

ENGAGING HYBRID AND BLENDED LEARNING IN HIGHER EDUCATION

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Chapter 4: Learning Efficiency of Hybrid Courses—“Hybrid Online Face-to-face Teaching: When is It an Efficient Tool?”

Hermann Kurthen and Glenn G. Smith

Introduction

The first wave of e-learning, fully web-based asynchronous college courses, has taken the world by storm, quickly grabbing a sizable portion of the college market, opening up college education to new demographic groups and dominating educational research conferences. Now a second wave of E-learning, blended-hybrid learning, combining online and face-to-face (FTF) activities, is creating a quiet revolution among instructors who want to combine the advantages of online and FTF.

Virtually all U.S. universities have online course management systems, such as Blackboard, WebCT, First Class, Angel etc., as an infrastructure for their fully web-based courses. Recently instructors are using online course management systems to add online components to their traditional FTF classes. As instructors add online components, their FTF classes are morphing into something slightly different.

These combined online face-to-face courses go by terms such as web-enhanced, blended and hybrid courses. However because these terms are relatively new there is no consensus on definitions. At a recent conference, Kaleta and Aycock (2004) defined web-enhanced as any course with 20% or less online with the remainder face-to-face. They defined hybrid as any course with more than 20%, but less than 80%, online. Because some online courses have a face-to-face orientation or summation meeting, Kaleta and Aycock (2004) classify anything over 80% online as fully online E-learning. Other researchers use terms like “blended” and “hybrid” synonymously without a precise definition (Parkinson, Green, et al, 2003; Voos, 2003).

The current authors think that three distinct categories provide a more useful taxonomy. Therefore we suggest that these combined face-to-face and online

classes can be classified into three broad types, 1. *web-enhanced*; 2. *blended*; and 3. *hybrid learning*, defined by the percentage of web-based interaction.

1. A growing number of instructors put portions of their course online for convenience, saving strain on the department photocopier and avoiding lugging bundles of handouts to class. *Web-enhanced* courses add on a minimal number of web-based elements such as the syllabus and course announcements, into an otherwise entirely FTF course. We consider web-enhanced courses to be predominantly FTF and, therefore, have not included them in this study.
2. In *blended* courses, the instructor adds some significant online learning activities, which change the flavor of the class. A blended course might include online quizzes, real-time chat room or online asynchronous discussions, counting for about 10% of the course grade. In blended courses, these online activities represent the lesser part of the course. Either they do not replace any of the regular FTF class meetings or if they do replace FTF meetings, it is less than 40%.
3. If the online activities replace FTF class meetings by more than 40%, but less than 80%, then the course is considered *hybrid*.

In our taxonomy, classes with 80% or more E-learning, are considered *fully online*. Given that fully online courses have already received their share of research (see, for example, Swan, 2001; Blignaut and Trollip, 2003; Sutton, 2001 and many others), we will exclude them from our further deliberations in this paper.

Some may consider online activities natural for students raised on computers and video-games. But offering an online activity is no guarantee that students will embrace it, even if heavily graded. It is hard to predict which type of blended or hybrid online course and design will be successful and 'takes off.' The authors propose a blended-hybrid 'threshold' effect derived from micro sociological theory based on the concept of norm internalization. Based on case studies and empirical studies (see Smith and Kurthen, in press), we also will consider a number of additional factors (integration, timing, ownership) that influence student adoption of online components. Our ideas from the pilot study suggest a framework for future research and provide food for thought for instructors to predict which hybrid E-learning designs reduce student resistance.

The Centrality of Norm Internalization

How students internalize the norms of an online class is a major factor in how and whether students adopt the online components of hybrid and blended courses. People make sense of their social world through a psychological process called "accounting," i.e., using brief verbal, "signs," to interpret their actions within a social context. Much of this is done through shorthand statements which assume a common knowledge based on previous shared social situations (filling in the meaning with the "et cetera principle," Garfinkel, 1967). Garfinkel's work and some of the ideas presented in this paper derive from symbolic interactionism (and microsociology) which focuses on micro-interactions at the individual level,

i.e., "the interaction between a person's internal thoughts and emotions and his or her social behavior." (Mead, 1934 cited in: Wallace and Wolf, 1999, p. 191).

Students (and virtually all people) develop a sense of group membership, a sense of "us versus them," by signs which have meaning only to those within the group. A fluent use of these signs creates a sense of bonding in the group. As a person tries to be accepted into the group, s/he makes tentative attempts to make the signs and understand and correctly interact using these signs and gauges progress of acceptance by feedback from group members. This point is better understood if we compare the traditional classroom with E-learning interactions.

Students interpret a traditional classroom experience as "orderly" when the professor is teaching in front of the class and writing notes on the blackboard as he speaks. How the instructor says certain sentences emphasizes for the audience how s/he feels about a given subject. Unspoken meanings are transmitted not only by verbal, but also by non-verbal cues.

However E-learning lacks body language. An online instructor cannot present an "orderly" classroom setting, standing in front of a class and writing things on the blackboard as s/he tries to convey to students the meaning of the lesson. Gone are personal presence and non-verbal communication. Signs of mutual understanding and meaning that are not explicitly verbal or written (Garfinkel, 1967) are limited. The understanding of vague references, the missing meanings and unspoken intentions of FTF conversations are lacking in E-learning interactions. Students of online classes have to decipher written instructions, announcements, examples, or assignments to understand what is expected of them and what is of importance. Online instructors remark that instructions need to be highly detailed and even redundant, since there is less immediate question and answer and less non-verbal communication to disambiguate instructions (Smith, Ferguson and Caris, 2002).

It is not clear whether the more constrained non-physical and indirect ("virtual") communication prevent students from a better understanding of requirements and learning in comparison with FTF classes. Parks (1996) suggests that there is no "missing meaning" in online interaction. Internet language also has group-adopted "signs" functionally identical with the common group jargon of FTF interactions used to solidify group membership, such as repetitive use of words or abbreviations, certain writing and composition styles, use of emoticons, etc. Internet communities also learn the unspoken norms of their community. Online students learn what language is appropriate to use for what purpose and at what time. They learn to understand expressions by the instructor that have an underlying moral, critical, or motivating tone. They also adopt expressions with commonly-held implied meaning to describe situations otherwise difficult to explain more literally.

If an instructor uses very sloppy language, grammar, punctuation, etc. in his responses to the students and also lets pass sloppy online responses, students assume that informal communication is ok and not grade-relevant. Such classes will see an increase of informality. On the other hand, if an instructor is very formal and official (for example as being addressed as 'professor' in emails and also formally addressing students) this will also be reflected in the overall rigidity of 'forum' and personal professor-student interaction. These issues become even trickier if an instructor claims informality or 'bad language' for himself, but

hypocritically tries to enforce formality of students' responses. That can lead to confusion, conflict, dissatisfaction and a decrease in learning.

In online classes, the instructor has to construct an effective framework to transmit knowledge and symbolic meaning, and to establish group norms, group codes, and bonds in virtual reality (Lincoln and Guba 1985). Those who claim that online interaction is a medium devoid of emotions and human expression, ignore that people can, in the written format, communicate their feelings and "virtual" gestures via slang and with letters, digits, and graphical symbols, such as "shouting" via capital letters, exclamation or question marks, periods, "happy face" symbols, etc. (James and Jansen 1997). Online instructors also bond with students through the character, length, frequency, and type of responses. A key factor for establishing and maintaining online relationships is the amount of time and the degree of involvement participants invest in virtual interaction (Parks 1996). Students in online classes do not have immediate real-time question and response to disambiguate assignments. How much and how quickly the instructor responds is a major factor in student satisfaction (Shea, Swan, Frederickson and Pickett, 2001; Trippe, 2001). Previous studies measured successful appropriation of E-learning components and the quality of interaction patterns, for example, by counting and analyzing participation rates and message posting (Noriko, Bonk and Angeli, 2000).

Online communities also develop a shared sense of membership and mutual trust, perhaps compensating for the lack of non-verbal signals (hand shakes, looks into eyes, gestures and grimaces, sounds, body language, etc.). Chat room communities develop a shared use of language, stories and codes, providing common meaning and expectations about membership behavior. In fact, the written language used in emails, forums, instant messaging, or chat rooms can be more effective in creating community than the fleeting spoken word in FTF interactions (Putnam and Pacanowsky, 1999, p. 110).

For example, in one of the classes the authors studied, a student, who willingly provided advice in asynchronous discussions, became the "computer expert." After he answered an identical issue exhaustively several times over a period of about ten days, he reacted angrily when approached again with the same question. He pointed out that he voluntarily had given an answer previously and refused to do it again since there was an answer trail readily available from previous postings. Other students posted supporting comments. After this episode, the student expert continued to answer questions, but was never again approached with repetitive questions. It was considered rude to ignore his previous postings.

Students of blended and hybrid courses do see each other in the face-to-face portion of the course and may have internalized norms and developed some group codes FTF. However because of lack of familiarity with the environment and perceived isolation in E-learning, it may take longer and require more effort to internalize norms and develop codes in that environment. Students may not be willing to spend the extra time. Because of unfamiliarity and perceived isolation, adjusting to the norms of online learning in blended and hybrid courses may involve greater anxiety than adjusting to traditional FTF courses.

How do these issues of learning and internalizing norms relate to student adaptation of online components? Which E-learning type, hybrid or blended,

better reduces student resistance and increases learning efficiency? And what other course design and psychological motivational factors may influence student adoption of online components so that a course successfully ‘takes off?’ It is helpful to examine these issues by comparing the outcome of a number of case studies the authors conducted at a research university in the United States.

Pilot Study Method and Data Collection

The authors used a non-probability purposive sample of five blended and hybrid college courses to conduct a time-series pilot study investigating how students interacted in the online and FTF portions of these classes. Data were collected through instructor interviews, content analysis of online postings, and structured observations of FTF courses during 14-week semesters between 2000 and 2003. Construction of the research instruments was motivated by hypotheses based on micro sociological theories, such as “Initial student reluctance/resistance against E-learning will be resolved over time when students begin making sense of online routines.”

The *hybrid* class involved chat room and forum postings and some FTF class meetings. Online discussions and assignments represented a substantial percentage (about 70%) of the contact time in a Sociology theory course (SOC 362) with 75 students in the first and 29 students in the second section.

The *blended* classes were from a large survey course on technological trends in society (EST 201). E-learning accounted for about 40% of the grade in the Fall 2001 EST course (N=98 students), about 30% in the Fall 2002 EST course (N=65), and about 25% in the Spring 2003 EST class (N=242).

The instructor *interviews* were based on personal records (class journals and notes), observations, and continuous conversations about the causes of course progress.

For the *content analysis* the authors trained undergraduate and graduate research assistants who counted, classified, and qualitatively analysed postings from the E-learning components of the hybrid and blended courses. We looked at frequency and percentage of “on time” asynchronous class discussion forum and chat room postings per week or module, length of postings (paragraphs) as well as the qualitative comparative improvement of their content, at assignment complaints, etc.

To obtain some measure of interaction between students and instructors in the FTF components of hybrid and blended classes, undergraduate research assistants (working for credit) were trained and supplied with a one page observation sheet to conduct *structured observations*. Observations were entered into a database, recording information such as class interaction types between students and instructors, attendance, and other relevant information.

Pilot Study Results

Using quantitative and qualitative indicators similar to other studies (see Noriko, Bonk and Angeli, 2000), the authors sought to find out whether student’s initial reluctance to E-learning would resolve over time as students made sense out of the routines of online learning. We expected that as students internalized new

rules of interaction through virtual online postings and learned a new code of expressing themselves through writing, they would ask fewer organizational, technology, or grading related questions. Instructors would intervene less often with positive or negative feedback. For blended and hybrid courses over the course of each semester, we expected a decrease in total number and relative frequency of student postings related to non-content related issues. Similarly we expected a relative increase in content-oriented postings by instructors although the total number of instructor postings would decline in absolute terms. These assumptions were confirmed for the two hybrid classes and the 40% online blended course, but not for the two blended courses with less than 30% E-learning content (see Figures 1 and 2).

In addition, the authors expected that students would post, after some adjustment time, fewer but analytically deeper and better online contributions as students developed "orderly patterns" of behaviour in the E-learning settings of blended and hybrid classes. Correspondingly, the total number of instructor postings would decline too. Again, this turned out to be true only for classes with more than 40% E-learning share. Here the student and instructor posting frequency declined over time, while the length and analytical depth of individual postings increased. Again, the most obvious difference was that the hybrid classes had a higher percentage of online components, replacing FTF meetings (see Figures 3 and 4).

For example, in section 01 of the hybrid Sociology course, students posted 139 answers on the class discussion forum in weeks 2-3, i.e., 2.28 postings per student. The number of postings declined in weeks 6-7 to 90 postings, i.e., 1.58 postings per student, and 75 in weeks 12-13, i.e., 1.34 postings per student (compared to a semester average of 1.64 postings per student). While the number of postings declined over time, the length and qualitative content (depth) of the postings in the hybrid course increased. The average length of postings in weeks 2-3 was one paragraph per student. In weeks 10-11, it was six paragraphs and the content was significantly better with stronger analytical thinking and in-depth probing of topics. In the blended classes with e-learning content below 30%, none of these trends were replicated.

Another indicator, the ratio of instructor postings to student postings, declined significantly in section 01 of the hybrid course over time from 53/139 (a ratio of 0.87) in weeks 2-3, to 40/90 (a ratio of 0.70) in weeks 6-7, to 18/75 (a ratio 0.32) in weeks 12-13 (compared to a semester ratio average of 0.62).

Learning in Mixed Environments and 'Threshold' Effects

The instructor of one of the blended courses mentioned that he had great difficulty getting students to participate in online discussions. Over the course of four semesters, he tried many different strategies to boost student participation in online discussions. Despite online discussions counting for one third of the course grade, students never fully participated in the online discussions. Apparently students' resistance to E-learning (a relatively new environment at the time – 2000 to 2003) was overcome in the hybrid, but not the blended course. Our results suggest a '*threshold effect*' in E-learning. Based on first author's (Dr. Kurthen's) use of microsociology as a context for researching online interaction,

the second author Dr. Smith has hypothesized a threshold effect in adoption of online components, with various contributing factors. A critical mass of the course activities must be online to motivate students to successfully adapt to and learn from the E-learning components of blended/hybrid courses. This directly contradicts earlier studies such as Noriko, Bonk and Angeli (2000) which suggest that students tend to participate online as often as required.

An instructor of yet another blended class, a course on multi-media design, encountered a similar reticence in online participation. The instructor changed the format of the online discussions to increase student "ownership," assigning a student moderator to read the journal article and generate a discussion question. The moderator coordinated the discussion, wrote a summary on why the discussion did or did not take off, discussed best postings, and evaluated the original discussion question. With this new format, all of the students participated. However it was still hard to get the students to read and evaluate the articles, and to participate at a high level supporting their arguments with evidence and critical thinking. The instructor's view was that having the students take ownership improved discussion somewhat. She was still dissatisfied with overall student participation and involvement.

We suggest that the 'threshold' effect, mentioned above, is a logical explanation for the relative failure of online components in this type of blended course. It would be interesting to replicate the format of the course in different versions with larger and smaller percentages of the course taught online and then assess learning, student satisfaction, and the acceptance rate of the online portions.

The choices of the instructor (or instructional designer) are not easy. Sometimes there are a number of different online tools and environments that seem vital. However, components and additional tools presented at the beginning of the course are more quickly accepted as part of the normative environment than those introduced later. In our experience, students perceived online components introduced later as non-essential "add-ons," even if graded. For a variety of personal and course-related reasons students tended to resist inclusion of additional tools and learning components later during the semester and perceived such a policy as disingenuous.

When it comes to incorporating diverse environments (online and FTF) in the same course, "how integral" and "how soon" are key questions for student adoption and learning. However, an overriding psychological or emotional need for an additional component can turn the issues "how soon" or "how integrated" into moot points. For example, a course coordinating a K12 teacher internship program met FTF once a month (Saleh, 2004). During the intervening time the students did on-site teacher internships. Halfway through the semester, the instructor added online discussions which really took off. The students working as interns had a powerful feeling of isolation, insecurity and real need for day-to-day emotional support as they took on the daunting task of student teaching. The monthly FTF meetings simply did not provide the needed day-to-day emotional support. Therefore the students embraced the online discussions (Saleh, 2004).

Factors that Affect Blended and Hybrid Courses

In the above mentioned pilot case studies, the online components of the hybrid courses (more online components) took off, while those in the blended courses (fewer online components) did not. This pattern was repeated in other hybrid and blended courses. Based on our data collection, class observations, and instructor interviews, we ascribe this dramatic difference in online student participation between the blended courses and the hybrid class to at least three factors: 1. the degree of *norm internalization* engendered by the percentage of online course components ('threshold' effect); 2. the *integration* and *timing* of E-learning components with the overall structure and content of the course; and 3. the *ownership needs* of students.

1. ***Norm Internalization:*** In the blended EST course, the E-learning components represented 30% of the course grade, but did not actually replace any of the FTF lectures. So if students averaged half an hour a week in online discussion (a generous estimate), then E-learning represented 12.5% of course contact time. In the hybrid sociology course, the E-learning components actually replaced more than 70% of the FTF meetings (including quizzes and tests). We believe that the percentage of a course that is in an alternate environment (online in this case), is a major factor determining whether students embrace it. Students must overcome some resistance and internalize the norms and rules of another learning modality. Instructors have to provide sufficient explanation, training and advice at the beginning of a course to reduce 'learning curve' problems. If online interaction does not reach a critical mass, it hampers norm internalization. From a student's perspective it may not be worth the effort. E-learning components, then, do not 'take off.' If the novel online component is only intermittent, the students may actually have to repeatedly habituate to the norms. Student resistance will be especially pronounced as they cling to familiar modalities, i.e., traditional FTF classes.
2. ***Integration and Timing Effects:*** The blended EST course was a large enrolment survey class with lectures by the instructor, a number of guest lecturers, text-book readings, in-class assignments and online discussions. The main assessment was multiple choice tests. The culture of the class revolved around the FTF classroom meetings. When the instructor initially developed the course, he believed that online discussions might overcome the impersonal, passive qualities endemic to many large lecture courses, i.e., that adding online discussions would make it more personal and learner-directed. However, the students seemed to perceive the 120 minute FTF lecture as the fundamental social unit of the class. Online discussions which spanned two or three weeks had a very different sense of time than the rest of the course which often focused on a 120 minute period. Because the content of the online discussions was only peripherally related to themes in the text and lectures, the online discussion did not "feel" integrated with the rest of the course. Also the grading structure was completely separate for the online discussions versus the FTF lectures. The online discussions were graded according to quality and quantity of discussion postings, whereas

the lecture material was assessed by multiple choice exams. This may have contributed to a perceived lack of integration between online and FTF components.

Another important point is the timing of introducing a new environment. The timing seems to heavily affect whether students perceive the 'new' modality as integral or peripheral to the course. New teaching modes ('environments') introduced at the beginning of the course, when students are busy with internalizing norms and class codes, are more likely to be perceived as "integral." Once that initial period of internalization is over, students may be loath to learn a new environment and internalize its associated social rules. Internalizing norms of new environments is tacitly the "business" of the beginning of the semester.

3. **Ownership Needs:** The integration and the percentage 'threshold' effects can be compensated or even rendered moot, if there is an over-riding emotional or psychological need for an alternative modality. The course coordinating a K12 teacher internship program provides a powerful example. Meeting FTF once a month did not provide sufficient emotional support. But the addition of online discussions met a real psychological need.

A corollary of psychological-emotional and motivational function is the student perception of 'ownership.' It is a basic human need to want to actively control one's life. The educational philosophy of constructivism has tapped into this desire to motivate students to customize their own learning experience and to build on their existing knowledge and experience. It should come as no surprise that a student sense of ownership, as illustrated by the blended multi-media class, can boost participation in an online component. However the need for active control is a general emotional need. The example of the course coordinating the internship program is a specific and unique context-dependent psychological-emotional and motivational need. Instructional designers should be on the lookout for specific tools that foster course identification and curiosity (competitive group dynamics, online projects, student homepages and chat rooms, etc.) and attempt to use them to achieve their learning goals beyond the reliance on extrinsic motivation (grades).

In our case studies, the cumulative weight of the effects mentioned above, i.e., 1) the 'threshold' percentage of online course components providing sufficient *norm internalization*, 2) *integration* and *timing* effects, and 3) psychological-emotional and motivational *ownership needs*, may explain why the learning efficacy of online components in blended and hybrid courses is often significantly different. We hypothesize that these factors therefore are also central for the understanding why students do or do not embrace components of a course.

Conclusion

Instructors adding online elements into their FTF classes should consider whether there is good reason to include them and whether those online components are likely to "take off." The factors mentioned above are a good starting point for estimating the probability that students will embrace online components.

But before even entering the discussion of which online components will be adopted by students, instructors should ask if there is a good reason to include them in the first place. Adding online components because other instructors do it or because of pressures by peers and administrators is not recommended. Convenience may be a legitimate factor. By putting the syllabus, announcements, assignments, quizzes, and handouts online, instructors save paper, class-time, and the problem of distribution material and its access. Furthermore, if changes are made to the syllabus or and assignments, students can immediately see those changes. For example, course management systems like *Blackboard* have the advantage of being able to reflect up-to-the-minute events like class cancellations or providing text related revisions, etc. The online posting of a few course documents requires students to download, but not interact socially with each other or with the instructor. Socialization effects are negligible. However before instructors include online components with social interaction below the 40-80% hybrid level, they should ask themselves whether the adjustment required of students is realistic and justified.

What are specific reasons why a particular class should be transformed from traditional FTF into blended or hybrid learning? Perhaps a discussion-oriented class might have an enrollment slightly too large to allow each student to fully participate face-to-face. Online discussion can help extend the discussion so that all students can participate. Perhaps the character of a student population may suggest online activities. If the course requires out of class group projects and most of the students are commuters, then online group activities make a lot of sense. If the course involves a lot of remote fieldwork, then frequent face-to-face meetings may be awkward and E-learning components become vital. Some classes may benefit from informational resources that are more accessible in an online format. For example, in a course where students are required to conduct a research literature search, an online document describing how to write such a literature search can link them directly to research databases at the university library web page.

Finally if a decision is made to add online components, the instructor should consider the design factors that make it likely for the online components to "take off," factors such as *norm internalization, integration, timing, and ownership needs, all of which may help to put them over a participation threshold.*

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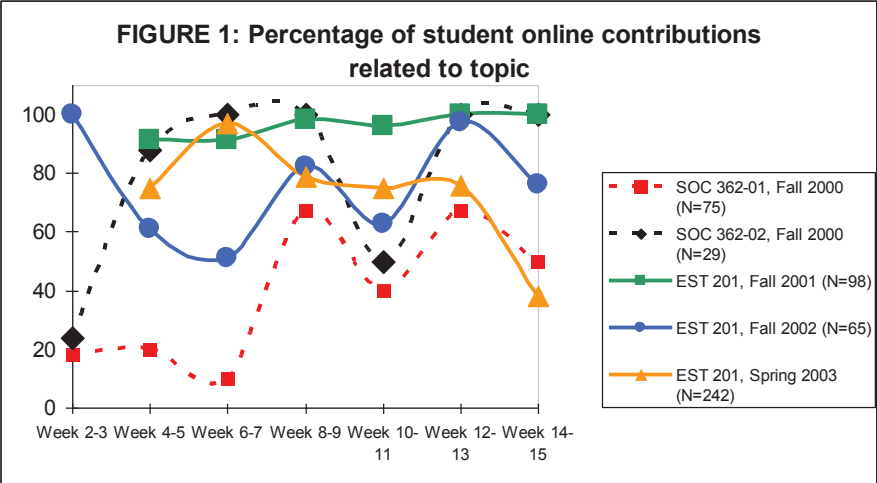


Figure 1: Percentage of Student online contributions related to topic.

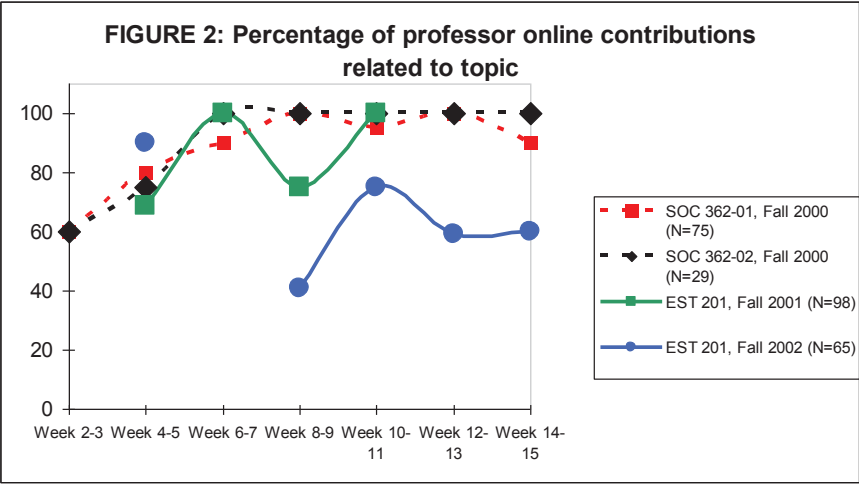


Figure 2: Percentage of Professor online contributions related to topic.

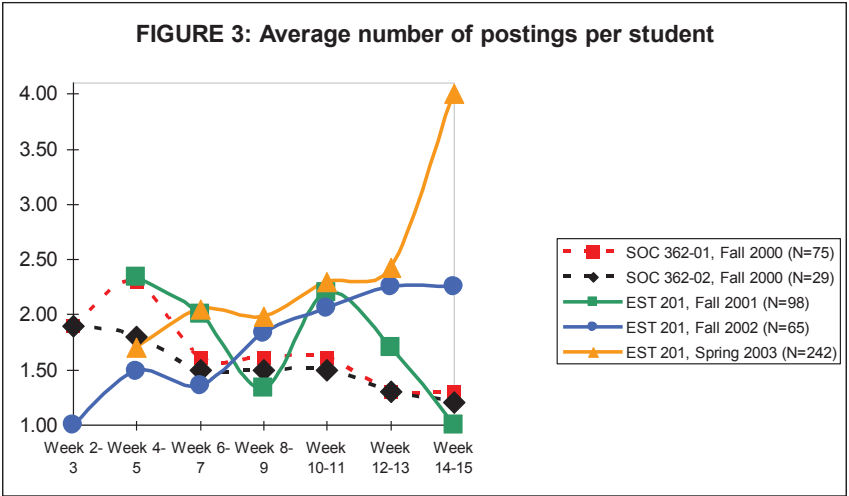


Figure 3: Average number of Postings per Student.

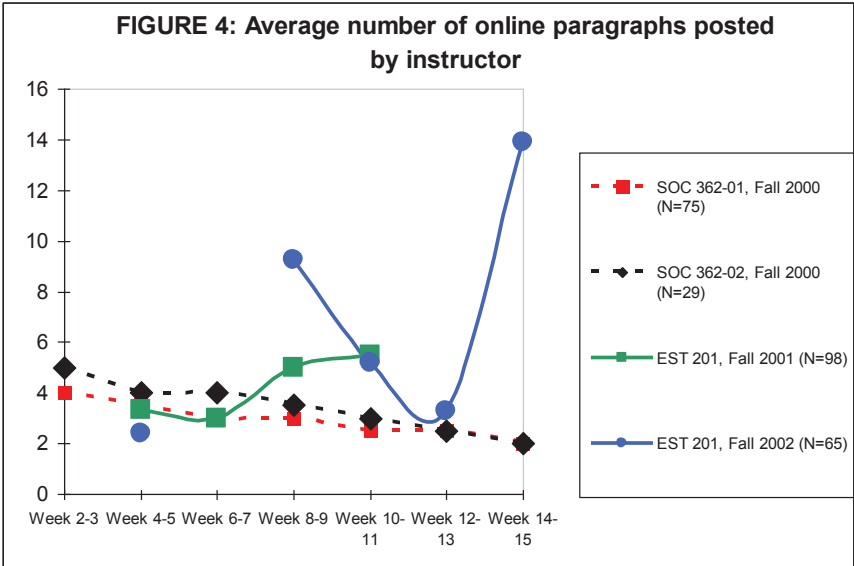


Figure 4: Average number of online paragraphs posted by instructor.