

# **Center for Communication Excellence**

**GRADUATE COLLEGE  
1137 PEARSON HALL**

<http://cce.grad-college.iastate.edu>

# Center for Communication Excellence

## **Vision**

Foster excellence in the communication skills of developing scholars by providing advanced written and oral communication support that is grounded in scholarship of discourse studies, teaching, and learning.

## **Mission**

- Enhance the professional development of ISU graduate student' and post-doctoral associates by creating opportunities for improving their disciplinary communication competence.
- Promote scholarly visibility and attainment of academic/career goals.

## Need

- Mastery of research genres (e.g., research article, proposals, conference abstracts, theses/dissertations) is critical for student academic success, but is a daunting task for graduate.
- Little institutional support for graduate student learning regarding
  - Understanding research writing conventions and disciplinary expectations.
  - Writing effective research documents.
- Too little time with faculty for consulting/feedback on student writing.
- International and Native English speaking students often struggle with English fluency while learning the specialized language use in their disciplines.

# Center for Communication Excellence

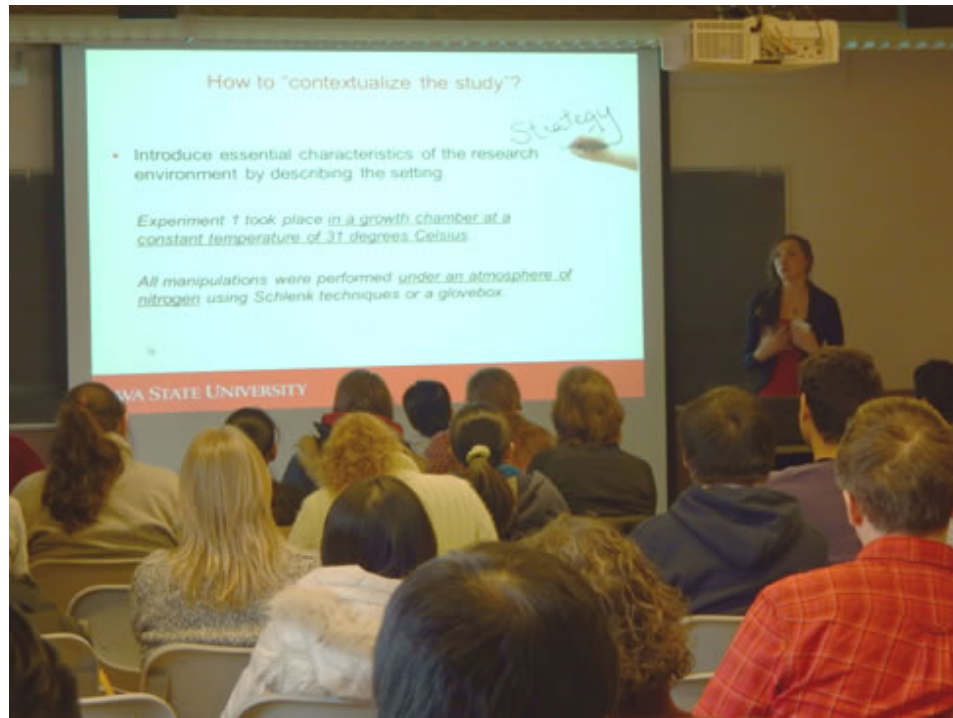
- *Academic Communication Program*
- *Peer Review Groups*
- *Graduate Peer Mentor Program*
- *International Teaching Assistants Program*



# Academic Communication Program

*....coordinates and implements opportunities for graduate students and postdoctoral associates to master the necessary communication skills as they move toward the attainment of their academic and career goals*

<http://cce.grad-college.iastate.edu/acp>



# Academic Communication Program

## The Research Writing Seminar Series

### **Part I - Beginning a Scientific Argument in your Introduction**

Monday February 22 from 3:10-4:40pm in Food Science 2432

### **Part II - Writing the Literature Review**

Wednesday February 24 from 3:10-4:40pm in Food Science 2432

### **Part III - Revealing your Methods**

Monday February 29 from 3:10-4:40pm in Food Science 2432

### **Part IV - Unveiling Results**

Wednesday March 2 from 3:10-4:40pm in Food Science 2432

### **Part V - Writing the Discussion/Conclusion**

Monday March 7 from 3:10-4:40pm in Food Science 2432

### **Part VI - Revising with the Research Writing Tutor**

Wednesday March 9 from 3:10-4:40pm in Food Science 2432

# Academic Communication Program

*Workshops offered in response to requests from graduate student and postdoc groups, graduate program staff, faculty and departments.*



## Workshops in Fall 2015

Workshop	Department/Course	Date	Presenter
The Literature Review as a Scientific Argument	Human Development and Family Studies: 501	9/28/15	Sarah Huffman
Research Writing Tutor Workshop	English: 101D	10/4/15	Sarah Huffman
Research Writing Tutor Workshop	Iowa State University Postdoctoral Association	10/20/15	Sarah Huffman
Research Writing Tutor Workshop	Curriculum and Instruction: 615	10/28/15	Sarah Huffman
Transforming graduate writing pedagogy with corpus-based technology	Curriculum and Instruction: 615	11/4/15	Elena Cotos
How to Effectively Design a Research Poster	Food Science Interdisciplinary Learning Community	11/9/15	Anna Prisacari



# Academic Communication Program

**Workshops in Spring 2016**

## **Improving Writing Productivity**

Dr. Kasthurirangan Gopalakrishnan, Professor of Civil Engineering and author of *The Productive Academic Writer* and *Efficient Book Writing*, will focus on techniques for improving writing productivity through topics like overcoming perfectionism and procrastination, managing time, and using accountability mechanisms.

March 23rd from 2:10-3:10pm in Coover 1012.



# Academic Communication Program

## GRST 529: Preparing Publishable Thesis Chapters

**Section 1:** Reporting original research results within the norms for writing of a student's discipline. Emphasis on preparing thesis/dissertation chapters that will be both acceptable to the Graduate College and ready for submission to a refereed journal in the student's discipline. Focus on reporting student-generated data, norms for discourse within disciplines, and how thesis chapters differ from journal manuscripts. Particularly helpful for students preparing a research article.

**Section 2:** Focus on the writing conventions of research genres as well as on best practices of academic writing mentoring. Particularly helpful for students who intend to pursue an academic career. Students interested in becoming consultants in the new Graduate Peer Mentor Program are encouraged to enroll in Section 2 and receive the training needed for such a position.

# Academic Communication Program

*Online Resource Database*

<http://comm.grad-college.iastate.edu/cce/resources-database/>

*Research Writing Tutor (software)*

**RESEARCH WRITING TUTOR**

Home >>   Understand writing goals >>   Explore published writing >>   Analyze my writing >>

Improve your writing   ClaimingCentrality

**About RWT**

The Research Writing Tutor is a web-based tool that analyzes your research writing and offers feedback tailored to specific fields of study.

**Get Started**

If you want to try RWT, all you need to do is sign up. Start by logging in using the link below and fill out a writer's profile.

**Contact Us**

Please contact us directly with questions about RWT or issues/concerns regarding the tool. We are happy to answer any questions that you might have.

# Peer Writing Groups

...offer students the opportunity to cultivate a supportive professional scholarly community while investing in the process of critical and constructive peer review.

<http://cce.grad-college.iastate.edu/gpwg>



# Peer Writing Groups

## Quotes from Our Members

"Presenting work to graduate students outside of my subject area helped me find places in my writing where I was assuming too much about what the reader would know. I think feedback like this is extremely helpful in converting my writing from the kinds of things I would say to another member of my lab to the kinds of things that communicate my ideas clearly to a larger audience."- *Allison, Chemistry Department*

"PRG is a good opportunity for all kinds of students to prepare themselves for writing an academic paper, share helpful comments and operate feedback."- *Davood, Industrial Engineering, Industrial and Manufacturing Systems Engineering Department*

"A great way to gain critical feedback on your work and to learn how to give constructive feedback to others" - *Michael, Chemical Engineering, Chemical & Biological Engineering Department*

"PRGs made research writing much less intimidating for me."- *Mat, Wind Energy Science, Engineering, and Policy, Electrical and Computer Engineering Department*

# Peer Writing Groups

## **WESEP/ECpE peer writing group**

- *first meeting will be Tuesday Feb. 2nd at 2:30 in Coover 2205*
- *regular meetings Tuesdays 2:30-4pm in Coover 2205*

**Kelly Cunningham** – former group facilitator

**Aaron Bertram** – current group facilitator



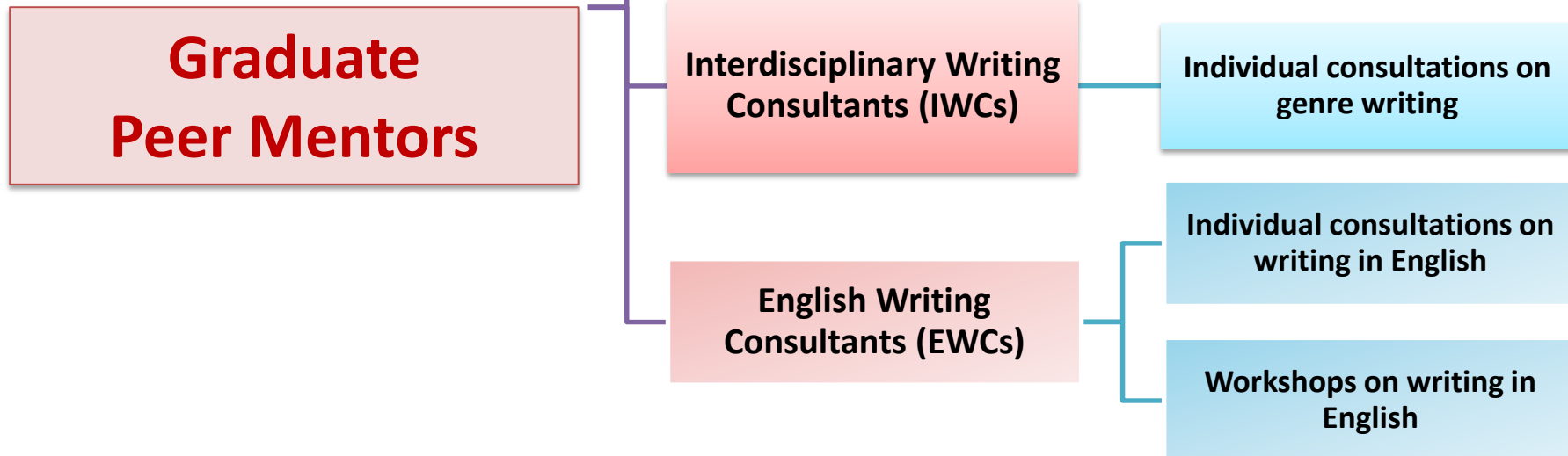
**Aaron**, PhD student in Mechanical Engineering  
*Interests/Specializations:* Computational Fluid Dynamics;  
Heat Transfer; Thermal Engineering; CFD Simulation

*Insights/Feedback from Mat Wymore, PWG member*

## Graduate Peer Mentor Program

*... individualized support for research communication from qualified peer graduate students, tailoring consulting to each discipline's expectations.*

<http://cce.grad-college.iastate.edu/gpmp>



<b>Graduate Peer Mentors</b>		<b>Expertise</b>
<b><i>Disciplinary Writing Consultants (DWCs)</i></b>		
Aaron Bertram	Mechanical Engineering (ME)	✓ Knowledge of research writing conventions in their discipline
Eric Murphy	Mechanical Engineering (ME)	
Jenny Phan	Human Development & Family Studies (HDFS)	✓ Knowledge of disciplinary subject matter
Brett Ramirez	Agriculture & Biosystems Engineering (ABE)	✓ Knowledge of research methodologies in their discipline
Lee Trask	Chemical & Biological Engineering (CBE)	✓ Trained in genre theory and tutoring practice
<b><i>Interdisciplinary Writing Consultant (IWC)</i></b>		
Anna Prisacari	Human Computer Interaction	✓ Knowledge of cross-disciplinary research writing conventions
Hardeep Obhi	Gerontology	
Deborah Burns	Sociology	✓ Understanding of research methodologies across disciplines
Georgi Batinov	Computer Science	
Mitch Stephenson	Kinesiology	✓ Trained in genre theory and tutoring practice
Angie Ford	Rhetoric & Professional Communication	
Tony Fontanini	Mechanical Engineering	
<b><i>English Writing Consultant (EWC)</i></b>		
Joseph Geluso	Applied Linguistics &	✓ Experience working with non-native speakers of English
Monica Richards	Technology Applied Linguistics & Technology	
		✓ Knowledge of writing conventions of research genres
		✓ Trained in second language acquisition theory, genre theory, and tutoring practice



# GPMs (D/I/E Writing Consultants)

- All highly qualified
- Selected by nomination / application
- Semester-long training and supervised practice



## Benefits to Graduate Students

- Individual feedback from a peer mentor who is familiar with subject matter and with communication expectations in their community of scholars.
- Opportunities to enhance understanding of formal conventions or requirements of research and scholarly communication from personalized one-on-one consultations.
- Opportunities to assess and practice scholarly communication conventions in discipline-specific peer review groups.
- Enhanced communication with and more effective guidance from advising faculty, given time constraints.
- Greater possibilities for publishing and visibility as scholars.
- Enhanced potential to meet graduate review requirements.

## Benefits to Faculty / Graduate Programs / Departments

- Less time spent editing students' papers, and more focus on mentoring and responding to content. May refer students to DWCs to follow up on ways to implement advice.
- Influence the types of topics and communication expectations DWCs incorporate while mentoring graduate students.
- Presentation opportunities to impart knowledge of the research and/or writing process to groups of graduate students.
- Improved visibility from graduate students' publishing.
- Improved recruitment, retention, and graduation rates with research-based professional development support.

# Common Questions

## How do I make an appointment?

Go to: <http://dwcisu.appointy.com/>

Click on a writing consultation and consultant

Sign up for an available time with a created username

## Who do I make an appointment with?

An **Interdisciplinary Writing Consultant** or an **English Writing Consultant**

## What types of papers GPMs can help with?

Research articles, theses/dissertations, conference proceedings, conference presentations, job application materials

Iowa State University

# Introduction

## The impact of atmospheric stability on the near-surface wind over sea in storm conditions

P. Baas, F. C. Bosveld and G. Burgers

Royal Netherlands Meteorological Institute, Regional Climate Section, Utrechtseweg 297, P.O. Box 201, 3730 AE De Bilt, The Netherlands

### ABSTRACT

We study the influence of boundary layer stability on the near-surface wind speed, especially for high-wind conditions. An analysis of the wind speed ratio between two vertical levels observed at tall masts in the North Sea and The Netherlands demonstrates that over sea non-neutral conditions commonly occur, even when the 10 m wind speed is 7 Bft or higher (at least  $13.9 \text{ ms}^{-1}$ ). Over land, stability conditions are always close to neutral for these strong wind conditions. This is because over land, large vertical temperature differences are rare in these conditions. An analysis of 30 years of station data shows that even in storm conditions the ratio of the 10 m wind speed between sea and land depends systematically on the difference between the air temperature and the sea surface temperature. The observational results are reproduced by HARMONIE, a state-of-the-art Numerical Weather Prediction model, although the impact of stability is smaller than in the observations. A model sensitivity analysis for a severe storm shows that the near-surface wind speed over sea can vary by 10% depending on the difference between the air temperature and the sea surface temperature. The results presented in this study indicate that even in conditions that are usually classified as '(near) neutral', small variations in stability may have a significant impact on the wind profile. They also indicate that for high wind speeds, the sea-to-land wind speed ratio is dominated by the stability over sea as in these conditions the stability over land is close to neutral. Copyright © 2015 John Wiley & Sons, Ltd.

### KEYWORDS

stability; boundary layer; wind profile; modeling

### Correspondence

P. Baas, Royal Netherlands Meteorological Institute, Regional Climate Section, Utrechtseweg 297, P.O. Box 201 3730 AE, De Bilt, The Netherlands.

E-mail: peter.baas@knmi.nl

Received 22 April 2014; Revised 31 October 2014; Accepted 13 November 2014

## 1. INTRODUCTION

Knowledge of the wind at heights in a range of 50–200 m above ground level is important for many applications, including loads and power output of wind turbines,<sup>1–3</sup> air pollution studies (e.g.<sup>4</sup>) and architectural design (e.g.<sup>5</sup>). As observations are mostly limited to a single level, knowledge of the vertical structure of the wind profile is important. For wind turbines, not only the average wind at hub height is important: enhanced shear values over the rotor blades may reduce the power output by 26%.<sup>6</sup> Wharton and Lundquist<sup>7</sup> concluded that atmospheric stability affects the power yields of wind turbines significantly. Since many wind parks are located at sea, reliable estimates of wind profiles over

what's this about?

Establish knowledge territory

why should I bother?

Identify a niche

what will I learn?

Address the niche with reported study

# Introduction

P. Baas, F. C. Bosveld and G. Burgers

Stability influences the wind profile even in high-wind conditions

must be made.<sup>12</sup> In this way, much better estimates of the wind profile can be obtained both over land<sup>13</sup> and over sea.<sup>14</sup> Gryning *et al.*<sup>15</sup> proposed to include the boundary layer height in the formulation of the length scale (refer also to Peña *et al.*<sup>16</sup>). Especially above the surface layer, at levels higher than 50–80 m, this improves the description of the wind profile for all stabilities.

For estimating winds over open water from a nearby land station, two-layer models are applied that account for the difference in surface roughness. For example, in the lower layer of the model of Wieringa,<sup>17</sup> the wind at the so-called blending height, which is defined as the level at which local disturbances have been blended out, is calculated from an observed 10 m wind of a land station. Next, the upper layer determines the wind in the free atmosphere using a 'regional' roughness and the geostrophic drag law. Then the near-surface wind over the open water location can be calculated by applying the reverse procedure using appropriate roughness lengths. This is close to the procedures implemented in the frequently used Wind Atlas Analysis and Application Program model.<sup>18</sup>

As an alternative for the aforementioned semi-empirical extrapolating techniques, output from a Numerical Weather Prediction (NWP) model can be used. In recent years, with the advent of high-resolution meso-scale models, this approach has become increasingly popular.<sup>19–21</sup>

As demonstrated by, for example, Barthelmie<sup>22</sup> and Sathe *et al.*,<sup>23</sup> the frequency of occurrence of strongly stable and unstable conditions decreases for increasing wind speeds. However, in this paper we demonstrate that stability still has a significant impact on the near-surface wind speed and the shape of the wind profile when the wind speed at 10 m is 7 Bft or higher (at least  $15.9 \text{ ms}^{-1}$ ). We choose this threshold value as it represents still reasonably high wind speeds, while setting a higher limit would reduce the number of available observations significantly. The threshold value is close to the rated wind speed of present-day wind turbines. Maximum observed 10 m wind speeds in the used data set are in the order of  $22 \text{ ms}^{-1}$ .

The aim of this paper is to demonstrate that stability effects play a significant role on the wind speed profile even in high-wind conditions. It will turn out that this is especially true over sea. More specifically, the objectives of this study are the following:

1. determine the impact of stability on the vertical wind speed profile for high wind speeds
2. determine the impact of stability on the sea-to-land wind speed ratio
3. determine the impact of stability on near-surface storm winds over sea.

To this end, we analyze the wind speed ratio between two vertical levels as observed along tall masts both over sea and over land. The ratio between wind speed over sea and over land is studied by analyzing routine station observations. Similar analyses are performed on the NWP model output to assess the model's ability to reproduce the observational results. By analyzing sensitivity experiments performed with the model, the impact of stability on the 10 m wind over sea is studied explicitly.

This paper is organized as follows. Section 2 provides a description of the observations and the atmospheric model. The results are presented in Section 3. Section 4 summarizes the conclusions.

## Addressing a niche strategies

- Introducing research descriptively *and/or*
- Announcing research purposefully *and/or*
- Presenting research questions *and/or*
- Presenting research hypotheses *and/or*
- Summarizing Methods *and/or*
- Stating the value of the paper *and/or*
- Clarifying definitions *and/or*
- Outlining structure of paper

## Research Writing Tutor

Observe and understand conventions in disciplinary writing

- ▼ Birgand, F., Faucheux, C., Gruau, G., Moatar, F., Meybeck, M., "Uncertainties in assessing annual nitrate loads and concentration indicators: Part 2. Deriving sampling frequency charts in Brittany, France", *Trans. ASABE* 54(1):93-104, 2010

Sampling frequencies in regional and national water quality networks are often set to be time proportional (e.g., from bimonthly to bimestrial) and generally uniform across all monitoring stations (e.g., monthly sampling in the implementation of the Water Framework Directive in Europe; EU, 2000). The advantages of using uniform frequencies include, among others, a set schedule for field service and ease of budget allocation. However, it seems quite intuitive that the variability in size and hydrological regime among watersheds of the same network would call for an adjustment of the sampling frequency on a per watershed basis. Indeed, uncertainties of water quality indicators (e.g., loads, average, median concentrations, etc.) induced by infrequent sampling have been shown to vary considerably between watersheds of variable sizes and hydrological years (e.g., Wang et al., 2003; Moatar et al., 2006; Moatar and Meybeck, 2005, 2007; Johnes, 2007, Moatar et al., 2009; Birgand et al., 2010). The consequences are potential ill comparisons, between watersheds and between years, of water quality indicator values for which the uncertainties may differ by several fold (e.g., Birgand et al., 2010). Harmonizing uncertainties to a standard level for indicators is key to improving the quality of reported values and to deriving meaningful conclusions about the state and trends in water quality in regional and national monitoring networks. This essentially implies adjusting sampling frequencies on a station by station basis. Until now, however, to our knowledge there has been no detailed report linking the uncertainty level, the sampling frequency, and the watershed characteristics, and proposing sampling frequency recommendations on a case by case basis. Moatar and Meybeck (2007) and Moatar et al. (2009) have shown that the hydrological regime of watersheds could be used to predict uncertainty levels for pollutants usually linked to particles. This work proposes to expand on this approach and derive sampling frequency guidelines as a function of the hydrological reactivity and a desired uncertainty level to annual nitrate fluxes and concentration indicators in Brittany, France.

- ▶ Zeng, G., Yu, Z., Chen, Y., Zhang, J., Li, H., Yu, M., Zhao, M., "Response of compost maturity and microbial community composition to pentachlorophenol (PCP)-contaminated soil during composting", *Bioresource technology* 102(10):5905-5911, 2011

- ▶ Patterson, T., Esteves, S., Dinsdale, R., Guwy, A., "Life cycle assessment of biogas infrastructure options on a regional scale", *Bioresource technology* 102(15):7313-7323, 2011

(example: Methods section)

# Research Writing Tutor

## Observe and understand language use in disciplinary writing

Caldwell, E., Leib, B., Savoy, H., "Irrigation, Fertigation, and Plasticulture Increase Yield and Quality while Reducing Carcinogen Formation in Burley Tobacco", *Applied Engineering in Agriculture* 26(3):381-390, 2010

The irrigation treatment was created by running drip tape at the base of each plant row on the soil surface. Drip tape is not the most common means of irrigating tobacco but it allowed for smaller plot size and better control of water applications. The watering protocol was based on the best yielding treatment from Caldwell et al (2010).

Ondier, G., Siebenmorgen, T., Wiedower, A., "Research-scale drying of rough rice using silica gel", *Applied Engineering in Agriculture* 27(1):99-106, 2011

However, unless otherwise noted, silica gel adsorptive capacity was estimated as 26.6% (0.266 g H<sub>2</sub>O/g silica gel), based on preliminary experiments. This value, which is less than the purported 30% free-water adsorptive capacity, accounts for intra-kernel resistance to moisture migration. Unless otherwise noted, silica gel packets were intimately mixed with rice samples.

Engler, C., Capareda, S., "Energy Usage Survey of Dairies in the Southwestern United States", 2008

The most complete data for electrical energy usage was the availability of monthly bills for each meter dedicated to a specific process or operation at a dairy. However, such detailed information was not available for all dairies surveyed, so alternative methods for estimating electrical energy usage from incomplete data were evaluated. For method 1, it was assumed that a bill for one of the winter months (December or January) represented usage for one half of the year and a bill for one of the summer months (June or July) represented usage for the other half of the year.

Wong, K., Sugumaran, M., Lee, D., Zahid, M., "Ecological aspects of endemic plant populations on Klang Gates quartz ridge, a habitat island in Peninsular Malaysia", *Biodiversity and Conservation* 19(2):435-447, 2010

In the quadrats, the density and cover of plant species were recorded. The occurrence of *L. praetermissa* (a small tree mostly 3-6 m high) on the rockfaces rather than flatter sites on the ridge spine implied that quadrats could not be used efficiently, so a transect survey was adopted. A 250-m survey transect was followed along the ridge spine, enumerating the number of *Ilex* individuals seen within 50 m intervals, at the uppermost 5 m zone of both the north-facing and south-facing rock faces.

Pearson, T., Wicklow, D., Brabec, D., "Characteristics and sorting of white food corn contaminated with mycotoxins", *Applied engineering in agriculture* 26, 2010

Insect-damaged kernels, larger broken kernel pieces, and kernel fragments that can pass through a grain-grading 12/64 sieve were not included in this portion of the study, but they were included in the subsequent sorting tests. The rationale for excluding such kernels was that many of these kernels would be eliminated by standard mechanical cleaning equipment. Visible and near-infrared spectra (500-1700 nm) were acquired on both the germ side and endosperm side of each kernel using a Perten DA7000 spectrometer per the procedure in Pearson et al 2004.

(example: "Rationalizing Experimental Decisions" Methods section)



## Research Writing Tutor

Apply and assess disciplinary conventions in own writing

Introduction	Methods	<b>Editing Results</b>	Discussion
--------------	---------	------------------------	------------

Enter or edit text below:

**EXPERIMENTAL STUDY OF THE WEB-BASED COURSE**  
Twenty university students (non-native English speakers, majoring in Computer Science) from Southwest Normal University in China participated in this experiment via the Internet. The participants were randomly divided into two groups and assigned to different treatment conditions (see Table 3). The first group was assigned to the intra-personal treatment (i.e., where language is used for a functional purpose) comprised of a note-taking task and a dictation task (abbreviated as N + D). The other group was assigned to inter-personal treatment (i.e., where language is used for a communication purpose) comprised of an information-gap task (abbreviated as IG).  
**Materials**  
The prototype course consisted of 20 dialogues. Each dialogue contained three videos from simple to complex (specified to support the same instructional goal, though by different dialogue strategies)<sup>1</sup> and a set of questions in different task types as described in the Course Structure section, above. The structured or unstructured input video clips are based on the topic "Search"; The task types are defined as dictation, note-taking, and information-gap. The lesson contents were selected based on the participants' current knowledge level and course strategies. The selection of level of the video for each dialogue was left to the students themselves. The default level was based on the participants' progress. However, if the participants were not satisfied with the default level, they were able to select their own preferred level (see video levels in Figure 2).

Click text below for feedback

**Instrumentation**  
The independent variable was defined as type of treatment. The dependent variables were achievement and attitude. The achievement variable was used to address the extent of learning associated with the two treatments, N + G and IG, respectively. The attitude variable was employed to address the degree of motivation reported for the Web-based communication platform as well as the different tutorial functions.  
The tracked data (i.e., the participants' written responses to each question) were used to measure the participants' levels of achievement. The first session was used to acquaint the participants with the training process and was therefore not scored. Three of the remaining 19 dialogues were randomly selected to be scored and were used to measure the participants' achievement in L2 learning in the Web-based CALL environment.  
Finn's (1977) type and token analysis was employed to score participant responses. Hunt's (1977) T-unit2 word count was also used to measure their syntactic complexity. Types are the number of different words used in the participants' responses. The tokens are the total number of words written. The number of types reflects a direct measure of the breadth of subject-specific vocabulary items acquired. The token analysis was conducted on T-units. The assumption is that the length of the T-unit increases as learners mature or develop intellectually (Hunt, 1977)

FEEDBACK (Click on text above for sentence level feedback)




You are likely providing general orientation, giving theoretical, empirical, or informational background relevant to the results of your study here.

Words: 1028    Goal: 636 to 2385

Change Draft: Draft2 2013/10/09 14:01

**ANALYZE**

**Export Options**

Comments   

Analysis

**MOVE 1. APPROACHING THE NICHE** ?

You: 93%

0% - 4%	4% - 11%	11% - 14%
not enough	goal	too much

1 step(s) needs work | 2 step(s) good work >>

**MOVE 2. OCCUPYING THE NICHE** ?

You: 6%

26% - 43%	43% - 77%	77% - 94%
not enough	goal	too much

1 step(s) needs work | 1 step(s) good work >>

**MOVE 3. CONSTRUING THE NICHE** ?

You: 1%

0% - 6%	6% - 22%	22% - 30%
not enough	goal	too much

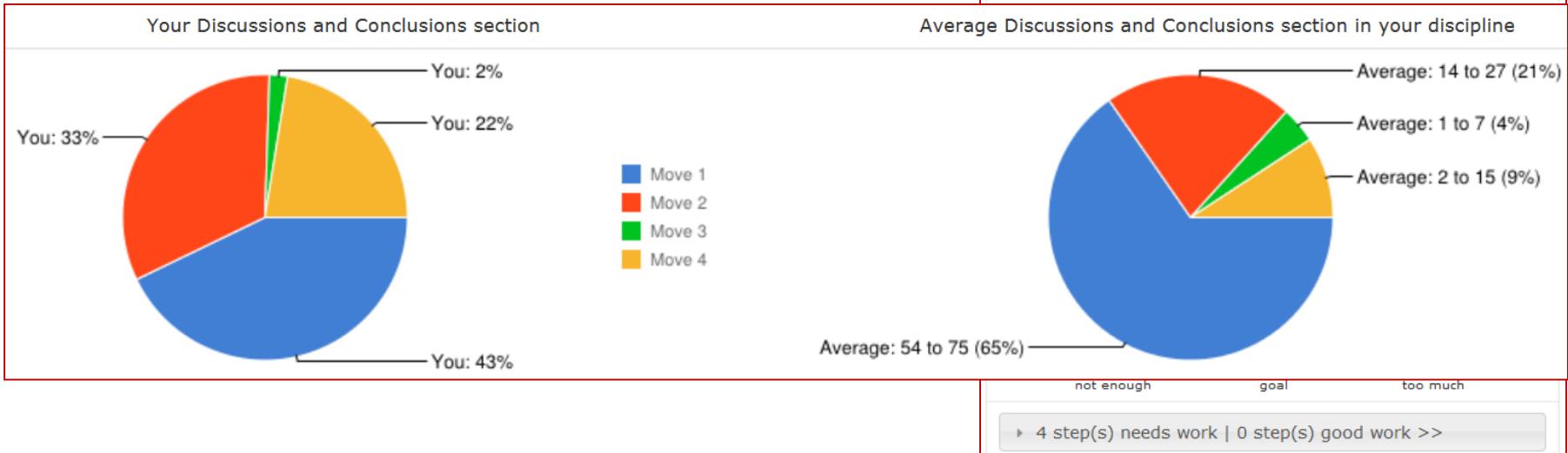
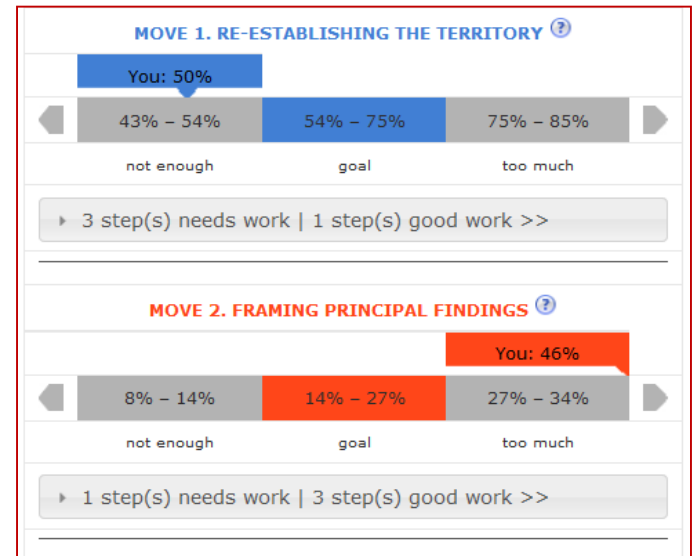
4 step(s) needs work | 1 step(s) good work >>

## Research Writing Tutor

Apply and assess disciplinary conventions in own writing

➤ Feedback writing strategies

- section-level
- discipline-specific



# Research Writing Tutor

Apply and assess disciplinary conventions in own writing

- Feedback on writing strategies:  
sentence-level

often correlated directly with surface slip steps and grain-scale cracks. Overall, there is not a clear correlation between local strain level and Schmid factor, which may indicate the importance of interacting grain neighborhoods in determining the local stress and strain development. There appears to be evidence of grain boundary sliding, the extent of which is still being analyzed, which is consistent with conclusions previously reported by Soula et al. [9]. This is particularly interesting since these were observed in spite of the significantly larger stress levels, and in turn strain rates, imposed in the present study. Nevertheless, the present technique yields a direct correlation between 2-D localized deformation behavior and microstructure. As such, it is a powerful tool for examining how deformation behavior is controlled by a variety of characteristics, including: grain boundary character, 3-D boundary orientation relative to the stress axis (using subsequent FIB sectioning to reveal boundary orientations [21]) and second phase/impurity content (using FIB/TEM analysis [22]).

There appears to be evidence of grain boundary sliding, the extent of which is still being analyzed, which is consistent with conclusions previously reported by Soula et al. [9].

You are likely supporting with evidence.

**MOVE 2. FRAMING PRINCIPAL FINDINGS** ?

You: 46%

8% – 14%	14% – 27%	27% – 34%
not enough	goal	too much

▼ 1 step(s) needs work | 3 step(s) good work >>

- ⚠ Too much focus on explicating results compared to Mechanical Engineering papers. Needs more work.  
[Learn More](#) | [Examples](#)
- 😊 Good work on accounting for results. Very similar to Mechanical Engineering papers.  
[Learn More](#) | [Examples](#)
- 😊 Good work on addressing limitations. Very similar to Mechanical Engineering papers.  
[Learn More](#) | [Examples](#)
- 😊 Good work on relating to expectations. Very similar to Mechanical Engineering papers.  
[Learn More](#) | [Examples](#)

# Contact us

**Elena Cotos ([ecotos@iastate.edu](mailto:ecotos@iastate.edu))**  
**Sarah Huffman ([shuffman@iastate.edu](mailto:shuffman@iastate.edu))**