

Teaching Scientific/Academic Writing in the Digital Age

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Abstract: This paper describes a graduate-level scientific/academic writing course for non-native speakers (NNS) of English at Ben-Gurion University of the Negev (BGU), Israel, which is taught in a technology-enhanced or blended learning environment. The use and integration of electronic discourses, such as email and Powerpoint, on-screen marking techniques, and submission of written assignments and writing consultancies by email, and asynchronous online discussion forums are described. Features of the HighLearn course-supporting WEB site, which enable the integration of discussion forums into the writing course, are explained. Results of teacher-initiated student evaluations and advantages and dilemmas of teaching scientific/academic writing in the digital age are discussed. The paper concludes with recommendations for future research and suggestions for the further integration of ICT in the scientific/academic writing course.

Keywords: scientific/academic writing; technology-enhanced learning; CMC/ICT; e-learning; asynchronous discussion forums; EFL

1. Introduction

There is no dispute that the digital age has affected our everyday lives in general and education in particular. This can be seen in the rapid developments in information and communication technologies (ICT), the multitude of Web-based tools available to institutions of learning, and the ever-increasing technical skills of students, all of which are changing the ways in which we teach and learn. In the field of language teaching, Warschauer (2004) states that the changes are most noticeable in written communication, where the reasons for writing and the written genres used, as well as the nature of audiences and authors, are undergoing modification, for both native and non-native writers, as a result of the proliferation and availability of ICT. In short, computer-mediated communication (CMC) has altered the way we write, the genres we use, how we send and receive information, and how we teach and learn (Barker 2002; Warschauer 2002; Warschauer 2004). Corich, Kinshuk, and Hunt (2004) note that the flexibility of e-learning and the increase in WEB-supported learning management systems have resulted in the recognition of potential applications of CMC for educational purposes. They emphasize the pedagogical value of CMC tools in general, and of online discussion forums in particular, stating that the latter encourage student collaboration on assignments, promote interaction between course participants, and enhance higher-level

thinking skills (Corich, Kinshuk, and Hunt 2004).

In the field of scientific and academic writing, recent research has demonstrated that academic conventions are neither universal nor independent of particular disciplines (Hyland 2000, 2002; Hyland & Hamp-Lyons 2002; Johns & Swales 2002; Swales 1990). In other words, there is significant variation of discourses between and within disciplines. This has led to the concept of discourse communities and to an expansion in research on and materials for thesis and dissertation writing and supervision (Braine 2002; Johns & Swales 2002; Swales & Feak 1994, 2000; Weissberg & Buker 1990). It is recognized that good writers go through a number of processes, in particular writing and revising at each stage of the composing process, before the final product is produced (Chandler 2003; Chen 1997; Ferris 1997; Myles 2002). Good writers also share and discuss the writing process with others, are critical of their own work, and are aware of the genre(s), or style(s) of writing, used in their fields. Effective writing is thus the result of rewriting and revising, of going back and thinking before continuing to write. Writing courses based on how good writers compose, such as the graduate-level scientific/academic courses for nonnative speakers (NNS) of English at Ben-Gurion University of the Negev (BGU), Israel, are said to follow the process approach to writing.

The primary question facing teachers working with NNS of English in general, and of heterogeneous graduate-level courses in scientific/academic writing in particular, is how students' demands for personal relevance can be satisfied in multidisciplinary classes. In this paper I attempt to show that this demand for personal relevance can be realized when writing is taught in a technology-enhanced or blended learning environment. First, I briefly present relevant background information concerning the writing course itself. I then describe the integration and role of ICT in the writing course, focusing particularly on electronic discourses such as email and on-screen marking techniques and asynchronous discussion forums. Features of the HighLearn course-supporting, or course management, WEB site are briefly described. The results of teacher-initiated student evaluations are analyzed and the advantages and dilemmas/problems of teaching scientific/academic writing in the digital age are noted. The paper concludes with recommendations for future research and suggestions for the further integration of ICT in the scientific/academic writing course.

2. The writing course

2.1 Students

The Israeli and overseas NNS of English who participate in the scientific/academic writing classes at BGU are linguistically and culturally diverse MSc/MA and PhD students from a wide range of disciplines. Fields of study represented in a given semester have included the life sciences, chemistry, physics, mathematics, computer science, the health sciences, mechanical engineering, electrical engineering, industrial engineering and management, biomedical engineering, nuclear engineering, ecology, geography, economics, education, and comparative literature (Chinese and Hebrew).

Languages spoken as mother tongue have included Hebrew, Arabic, Russian, German, Spanish, French, Portuguese, Ukrainian, Armenian, Mongolian, Hindi, Nepali, Chinese, Amharic, and various languages spoken in Kenya, Zambia and the Gambia, with as many as 6-11 languages represented during any given semester. Students from Kenya, Zambia,

the Gambia, Ethiopia, and India, who are quite fluent in English since they attend English-medium schools in their respective countries, elect to participate in the course in order to acquire proficiency in the specific genres of experimental research report writing and in the organization of academic research articles, and to present their research in the 'friendly' atmosphere of the English as a Foreign Language (EFL) classroom..

2.2 Location

Classes are conducted on two university campuses. Students in the Faculties of Science, Engineering, Health Sciences, and Humanities and Social Sciences study on the main campus in Beer-Sheva, ca. 100 km south of Tel Aviv, while students at the Jacob Blaustein Institute for Desert Studies study on the Sede-Boqer Campus, some 60 km south of Beer-Sheva. Hebrew is the primary language of instruction on the Beer-Sheva Campus, although English is used in English classes, such as the writing course, and in graduate courses attended by international students. At Sede-Boqer, all classes and seminars are conducted in English.

2.3 Course objectives

The faculties and institute expect that, as a result of participating in the course, students' writing skills will improve so they will be able to communicate more effectively in English. The needs of the students, who are highly motivated and share similar goals, are twofold. Their immediate needs are to write a proposal, a thesis or dissertation, an article for publication, or a proposal for a conference presentation. Their long-term or future needs are to be able to communicate effectively in English in order to conduct research and publish their results, and to continue their studies towards a PhD or post-doc, often in English-speaking countries. The writing course attempts to meet these objectives and needs. Thus, the objectives of the course are to equip students with writing tools, and to provide them with relevant reference materials, so they will be able to write effectively and appropriately for their individual purposes; i.e. they will be able to express themselves in acceptable academic English ('acceptable' refers to norms within their fields and sub-fields).

2.4 Prerequisites

In order to be accepted as graduate students at BGU, international students must demonstrate knowledge of English, usually a passing score on the TOEFL examination. Israeli students must have successfully completed the nation-wide university undergraduate requirement for English or have received an exemption from studying English as a result of a high score on the national psychometric examination used by Israeli universities as an entrance examination. A prerequisite for the writing course is that students must have a well-defined research topic, an advisor/supervisor, and be actively involved in research. Since participation in the writing course is restricted to students who are ready to write a proposal, introduction and methodology, or an article for publication, most of the students have completed their first semester of graduate studies before they register for the course.

2.5 Course requirements

Assignments are content-based authentic tasks, which are submitted by email as Word attachments. All students are required to submit a CV (academic or job-related), one formal letter on a topic that is relevant and meaningful to them (Figure 1), a short abstract of 200-250 words, and either their MSc/MA/PhD proposal or introduction and methodology (thesis/dissertation) or an article for publication. Students are also required to participate at least once in three different online forum discussions during the semester. Because oral presentations and participation in seminars are difficult for NNS of English, the final component of the writing course is a 15-20 minute oral presentation, accompanied by appropriate visual aids (Powerpoint, slides, actual specimens, etc.), in which students discuss their research. In addition, at the beginning of the course, students are required to submit two academic articles representative of their field or sub-field. These articles are referred to during the course of the semester when looking at differences in genres, language forms, and formats of experimental research reports in the students' fields.

- Apply for a job or academic position
- Request permission to use the library facilities at another university

- Ask for an interview with a colleague or specialist in your field
- Invite a colleague or specialist to visit you at your university
- Request a scholarship
- Inquire about a point you read in a research article
- Follow up a contact you made at a conference
- Submit an article to the editors of a journal for publication
- Request information about post-doc opportunities and conditions

Figure 1: Suggested topics for formal letter assignment

2.6 Framework

Scientific/Academic Writing is a one-semester course of between 12-14 weeks. Although each class is officially limited to 10-15 students, in practice 28-32 students enroll in the two classes each semester. Although students receive credit (2 points) for the course, since it is an elective in many of the departments, students "talk with their feet". As Myles (2002) notes, it is thus crucial that written assignments and topics covered in class be perceived by the students as relevant and useful. A multiple-draft approach is used and students revise their work until they and the instructor are satisfied.

Classes meet once a week for three academic hours. Focus in the group sessions is on linguistic development, particularly language forms and conventions and common 'language' problems, in-class exercises and exercises assigned for homework. Topics covered include characteristics and conventions of scientific/academic writing such as organization, style, flow and presentation, cultural preferences for different writing styles, and acceptability of "World Englishes" (e.g., academic and informal English as written and spoken in the USA, Great Britain, Africa, India, etc.). Language patterns and grammatical choices are reviewed, even though students are familiar with tenses and active and passive voice, and terminology is kept to a minimum. Common areas of difficulty for NNS of English that are reviewed and practiced in class include countability, articles, prepositions, and connectors. Hedging and data commentary, common features of

experimental research report writing, are discussed in detail. Plagiarism is discussed in depth, especially since the student body is culturally diverse and because the Internet facilitates deliberate, inadvertent or poorly-informed plagiarism by students (Warschauer 2004). Citation- and reference-format is reviewed and students are urged to refer to professional journals and follow format acceptable in their fields and sub-fields. Students are also directed to free websites such as those providing online dictionaries, suggestions for making oral presentations and for writing CVs, and online writing labs/courses.

In the group sessions, students are encouraged to work in pairs or small groups. One might think that graduate students would indeed do so, especially since research in the sciences is often collaborative. However, most of the graduate students, including the Israelis, appear to prefer to work alone. This may be due to the presence of the international students and to multicultural differences. Writing consultancies are conducted as needed, nearly always by email, and may be initiated by students or instructor.

3. Integration of ICT

Online communication has gradually replaced traditional ways of communicating such information as assignments, notices, reminders, feedback, and conferencing. Email, which can be teacher- or student-initiated, is used for one-to-one and one-to-many communication. During the first course (Fall 2000), students were permitted to prepare transparencies and use the overhead projector while making their oral presentations because many were unfamiliar with Powerpoint. Since that time, however, all students have made Powerpoint presentations, as it has become a familiar tool used by them in their other courses.

Written assignments are sent as email attachments and feedback is provided electronically. Marking is done on-screen using the editing tool, the comment function, and a system of color-coding where different colors represent specific types of errors, denote that information is missing, and indicate that I have questioned what has been written.

Examples of feedback received by students are presented in Figure 2. The editing tool, which appears in red on students' papers, indicates suggestions for revision as well as errors that the instructor believes students will not be able to correct by themselves. Students may reject a suggestion for revision if they are able to provide a logical explanation for doing so. Possible reasons for rejecting suggestions for revision include a preference for their own "voice" and a feeling that the intended meaning has been changed. Errors that students are expected to correct by themselves, such as punctuation, spelling, upper/lower case, singular/plural, and subject-verb agreement, are marked in pink, while missing information that needs to be added is marked in blue. Green is reserved for questions and requests for clarification or further explanation. I try not to impinge on the role of the advisor/supervisor and thus comment on organization and content (lavender or comment function) only when it is a glaring problem; in other cases, organization- and content-related issues within various sections or chapters, and within the proposal or thesis as a whole, are left to the advisor/supervisor.

- Red = **When consumed** either as food or juice...
- Red = ...to understand the Red Sea marine ecosystem in the context of **investigating** biological productivity...
- Pink = E.coli G35 **strains has...**
- Pink = ...will be examined and **than** tested...
- Blue = Full lengths of TYLCV in pBluescript-labeled (**something is missing**) served as...
- Blue = At the second stage 4 μ l were transferred to a (**something is missing**) following PCR...
- Green = **this** non-oxidative **enzymes**... [The question, in green, to the student is: Do you mean 'this enzyme' or 'these enzymes'?]
- Green = which corresponds **somehow** to the dimensionless analyses... [The question, in green, to the student is: Is this acceptable in engineering? Don't you need to be more specific?]
- Lavender = Results of this study may suggest a broader hypothesis for further research related to semi-

nomadic herd raising. [The comment, in lavender, to the student is: This sentence is very general. You might want to wait until you have completed your study before making suggestions for further research. Hopefully, your suggestions will then be more specific. What does your advisor think?]

- Comment function = Leaf discs were sampled at different **times** from inoculation (24h -168h). [The comment appears in yellow; the student sees the following:
- The meaning is not clear. What are the differences in time? You need to rewrite this sentence.]

Figure 2: Examples of on-screen electronic feedback (Corrections made or errors to be corrected are in bold.)

When returning their revisions, students are expected to respond to my questions and comments. Some use the comment function and/or color-code their revisions, comments, and questions while others prefer to respond by email. In both cases, students communicate electronically. Writing consultancies are conducted almost entirely by email. When the course was first offered (Fall 2000), students met in individual tutorial sessions at least once a week. However, as the use of technology has become more effective and more efficient, face-to-face meetings have become extremely infrequent. On rare occasions, a student who has not understood my comments will print out the assignment with my comments and ask to meet with me personally for clarification.

HighLearn is a course management system used by most of the universities in Israeli since it supports a Hebrew and English interface. The HighLearn course-supporting Web site developed for the writing course enables the further integration of e-learning and e-delivery in the scientific/academic writing course. The principle features of HighLearn are listed in Figure 3. All materials previously photocopied by students, sent to them as email attachments, or distributed as hard copies in class are now available on the HighLearn site, under the heading 'Course Library'. The message board permits the posting of one-to-many notices while the assignment feature permits the separate listing of assignments and instructions for each class, which may differ as a result of

the university calendar, as well as the listing of grades. Grades are listed separately for each class and posted anonymously by student identification numbers. They can also be listed under the Course Library. The forum feature, located under the heading 'Collaboration', is teacher-initiated; i.e. only the instructor is able to enter items for discussion. Participation in the forum is asynchronous, and a topic or question remains 'open' until deleted by the instructor. Students are able to view all entries and can decide whether to respond to a previous comment or to offer a "new" response that is not related to previous postings. Each reply to a specific comment is displayed hierarchically by means of indentation and chronologically. Another feature of the online forum is that student comments can be archived for analysis at a later time. HighLearn also enables teachers to verify how many students have actually viewed assignments and grades and to conduct polls and evaluations.

- Message board
- Course library (and grades)
- Collaboration (forums, bulletin boards, polls)
- Assignments (and grades)
- Directory (list of students registered for the course)
- Administration (access restricted to instructor)

Figure 3: Principle features of HighLearn

4. Teacher-initiated student evaluations

4.1 The evaluation form

Students complete an evaluation form at the end of each semester, usually after their final grade has been entered into the university computer system. The January 2005 version of the teacher-initiated evaluation form which reflects the format and content of the course as taught during the previous semester is presented in Figure 4. It is important to emphasize that the evaluation form is revised each semester to reflect changes in course content and course format. The present form will thus be revised in June 2005 to reflect the changes in forum discussion topics from teacher-initiated (Fall 2004) to student-initiated (Spring 2005).

- 1 Did you find the overall format (assignments and feedback sent by email, all material found on the HighLearn site) useful?
- 2 What changes would you make concerning the overall format?
- 3 Were the exercises that dealt with common language 'problems' useful, i.e. did you learn something from them?
- 4 Was the format of introducing the language 'problem' in class and then assigning exercises as homework acceptable or helpful? If not, what would you suggest as an alternative?
- 5 Was the reference material useful? Will this material be useful in the future?
- 6 Do you think students should give more than one oral presentation? Why or why not? (If your answer is affirmative, how many oral presentations should be required?)
- 7 Did participating in the Forum encourage you to share ideas, ask questions, raise problems, discuss homework, etc.? Why or why not?
- 8 HighLearn course-support site:
 - a Is it useful to have material and information on the WEB?
 - b Was the information (messages, assignments, grades, handouts, etc.) easy to access?
 - c Is such a site preferable to email and attachments or is there no difference?
 - d Other comments about HighLearn:
- 9 Which would you prefer concerning written material used in class?
 - a The material should be distributed in class by the teacher.
 - b The material should be sent by email as attachments for students to print.
 - c The material should be on HighLearn for students to download and print.
- 10 What did you find most useful or most helpful?
- 11 What did you find least useful or least helpful?
- 12 Other comments and suggestions:

Figure 4: Teacher-initiated evaluation form

4.2 Analysis and discussion

Results of teacher-initiated evaluations indicate that students are satisfied with email communication and find it both effective and efficient (Questions 1 and 2) so that the traditional form of conferencing has in effect been replaced by asynchronous CMC. All students replied in the affirmative to Questions 3, 4, and 5, which dealt with presentation of common language problems, types of exercises, and reference material in the group sessions. Students who did not use the reference material during the course of the semester were certain it would be helpful to them in the future. While students agreed that it was important to prepare Powerpoint slides and present their research in English, especially since this was the only opportunity for some of them (those studying on the Beer-Sheva Campus) to do so, none of them thought it necessary to make more than one presentation (Question 6). Their reasons included the fact that this is a writing course and not a course in oral or presentation skills, that preparing a good presentation is time-consuming, and that they have to make presentations in their other courses.

No conclusions can be drawn regarding student responses to Questions 10 and 11 in which students were asked what they found most or least helpful and useful. The only clear pattern is that those Israeli students who were near-native speakers of English, i.e. had spent several years in an English-speaking country or international school, felt that anything remotely related to "grammar" was unnecessary, whether or not this was reflected in their writing. It is interesting to note that students from the Gambia, Zambia, Kenya, Ethiopia, and India did not make such comments. This may reflect cultural differences vis-à-vis acceptable behavior for students, i.e. whether or not perceived criticism of a lecturer is permissible.

Like the first two questions, Question 7, 8, and 9 refer to the technology-enhanced aspects of the writing course. In Question 7, students were asked whether participation in the Forum encouraged them to share ideas, ask questions, raise problems, discuss homework, etc. Student responses to the first part of the question indicated that the teacher-generated

topics, which focused on informal elements in research articles such as the use of imperatives, *I/my/me/we/our/us*, and direct questions, did not encourage student communication but merely passive responses to the teacher-directed questions. In other words, although students replied to the questions by referring to their specific areas of research, this did not lead to real communication or result in interaction between the students (Corich, Kinshuk, and Hunt 2004; Ho 2002). All of the students thought this type of forum participation was unnecessary and uninteresting and took too much time. They participated in the Forum only because 10% of the overall course grade was designated for this activity. This was true not only for students who participated actively in face-to-face conversation in the classroom but also for those who originally felt participation in asynchronous online discussions would enable them to practice what they perceived as 'spoken' English in a less-threatening atmosphere, i.e. those who were most quiet in class. The two groups of students can further be identified according to country of origin or cultural background. Students in the first group were from Israel, Europe and South and Central America while the others were from Asia and Africa. None of the students thought that asynchronous communication, whether teacher-initiated as in the

Forum or teacher-/student-initiated in email exchanges, could or should replace the weekly group sessions. Students stated that the "human element" is lacking in online communication. They felt that CMC is cold, impersonal, and unnatural, and that "real" learning takes place as a result of face-to-face student-teacher and student-student interaction in the classroom. These responses are also supported by Shetzer (1996), Susser (1993), and Warschauer (1996, 2001).

Nevertheless, it will be interesting to see whether students feel differently about the Forum discussions this semester since the topics, which were generated by their peers, focus on issues that are of interest to graduate students beyond the constraints of the classroom (Figure 5). According to Ho (2002), this in itself should motivate students to participate in online discussion of topics that encourage

students to share knowledge or express diverse opinions. Preliminary results, based on this semester's Forum participation, types of responses following explicit instruction prior to participation in the Forum, and student comments, appear to support research which indicates that when topics are relevant and interesting student participation increases (Funaro and Montell 1999). It has been noted that online discussion forums promote more egalitarian modes of discourse than face-to-face discussions since they offer time for critical reflection and analysis of peers' contributions in a non-threatening environment (Thomas 2002). This means that introverted students or students whose cultural backgrounds do not encourage overt participation in classroom-based discussions are able to express their opinions freely and to practice language in the impersonal setting of the online Forum. Participation in asynchronous online discussions may also lead students to acknowledge and even develop more complex perspectives on a topic.

Finally, asynchronous writing promotes more sustained interactions and greater syntactic complexity than synchronous writing (Sotillo 2000) since students are forced to write in such a way that others will understand and react to their thoughts and opinions.

- The role of rules in learning English
- Life after the MA/MSc/PhD
- Citing references you have not read
- Proving something "for sure"

Figure 5: Student-generated forum topics

The students, all of whom are familiar with technology, found the HighLearn site easy to access, once they were given a password and user name by the university (Question 8). All thought it was better to have everything on one site, rather than to receive email messages with attachments that were sometimes too large for their student email accounts. The international students especially liked having all the information and material on one site, and said they intended to save everything on a CD or DiscOnKey in order to take it home with them. This was preferable to having everything distributed in class; it was also more environmentally friendly, assuming students would not need to print out reference material in the future. There was no definitive answer to Question 9.

Although students preferred that material for class work be distributed by the teacher (immediate need), they also wanted the information to be available on HighLearn (future need).

The final question asks students for "other comments and suggestions". Here students noted that the course should be a year-long course, not a one-semester course, as there was too much to cover in a 12-14-week semester. Students also felt they should be given more than two points of credit since the amount of time spent on writing and revising was disproportionate to the amount of work required by other courses. All students appreciated the opportunity to improve their writing skills and the time spent by the instructor on each assignment. Students also stated that the integration of online communication in course format contributed to making the course personally relevant for them.

5. Conclusions and recommendations

5.1 Advantages of online communication

Online communication has been integrated into the scientific/academic writing course because I believe that computer-mediated interaction among students and with their instructor and other academics helps students become better writers (Warschauer 2002, 2004). One-on-one writing consultancies via email, on-screen marking using color-coding, the editing tool and comment function, and email submission of written assignments have proven to be more effective than the traditional paper submission and pen-and-pencil 'correction' of assignments permitted and used during the pilot course taught in 2000-2001. Furthermore, as noted by students in their course evaluations, integration of CMC in linguistically and culturally diverse writing classes contributes to satisfying students' demands for personal relevance. The integration of online forum discussions into the writing courses this year has provided students an opportunity to communicate with each other in an open, non-threatening, and 'faceless' environment about issues that are of interest to them, issues which would not have been discussed during the course. Because the

Forum is asynchronous, students have time to think and organize their thoughts and ideas more clearly and persuasively.

It has been noted that without individual attention and sufficient feedback on errors, writing will not improve (Chandler 2003; Myles 2002). The effectiveness of feedback given also depends on student motivation, language level, and clarity of feedback (Myles 2002). Studies have indicated that most students have a positive attitude toward using computers for writing and communication, since this is something they do in the real world. When the computer and online communication are an integral part of a course, students have a feeling of personal empowerment as well as a sense of increased learning opportunities (Chen 1997; Susser 1993; Warschauer 1996, 2001, 2002, 2004).

CMC enables teachers to give learners sufficient, explicit and helpful feedback that is both personalized and at their level of proficiency. Chen (1997) found that personalized and accurate online feedback resulted in a reduction of error types and an increase in editing activity. In her study of types of error feedback in second language writing classes, Chandler (2003) demonstrated that teacher correction of errors (my use of the editing tool) and underlining with description (my use of pink for errors to be corrected by the student and green for questions, indicating that clarification or explanation or rewriting is needed) resulted in significant improvement in writing.

In theory, CMC enables prompt response by instructor and students. Feedback, including questions, replies, and comments of instructors and students, based primarily on acceptable usage and format in the professional literature of particular disciplines and/or sub-fields and on the preferences of advisors, who may or may not be native speakers of English, can be instantaneous. Online communication facilitates a higher degree of interaction than that found in traditional classrooms, where the usual pattern is teacher initiates, student responds, and teacher comments. It is a useful tool for the multicultural classroom, for students whose cultures traditionally expect behavior that is different from that found in

"Western" classrooms, because it enables these students to significantly increase their participation through e-mail communication and participation in online forum discussions. Finally, CMC enables teachers to personalize and individualize instruction and emphasize disciplinary-based genres, thus satisfying students' demands for personal relevance, in multilingual classes, multidisciplinary groups, and 'mixed' classes of Masters and PhD students.

5.2 Dilemmas

Despite the encouraging responses of students, problems and dilemmas still remain. The return rate of feedback is often too slow, since 25-30 students enroll in the two writing classes each semester. (In addition, the university requires that I teach an advanced-level reading comprehension course to 25-30 engineering students each semester.) Unfortunately, electronic discourse cannot solve the problem of too many students and lack of time. Research has shown that while on-screen marking and online communication are motivating, they are far more time consuming than traditional face-to-face teaching (Barker 2002; Warschauer 1996).

Dilemmas facing the foreign-language writing teacher relate to the extent and type of feedback students receive. Dangers include misinterpretation (Yates & Kenkel 2002) and too much correction, both of which may result in appropriating student writing so that the student's voice is no longer heard, having been replaced by the writing teacher's voice. I have attempted to solve this by not making suggestions for revision unless there are serious problems or errors, such as grammatical, syntactical and lexical mistakes, that interfere with or prevent comprehension. The distinction here is between "poor" English and "bad" English; the former is understandable while the latter is not. In addition, I ask questions when I am not sure what message or meaning the student wants to convey. Students appear to appreciate and learn from this since they are forced to consider what they have written and to make appropriate revisions (Chandler 2003; Zamel 1985). Because electronic communication differs from face-to-face exchanges (Barker 2002), teachers must also be careful when using CMC to

communicate with students for such purposes as giving instructions, asking questions, offering alternatives, and drawing attention to problems.

Another question relates to whether or not teachers should participate in online discussions. Although student Forum postings were monitored and archived, no teacher intervention occurred during the online discussions as it was felt that teacher comments might be viewed as an intrusion, stifling rather than encouraging student communication. This semester's evaluation form will include a question in which students are asked whether or not they think the teacher should participate in the Forum in order to lead or encourage discussion, moderate content, and add pedagogical comments. During the Fall 2004 semester, one teacher-generated Forum topic was opened for three weeks. At the end of the third week, a second topic was posted, which also remained open for three weeks. This pattern was followed for the third topic as well. At the beginning of the Spring 2005 semester, however, students requested that the four topics be opened simultaneously for a period of two months. Students will also be asked whether they were satisfied with the simultaneous posting of topics or whether they would have preferred separate postings for shorter periods.

Although the writing course is delivered in a technology-enhanced or blended learning environment, students and instructor have continued to meet weekly in a traditional face-to-face setting. It is clear that the frontal sessions can be combined so that classes meet for a four-hour weekly session every other week, rather than every week for 1 1/2-2 hours. The question that arises, however, is whether fewer frontal sessions will have a negative effect on learning. Students will also be asked to consider this issue when completing the evaluation form at the end of the semester.

Two limitations of the HighLearn Web-based course support program used by BGU relate to the collaboration feature. The Forum is teacher-initiated, which means that students cannot pose questions or begin dialogue by themselves; rather, they must "wait" for the instructor to post a topic, even one that is student-generated. The second

limitation is that only one question or item can be listed under the evaluation (polls) feature, which is why the teacher-constructed course evaluation form appears under the heading 'Course Library'. A third limitation of HighLearn is that it does not permit synchronous discussion.

5.3 Recommendations

It is recommended that research be conducted on changes in the writing styles of participants as online discussions progress. The quality of student contributions should be analyzed and assessed for evidence of critical reflection and language that promotes interaction with other students. Although some work has been done on teacher intervention/mediation in online forum discussions, no definitive conclusions have been reached. It is hoped that further research will more clearly identify when teacher participation is desirable, what types of comments encourage student participation, and how students view such intervention or mediation. Plans for the further incorporation of new technologies into the graduate-level scientific/academic writing course include a HighLearn Internet Relay Chat (IRC) application to be installed by the university at a future date, which will enable synchronous communication initiated and directed by the instructor. It is hoped that students will one day be able to initiate dialogue via the ICR application so that participation in online discussion becomes more meaningful and relevant to them.

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