Bradley Horn, Fredricka Stoller, and Marin S. Robinson
UNITED STATES

Interdisciplinary Collaboration: Two Heads Are Better Than One

To meet the ever-changing needs of students in the modern world, forward-thinking educators are crossing the traditional borders of their own disciplines to work with colleagues from other fields to develop novel approaches to teaching. Examples of cross-disciplinary efforts illustrate both the creativity of their participants and the promise and excitement that they hold for students: Biochemists are working with business faculty (Keller and Cox 2004), philosophy teachers are collaborating with physicists (Jordan 1989), and mathematics instructors are teaming up with music teachers (Bamberger 2000). Similarly, English language teaching (ELT) professionals are reaching out to colleagues from other disciplines (including health, history, humanities, math, psychology, science, social studies, and sociology) at primary, secondary, and tertiary levels to develop innovative courses, materials, and instructional approaches (see Appendix 1). The majority of these ELT/content-area specialist interactions are characterized by cooperation, collaboration, and/or team teaching (Dudley-Evans and St. John 1998; see also Teemant, Berhhardt, and Rodríguez-Muñoz 1996).

We have experienced both the joys and challenges that such projects bring, having participated in a multi-year interdisciplinary project involving chemists and language professionals. (See www4.nau.edu/chemwrite for details on our U.S. National Science Foundation-supported *Write Like a Chemist* project.) Overall, we believe that our experiences have led to improved learning for our students and tangible professional growth for us. We recognize that many in the ELT profession are interested in forming similar cross-disciplinary alliances but may feel apprehensive about where and how to begin.

In this article, we share insights gained from our interdisciplinary work in the hopes that other ELT professionals might benefit from them. We explore several reasons why ELT professionals should consider interdisciplinary projects, and we discuss specific steps that can be taken to

ensure successful partnerships. We focus on three key areas: initiating an interdisciplinary project, establishing an interdisciplinary team, and working successfully with other disciplines. Our discussion is organized around nine ELT scenarios, and numerous English idioms, that illustrate the many issues that may arise in the course of interdisciplinary collaboration. (See Appendix 2 for a compilation of idioms used and their meanings.)

Initiating an interdisciplinary project

There are many reasons for starting up an interdisciplinary partnership. Whatever the actual impetus is (whether it be to create a new course, write new materials, start a new school, or meet the needs of new student populations), the not-so-simple act of crossing disciplinary boundaries can lead to innovations that would be impossible without the merging of two disciplinary perspectives. Scenarios #1 and #2 (below) highlight some reasons for collaborating with individuals outside ELT.

Scenario #1: Ibrahim has been asked to develop an English writing course for electrical engineering students at the university where he teaches. Although he has a Master's degree in TEFL and feels comfortable teaching general academic English courses, he has never tried to create a discipline-specific course. He isn't certain where to begin in designing the course. Initially, he collected a number of electrical engineering textbooks and journals from the university library to get a sense of the English language needs of his future students. Unfortunately, because of the many different areas of specialization within the field of electrical engineering, Ibrahim has found it difficult to determine which topics would be most relevant to his students.

Luckily, Ibrahim has a friend who is a professor in the electrical engineering department. As it turns out, this friend is quite concerned about his students' abilities to use English in their engineering studies. Many of them plan to pursue graduate degrees in English-speaking countries but have never written an academic paper in English. Feeling that he has a duty to prepare his students for advanced studies, the professor has agreed to meet with Ibrahim to discuss the English language needs of his students and to see how he can assist in developing the new course. Ibrahim is sure that his friend's contributions to the course will be tremendously valuable.

Ibrahim's situation can best be summed up by the following idiom: *Two heads are better than one*. Even if this common saying seems clichéd, it reflects the primary reason ELT educators should pursue interdisciplinary partnerships: When two people work together to solve a problem (e.g., making educational content engaging and relevant for students), they are far more likely to *strike gold* and find novel, effective solutions than if either had tried to generate solutions on his or her own. By crossing traditional disciplinary boundaries, we can push ourselves (and our partners) to develop new ways of thinking and teaching that would never be possible if we had *played it safe* and remained within the confines of our own respective domains.

In ELT, border crossings often entail working with content-area specialists to develop courses and materials that will be more relevant to specific groups of language learners. It is typically the ELT professional who seeks out the content-area specialist for *the scoop* on the English-language needs of students in a specific field. However, as English assumes more predominant roles in different professions, increasing numbers of content-area specialists are likely to approach ELT professionals to get *the 411* on students' developing language abilities.

As language-teaching professionals, we are well-suited to participate in such projects. Whereas instructors in many other fields tend to focus on the content knowledge that students need to succeed in their disciplines, ELT professionals also ascribe a great deal of importance to the *nuts and bolts* of teaching (e.g., how to make instructional content more accessible to students). Thus, in many interdisciplinary projects, the ELT professional is able to offer valuable insights into how best to select and structure learning activities and

materials to meet instructional goals. At the same time, our content-area partners can offer informed perspectives on the knowledge and skills most valued within their own disciplines, thereby providing key information that can *make or break* a project. In effect, our working together makes the sum of our contributions greater than either part.

Scenario #2: Rose and Grace work together at a primary girls' school. Rose teaches mathematics, and Grace teaches English. Recently, they have been making plans to develop a series of word-based math problems so that their students can practice using English to express basic math concepts. Rose and Grace are convinced that this idea is worthwhile, but some of their colleagues have objected, asserting that the English class is for learning English and the mathematics class is for learning math—that the two do not go together. Rose and Grace need to obtain permission from their school director to put their plan into action, but they're concerned that the director won't see the value of their idea and will take an unfavorable view of them for wanting to make changes in the existing (and functioning) curriculum.

Rose and Grace face a typical dilemma: namely, *there's a first time for everything*. The novelty associated with most interdisciplinary projects can be viewed as both an inherent strength and a potential challenge. Although the end product of a successful interdisciplinary project offers the possibility of enriching the educational experience of teachers and learners alike, participants in collaborative efforts are also *exploring uncharted territory*, which entails certain risks. From the outset, interdisciplinary partners may have to *take a stand* and defend their efforts in the face of resistance from colleagues who may not recognize the potential benefits of collaborating with others. If the doubting colleague is a chairperson or supervisor, the chance of *having the wind taken out of one's sails* is even greater, and the need to defend one's ideas or the goals of an interdisciplinary project is therefore much more important. In other instances, those needing further assurance might be interdisciplinary team members themselves. Even when the original impetus to collaborate might have seemed unproblematic, as challenges arise and risks become apparent, it is only natural that team members may need a little *pat on the back* to help them continue with the idea that initially sparked their interest.

In the face of such challenges, we must remind ourselves and our colleagues that there is a first time for everything. Following the *well-traveled path* may be a safe option, but it is unlikely to lead us to new and improved teaching practices. If we are hesitant to accept some degree of risk, we may not fail, but we may not achieve new successes either.

Establishing an interdisciplinary team

Collaborating and cooperating with interdisciplinary team members is most often accompanied by a series of *ups and downs*. Forming a compatible team, nurturing effective professional relationships, and working to *find common ground* are essential considerations when pursuing interdisciplinary goals.

Scenario #3: Alberto, an experienced ESP instructor, has been hired by the national flight training academy in his country to teach a special English course for new pilots. He is supposed to work closely with the flight training coordinator to develop the English course. Alberto has never met this man before, so he wonders how well they will get along with each other.

Alberto faces a common dilemma: He has been asked to work with someone he does not really know, so he has no way of predicting how well they will work together. When forming an interdisciplinary team, it is important to consider how different personality types might interact. Two idioms may apply in such situations. The first denotes a favorable situation: *To be like two peas in a pod* implies that two people are very similar or complementary to each other. The second idiom, in contrast, suggests a not-so-favorable outcome: *Oil and water don't mix* can describe two people who are incompatible. Obviously, we prefer to work

with individuals we get along with, as opposed to people who are so different from us that we are not likely to *see eye to eye* with them.

Collaborators who have vastly different personalities and/or priorities may find it difficult to accomplish their goals if they *get on each other's nerves*. Of course, there will surely be times when we are asked (possibly by a supervisor) to work with someone we do not really get along with. In many cases, we simply will not have the option of saying no. In such circumstances, it will be necessary to take action to minimize the potential negative effects of personality differences.

Whether interdisciplinary team members are like two peas in a pod or like oil and water, a number of steps can be taken to ensure that a project *gets off the ground* and continues smoothly until project goals and new levels of success are achieved. These steps are addressed in the remainder of this article.

Working successfully with other disciplines

Successful interdisciplinary partnerships are dependent upon good working relationships. In the scenarios that follow, we showcase practices and mindsets that can contribute to positive and fruitful interdisciplinary efforts.

Scenario #4: Elena is an EFL instructor at a binational center. The director of the center has asked her to serve on a committee with several other teachers to develop a new English for Tourism course. All of the committee members are excited about the project, full of new ideas, and eager to work together. In their first meeting, however, they find that it is taking longer than they had expected to agree on what the basic goals of the course should be and how they should divide up committee work.

Elena and her colleagues might have been surprised or frustrated that it took them longer than expected to agree on the basic goals of their project, but, in fact, they have taken an important first step toward ensuring that their project will succeed. They have begun by *making sure everyone is on the same page*. Whenever two people work together, misunderstandings may arise. To avoid conflicts, it is imperative that agreement on critical issues be reached early. Our experiences have taught us that at least three issues need to be discussed among team members in the earliest stages of a project: (a) goals and expectations, (b) each member's level of commitment, and (c) the terminology to be used in team discussions.

Agreeing on project goals and expectations is the first step. If team members start off imagining project outcomes in fundamentally different ways, it may be difficult to realign goals after the project is under way. While it is important to recognize that goals can evolve over time, it is also necessary to make sure that the original expectations of different group members are not irreconcilable.

In an ideal world, all partners embark upon an interdisciplinary effort with an equal sense of responsibility, which translates into a shared commitment to one another, the successful completion of the project, and the coordination of team efforts. Nothing is more frustrating than feeling like one is doing most (or all) of the work, while one's colleague is taking most (or all) of the credit! This is, of course, a worst-case scenario, but it highlights a common source of friction between partners: If both members of an interdisciplinary team do not share a similar sense of commitment to a joint project, then one team member may end up feeling like he or she is doing the *lion's share* of the work.

It is also vital that everyone *speak the same language* (a common idiom, used in a more literal sense here). That is, it is important during cross-disciplinary discussions to avoid overusing terminology from one's own field, especially highly theoretical jargon, just for the sake of showing off one's intellectual credentials. The use of jargon may not only confuse colleagues from other disciplines, but it may also make them feel like they are unwelcome outsiders. Of course, in some cases, it will be necessary to use discipline-specific terminology, especially when such language is used in the project's end product (e.g., a course or a series of instructional materials). In such circumstances, the person whose field's terminology is being used will need to ensure that the meaning of project-essential terminology is clear, essentially creating a shared language among team members.

Scenario #5: Fatma teaches in the preparatory program at an English-medium university in an EFL setting. The director of her program recently attended a workshop on content-based instruction (CBI) and is interested in transitioning the program curriculum from a more traditional model to a content-based English for academic purposes model. The director has arranged for Fatma to work with a professor from the economics department to begin developing a CBI course for business students.

In her first meeting with the economics professor, Fatma was encouraged by his enthusiasm about the project. He suggested several books about business communications for Fatma to look at and offered some advice about what should be included in the course. While Fatma appreciated his input, many of his views about teaching differed from her own. Fatma hopes that they can reach some sort of consensus.

Fatma's story highlights the wisdom reflected by another common idiom: *Keep an open mind*. Fatma has learned a lesson that most participants in interdisciplinary projects eventually learn: People in different disciplines sometimes have (very) distinct ways of doing things, including diverse ways of teaching, thinking about teaching, and talking about teaching (see Barron, 2002). For example, small group activities, which are commonplace in English language classrooms, may not be favored in disciplines where lectures are the norm. It may be difficult to persuade colleagues from these disciplines that such student-centered activities are not *child's play*. Even when ELT professionals are convinced of the value of such activities, having seen them work well in practice, colleagues from other disciplines may be equally certain that lectures are the most effective form of teaching. When such impasses are encountered, both parties must remember not to be dismissive of the other team member's views, no matter how *at odds* they may initially seem. To reject the other team member's views *out of hand* can *hit a raw nerve*, thereby jeopardizing progress on project goals.

While this point may seem obvious, keeping an open mind may be especially important for language teachers. Most everyone, language teachers and non-language teachers alike, has had experiences learning and using languages, so it often seems that everyone wants to *put in his/her two cents' worth* about how languages are best taught and learned. As language professionals, it can be difficult to listen to other peoples' theories about something that we consider to be "our territory," especially if those theories do not fit with the received wisdom of our field. Again, it is important to keep an open mind toward such views. Indeed, they can remind us that although we are language professionals, we are not the final authority on all matters of language use. There will always be much to learn from others about language use and learner attitudes.

Scenario #6: Kofi is working with a colleague at his vocational high school to develop a reading course for students who need to be able to understand technical manuals and other documents in English. Kofi has taught reading in most of his English courses, but the reading passages he assigns cover general topics and the language of the passages is much simpler than the language in technical manuals. In the new course, Kofi's colleague will be responsible for teaching students the technical content, but Kofi still is not sure how he should teach the necessary reading skills.

The apprehension that Kofi feels is quite normal for a teacher preparing a brand new course. Anxiety increases, however, when we set out to teach an interdisciplinary course because we may be less familiar with the content than we would like to be. Furthermore, when we recognize that we are part of something new, we often feel pressured to do everything in a novel way. In such situations, it may be helpful to remember the following idiom: *You don't need to reinvent the wheel*. We use this idiom to point out that it can be unproductive to create completely original materials and/or teaching

techniques when tried and true practices have already been used effectively.

Believing that all aspects of an interdisciplinary project have to be entirely original can leave us *spinning our wheels*. The strength of interdisciplinarity lies in the melding of different perspectives and areas of expertise, not simply the fact that the given combination of disciplines has not been attempted before. Kofi is an *old hand* at teaching reading skills, and many of the teaching practices that he developed in those earlier courses will be helpful in the new course. In consultation with his colleague, who understands and will teach the technical content, Kofi can ascertain the reading needs of his new students. He can determine under what circumstances the students will read manuals and for what purposes. Given information of this type, he will be able to structure his reading instruction. The point is that Kofi and his colleague, together, are able to build on each other's strengths to make their joint course more responsive to students' needs.

Scenario #7: Somying is a teacher supervisor in charge of foreign language instruction in a rural school district. She recently learned about a national education competition in which students are asked to design a tourist guidebook (in English) to promote their local village or region. The winners of the competition will receive a trip to their nation's capital, where they will attend an awards ceremony hosted by the minister of education. The winning guidebooks will be published and distributed to real tourists. This would be a great honor.

Somying has been promoting the competition in each school that she visits; she is encouraging English teachers to collaborate with geography teachers to develop joint lessons in which students could design and write their guidebooks. A few weeks after first presenting her ideas and helping teachers start their lesson planning, Somying visits the schools again to see what progress has been made. She learns that at some schools the teachers have been working well together and accomplishing a lot. At other schools, however, little progress has been made. Especially in schools with more than one English teacher and more than one geography teacher, the interdisciplinary teams have had trouble agreeing on how the lessons should be divided and who should be responsible for each part of the project.

The dilemma that Somying faces reminds us of another idiom: *Too many cooks spoil the broth*. This idiom suggests that if too many people try to work on the same task, they can ultimately ruin it. This is not true every time more than two people are involved in a group project, but it can happen if a large team is not managed well. Put simply, without a coordinator of interdisciplinary team efforts, the project may not turn out as planned.

Successful interdisciplinary efforts depend on the contributions of everyone involved, but one or two people need to take responsibility for *running a tight ship* so that the project as a whole progresses smoothly. Such an arrangement does not require project supervisors *to act in a top-down fashion* or to micro-manage. In fact, the weighing of different viewpoints can be addressed by the group as a whole, as long as a decision is ultimately made. Because consensus is sometimes difficult to reach, the supervisor may need to step in as the final decision maker to ensure that the project does not progress at a *snail's pace* or *grind to a halt*. In such circumstances, the supervisor should avoid dismissing team members' ideas without first carefully considering each viewpoint; ignoring team members' ideas could have a negative effect on the project.

Scenario #8: Deepa, an EFL teacher at an English-medium international school, has been working with subject-area teachers for some time to revise the curriculum so that language and content classes are more closely aligned with each other. Because all of the teachers have multiple commitments, it has taken them much longer to make progress on the curriculum revision project than they had originally expected.

Typically, English language teachers like Deepa tend to *burn the candle at both ends*; thus, adding one more task (like working on an interdisciplinary project) to a busy schedule creates time and coordination challenges. When teachers commit themselves to interdisciplinary projects, they often get sidetracked and leave the project unfinished. To avoid such unfortunate outcomes, teachers need to learn to *take one step at a time*. Sometimes, it is unrealistic to expect to make rapid progress toward achieving project goals. Nonetheless, it behooves us to keep working toward those goals, even if progress is measured in *baby steps* rather than great strides. Such persistence requires that team members be patient—both with each other and with the overall pace of the project. One may well find that what was originally envisioned as a short-term project develops into a much longer effort, especially as early project goals are revised and expanded in response to new successes and new challenges.

Scenario #9: Alexander teaches English at the national legal academy. For several months, he has been collaborating with a professor of legal studies, Vladimir, to develop a specialized English course for future judges and lawyers. When they presented the course syllabus and materials that they developed to the director of the academy, she praised their overall plan but pointed out several shortcomings that she wants corrected before she will approve the course. Alexander and Vladimir left the meeting feeling unsure of how to proceed. Alexander thinks that they should just modify the syllabus and materials in response to the director's requests, but Vladimir thinks that they need to start over from the very beginning.

Vladimir's reaction is a familiar one: When we are asked to revise something that we have worked on long and hard, our first reaction is often to assume that nothing about our original effort is good enough to keep. Alexander is now in the difficult position of reassuring his partner that the director liked much of what they had done, and only wants some parts to be changed—not everything. The idiom *don't throw out the baby with the bath water* might encourage Vladimir. That means these professors can keep what is good and discard only the parts that do not work.

When developing materials for an interdisciplinary endeavor, it is advisable to create more than the project may ultimately need. Such an approach is especially beneficial if opportunities to pilot materials and solicit feedback from colleagues are available. After receiving feedback, the interdisciplinary team can revise as necessary, keeping parts that worked well and discarding those that did not. It would be unwise to toss out everything just because one component is not well-received by others.

Conclusion

From our own experiences, we have come to believe that interdisciplinary collaboration can lead to outstanding opportunities for personal and professional growth. Making certain that those opportunities remain positive requires that all members of an interdisciplinary team strive to ensure the success of the partnership and the project. Each stage of an interdisciplinary venture—from initial planning, to setting up the team, and, finally, to seeing the project through to completion—can present new challenges. Working to solve those challenges together, rather than individually, is the key to success. It is our hope that the points presented in this article both inspire and prepare ELT professionals to cross disciplinary boundaries.

Note

Any opinions, findings, conclusions, or recommendations expressed in this article are those of the authors and do not necessarily reflect the views of the National Science Foundation.

References

The American heritage dictionary of idioms for students of English. 2001. Boston: Houghton Mifflin.

Arkoudis, S. 2005. Frilled up science: Developing practices within collaboration. In *Content-based instruction in primary and secondary school settings*, ed. D. Kaufman and J. Crandall, 133–141. Alexandria, VA: TESOL.

Bamberger, J. 2000. Music, math, and science: Towards an integrated curriculum. *Journal of Learning through Music* 1: 32–35.

Barron, C. 2002. Problem-solving and EAP: Themes and issues in a collaborative teaching venture. *English for Specific Purposes* 22 (3): 297–314.

Cargill, M., and P. O'Connor. 2006. Developing Chinese scientists' skills for publishing in English: Evaluating collaborating-colleague workshops based on genre analysis. *Journal of English for Academic Purposes*, 5, 207–221.

Dudley-Evans, T. and M. J. St. John. 1998. *Developments in English for specific purposes: A multi-disciplinary approach*. New York: Cambridge University Press.

Feryok, A. The impact of TESOL on maths and science teachers. *English Language Teaching Journal 62* (forthcoming).

Hurst, D., and C. Davison. 2005. Collaborating on the curriculum: Focus on secondary ESOL. In *Content-based instruction in primary and secondary school settings*, ed. D. Kaufman and J. Crandall, 41–66. Alexandria, VA: TESOL.

Iancu, M. A. 2002. To motivate and educate, collaborate and integrate: The adjunct model in a bridge program. In *Content-based instruction in higher education settings*, ed. J. A. Crandall and D. Kaufman, 139–153. Alexandria, VA: TESOL.

Johns, A. M. 1997. Special roles: Literacy practitioners as campus mediators and researchers. In *Text, role, and context: Developing academic literacies*, 71–91. New York: Cambridge University Press.

Jordan, T. C. 1989. Themes and schemes: A philosophical approach to interdisciplinary science teaching. *Synthese* 80 (1): 63–79.

Keller, H., and J. R. Cox. 2004. The proteomics stock market project. A cross-disciplinary collaboration in biochemistry and business education. *Journal of Chemical Education* 81 (4): 519.

Leung, C., and C. Franson. 2001. Mainstreaming: ESL as a diffused curriculum concern. In *English as a second language in the mainstream: Teaching, learning, and identity*, ed. B. Mohan, C. Leung, and C. Davison, 165–176. Harlow, UK: Longman.

López Torres, E., and M. D. Perea Barberá. 2002. An ESP program for students of shipbuilding. In *English for Specific Purposes*, ed. T. Orr, 71–87. Alexandria, VA: TESOL.

Makkai, A., M. T. Boatner, and J. E. Gates. 1995. *A dictionary of American idioms*. Hauppauge, NY: Barron's.

Martínez, I. A. 2002. Developing genre awareness in nonnative-English-speaking writers of experimental research articles: A collaborative approach. In *Content-based instruction in higher education settings*, ed. J. A. Crandall and D. Kaufman, 79–91. Alexandria, VA: TESOL.

Nagano, R., and Y. Koyama. 2000. Content-based team teaching. In *KOTESOL Proceedings 2000, Casting the net: Diversity in language and learning*, 195–202.

Orsi, L., and P. Orsi. 2002. An ESP program for brewers. In *English for Specific Purposes*, ed. T. Orr, 175–188. Alexandria, VA: TESOL.

Perry, B., and T. Stewart. 2005. Insights into effective partnership in interdisciplinary team teaching. *System* 33 (4): 563–73.

Schneider, M .A., and J. E. Friedenberg. 2002. A collaborative approach to sheltering complex content for native and nonnative English speakers in a university setting. In *Content-based instruction in higher education settings*, ed. J. A. Crandall and D. Kaufman, 155–168. Alexandria, VA: TESOL.

Stapp, Y. F. 1998. Instructor-employer collaboration: A model for technical workplace English. *English for Specific Purposes* 17 (2) 169–182.

Stewart, T., and B. Perry. 2005. Interdisciplinary team teaching as a model for teacher development. *TESL-EJ* 9 (2) 1–17.

Stewart, T., M. Sagliano, and J. Sagliano. 2002. Merging expertise: Developing partnerships between language and content specialists. In *Content-based instruction in higher education settings*, ed. J. A. Crandall and D. Kaufman, 29–44. Alexandria, VA: TESOL.

Teemant, A., E. Berhhardt, and T. Rodríguez-Muñoz. 1996. Collaborating with content-area teachers: What we need to share. *TESOL Journal* 5 (4): 16–20.

Bradley Horn is a Regional English Language Officer with the U.S. Department of State and a PhD student in the Applied Linguistics program at Northern Arizona University. His research focuses largely on the assessment of languages for specific purposes and the use of technology in discipline-specific writing assessment.

Fredricka L. Stoller is Professor of English at Northern Arizona University where she teaches in the MA TESL and PhD in Applied Linguistics programs. She is co-Principal Investigator of the *Write Like a Chemist* project.

Marin S. Robinson is Associate Professor of Chemistry and Environmental Sciences at Northern Arizona University. She is the Principal Investigator of the *Write Like a Chemist* project.

Appendix 1 A Sampling of Interdisciplinary Efforts Involving Language Professionals

Author(s)	Setting and Level	Nature of the Collaboration
Arkoudis (2005)	ESL (Australia), grade 10	ESL and science teachers collaborate to plan an instructional unit on genetics
Bernache, Galinat, and Jimenez (2005)	ESL (USA), grades 7 and 8	ESL and content teachers co-teach core content subjects (Language Arts, Social Studies, Science, Math, Health)
Bunch, Lotan, Valdés, and Cohen (2005)	ESL (USA), grade 7	Language Arts and Social Studies teachers collaborate with university faculty to develop a curriculum for linguistically diverse students
Cargill and O'Connor (2006)	EFL (China), post-graduate	English for Academic Purposes and content-area faculty collaborate to present workshops to Chinese scientists seeking to publish their research in English
Feryok (forthcoming)	EFL (Malaysia), teacher training	University mathematics and language studies faculty collaborate to prepare secondary school content instructors to teach English-medium math courses
Hurst and Davison (2005)	EFL (Thailand, International School), grades 9–12	EFL and content teachers collaborate to plan the core academic curriculum (History, Civilization, Science)
Iancu (2002)	ESL (USA), bridge program in higher education intensive English program	ESL and content professors (in, e.g., History, Sociology) collaborate in the design of bridge courses that incorporate content, tasks, and assignments from regular university classes
Johns (1997)	ESL (USA), university freshman	ESL and discipline-specific faculty collaborate in an integrated curriculum that links general education, literacy, and campus-orientation classes, and study groups
Leung and Franson (2001)	ESL (UK), grades K–12	Language support and content teachers engage in *Partnership Teaching* to develop curricula that are responsive to mainstreamed ESL learners

A Sampling of Interdisciplinary Efforts Involving Language Professionals *(continued)*

López Torres and Perea Barberá (2002)	EFL (Spain), university	English for Specific Purposes instructors collaborate with university faculty, industry, and an interdisciplinary research group to develop an ESP course for shipbuilders
Martinez (2002)	EFL (Argentina), university	EFL teachers and their students, who already have expertise in an academic area, collaborate in the implementation of an advanced-level course focused on the writing of experimental research articles
Nagano and Koyama (2000)	EFL (Japan), university	English and engineering faculty collaborate to develop and team teach a content-based EFL course
Orsi and Orsi (2002)	EFL (Argentina), workplace ESP	English for Specific Purposes teachers work with industry management to design and deliver an ESP course
Perry and Stewart (2005)	EFL (Japan), liberal arts college	Language and content teachers team teach task-based modules in anthropology, literature, politics, psychology, religion, and sociology
Schneider and Friedenberg (2002)	ESL (US), university	Sociology professor and language professional collaborate to shelter complex course content
Stapp (1998)	ESL (US), workplace	Language instructor and employer collaborate in development of workplace English course
Stewart and Perry (2005)	EFL (Japan), liberal arts college	ESL and content faculty team teach humanities and social science classes
Stewart, Sagliano, and Sagliano (2002)	EFL (Japan), liberal arts college	ESL and content faculty team teach humanities and social science classes

Appendix 2 Key Idioms (Listed in Order of Presentation) and Their Meanings

Idiom	Meaning
Initiating an interdisciplinary project	
Two heads are better than one.	Two people working together are more likely to solve a problem than if they try to do the same alone.
(to) strike gold	(to) achieve success
(to) play it safe	(to) be careful and not take risks
the scoop	current information or details
the 411	current information or details
nuts and bolts	detailed practical information about how something works or how something can be accomplished
(to) make or break (something)	(to) cause either total success or total failure
There's a first time for everything.	Something that has never happened before can and will happen.
(to) explore uncharted territory	(to) go somewhere or do something that no one has tried before
(to) take a stand	(to) take a firm position and strongly assert one's opinions
(to) have the wind taken out of one's sails	(to) make someone feel less confident or less determined to do something
a pat on the back	a word of praise or encouragement for something that someone has done well
well-traveled path	the most common way to go somewhere or do something
Establishing an interdisciplinary team	
ups and downs	the mixture of good and bad things that happen to people
(to) find common ground	(to) find shared beliefs, priorities
to be like two peas in a pod	to be similar or complementary to each other (usually said of people)
Oil and water don't mix.	Incompatible people don't work well together
(to) see eye to eye	(to) agree with one another
(to) get on each other's nerves	(to) annoy one another
(to) get off the ground	(to) get a successful start

Key Idioms (Listed in Order of Presentation) and Their Meanings *(continued)*

Working successfully with other disciplines	
(to) make sure everyone is on the same page	(to) reach agreement on basic assumptions before moving on to more difficult issues
the lion's share (of something)	the largest portion of something (e.g., work)
(to) make sure everyone is speaking the same language	(to) reach agreement on important issues
(to) keep an open mind	(to) consider differing opinions before making a decision or judgment
child's play	something that requires no real effort to accomplish
at odds	in disagreement
out of hand	without thinking about it carefully
(to) hit a raw nerve	(to) cause another person to be angry or uncomfortable
(to) put in one's two cents' worth	(to) give one's opinion in a conversation, often when it is not wanted
don't reinvent the wheel	(to) try to do something in a completely original way when it has already been done in an effective way
(to) spin one's wheels	(to) waste time doing things that achieve little or nothing
(to) be an old hand (at something)	(to) have extensive experience
Too many cooks spoil the broth.	If too many people try to work on the same piece of work, they may ruin it.
(to) run a tight ship	(to) control an organization or team firmly and effectively
to act in a top-down fashion	(to) act like a boss; to take on the role of a boss
at a snail's pace	very slowly
(to) grind to a halt	(to) slowly come to a stop, especially due to resistance
(to) burn the candle at both ends	(to) work very hard without getting enough rest
(to) take one step at a time	(to) work toward established goals in an incremental fashion
baby steps	small steps
Don't throw out the baby with the bath water.	(to) keep what is good and discard only the parts that do not work

Definitions adapted from Makkai, Boatner, and Gates (1995) and *The American Heritage Dictionary of Idioms* (2001).