

Writing IS Teaching Tips: Guidelines for *JISE* Submission

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ABSTRACT

JISE has a lengthy history of inviting the submission of Teaching Tips for publication consideration in the journal. Past submission guidance for Teaching Tips has consisted of asking contributors to document the teaching experience and indicate what has worked, and not worked, in its execution within a journal page constraint of one to five pages. Over time, and with increased senior editor attention to the academic rigor of the journal, the editorial board and reviewers have exhibited more demanding expectations for the publication of Teaching Tips. Additionally, the kinds of Teaching Tips that are applicable to our information systems discipline have evolved into a recognizable set of characteristics that can be used to guide future authors of such articles. To encourage Teaching Tip submissions, the purpose of this article is threefold: (1) to provide potential authors with guidance for writing Teaching Tip manuscripts; (2) to provide reviewers and editors with advice for accepting manuscripts for publication; and (3) to contribute to the body-of-knowledge for the reflective practice of information systems education.

Keywords: Pedagogy, Teaching Tips

1. INTRODUCTION

A *Journal of Information Systems Education* Teaching Tip is a presentation of a field-tested instructional improvement whose purpose is “To Improve Practice (TIP)”. The tip may be a teaching technique, method, assignment, or an approach to structuring educational content. It is the sharing of instructor experience in facing an educational need and addressing that need, where the need might be a solution to a problem or an opportunity to leverage technology to influence information systems education. An important consideration is that the teaching improvement must be new or inventive (innovative). The teaching improvement must advance the practice of information systems education. *JISE* invites Teaching Tip submissions for publication consideration. What needs to be provided in such a presentation? With *JISE*'s mission to be “the premier journal on Information Systems education” (Kruck, 2010), the presentation of a Teaching Tip must include richer informational value than a simple recounting of the activity undertaken in a particular class. A published Teaching Tip needs to improve practice by identifying the educational need it addresses, the tip’s response to the need, and

evidence of how the response meets the need. A published Teaching Tip is an example of Schön’s “reflection-in-action” or “reflective practice” (1983) that is a cycle of action, reflection on the action (e.g., what worked, what didn’t, what have you learned from this), and a future deliberate application of that learning experience.

To date, *JISE* has not published guidelines as to how to write and submit a Teaching Tip. Since *JISE* has not had such guidelines in the past, authors, reviewers, and editors have been inconsistent in what was accepted as a published Teaching Tip. Prior *JISE* issues show many different types of articles labeled as Teaching Tips, some providing innovative methods for teaching, but others that might be considered Teaching Cases or research articles. Some of the papers that we use as examples of Teaching Tips might not have been labeled Teaching Tips when first published. The purpose of this article is to provide consistent guidelines for authors who are interested in writing Teaching Tips for publication in *JISE*, for reviewers to use when reviewing papers, and editors to use when accepting papers. Our goal in writing this article is to assist in the development of future knowledge for the reflective practice of information systems education.

2. BACKGROUND

The sharing of educational improvements through acknowledged academic journals is not unique to the information systems discipline. Our business colleagues in management, marketing, and accounting have a substantial history of publishing work related to improving the quality of education in each of these disciplinary areas. More recently, educators in the decision sciences area have also gained a discipline-specific journal for educational-focused resources. A sampling of such disciplinary-specific journal outlets includes: *Issues in Accounting Education*, *Journal of Accounting Education*, *Journal of Management Education*, *Academy of Management Learning and Education*, *Journal of Marketing Education*, and *Decision Sciences Journal of Innovative Education*. In addition to the disciplinary-specific journals, there is also the *Journal of Education for Business* that indicates it “offers a forum for authors reporting on new successful teaching methods and curricula,” (Journal of Education for Business website, 2012) though recent issues did not show evidence of such published work. In most of these examples, published resources aimed at improving the quality of general business or disciplinary-specific education included: a description of the idea, a theory or practice context for the idea, a detailed discussion of the idea so that others can replicate it, and a discussion of the evidence for the efficacy of the idea. Further, each academic journal provides advice to potential manuscript authors regarding expected content and formatting rather than leaving this decision to the operations of the journal’s editorial board.

Although the information systems academic community has several education-related conferences (e.g., ISECON, IAIM) and continuing tracks at its major academic conferences (e.g., ICIS, AMCIS, PACIS, ECIS) and several regional conferences (e.g., Midwest AIS, Southern AIS), there are few permanent, easily accessible, and dedicated repositories for information systems instructional improvements. The Association for Information Systems website has attempted to provide access to useful and academically-reviewed teaching resources, though this effort has been coordinated through a network of volunteers and has proven difficult to maintain over time. Past resources were hosted at Grand Valley State University through the efforts of Dr. Simha Magal; a current initiative by AIS-SIGEd/IAIM volunteers is still in process. *JISE* provides one of the few archival, academic, peer-reviewed journal outlets for such teaching and learning scholarship focused on the information systems area.

Teaching Tips submitted to *JISE* have reported on many different types of improvements. Some are project-based and suggest assignments for a specific course or courses (e.g., Chen & Brabstone, 2010 or Liu & Downing, 2010). Some introduce a technique that can be used in a number of courses (e.g., Whisenand and Dunphy, 2010). Some introduce a technology (e.g., Dunlap & Lowenthal, 2009). In this section we provide an overview of what makes a Teaching Tip a Teaching Tip and what makes it suitable for publication in *JISE*. We also discuss the purpose of publishing Teaching Tips in *JISE* and the motivation for writing a Teaching Tip.

2.1 What makes a Teaching Tip a Teaching Tip?

We first must distinguish a Teaching Tip submission from other types of articles published in *JISE*. Weimer (2006) provides a helpful dichotomy of scholarship in the teaching and learning field by categorizing such scholarship as either being wisdom-of-practice scholarship or research scholarship. Wisdom-of-practice scholarship is based upon experience in instruction. Weimer (2006) calls this the how-to-literature of teaching. Teaching Tips fall into this category. Research scholarship is a more typical type of scholarly research using quantitative, qualitative, or descriptive forms of research. In this type of scholarship, surveys and experiments on information systems educational methods are common examples.

The distinction between these two categories is not always clear. A good Teaching Tip includes evidence that the improvement worked. If that evidence is provided by a survey, is it still a Teaching Tip? The answer to that question is based upon *emphasis*. If the *emphasis* in the paper is on the teaching and/or learning improvement with a detailed description of the improvement in such a way that another instructor could adopt or adapt the idea, it falls into the Teaching Tip category. Such a paper would include example exercises, methods of using the idea, and guidance on how to adopt the idea. On the other hand, if the emphasis of the paper is on the evidence collection and analysis of the evidence, it falls into the research scholarship category and thus is not a Teaching Tip. As an example, contrast two *JISE* papers: a Teaching Tip, Lending (2010) and a research paper, Part, et al. (2010). Both papers are about introducing Wiki technology into a course and both include evidence of how it worked. The Teaching Tip focuses on how to introduce a particular Wiki assignment into a course. The research paper focuses on the methodology and analysis of Wiki technology in graduate education outcomes.

Secondly, we must distinguish Teaching Tips from Teaching Cases. A Teaching Case is based upon a real-world or real-world-type situation. It provides a case that students can analyze or a problem that they can solve. Cappel and Schwager (2002) classified Teaching Cases into two different types: non-project-based cases and project-based cases. The non-project-based cases are discussion-based and typically provide questions for students to answer. Often they ask students to take the role of a decision-maker in an organization. Non-project-based cases are used by many business disciplines and resemble the Harvard or Ivey cases often used in advanced undergraduate and graduate business education. Project-based cases are categorized as “systems solution cases” (Cappel & Schwager, 2002). In these cases, students create an information systems solution which may include models, documentation, or working systems. This type of case is more typical in the information systems discipline than other business disciplines, as information systems practitioners are quite active in building such artifacts for use in organizations.

A Teaching Tip may also present a real-world case or situation to be solved. The distinction between a tip and a case can be subtle but again is based upon emphasis and presentation. A Teaching Case emphasizes the actual business problem that you want students to solve. The published portion of a Teaching Case describes the real

world situation in a form that can be passed out to students. The case also includes teaching notes describing teaching suggestions, discussion questions, and possible solutions to the questions/exercises but these are unpublished and available only to verified instructors. On the other hand, a Teaching Tip emphasizes the teaching- or learning- need and solution: what is the instructional situation and how can we address it? It provides evidence that the solution meets an instructional need and a reflective discussion of what might be done in the future to change things or adapt the idea for different audiences or situations. Teaching guidelines are an important part of the published tip. Unpublished solutions may also be appropriate for a Teaching Tip and are strongly encouraged for an assignment tip. As an example of the difference contrast two *JISE* papers: a Teaching Tip, Bunch (2011) and a Teaching Case, Guidry and Tutarro. (2010). Both present a short fictional business problem that can be used in instruction. The published Teaching Tip presents context about the instructional situation and how this assignment can be used. The published portion of the Teaching Case focuses on the business situation.

2.2 What makes a Teaching Tip suitable for *JISE*?

To be suitable for *JISE*, the Teaching Tip must go beyond what McKinney (2007) calls the "I tried it and I liked it genre". The author(s) cannot simply present an improvement and say it worked. A good Teaching Tip submission presents a need and an innovative solution. The article should provide:

- A description of the teaching- or learning-need.
- A concrete description of the teaching improvement and how it can be introduced into a teaching situation. The description is detailed enough so that it can be replicated in another teaching situation by another instructor. The description also makes it clear how this solution is innovative.
- A theory, literature, or practice based justification for this need, idea or solution.
- Results from field-testing (e.g., in the classroom.)
- Evidence that the innovation works.

More detailed guidelines can be found in later sections of this paper.

2.3 Motivation for writing and publishing Teaching Tips

The purpose of the *JISE* is to focus on topics of interest to IS educators (*JISE*, 2012.) A Teaching Tip can be considered a visible dialog between IS educators. The tip presents a teaching- or learning-need and a solution for that identified need. It provides guidance on how to implement the solution. Facilitating that dialog is viewed as part of the mission of *JISE*.

For the author of a Teaching Tip, writing the tip is a way to focus on a need faced in day-to-day teaching responsibilities. In developing the rigor necessary to publish a Teaching Tip in a premier journal, one thinks more deeply about one's teaching avocation. Grounding the Teaching Tip in learning theory or discipline-specific theory, literature, or "best practices" suggests that the author is improving his/her teaching expertise based upon existing knowledge. The author becomes involved in conversation about teaching with

others in the discipline, and as noted by Schön (1983) and Dewey (1933) before him, begin to integrate both theory and practice into a continuous learning cycle to develop new knowledge for practice. Just as writing research papers places the writer in a dialog with other "experts", in order to advance the practice of research on a particular topic, so to does the writing of a Teaching Tip.

One common warning about working in the field of scholarship of teaching and learning is that not all institutions consider such research as *substantial research*, i.e., research that contributes to promotion and tenure decisions (McKinney, 2007.). However, the components of an academic career are often compared to a three-legged stool with teaching, research, and service forming the three legs. Writing a Teaching Tip reinforces all three legs: improves your teaching, contributes to the knowledge of discipline-specific educational practice, and provides service to one's colleagues and disciplinary field. An argument can be made that a peer-reviewed, published Teaching Tip in *JISE* contributes to the body-of-knowledge related to the quality of information systems education, and in that sense, is an example of applied business research. However, if the published Teaching Tip is not viewed as substantial evidence for the research leg at one's institution, the published Teaching Tip can provide evidence for the author's contributions to teaching and service. Having a peer-reviewed Teaching Tip published in *JISE* is evidence that the author's teaching improvement was considered noteworthy and innovative. The Teaching Tip was published through a double-blind, academic peer review. Additionally with the publication of the tip, the author is providing a solution to a teaching need for others thus providing a service to one's colleagues in the field.

3. TEACHING TIP CATEGORIES

There are many different types of Teaching Tips that are appropriate for submission to *JISE*. Categorizing these tips can be done in two dimensions: type and duration. Tip **types** can be categorized as a recommended assignment, teaching practice, method of covering specific content, or a technology. The first three of these are based upon Weimer's categorization of wisdom-of-practice scholarship (Weimer, 2006.) The fourth type is an important aspect of information systems education. Each type is described below with examples given. Any one Teaching Tip may encompass multiple types.

Duration of the improvement may vary from an assignment used in a single instructional session, projects that are used over several weeks, a technique to structure a course, or methods used across several courses. Examples of each are provided below.

3.1 Recommended Assignment

Many Teaching Tips take the form of reporting on a recommended assignment whether it is a single session exercise, a homework assignment, a longer project, or a short case. In this type of Teaching Tip, the authors describe an assignment that they have used in the instructional session with enough detail that the reader could replicate it or modify it for use in their own situation. Examples of such

tips in *JISE* are suggesting two projects for use in a data communications course (Chen and Bradston, 2011), providing a Java Bean programming assignment (Mitri 2010), using cascading style sheets to design a fly-out menu (Liu & Downing, 2010) and using a Wiki study-guide project in an introductory information systems (Lending, 2010).

To be a good assignment Teaching Tip, the tip must meet all the characteristics of a good tip in the next section. In particular it should report on a concrete assignment in a way that others could adopt it. The actual assignment can be provided as a figure or an appendix (e.g., Lending 2010.) The author may also wish to provide solutions to the assignment which should not be published. For example, a programming assignment Teaching Tip had solutions that were not published in the journal but are available to instructors (Mitri, 2010).

This type of Teaching Tip can be similar to a Teaching Case. The difference is one of purpose: a Teaching Case provides a substantial business problem that can be handed out to students; a Teaching Tip provides an innovative solution to a teaching need. The emphasis of the tip is on the improvement and how it is implemented in an instructional situation.

3.2 Recommended Teaching Practice

Other Teaching Tips introduce a teaching method or technique. The authors offer advice based upon their own experience. The techniques should be specific improvements that are appropriate in information systems education. Examples of such tips are the use of crossword puzzles to teach vocabulary (Whisenand & Dunphy, 2010), the use of comment-first-coding to teach programming (Sengupta, 2009), and two approaches to reducing cognitive overload in teaching database (Bunch, 2009).

This type of Teaching Tip is usually grounded in a need that is encountered in many courses. The need is described in detail. Examples of assignments or methods of creating assignments (e.g., Bunch, 2009) are helpful in these tips. Presenting a theory base as to why this solution meets the instructional need is a critical piece of this type of tip (e.g., Bloom's taxonomy in Whisenand & Dunphy, 2010 and visualization in Sengupta, 2009).

3.3 Recommended method of covering content

The Teaching Tips that recommend a method of covering specific content are focused on how to cover a content area, usually in a specific course. The authors may offer techniques, assignments, or technologies to cover that content. In this instance, this type of Teaching Tip may also fit into one of the other three types of Teaching Tips. Previously-published examples of this category are an introduction to a server virtualization tool that can be used to give students real-world experience in enterprise-level DBMS, (Wagner & Pant, 2010), making Web 2.0 technology meaningful to students (Lending, 2010,) or how to demonstrate public key encryption in a meaningful way (Pendegraft, 2009.)

Other recommended methods of covering content can provide structure for an entire course or group of courses. One example of this is found in Peace (2011) who suggests

using debates as a method of teaching information systems ethics.

Like recommended practice Teaching Tips, these tips are usually grounded in a specific need or needs that are faced in the instructional situation. However these tips focus on the content area of a specific course. In these Teaching Tips, course objectives and their importance may form an important piece of the Teaching Tip submission. In the future, this category of Teaching Tips might be linked to assessment ideas or practices for accreditation, as the publication of a Teaching Tip might provide a useful approach to gathering, analyzing, or interpreting assessment evidence especially for AACSB or ABET.

3.4 Recommended technology

Teaching Tips that recommend a technology are an important part of information systems education. Examples of such tips are a suggestion of low cost ERP software for use in the classroom (Ayyagari, 2011), and using Twitter in online learning (Dunlap & Lowenthal, 2009.) The needs addressed in these tips differ from the other types of tips, as they may be solely focused on solving problems rather than taking advantage of opportunities. For example the Ayyagari paper (2011) solves a cost problem: how do we bring an ERP into the classroom for a reasonable cost? The Dunlap and Lowenthal paper(2009) addresses the problem of keeping students engaged in an online class. What technology can help?

Good Teaching Tips on recommending technology need to be written based on the problem they are solving. For example, the tip recommending a low cost technology makes it clear what features this tool offers compared to the features of technology tool(s) where cost may prohibit instructional adoption. The tip recommending student engagement was grounded in social presence theory and what promotes engagement.

3.5 Duration of change

The duration of a teaching or learning need varies and thus duration of the improvements vary. A Teaching Tip may introduce a technique that is used in a single instructional session, for example, Pendegraft's method for demonstrating public key encryption (Pendegraft, 2009). An assignment based tip might cover a single assignment or project in a course (e.g., Mitri, 2010) or multiple assignments in a single course or multiple courses (e.g., Chen & Brabston, 2010.) It may be a technique used throughout a course or in multiple courses (e.g., Whisenand & Dunphy, 2010.) The course may be structured or designed around a method (e.g., Peace, 2011.) It may also be a technique that can be used across several courses (e.g., any programming course in Sengupta, 2009) or types of courses (e.g. online courses in Dunlap & Lowenthal, 2011).

The duration of the improvement will influence how the author writes the tip. A tip that focuses on a single assignment will be very specific to that assignment and will include detailed descriptions of that assignment. A tip that covers an entire course will have more details about the course and less on specific assignments. Evidence for the different types of tips will also vary.

4. CHARACTERISTICS OF A GOOD TEACHING TIP

A Teaching Tip suitable for publication in *JISE*, while based upon the authors' experience in an instructional situation, must go beyond what McKinney calls "I tried it, I liked it." What takes a tip beyond this anecdotal stage? The following characteristics are based upon the scholarship of teaching and learning literature including McKinney (2007), McKeachie (2006), Weimer (2006), Cappel & Schwager (2002), and the authors' experiences. A "good" Teaching Tip:

- Provides an innovative solution to an IS teaching or learning need.
- Is grounded in theory, literature, or practical experience.
- Is concrete enough that another instructor can adopt it.
- Is tested in the field (e.g., classroom, instructional session).
- Includes evidence.

4.1 Provides an innovative solution to an IS teaching or learning need

The Teaching Tip must start with a description of the need. If the need has been discussed in other literature, such prior work should be referenced. The need must be one faced in current IS instructional situations. A full description of the instructional situation should be given, including the types of students, course(s), topic(s), individual or team teaching, and setting (e.g., online, blended, face-to-face). Depending on the type of need, the solution can be a single exercise, a technique, a tool, a method of teaching. The solution should be an effective "how to" type solution. The types of problems and solutions were more fully discussed in section 3.

The other important piece of this characteristic is that the tip must explain why the improvement is an innovation. The explanation needs to highlight what is new or inventive about the improvement. It may be used for a new content area or course. However, it may describe a new method or technique for covering existing content or courses. It may discuss the use of new technologies. The paper must explain why this new improvement is proposed as an improvement to information systems educational practice.

4.2 Is grounded in theory, literature, or practical experience

A theory-base provides explanation. It gives the reader a lens or a context to look at the improvement and understand why it works, "a set of assumptions and propositions about a phenomenon, or beliefs about how/why something happens" (McKinney, 2007, p.31.) With this context, another instructor can adapt the teaching improvement for him or herself (McKeachie & Svinicki, 2006). Theories of learning are a particularly relevant theory base but theories found in information systems or fields such as psychology, organizational behavior, or other academic fields are also useful. Using models developed in prior *JISE* articles or other articles can also provide a context for this type of

research. In the discussion section of the Teaching Tip, extensions to the theory-base or model can be proposed.

Examples of theory bases in recent *JISE* Teaching Tips include Abrahams and Singh (2010) use of Kolb's experiential learning model (Abrahams & Singh, 2010), Bloom's taxonomy (Abrahams & Singh, 2010, Whisenand & Dunphy 2010,) social presence theory (Dunlap & Lowenthal, 2009,) and visualization (Sengupta, 2009.) An example of using prior literature in *JISE* to provide a base can be found in Lending's (2010) adoption of a model for mapping objectives to technology proposed by Huang and Behara (2007.)

4.3 Is concrete enough that another instructor can adopt it

A major purpose of publishing a Teaching Tip is to meet a need in such a way that other people can use it. That means the tip must include all relevant material for adoption. This may include assignment descriptions, student handouts, portions of a syllabus, or grading rubrics. It should include suggestions on usage and reflective analysis on what worked and what did not. Methods of extending or adapting the improvement can also be included. Where relevant, solutions should be included though they will be unpublished and available only to verified instructors.

Different types of Teaching Tips require different types of material. For a single assignment tip, Lending (2010) provides objectives that the assignment meets, grading suggestions, examples of student work, and teaching suggestions on how to handle the assignment in terms of class discussion and group size. A complete assignment is given in an appendix as well as a grading rubric. For a programming assignment tip, Mitri (2010) offers unpublished teaching notes which include a solution. For a technique tip that could be used in multiple courses, Sengupta (2009) provides sample assignments and suggestions on how to write new assignments. For a using a debate format to teach ethics tip, Peace (2011) gives debate formats, suggested topics, and problems encountered with interventions used to resolve the problems. For a single lecture using a device, Pendegraft (2009) provided diagrams and photographs of the public key encryption device that he designed and used.

When writing the Teaching Tip, be sure to consider what would make it easier for someone else to adopt the improvement and provide that material in your tip. When the material is long, put it in figures or appendices. If it should not be available to students, provide it as unpublished solutions to be posted on the password protected *JISE* website (jise.org/Notes.htm).

4.4 Is tested in the field

When a Teaching Tip is written and published in *JISE*, the author is sharing his/her experiences with other instructors. "Testing in the field" means that the authors have tried the teaching improvement themselves and in their experience found that the solution addresses the original need. Often it takes several tries to make the improvement work as desired. Writing about this iterative learning experience is part of what makes a Teaching Tip a valuable contribution to the information systems education body-of-knowledge. Further,

the communicated experience serves as evidence of the author's reflective practice as an information systems educator (Schön, 1983).

The experiences that the author gained in using the technique should be shared in the Teaching Tip. Peace (2011) describes several problems that he encountered in using his technique and the interventions that successfully overcame those problems. Lending (2010) describes her grading approach, why it was adopted, and the issues that arise with using that approach.

4.5 Includes evidence

A good Teaching Tip provides evidence that the teaching improvement worked, i.e., that it solved the problem it was intended to solve or met the need it was intended to address. The evidence does not need to be statistical or extensive, but it must be present. Some types of evidence that might be included are professor observation or reflections, student grades, results, student feedback, or feedback from others such as peer faculty or employers. Particularly relevant evidence is comparisons with and without the improvement.

Embedded course assessment comparisons provide convincing evidence. Sengupta (2009) provided statistics on percentage of students who produced code that compiles correctly with and without the teaching technique. He also showed sample programming code with and without the technique. Wisenand and Dunphy (2010) provided average quiz scores with and without the crossword puzzle quizzes. Pendegraft (2009) used a short quiz after the method was used to gauge student learning.

Student reactions are common evidence for *JISE* Teaching Tips. Reactions can be collected in end-of-course evaluations (Peace, 2011), via the assignment itself (Chen & Brabston, 2011, Lending, 2010) or by post-assignment survey (Abrahams & Singh 2010.) Authors often provide anecdotal evidence of student reactions but a more systematic collection of their reactions is stronger evidence.

Reactions of other constituents can also serve as evidence for an improvement. Employer surveys or reactions of other faculty who teach upstream from the course can be used to provide evidence on the effectiveness of the improvement. Additionally, selected comments from peer reviews of teaching practice are also valid evidence for a published Teaching Tip.

5. RECOMMENDED FORMAT FOR SUBMITTING TEACHING TIP MANUSCRIPTS TO *JISE*

Teaching Tips submitted to *JISE* are expected to meet the submission guidelines for all journal articles submitted to the journal. The appearance of the paper including font, page formatting, heading, references, and all other formatting issues should follow the "Author Guide for Preparing Your *JISE* Paper for Publication" published in the journal or found at www.jise.org. The one exception to these standards is paper length. Paper length for Teaching Tips are usually (but do not need to be) substantially shorter than the length of a research paper.

Since Teaching Tips have a specific function that is not part of research articles, the following section is provided as

a guide for submitting Teaching Tips to *JISE*. Authors are encouraged to follow these guidelines for their Teaching Tip submissions.

If a solution is required for the Teaching Tip, it will not be published. It should be submitted with the manuscript. The solution will be maintained by the *JISE* editor and will be made available to verified instructors upon request.

The suggested components of a Teaching Tip follow. Depending on the length of the component, sections may be combined or separated.

Title. The title of the article contains the first words the audience encounters when reading the article. The title should attempt to introduce the main points of the article and to generate interest in reading the article. Please remember that the article's title words, along with the abstract and keywords, are generally used in indexing and archival searches of the journal contents. The choice of title words will affect how the published article is discovered by future searches.

Abstract. The abstract should both convey the teaching or learning need and the key elements of how the innovation addresses the need. If the Teaching Tip is relevant to specific courses, content, or curriculum, that should be part of the abstract. The abstract should not exceed 250 words.

Keywords. Immediately following the abstract, two to six keywords should be specified. They should include appropriate course(s) or topical areas and are included at www.jise.org.

Introduction. The introduction provides an overview of the need. It gives the reason for the tip to be adopted. Where appropriate, it includes references to other articles that have discussed the need. It also gives an overview of how the need is addressed by the Teaching Tip. The introduction should describe which course(s) this technique or assignment could be used in or topical areas that are related to this tip. The introduction may also include the theory, literature, or practical basis that provides the context for why the solution works or is an innovation. If the theory-base is extensive, it can be put in its own section. Models for how this tip fits into the literature or theory are common figures in this section.

The assignment, course or curriculum. The section includes a discussion of what was done with sufficient detail so that it can be replicated in the reader's instructional situation. Depending on the length of the assignment it can be included in its entirety in this section or summarized here with details provided in an appendix. Common figures in this section are short assignments, pieces of code, diagrams, or student results. Complete program code and exercise handout(s) are referred to in this section and included in an appendix.

Teaching suggestions. This section provides the benefits of the author's experience in using the technique. Some common parts of this section are how it worked, what was tried and not tried, grading guidelines, ways that the assignment could be extended, problems that occurred with your solutions and how overcome, and examples of results. Again, depending on length, these items may be highlighted in figures, provided in the appendix, or split into different sections.

Evidence. This section provides discussion showing that the innovation worked. The results do not need to be extensive and do not need to include statistical analysis. For suggestions as to types of evidence that may be included here, refer to section 4.5. Common figures here are tables showing statistical analysis, student reactions, or survey questions that were used to collect the evidence. Again, depending on length, these items may be highlighted in figures, provided in the appendix, or split into different sections.

Discussion. This section is the place for you to reflect upon the Teaching Tip and share your experiences with others. You provide your thoughts on why the improvement worked. You can discuss how the technique could be extended, or what you might do differently if you tried it again. You may provide a model or extension to the theory-base that you used. A contrast to other methods may be described.

Conclusion. The conclusion should reflect upon how this tip contributes to information systems education.

References. The format for References should follow the guide for preparing your *JISE* Paper for publication available at www.jise.org.

Author Biographies. All authors of the work need to submit a brief biography and a picture in .JPG format.

Appendix (optional). The optional appendices are the place to put longer portions of the improvement that were referred to or summarized in the body of the paper. Common appendices are the assignment, program code, portion of a syllabus, grading rubrics, or surveys used to collect evidence.

Unpublished Solution Format (optional). For some Teaching Tips, the authors will wish to provide a solution to an assignment. The published journal article will not contain the solution so that students cannot obtain the assignment answer by reading the journal article. The solution instead will be available from the *JISE* website. The solution should be submitted with the article and will undergo review. If there are comments that accompany the solution, these should also be included here. These comments might include common mistakes or results that only the best students will achieve. If multiple solutions are possible, they should be provided and discussed.

6. DISCUSSION AND CONCLUSIONS

Teaching Tips provide an opportunity for faculty to share their experiences with teaching improvements with other faculty. However, a Teaching Tip is not simply a description of an assignment. It is a carefully written and researched scholarly product. Much of the research occurs over time as the author(s) experience the effects of the innovation in the original course or other courses. In one way, the Teaching Tip can be considered as design science research (Cuellar, 2011). In design science, an artifact is designed, constructed, implemented, and the implementation evaluated. The educational innovation is that artifact and the Teaching Tip communicates the design, implementation, and evaluation of the innovation. An important part of the Teaching Tip is the evaluation of the tip. Without a careful evaluation, the tip is not worthy of being published in a premier journal. Teaching Tip submissions to *JISE* undergo the same double-blind

review process as research articles. Thus they may be considered research articles by some institutions.

Until now, *JISE* has not had published guidelines for Teaching Tips. With this article, the standards for writing and submitting Teaching Tips are now available to authors, reviewers, and editors.

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