How Computer Mediated Learning can Mitigate the Tension Between Collaboration and Teaching Autonomy

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A sound theoretical framework for language teaching should be one that helps teachers and learners to be comfortable in their roles: enabling them to think clearly by seeing simplicity in complexity, to be effective and self-aware, and to enjoy their work (Mark 2018).

This work surveys prior work on teaching collaboration and then assesses the effectiveness of various systems managed approaches to support collaborative instruction and student autonomy. While many instructors desire to collaborate in curriculum development and instruction with their colleagues, a number of barriers such as busy instruction schedules, administrative demands and a diversity of teaching approaches hamper desired levels of collaboration. A number of case studies detail such challenges and offer strategies to increase collaboration despite the barriers. Additionally, past research demonstrates the value of successful collaboration for the students, teachers and institutions (Vangrieken et al. 2015). Another thread of this work examines case studies of systems managed approaches. While largely referring to computer mediated learning, another emphasis is on the active connection and integration of classroom activity, materials development, and online learning in a way that produces a productive loop in which one area of activity feeds into another. For instance, the TRIO program involves a cycle of: students producing English; students feeding their English and Japanese translations into a database; the instructor creating parallel English versions of the students'

English expressions; followed by student access to the database to see models of English they would like to reproduce (Mark 2001). The "system" consists of computer mediated learning but also accounts for other learning activities that create a feedback loop.

Systems managed approaches are integral to much of the work of Kevin Mark; throughout his career, Mark emphasizes an overarching theme of how fostering autonomy within any number of educational contexts can engender originality and confidence in learners. With respect to the learner, he applies an empathetic frame to demonstrate the pull of praxis and push of applied linguistic theory. Learners have a range of needs, goals and styles that require affordances with respect to teaching and learning. Keeping the learner at the center of education has been the persistent aim of Mark over his 30 plus years of teaching and writing. The educational context inhabits various dimensions and can refer to a larger cultural milieu such as Japan or smaller intimate contexts such as a small writing group. Institutional practices vary and Mark presents a range of methodologies conditioned by such contexts.

Mark's ongoing query is "how individuals—students and colleagues alike—can thrive in a 'mass education' environment" (Mark 2015, 30). Mark focuses on systems managed approaches to grapple with the demands of the mix and match of learners and learning environments. A systems managed approach refers to the integration of classroom instruction and selections from a range of accessible technologies to facilitate learner independence, confidence and growth; this includes student generated corpora, online connected databases created through collaboration, and in-class CALL technologies. Mark sketches out a long term vision of how the application of recent technologies can facilitate learner autonomy and teacher flexibility. This vision supports the thriving of the individuals within educational institutions and the growth of educational institutions. Systems managed approaches support the logistical, practical and emotional needs of all of the stakeholders in the educational setting.

This work will begin with a discussion of the literature on creating collaborative learning environments, then move on to examining a variety of systems managed approach case studies and finally discuss how such approaches can address the barriers to collaboration and student lead learning. Ultimately there is no one size fits all approach that can encompass the needs of all potential learning environments. A systems managed approach requires a flexible and varied toolkit of accessible

systems, a diversity of creators and constant reevaluation in light of ever changing needs of the student body. A successful integrative approach involves an ongoing conversation and exchange between teachers and students, both which can sometimes inhabit the role of teacher and learner in seemingly non-traditional ways.

Collaborative Teaching

The vast literature on teacher collaboration explores in teaching collaboration in detail, examining its definition, benefits, challenges and ways of facilitating collaboration. Most authors conclude that teacher collaboration provides significant educational benefit but oftentimes a tradeoff between collaboration and teacher autonomy often emerges. A number of case studies provide a backdrop and examples of how educators have successfully created collaborative working relationships and employed strategies to mitigate personal and philosophical conflicts. This section provides a brief overview of this literature.

The literature has a range of descriptions of teaching collaboration, which differ by type, degree and level of involvement. For instance collaboration can involve teachers creating individual lesson plans and then pooling them in a database for group access, or at the other extreme, teachers can work in groups to formulate lesson plans. Or collaboration may only occur at an earlier stage with curriculum development in which general agreed upon aims and approaches are established; subsequently instructors develop individual plans based on those established narrow or broad outlines. Collaboration could involve shared classroom involvement in the form of team teaching, course sharing or observation that allows feedback among instructors. The extent and depth of collaboration can vary; perhaps the collaborative process takes place once at the beginning of a school year or occurs on a regular basis throughout the year or term.

Collaborative teaching does not represent a singular, static activity but refers to a broad range of interaction that involves achieving various shared aims in the educational context; case studies of teacher collaboration demonstrate diverse approaches. Kelchtermans (2006) frames collaboration within the broader institutional context and shows how conflict can emerge from individuality and the interaction of varied goals. Collaboration is broadly framed as all of the interaction and negotiation necessary to doing shared tasks and distinguished from

collegiality based on shared mores of maintaining good interpersonal relationships. Research such as Fulton and Britton (2011) looks at professional communities. Fulton and Britton (2011) specifically examines a STEM community that engaged in discussions of math and science. They felt that they understood their subjects better and became more responsive to their students understanding and engagement with the material. Seo and Han (2013) examined a voluntary online collaborative community of teachers in Korea who engaged in peer-support, materials exchange and online workshops. Romeu et al. (2016) look at collaboration through an online university course that coordinated content sharing, communication, and feedback. Kabilan et al. (2011) investigate an online collaborative project involving teacher of TESOL in Malaysia; the group worked together to produce an online newsletter.

The Benefits of Collaborative Teaching

The literature outlines a number of benefits of collaborative teaching for instructors, students and institutions. The Vangrieken et al. (2015) review of teacher collaboration identifies a number of benefits from collaboration. Benefits for teachers included increased motivation, more easily managed workloads due to greater efficiency, better understanding of technologies, more engagement with other teachers, which resulted in less teacher isolation and increased morale. For students, they performance improved through better understanding of the materials due to an increase in more student-centered lessons. Educational institutions found greater increases in equity, increased flexibility and greater support for innovation and change, increased support for intellectual enquiry and an improved social climate. Increased instructor interaction allowed veteran instructors to communicate with junior faculty more frequently and in turn this allowed for a freer and clearer sharing of ideas, techniques, methodologies and instruction methods. Interactive environments appeared to foster more professional development and growth, which attuned instructors more to the needs of the students and their colleagues.

　　A number of case studies describe specific benefits. Seo and Han (2013) describe an instance of a first year teacher in an inter-school online collaboration context, who was encouraged by specific advice and consolation in response to expressed teaching anxiety (p 230). Romeu et al. (2016) in an investigation of an online training activity found that collaboration supported information change and

building of collective knowledge; they emphasize the importance of exchanging views that serve as a foundation for creating a cognitive presence that produces professional development and creates a shared teaching practice. The teachers found exchange of ideas, developing knowledge, encouragement of debate and active participation as benefits. The Kabilan et al. (2011) case study of an online collaborative project for Malaysian teachers engaged in producing an online TESOL newsletter found that participants gained a stronger vision for professional development, developed a number of problem solving skills, engaged in a successful exchange of ideas and felt a strong sense of commitment to the project.

Barriers to Collaborative Teaching

In spite of potential benefits of teacher collaboration, a number of barriers in the school culture can undermine attempts at building a collaborative culture; some are due to perceptions and some are due to the result of increased interactions (Vangrieken et al. 2015). Contrary to one of the benefits collaboration can sometimes increase the workload if the group becomes reliant on the work of a few. Collaboration may also increase competitiveness in a negative way or bring out incompatibilities among individuals. Group pressure could increase and lead to a conformity that blocks out contrasting ideas or contributions. Teachers may fear or actually suffer from the loss of autonomy in a collaborative work environment.

The case studies also specify some of the difficulties. Seo and Han (2013) found in their inter-school online context that teachers rarely collaborated in developing or revising materials online, although teachers freely shared materials (p 232). Additionally, only a small pool of teachers typically posted materials while a majority of the users used the teaching materials. Likely due to different approaches and attention towards preparation they witnessed an asymmetry with respect to contributions of materials. Romeu et al. (2016) in their study of an online training found a number of benefits but teachers felt that collaboration did not particularly improve their working styles, support individual strengths/weaknesses, or encourage critical thought. The Kabilan et al. (2011) case study on the creation of an online newsletter largely successful, but participants had a number of problems with technology—either due to inconsistent access to internet or due to a lack of experience and familiarity with an online setting.

　　Generally, teacher collaboration involves trade-offs between the benefits of working in a group and the emergence of constraints on autonomy or individual work styles. The creation and maintenance of any collaboration requires consideration of the needs of the teachers and students in a given educational setting. Also teacher attitudes are critical to creating a sustainable collaborative environment. Schools at the primary or secondary level may lend themselves to some natural degree of collaboration since they tend to be of a size that supports a tight-knit community. Much larger institutions such as universities may have less of a natural community for collaborative work. Especially with respect to university instructors there is a tendency to value the freedom to teach subjects grounded in one's own original research making it more challenging to build collaborative affinity groups. However, such academic diversity also offers and opportunity for interdisciplinary collaboration that takes advantages of the strength of collaboration to produce a shared knowledge base that helps to show students relational aspects of varied disciplines.

Systems Managed Approaches to Collaboration

A systems managed approach refers largely to computer assisted learning education technologies whether they are broad systems for communication such as Learning Management Systems (LMS) or customized learner generated corpora such as Mark's (2001) TRIO. Fundamentally, the use of technology in education aims to facilitate communication between the instructor and students, add efficiency to the instructor workload by automating repetitive tasks and producing tasks that students can carry out autonomously, and provide access to supplemental and even novel pedagogical content and resources. This section will consider a few systems managed educational resources and reflect briefly on how they can work in the service of facilitating a collaborative educational environment. The three systems discussed here will be Learning Management Systems (LMS), learner corpora and one interaction centered Artificial Intelligence (A.I.) system *Perusal*.

Learning Management Systems (LMS)

Learning management systems (LMS) refers to a network system of organization

typically in universities that facilitates assignment distribution, grading, course management, and communications. A key feature centers around communication and interaction between the instructor and students as well as peer to peer facilitation. The degree to which teachers vary, with some using it for basic communications and announcements to the class and in the other spectrum teachers using it for assignments, peer to peer feedback, tests, surveys, and even classroom presentation and facilitation. The spread of COVID drove much of the university instruction online in 2020 and many institutions relied critically upon the features of their school LMS.

An LMS typically has tools to allow online collaboration between students, and it is also possible to set up an LMS to handle teacher to teacher collaboration and communication as well. For instance, instructors collaborating can simply allow each other access to their own classes on LMS in order to facilitate sharing of curricula, lesson plans and class management strategies. Instructors can create shared lessons or lesson plans that they several teachers may access and even create a joint class via an online curriculum. Shared classes can participate in multiple class peer-to-peer feedback sessions or participate in surveys with larger more diverse samples. Instructors can create groups for any desired educational activity including curriculum development, academic research sharing, professional development and peer support. An LMS is a highly flexible system for facilitating extensive collaboration. However, limitations of an LMS resemble limitations about collaboration in the literature. One of the largest is the degree to which instructors use an LMS. For the most part university instructors focus on classroom instruction, which inherently isolates classes; however, such a result indicates that instructors prioritize building relationships within their classes, which is a much more accessible goal than linking classes across an internet platform. Curriculum and lesson sharing along with collaboration along those lines may more realistically reflect a collaborative use of an LMS that also does not negatively impact teacher workload.

Learner Corpora

Learner Corpora refer to the assimilation of text and lexical distributional data in order to provide global models of language use, specialized or otherwise, that

learners can use to produce their own texts based on practical learner needs (Granger 1998). Haase (2019) points out two large categories of TESOL academic corpora, on which represents English as a lingua-franca of academia and corpora that collect samples of academic text that models standardized English models such as American English, without consideration for English as a lingua-franca. In short, one can assemble corpora that includes a variety of Englishes including from second-language speakers or one which adheres to only a few prestige variants. Haase (2019) notes that in contrast to prestige English corpora, which fail to distinguish levels of text difficulty, learner driven corpora generate standards and parameters that allow the difficulty levels of texts to be recognized allowing for more functional uses for language learners.

　　Most important to the discussion here are texts which incorporate learner texts, whether on a local or global scale. Two examples of learner centered corpora are CUJOE, a new academic learner corpora of English and TRIO. CUJOE consists of a global corpus collecting academic essays from users of various varieties of English while TRIO has a collection of university learner English writing from a single university in Japan. Both corpora focus on building an accessible corpus calibrated to the specific needs of the language users.

　　The CUJOE corpus collects academic English writing of writers belong to over a dozen of language backgrounds (Haase 2019). CUJOE produces a resource aimed at educating English learners in a variety of English centered in the academic domain. The system emphases language as a genre and produces a lexical statistical analysis of a particular sociolect. CUJOE address the direct language needs of the learners by providing a strong context based dataset appropriately scaled to the language level of the learners; therefore, CUJOE increases accessibility relative to more traditional prestige English grounded corpora.

　　Mark (2001) describes TRIO as a "parallel" learner corpus, which consists of over 100,000 lexical items from university English learner writing as well as instructor mediated versions of the student writing. Mark began from a learner-centered humanistic approach, which eventually led to a corpus learner based strategy for assembling and comparing student language production. TRIO's direct application to language pedagogy serves as its key feature. TRIO presents accessible models of language through small samples of student language, the target language and their L1 featured in side by side comparisons that they can review intuitively;

the three language sample variants underly the naming of the corpus. TRIO acts as a corpus builder directly accessible to instructors without applied linguistics experience and learners as well.

The TRIO corpus allows learners to compare and contrast their own writing with a native speaker reinterpretation and a Japanese version; the models allow students to have a metacognitive reflection of their own writing through concrete models. The TRIO corpus consists of lexical items from students' short course writing assignments of roughly 150 words on general life topics. The learners produce intermediate level second language learner source input which in turn, the instructor reformulates using the original language as much as possible to a more native-like version, and the students also translate into Japanese whenever possible. The three versions of the corpora make up a 3-way parallel corpus inputed into a searchable database; therefore, students can search for specific language models based on key words from either English or Japanese. Ultimately, TRIO allows students through comparison to get a sort of feedback to their own English writing interpretations of a given meaning.

Learner corpora serve as very effective collaborative tools between the instructor and students. Through a shared process they create a knowledge base that defines and shapes learner needs. While learner corpora are a very useful tool for collecting, analyzing and accessing learner language, assembling such corpora present a challenge as collections typically have to be built over many years. Sustainability and scalability are key to any successful learner corpus. While it is not clear whether or not CUJOE or TRIO can achieve long term growth, they still serve as useful models as a basis of learner corpora development.

With respect to teacher collaboration, learner corpora can readily assemble data from across different classes and even interdisciplinary depending upon the learner aims. Various instructors can provide sample writing data as in CUJOE to produce a broad picture of a given language learner community. The corpora can serve as a foundation for curriculum development or revision based on the ever shifting needs of a given learning population.

Interactive Artificial Intelligence systems

Interactive or responsive A.I. systems, such as Perusall, aim to frame and display

student input to other students for response and feedback. Such systems leverage the potential communal nature of classroom interaction and give students access to peer feedback outside of the classroom.

Perusall, a generative social annotation environment, serves as one of the most notable and widespread interactive A.I systems. Teachers assign a text with a required number of annotations, work notes and groups; students then read the text and make comments that other students can view. Students may upvote comments and present questions to the group, which in turn can lead to student responses and additional annotations. The back and forth social nature of the feedback flow creates a generative environment that encourages students to engage mutually in interpreting a text. Perusall automatically assesses student contributions based on timeliness, quantity, quality, spread of annotations, number and depth of reading sessions and upvotes given and received. Perusall measures work quality with an Automated Essay Scoring component with parameters calibrated by the instructor.

Cecchinato and Foschi (2020) investigate the degree to which Perusall assesses similarly or differently from instructors and students' feelings about A.I. assessment. They find that Perusall's machine assessment correlated with human instructor assessment to a significant degree. Despite the strength of the assessment component, most students preferred an integrated assessment system; an A.I. assessment to provide a strongly objective basis for grading and a teacher component to ensure that merely blind machine criteria fails to recognize significant nuances in the student work. Overall Perusall appears to serve as a successful system for supplementing and streamlining assessment work in student interactive writing tasks.

Machine learning algorithms such as Perusall can serve as a strong basis for instructor collaboration. Teachers can create joint criteria for assessment of student responses to a given text, and as a result, produce a sort of shared pedagogical view of a particular assignments aims. Teachers can have multiple classes respond to a particular text and create a unique space for inter-classroom interaction and response to given material. Joint classroom participation creates a more diverse sample of students for assessing student interest and knowledge of a given topic. Based on a shared curriculum, instructors can create a unified assessment basis to create grading consistency across courses if so desired. The ability of Perusall to objectivity apply agreed upon evaluation criteria allows for a dimension of teacher collaboration otherwise not readily available without a huge amount of additional labor.

Three types of educational systems managed approaches have been described. Each has varied strengths and weaknesses but all have potential for supporting some form of teacher collaboration. The final section will look at how such systems might be used to build an integrative approach linking student production to classroom interaction to out-of-classroom interaction in a virtuous cycle.

An Integrative Learning Framework

Mark typifies his integrative learning aim with the expression, "less teaching, more learning"; his expression captures a process of student-centered learning based on an integration of: collaboration through classroom instruction/interaction; autonomous work within a collaborative online framework followed by student production and exchange through feedback. This produces a vision of a workflow cycle that extends beyond the classroom and fostered at maintaining regular interaction among the class and instructor. Mitigating the instructor workload while building a more collaborative, interactive system reflects the fundamental problem Mark addresses with a variety of systems approaches along with a holistic, humanistic educational approach (Mark 2018). Acknowledging the issues with respect to instructor collaboration and the challenges of significant teaching loads and the need to approach a large body of students as individual learners, Mark centers on technological tools to support a balance between a supportive educational environment and sustainability. This section provides a sample model in the spirit of Mark's approach to integrative collaborative learning.

Integrative learning can be viewed as a collection of systems and practices to produce a continuous cycle of learning and reinforcement through instructor and peer interaction. Students and teachers interact in the classroom to establish educational goals and build relationships. The instructor uses a number of means whether direct instruction, group work, or other activities to introduce material. Students then execute assignments outside of the classroom through some type of learning system, ideally with peer-to-peer interactive support. Students then produce responses, questions, or extra contributions that are then introduced to the classroom. Based on student feedback and assessment the instructor then continues with new materials adjusted to student response.

Classroom interaction

System learning

Student production
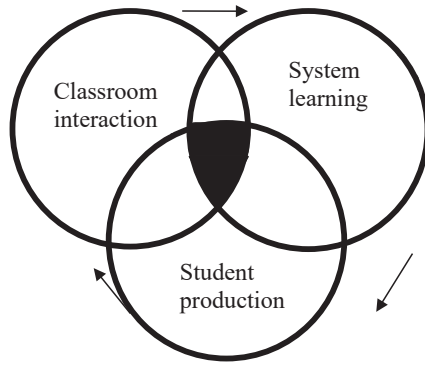
Interactive Learning Workflow

Teacher collaboration can be readily built into the system at the systems learning point. As discussed in the previous sections; classes with an LMS system can have shared access to the same materials; a learner database used to generate new assignments can collect data from multiple classes based on shared teacher parameters; or a Perusall lesson generated and adopted by a team of teachers can create workgroups across classes to create a larger interactive space beyond the classroom. A great advantage of teacher input into a system is that the desired aims and needs can be established at the planning phase mitigating conflicts during execution. After a systems analysis, instructors can then recalibrate the content or system as needed. A system adds predictability and objectivity to execution of the agreed upon curriculum. Instructors still maintain freedom to execute classroom instruction as desired insofar as the content remains consistent with agreed upon goals and parameters. Additionally, such a workflow can be based on a few lesson plans or even full classes. Teachers can adjust their degree of participation in such a workflow.

The workflow typifies a global approach to learning espoused by Mark (2015). The needs of all of the stakeholders, learners and instructors alike, find integration into a system tailored to produce constant feedback. Students learn through instruction, metacognitive processing, production, peer assessment and group reflection. Instructors can become more attuned to student needs through a

feedback system, especially when coupled with teacher collaboration. The workflow encourages student production outside the classroom by providing a platform for regular interaction between classes. Systems such as Perusall are task centered so students can remain focused and create a bond upon their shared understanding or questioning of the course content. Students can take advantage of their collective knowledge to reinforce their shared learning experience.

Although an idealized model of instruction appears above, it provides a blueprint to incorporate student feedback with instructor content, with a potential collaborative component. The framework is intended to meet the demands quoted from Mark (2018) at the beginning of this article; greater interaction promotes greater comfort for learners and teachers in their roles, the systems process aids in breaking down complexity into simpler components, and a student-centered approach hopes to nurture self-aware stakeholders while facilitating an enjoyable and memorable educational experience.

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