. Response time and communication style were also found to be contributors to social presence (Tu, 2000).

Supportive Interaction (SI)

The third and final main component of PII is support, which is an important factor for any learning environment (Caliskan, 2009). Providing support in a variety of ways to students is something many faculty take for granted in the online environment because the face-to-face environment allows them to be far more agile and responsive to student issues. In the online environment, students are separated by time and distance from the faculty and other learners, so student issues have the potential to further isolate students and increase the transactional distance faculty seek to decrease. For this reason, it is essential that faculty provide supportive interactions to students, as well as find ways to facilitate support from various resources in the event that a student needs assistance.

Student-interface interaction conditions that instructors cannot expect all learners to have the ability to interact with content, faculty, and their peers effectively without first ensuring that they can interact with the LMS, which is an important component of support in the online environment (Hillman et al., 1994). Providing support for navigating the LMS, either through tutorials, university resources (e.g., instructional design teams or tutors), or by request is an essential part of the online teaching experience, as other interactions cannot be successful if the student cannot effectively navigate the LMS.

Students may also struggle in a variety of other areas. In an online writing class, it may be appropriate to supply students with supportive assistance for APA or MLA formatting. Various software tools, external websites, and social networking tools may need to be thoroughly explained

to some learners, while other may embrace them early on. Many times, these student issues differ drastically by course, so it is essential for faculty to be aware of areas of their courses that warrant additional supportive interaction in the online environment.

Results from Northrup's (2002) study reveal that support is an important consideration for successful outcomes in the online environment. Providing support mechanisms can help obstruct the possibility of learners becoming frustrated and feeling isolated in an online course. Although the number of potential student issues are vast, it is most important for faculty to be cognizant that they will occur and be agile and responsive in providing supportive interaction to those students.

PII Summary

Purposeful interpersonal interaction (PII) is made up of three components: purposeful interpersonal instructional interaction (PIII), purposeful social interaction (PSI), and supportive interaction (SI). These interactions together make up the interpersonal interactions found in the literature that have been identified as important to student outcomes. Many attempts to examine the quantity of interpersonal interaction in the online environment have been apparent in the literature. In this light, PII can be summarized as looking at interaction from a quality standpoint.

How Can We Measure PII?

The rubric for assessing interactive qualities of distance courses (RAIQDC) created by Robyler & Wienke (2003) in Appendix A focuses on the level of interaction perceived by participants in an online course. This instrument can be used to determine the amount of PII perceived by students in an online course. The RAIQDC has been demonstrated to be a valid, reliable instrument to measure interaction in distance courses (Robyler & Wiencke, 2003; 2004). Robyler and Wiencke (2003) revealed that the rubric had convergent and divergent validity and had consistency among different raters of the same course, as 95% of the student ratings were within four points of the total 25 points. The rubric was also reviewed and improved based on feedback from 42 distance educators to be clearer and more comprehensive (Robyler & Wiencke, 2004).

Robyler and Wiencke's (2004) study used the rubric alongside course evaluations in four classes that had no or limited face-to-face components across two universities. The researchers assessed the reliability and validity of the rubric in three different ways in the study. First, inter-rater reliability was determined to be good, with Cronbach's alpha levels of .88, .64, .93, and .95 for the four courses involved in Robyler and Wiencke's (2004) study. Interestingly, the course with the lowest Cronbach's alpha, Course Two at .64, was the course with the greatest F2F component (80% asynchronous online and 20% F2F). Second, concurrent validity was determined using Pearson's correlations between formal course evaluations and scores on the RAIQDC. For the four courses, the correlations were determined to be .630, .720, .643, and .475. Three of the four correlations were significant at the .01 level, while Course One was significant at the .05 level (Robyler & Wiencke, 2004). Third, correlations between specific rubric elements and course evaluation scores were conducted and revealed that each of the five rubric elements were correlated with course evaluation sub scores at the .01 significance level. The results of these two studies (Robyler & Wiencke, 2003; 2004) give evidence that the RAIQDC is a valid and reliable instrument to assess the interactivity of online courses. The rubric is an acceptable measure for student samples, as demonstrated by Restauri (2006).

The instrument is easy for students to complete. Using a Likert-type scale, respondents choose one of five possible levels (1–5) for each of five different elements corresponding to the interaction in their course. Each level of each element has a corresponding label and description, and the respondents choose the option they perceive as most closely reflecting their course. The labels are as follows: Low is 1 point, Minimum is 2 points, Moderate is 3 points, Above Average is 4 points, and High is 5 points. The points for all elements are then totaled and used to categorize each course into one of three groups. The three groups are as follows: low interactive qualities group (1–9 points), intermediate interactive qualities group (10–17 points), and high interactive qualities group (18–25 points). These groups were used as a way to categorize courses in the study.

The five elements that make up the different sections of the RAIQDC are used to assess various types of quality interaction in the online environment. Each element either directly incorporates components of PII or facilitates PII to occur. In order to justify the use of this rubric as a measurement of PII, each element is tied to the components of PII by stating the criteria for the highest score level in for each element and using concepts from the components of PII to support its legitimacy and importance to student outcomes in online courses.

Element 1: Social/Rapport-Building Designs for Interaction

High Level description—*In addition to providing for exchanges of personal information among students and encouraging student-student and instructor-student communication and social interaction, the instructor also interacts with students on a social/personal basis.*

This element relates to PSI through its focus on establishing social interaction and building social presence in an online course, especially early in the course. Social interaction and social presence have been identified as important precursors for meaningful learning to occur and have been demonstrated to positively impact perceived learning.

Element 2: Instructional Designs for Interaction

High Level description—*In addition to requiring students to communicate with the instructor, instructional activities require students to develop products by working together cooperatively (e.g., in pairs or in small groups) and share results and feedback with other groups in the class.*

This element relates directly to PIII, as it requires interpersonal interaction with regard to instructional activities. In addition, the description refers to collaborative learning, which has been identified as crucial to cognitive development. The description also references the importance of peer feedback, which is one of the aspects that is highlighted as a component of PIII. Lack of feedback from faculty and peers was one of the identified challenges of online students.

Element 3: Interactivity of Technology Resources

High Level description—*In addition to technologies used for two-way exchanges of text information, visual technologies such as two-way video or videoconferencing technologies allow synchronous voice and visual communications between instructor and students and among students.*

This element is likely the most subtle but it essentially deals with the communication tools made available to students in an online environment. This is an instance where the rubric is not assessing direct interpersonal interaction, but rather the facilitation of interpersonal interaction using LMS tools. Two-way exchanges of information refers to faculty and students being able to

communicate reciprocally either by text or by video (e.g., instant messaging, videoconferencing, etc.), whereas one-way exchanges of information refers only to instances where information can be presented by one party but not by the other (i.e., faculty posting a course announcement with no response area for students). These tools allow faculty to have a greater presence in the course as well as enable a deeper social presence for all participants. In addition, such tools may allow faculty to increase the immediacy in their courses. The use of videoconferencing using a synchronous tool (e.g., Zoom, Adobe Connect, or Skype for Business) can help to humanize online distance education. In essence, the use of interactive technology resources as communication tools allow faculty and learners to interact interpersonally in a deeper fashion, which can effectively decrease the level of transactional distance in the online environment.

Element 4: Evidence of Learner Engagement

High Level description—*By end of course, all or nearly all students (90%–100%) are both replying to and initiating messages, both when required and voluntarily; most messages are detailed, responsive to topics, and reflect efforts to communicate well.*

This element reflects interpersonal interaction as a result of effective course design as well as social presence. It has been identified that social interaction and the development of social presence are key to unlocking instructional interaction. Social presence is something that must be developed early in a course and, when developed appropriately, will continue throughout the course without faculty influence. This element reflects the literature well as it requires that at least 90% of students are actively engaging in messages (whether through the discussion board or other communication tools) by the end of the course. In addition, it relates to purposeful interaction because the messages are required and voluntary (not forced) and must be detailed (i.e., not a simple "I agree" or "good point" response). The element of learner engagement seeks to measure how well a course and faculty have established social presence and in turn create an environment conducive to PII for learners.

Element 5: Evidence of Instructor Engagement

High Level description—*Instructor responds to all student queries; responses are always prompt, i.e., within 24 hours; feedback always offers detailed analysis of student work and suggestions for improvement, along with additional hints and information to supplement learning.*

This item directly relates to two types of PII: support interaction and purposeful interpersonal instructional interaction. Responding to student issues and concerns is identified as an important part of the online teaching experience. Whether through issues with navigating the LMS or different e-learning tools, faculty should provide support to students in a variety of areas when needed. Timely feedback has been identified as an essential component to successful learning in the online environment and positively impacts student satisfaction and academic achievement. The literature demonstrated that students would rather receive prompt feedback than extensive feedback, and the 24-hour time frame reflects this. Offering detailed analysis of student work and suggestions for improvement can be both confirmatory and corrective feedback. This feedback serves to guide learners on a path to achieving the key instructional goals of the course.

Summary of RAIQDC as PII

The five elements of the RAIQDC relate directly and indirectly to the different components of PII. In principle, all five of these elements either directly influence or facilitate PII in online courses. In that regard, this instrument can be used to identify how much PII has occurred in any online course from the students' perspectives. This rubric can be utilized as a tool for instructors to improve their online course design and instruction by finding an appropriate level of interaction for their course.

Conclusion

Despite extensive studies surrounding the topic of interaction in online learning, faculty are often still relegated to an attempt at replicating their face-to-face course interactions in the online environment. Building a quality lens to view interpersonal interactions in online learning is possible through purposeful interpersonal interaction (PII). The three interaction types in PII—purposeful interpersonal instructional interaction, purposeful social interaction, and supportive interaction—have been associated with important student outcomes like perceived learning, satisfaction, and academic achievement. Robyler and Wiencke's (2003) rubric for assessing interactive qualities of distance courses (RAIQDC) includes many of the concepts identified as important to PII and has been established as a valid and reliable tool for assessing the amount of quality interpersonal interaction that occurs in an online course.

Instructors can utilize this rubric to improve their online course design and instruction. Furthermore, instructors and researchers can utilize other validated research instruments in conjunction with the RAIQDC to determine the association between level of PII and important student outcomes like satisfaction, perceived learning, academic achievement, and persistence. Studies of this type will allow further insight into the point of diminishing returns for interpersonal interaction in online learning. Future research in this area is warranted to examine the effect of supplementing PII and decreasing nonpurposeful interactions on important student outcomes.

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Appendix A: Rubric for Assessing Interactive Qualities of Distance Course

(Robyler & Wienke, 2003)

"Rubric for Assessing Interactive Qualities of Distance Courses"

Assessment of Lessons and Courses

Pick 5 Scored

RUBRIC DIRECTIONS: The rubric shown has five (5) separate elements that contribute to a course's level of interaction and interactivity. For each of these four elements, circle a description below it that applies best to your course. After reviewing all elements and circling the appropriate level, add up the points to determine the course's level of interactive qualities (e.g., low, moderate, or high)

Low interactive qualities	1-9 points
Moderate interactive qualities	10-17 points
High interactive qualities	18-25 points

Element 1. Social/Rapport-Building Designs for Interaction

Low	Minimum	Moderate	Above average	High	Score
The instructor does not encourage students to get to know one another on a personal basis. No activities require social interaction or are limited to brief introductions at the beginning of the course (1 pt)	In addition to brief introductions, the instructor requires one other exchange of personal information among students, e.g., written bio of personal background and experiences. (2 pts)	In addition to providing for exchanges of personal informatoin among students, the instructor provides at least one other in-class activity designed to increase communication and social raport among students. (3 pts)	In addition to providing for exchanges of personal informatoin among students and encouraging communication and social interaction, the instructor also interacts with students on a social/personal basis. (4 pts)	In addition to providing for exchanges of personal informatoin among students and encouraging student-student and instructor-student communication and social interaction, the instructor also interacts with students on a social/personal basis. (5 pts)	

Element 2. Instructional Designs for Interaction

Low	Minimum	Moderate	Above average	High	Score
Instructional activities do not require two-way interaction between instructor and students; they call for one-way delivery of information (e.g., instructor lectures, text delivery) and student products based on the information. (1 pt)	Instructional activities require students to communicate with the instructor on an individual basis only (e.g., asking/responding to instructor questions). (2 pts)	In addition to requiring students to communicate with the instructor, instructional activities require students to communicate with one another (e.g., discussions in pairs or in small groups). (3 pts)	In addition to requiring students to communicate with the instructor, instructional activities require students to develop products by working together cooperatively (e.g., in pairs or in small groups) and sharing feedback. (4 pts)	In addition to requiring students to communicate with the instructor, instructional activities require students to develop products by working together cooperatively (e.g., in pairs or in small groups) and share results and feedback with other groups in the class. (5 pts)	

"Rubric for Assessing Interactive Qualities of Distance Courses" (continued...)

Element 3. Interactivity of Technology Resources

Low	Minimum	Moderate	Above average	High	Score
Fax, web pages, or other technology resource allows one-way delivery of information (text and/or graphics). (1 pt)	E-mail, listserv, conference/bulletin board, or other technology resource allows two-way, asynchronous exchanges of information (text and graphics). (2 pts)	In addition to technologies used for two-way asynchronous exchanges of information, chat room or other technology allows synchronous exchanges of primarily written information. (3 pts)	In addition to technologies used for two-way synchronous and asynchronous exchanges of written information, additional technologies (e.g., teleconferencing) allow one-way visual and two-way voice communications between instructor and students. (4 pts)	In addition to technologies used for two-way exchanges of text information, visual technologies such as two-way video or videoconferencing technologies allow synchronous voice and visual communications between instructor and students and among students. (5 pts)	

Element 4. Evidence of Learner Engagement

Low	Minimum	Moderate	Above average	High	Score
By end of course, most students (50%-75%) are replying to messages from the instructor, but only when required; messages are short and sometimes unresponsive to topics. (1 pt)	By end of course, most students (50%-75%) are replying to messages from the instructor and other students, both when required and on a voluntary basis; replies are short but usually responsive to topics. (2 pts)	By end of course, all or nearly all students (90%-100%) are replying to messages from the instructor and other students, both when required and voluntarily; replies are detailed and responsive to topics. (3 pts)	By end of course, most students (50%-75%) are both replying to and intiating messages, both when required and voluntarily; most messages are detailed and responsive to topics, but may be wordy or rambling. (4 pts)	By end of course, all or nearly all students (90%-100%) are both replying to and intiating messages, both when required and voluntarily; most messages are detailed, responsive to topics, and reflect efforts to communicate well. (5 pts)	

"Rubric for Assessing Interactive Qualities of Distance Courses" (continued...)

Element 5. Evidence of Instructor Engagement

Low	Minimum	Moderate	Above average	High	Score
Instructor responds only randomly to student queries; responses usually take more than 48 hours; feedback is brief and provides little analysis of student work or suggestions for improvement. (1 pt)	Instructor responds to most student queries; responses usually are within 48 hours; feedback sometimes offers some analysis of student work and suggestions for improvement. (2 pts)	Instructor responds to all student queries; responses usually are within 48 hours; feedback sometimes offers some analysis of student work and suggestions for improvement. (3 pts)	Instructor responds to all student queries; responses usually are prompy, i.e., within 24 hours; feedback always offers detailed analysis of student work and suggestions for improvement. (4 pts)	Instructor responds to all student queries; responses are always prompt, i.e., within 24 hours; feedback always offers detailed analysis of student work and suggestions for improvement, along with additional hints and information to supplement learning. (5 pts)	
Total each ___pts.	___pts.	___pts.	___pts.	___pts.	
Total overall ___pts.					

Source: Based on concepts in Roblyer, M. D. & Ekhaml, D. (2000). How interactive are YOUR distance courses? A rubric for assessing interaction in distance learning. *The Online Journal of Distance Learning Administration, 3*(2).