Sharing Innovations in STEM Education Through Digital Stories:
a case study in Organic Chemistry

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Abstract: In this paper we reflect on the experience of a teacher creating a digital case story of exemplary teaching, from the perspectives of the three roles which emerged in the development process: the teacher whose changes in Organic Chemistry courses are the subject of the story and the experts in faculty development and digital media who helped shape the resulting multimedia artifact. We provide a brief overview of the digital story in the case study and of the models of development and use which guided its creation. Then we present the reflections and “lessons learned” on three key areas where the creation of this case story advanced the models and methods, which have since been applied in over 40 subsequent case stories: the Starting Points for the project, the Structure and Format which emerged in the development process, and the way the three complementary Roles evolved during the case. A concluding section of the paper adds to the context of the case study with a discussion of related work by others and proposed future work.

1. Introduction to digital case stories

Our central focus was sharing digital case stories of exemplary faculty who have adopted new teaching approaches. Digital case stories are a relatively new genre of multimedia, with the following attributes:

- First and foremost, they are stories – not lessons, presentations or even reflections, although a good story may contain elements which overlap with all of these. The key characteristic of a good story is that it draws the audience in, to identify with the story and imaginatively place themselves in it. A good story about teaching helps other teachers to experience what it would be like for them to do what the story teller has done and feel what the story teller has felt. (See [Hoogfeld et al, 2005] for research on communicating both the process and the product for implementing a new teaching approach.)

- These case stories are also cases in the sense that they are organized for learning: for the digital case story described here the learners are other Chemistry teachers. So in addition to telling an engaging story, we ask our faculty storytellers to think about the questions their colleagues will be asking as they consider a new teaching approach.

The case story featured in this paper was the initial pilot for a larger initiative within the MERLOT network. All the case stories developed in this program were designed for use in faculty and professional development programs in our member institutions. The exemplary teachers whose stories are highlighted in the cases are supported in telling their story in this new medium through supporting roles. Someone with expertise in planning and offering faculty development programs engages in dialogue with the faculty storytellers and the participating teachers to organize and deliver each of the case stories. ¹ Center for Research in Mathematics and Science Education, San Diego State University and Department of Management Sciences, University of Waterloo ² Department of Chemistry, California State University – Long Beach ³ Center for Distributed Learning, California State University
with the teachers about the story and aids in editing the material to create engaging experiences for the colleagues who will later use them. Each case story teacher is also supported by an expert in digital media who helps to edit the story for maximum engagement and impact for other teachers.

In this paper we reflect on the experience of a teacher creating a digital case story from the perspectives of these three roles: Ken is the teacher whose changes in Organic Chemistry courses are the subject of the story, Tom brought faculty development experience and Lou was the digital media expert. The next two sections of the paper provide a brief overview of the digital story in the case study and of the models of development and use which guided its creation. Then we will present the reflections and “lessons learned” on the following key areas where the creation of this case story advanced the models and methods, which have since been applied in over 40 subsequent case stories: the Starting Points for the project, the Structure and Format which emerged in the development process, and the way the three complementary Roles evolved during the case. A concluding section of the paper adds to the context of the case study with a discussion of related work by others and proposed future work.

2. Example of a digital case story: Active Learning Groups in Organic Chemistry

Figure 1 shows the main components of the case story on Active Learning Groups in Organic Chemistry – you can interact directly with the online case story4 as you read the paper.

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4 http://pachyderm.cdl.edu/elixr-stories/active-learning-chemistry/
The Main Screen, Figure 1a, has three components:

- a Preview Video, composed of excerpts from the video segments of the story. The Preview Video is typically the last element created for the story;
- a Text introduction from Ken;
- links to the three main story Components.

**Figure 1a Ken's Story Main Screen**

The Ken's Story component reached by clicking on the image in the top left of the Main Screen, has 9 screens in all. Each contains text and video which outline the history, events and reactions of the story through the following elements:

- Why focus on engaging students in class?
- How the teaching process changed (Ken's perspective as instructor)
- How the learning process changed (student perspectives)
- Relating work in-class to group work outside of class
- Benefits as perceived by Ken
- Benefits as perceived by the students
- Challenges as perceived by the students
- Challenges as perceived by Ken
- Conclusion: why they will keep teaching and learning this way

At the bottom of each screen there is a time-line which allows users to navigate directly to each of these elements of the story, by clicking on the corresponding time-line point. There are also navigation options (in the top right) to go back one screen and to go back to the Main Screen. The first screen in this sequence is shown below as Figure 1b.
We used the Concerns-Based Adoption Model [Hord et al, 1987] as the framework for developing the recommended elements of the case story time-line. The model analyzes the concerns which a teacher would typically encounter in consider the adoption of a new teaching approach. Section 4 outlines some of the steps and issues in moving from a list of concerns to a compelling and accurate narrative of an instructor's experiences with a new teaching approach.

The three further screens shown below highlight particular features of this case story. The case story team selects additional resources to support other instructors in evaluating and adapting these methods. In Active Learning in Organic Chemistry case, these included the following:

- A video of a typical group problem-solving session within a lecture class. This segment demonstrates how Ken interacts with the students before, during and after group work, and has proven to be most effective in showing the potential for student engagement and deep learning to take place through the in-class group exercises. (This video plays in the video window of the screen in Figure 1c, which also provides navigation to the screens shown in Figures 1d and 1e.

- Resources from Ken's class which can be re-used by other instructors are show in Figure 1d. In addition to the course syllabus for context, the most valuable resources are the sample problem sets given out to groups for specific topics – these illustrate the appropriate level of difficulty and elapsed time as guidance to other instructors.

- Instructors will want evidence about the impacts on student learning and attitudes. Ken and his colleagues conducted an evaluation of some of the impacts [Myers et al 2007] and excerpts from this study appear here in the More About This Case section (Figure 1e).
Figure 1c  A virtual classroom visit and other resources are available

More on Ken Nakayama’s Active Learning Class
*“I’m still learning how to do this better, but I would never go back to the old lecture sessions...”*

You are welcome to drop in on a class session, through the Virtual Class Visit section on the right.

You can also use any of the course components included in the Resources section - syllabus, outlines of class sessions, questions I used with groups - to help you understand and implement Active Learning Groups in your own Organic Chemistry course.

We have recently begun to collect quantitative evidence on how this approach improves student learning. Take a look and share your thoughts.

Virtual Class Visit (Video)

Resources from Ken’s Course

Studying Student Achievement*

Figure 1d  Ken has included a course syllabus and 5 sample group exercises

Document Resources
*Click on the links below to view & download documents.*

These resources from my course can help you understand and implement Active Learning Groups in your own Organic Chemistry course. The group questions section expands on the problems I gave the groups to work on, incorporating what I learned about getting the right level of complexity and duration.

* Ken

Course Syllabus  Problem Set #1  Problem Set #2  Problem Set #3
As discussed in Section 4, a leading expert in active learning for Chemistry students, Don Paulson, gave extensive support to Ken and some of his work is also included in the case story.

Figure 1e  Demonstrations of more Active Learning practices by Dr. Don Paulson
3. Use and Development of Digital Case Stories of Exemplary Teaching

ELIXR Case Stories are autobiographical. Most authors of an autobiography need an editor, especially 1st time authors or anyone working in a new medium. Editors support authors in making the transition from a personal reflection – written for their own learning – to a case story which will support the learning of others. This section describes the process by which the faculty author and this support team interact to develop the case story.

Editorial guidance for ELIXR varies in scope, and can include:
- mapping an appropriate structure for the story;
- selecting critical story elements;
- including student voices;
- choosing language and tone to best convey what happened, and how it felt.

The work of a good editor never gets noticed by the readers or audience – they will experience it as the teacher’s story, with the added bonus of student reflections and insights.

Faculty authors normally have two co-Editors supporting them: a Faculty Development Editor who understands the context in which ELIXR Case Stories are used, and a Digital Media Editor who can help the faculty author to make use of the interactive medium most effectively. The authors of this paper filled the roles as follows: Ken was the faculty author, Tom was the Faculty Development Editor, and Lou was the Digital Media Editor.

Most faculty authors of case stories will also have support from media technical experts, e.g., in preparing video clips of teacher and students, recording audio files, creating graphics, etc. This is provided by the Faculty Development Office or Teaching and Learning Center commissioning the case story. The typical steps in the case story development time-line are shown in Figure 2. The target time commitment from faculty authors is 40 hours. This represents the “real time” commitment: as shown in the Figure 2, there are other steps in the process which extend the “elapsed time” to complete the case story, including review by potential users who may request revisions. The process is designed so that the effort by the faculty author occurs as early as possible within a 4 to 6 month period for completing the story, although it is not unusual for faculty authors to extend their involvement beyond the minimal target.

The reviewers are primarily faculty development experts who want to use the case story in faculty development workshops, online courses and other programming offered by their centers for teaching and learning. These programs support of faculty seeking to enhance their approaches to teaching and learning. The reported benefits of digital case stories for faculty development include the following [Souza et al, 2010]:

- Seeing “it” happen is better than just talking about or reading about how “it” should happen
- Discussing the case stories with others is a positive experience because it brings out different insights
- It was positive to have interdisciplinary discussions because it allows for the different insights to emerge
Figure 2  ELIXR Case Story Development Time-line

Legend: Who does what

- Faculty author
- Co-editors
- Faculty author & co-editors

1. Read the Faculty Guide to Authoring an ELIXR Case Story
2. Tell your story to your editors
3. Work through Preparing to Tell Your ELIXR Story
4. Find the narrative structure which best suits your story
5. Gather artifacts from your course as illustrations
6. Draft Story:
   - Intro
   - Product
   - Process
   - Personal
7. Review draft story with ELIXR program team
8. Additional video if required:
   - student voices
   - students @ work
   - your reflections
9. Create a personal reflection about your experience
10. Your Story:
    - Intro
    - Product
    - Process
    - Personal
11. More about your story:
    - Students at work
    - Course Resources
      - Syllabus, etc.
    - Student achievement
12. Preview
13. Personal Reflection
14. Revision based on pilot use
A secondary use of the ELIXR case stories has been through individual faculty access online, e.g., via a discipline teaching portal. The Science Education Resource Center at Carleton College, evaluated the value and utility of integrating two digital case stories into their existing web-based pedagogic modules for Geosciences faculty members, *Teach the Earth*\(^7\). Their findings indicate that case stories added value to the existing site. In particular, the faculty members in the study reported that the modules that integrated the case stories contributed to their knowledge about the topic or affirmed their existing knowledge.

4. Reflections on Starting Points for the Story

In the next three sections we draw on reflections from our experiences in this case study – and comparison with more than fifty subsequent ELIXR digital case stories which followed – to highlight lessons learned about story design and development in the following areas:

- initial perspectives on the purpose, product and process;
- decisions on the emerging structure and format for the case story;
- the interactions of the author and editor roles throughout the development process.

From Ken’s perspective as a STEM teacher, the digital case story is a virtual classroom visit which arose from his experience of visiting another instructor’s classroom and discussing the exemplary teaching he observed there. From Tom’s perspective in faculty development, the digital case story is like a panel of experts invited to a faculty development event. From Lou’s perspective as a digital media expert, the digital case story adapts current work in digital storytelling to meet the distinct needs of faculty development.

Ken: Since midway through the spring semester of 2005, I began to adopt active learning and group learning strategies from Dr. Donald Paulson [Paulson, 2001] into my Organic Chemistry curriculum. This decision came after experiencing several years of what seemed to me an impasse in getting the course contents across to my students. The better students were capable for the most part in comprehending the material. However, the problem existed with the large portion of my class who seemed passive about gaining course mastery or even passive-aggressive about engaging me and the course material.

It was during this time of much frustration and near despair that Don was invited to our university to present a workshop on his teaching techniques. Some of the senior members of my department were visibly skeptical during the workshop, but I found a glimmer of hope in Don’s message. I immediately implemented some his strategies in my Organic II lectures midway through the semester and gradually saw the atmosphere of my classroom transform into a livelier, more interactive environment. More students began to take ownership of the questions I posed during lecture. As I circulated the room and corrected errors, the students responded by attempting each subsequent problem with continued vigor. It was then that I realized I had to observe Don’s teaching method firsthand, so I began driving to his university\(^6\) at least twice a week and sitting in on his lectures. If Don was available after his lecture, we discussed teaching strategies over lunch, after which I rushed back to CSULB to give my own organic lecture. It was for me a time to reexamine and rejuvenate my entire approach in the teaching process.

Attending Don’s Organic II lectures provided continuous insights into how I was teaching my own class and how it could be done differently. He is a consummate teacher and I learned so much about not just

\(^7\)http://serc.carleton.edu

\(^6\)Don was then a professor at the Los Angeles campus of the California State University (now retired).
the specifics of teaching organic chemistry, but also the attitude and the demeanor with which to approach a classroom. As I’ve mentioned, I attended most of about 10 weeks of his organic II lectures and I would have kept attending more if my own schedule had allowed it.

**Tom**: At my university, we sponsored a regular series of Open Classroom sessions in which groups of faculty visited classes taught by exemplary teachers, including an introductory meeting with the instructor beforehand to discuss the lesson plan and a debriefing immediately afterward to share observations and reflections. While the Open Classroom program was well-received by our faculty, it was difficult to scale up beyond a few attendees without disrupting a class, and there were always instances where the session failed to demonstrate the intended methods and impacts (although even then the lessons learned were valuable!).

What we wanted were collections of classroom stories which illustrated a particular theme across multiple disciplines, so that we could run a workshop event on a topic – such as using clickers in the classroom or stimulating student creativity – with examples that would appeal to faculty from many different subject areas. This would give us the opportunity for both discipline-specific exemplars and cross-fertilization of ideas amongst disciplines.

**Lou**: from the digital media perspective, we tried to adapt ideas and tools from the growing movement of digital story telling. “Digital stories derive their power by weaving images, music, narrative and voice together, thereby giving deep dimension and vivid color to characters, situations, experiences, and insights.” [Rule, 2008]. There are two aspects of Digital Storytelling that add value to goals of ELIXR case stories. These are the ability of video to capture dynamic process, and how the emotional impact of a personal story can influence viewer attitudes.

Teaching is a very dynamic process. Good teachers are constantly observing and adjusting what they do based on what is needed in the moment. They must gracefully integrate what is taught and how it is taught and in a way that is engaging and meaningful to the learners. The video medium is very well suited to capturing the richness of this complexity and allowing others to observe it.

The personal story aspect of digital story telling adds an emotional element to the case story that makes it more compelling to hear. By encouraging case story subjects to share their personal motivation for changing their methods, their personal struggles and successes in making those changes, and the personal rewards that have resulted for them professionally or otherwise, the viewer is offered many more levels on which the story can have meaning for them then they would have otherwise.

We started with the assumption that motivating faculty to consider changing what they do was our highest priority. We did this because we believed that this initial decision to do something differently is the most critical part of the change process. We also made the assumption that faculty would be most powerfully motivated to change by two things: their personal satisfaction, and the satisfaction of their students. To address these areas of high value to faculty, we integrated the strong personal narrative aspects of the digital story telling genre into the case stories. When interviewing faculty, we made sure to talk to them not just about what they did and how they did it, but what personal or professional challenges brought them to consider making a change and what personal impact had resulted from the changes they made. We also made sure to include the voices of students where possible because faculty care about how students respond to what they are doing.

Another critical aspect of the content of the digital stories was to include both negative and positive aspects of the change process they engaged in; the challenges and limitations of what they had tried, in addition to how they were successful with it. We believed strongly that the stories would have more
credibility and influence with faculty if they included both of these kinds of information. Also, research shows that faculty learn as much, if not more, from this “negative” information as they do from successes. We also wanted the faculty and students speaking as directly as possible to the audience, unfiltered by a narrator if possible.

5. Reflections on Structure and Format for Digital Case Stories

Teaching with case studies is a well-known approach to engage learners with the decisions they will face in practice. They are not generally as effective in promoting a desire for change, since the details of the real life story can be altered or aggregated in the teaching case to fit the needs of the learners. They are intended primarily as a didactic rather than a persuasive technology.

Video case stories are frequently used in educating pre-service teachers [Pointer Mace, 2009], and our use of the term “case story” has on occasion led to confusion with the case method and teaching cases. Originally we added the term “case” to distinguish our digital media products from the more memoir-oriented tradition of digital storytelling and to highlight the focus on a specific intended application; all in all, we are still inclined to preserve the hybrid label of case story and to emphasize with faculty authors that we intend the stories to be experienced rather than studied.

In this section we describe some related aspects of what we learned about the “genre” of multimedia artifacts that emerged from our case story teams.

Ken: Given my transformative experience from visiting Don Paulson’s classes, my original inclination was to view the case story as Virtual Classroom Visit: a way for others to experience something similar to my visits with Don, in a compressed format with selected highlights while still communicating the energy that this approach generated in the teacher and the students. As the development process unfolded, I began to also think of the case story as a bit like a Memoir.

Tom: Ken mentions that a digital case story of exemplary teaching can serve as a Memoir, i.e., “how one remembers one's own life”7. It can be challenging for the editors when the author’s remembrances appear to obstruct the purpose of the case story as a tool for faculty development to advance the adoption of exemplary teaching practices. Anecdotes about the heroic efforts required to institute change – e.g., “how we fooled the Registrar’s office into letting us retrofit a room to provide the facilities we needed for group work in class” – will be important to the remembrances of the author. How they come across in the story will determine whether they serve as distractors in helping others to institute change or as vital illustrations of concerns which need to be considered and addressed.

A computer-based Tutorial is another genre familiar to many faculty authors: a presentation of content is accompanied by interactions with learners to engage them with the content and develop their capabilities. Some of our faculty authors have had to be coached to not fall into tutorial mode – or even to lecturing – when asked to tell their story. We encouraged them to speak from the “I” and help others learn by them sharing their personal experience instead of speaking from a second person voice and lecturing others on what do. As noted below re the Concerns-Based Adoption Model, some didactic elements may be necessary to address specific concerns about the efficacy or feasibility of a process; however, these should be positioned as secondary resources relative to the more narrative elements in the case story.

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While we had included faculty developers as part of the multi-disciplinary team creating the digital media case stories of exemplary teaching, we had not fully appreciated the additional role of faculty developers creating their own stories for these materials within their programs and events. They freely customized their use of case stories to fit with their own ongoing roles with the faculty, using their own skills as story tellers, their local knowledge of the audience, and with longer term objectives such as nurturing faculty cohorts around innovative teaching approaches. Taken together, these elements led to a wider diversity of ways of using the case stories to promote innovative teaching practices, often involving selecting excerpts from the case stories to fit with the faculty developers’ weaving of a contextualized story for an event or program. In effect we ended up with a team of multiple story tellers: the three of us involved in the creation of the story as a digital media resource and the many faculty development professionals applying it as a component of a story woven for a particular occasion and audience.

Lou: We originally emphasized the narrative structure of the story and avoided singular Vignettes outside the context of the storyline. As Tom comments above, we have subsequently been pleasantly surprised to see faculty development leaders use short excerpts from case stories very effectively as illustrations within a narrative structure they have constructed for a faculty workshop. We have also seen faculty authors use Vignettes to expand on a repertoire of related approaches and to highlight the differences amongst them, as illustrated by the Guide to Best Practices in Active Learning in Ken’s story. In both cases, embedding the snapshots in a narrative story structure requires planning and skill – but we now know that this can come either from the case story authors or from the planners of the faculty development event in which they are used.

Another digital media genre we continue to avoid is the Photo Op, characterized for us by one faculty author as “the ubiquitous three students and a tree that appear in every Viewbook sent out to prospective students”. In terms of engaging an audience or creating the positive effects of a story, this does not add much. Sometimes there is an institutional requirement that all video elements recorded on campus have to contain some stock footage identifying the institution, even if it is just “three students and a campus sign”. However, we have seen instances of effective use, e.g., where campus photos reinforce the voice-over message in setting the institutional context as an important part of the story.

6. Reflections on Case Story Development Team Roles

Our model for three complementary roles was the Author/Editor relationship in an ‘as told to’ autobiography. The teacher as author is given primacy, because this central voice provides authenticity for the story. The editors provide expertise in the digital medium and in the context of intended use.

Tom: We explain the role complementarity to teachers who are potential case story authors as follows:

ELIXR Case Stories are autobiographical. Most authors of an autobiography need an editor, especially 1st time authors or anyone working in a new medium. Editors support authors in making the transition from a personal reflection – written for your own learning – to a case story which will support the learning of others.

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8 http://elixr.merlot.org/creatingstories/
Editorial guidance for ELIXR varies in scope, and can include:

- mapping an appropriate structure for your story
- selecting critical story elements, including student voices
- choosing the language and tone to best convey what happened, and how it felt.

The work of a good editor never gets noticed by the readers or audience – they will experience it as your story, with the added bonus of student reflections and insights.

You will likely have two co-Editors supporting you, although a single person could fulfill both roles: a Faculty Development Editor who understands the context in which ELIXR Case Stories are used, and a Digital Story Editor who can help you use the medium most effectively.

Ken: I had a couple of concerns when I saw Lou’s first implementation of my story as a digital case. The first was around Don’s role, which I regarded as at least as important as my own. I was initially troubled by the implication that I was some kind of heroic instructor, when it was Don who had guided me so much along the way.

I was also concerned about the inclusion of some of my class resources in the case story, particularly the sets of questions that I had used for the in-class and out-of-class group exercises. I regarded these as still very much “works in progress”, and was wary of having them viewed as exemplars while I was still revising them based on student feedback and my observation of student groups engaging with the problem sets.

Lou: We found that trying to construct a narrative around the Don & Ken story led to an awkward structure for users. Flipping back and forth between viewpoints hindered the development of an engaging story, and ultimately we determined that Ken needed to be the focus since the teachers using the case story would be more like Ken (adapting ideas from an exemplary teacher) than like Don (originating many of the ideas). In terms of teachers identifying with the story teller, it was Ken on whom we felt we had to focus. We partly addressed Ken’s concerns about the imbalance this presented, by including a special section with Don explaining specific methods using video segments previously recorded in Don’s classes, which in effect was almost a story in its own right.

We also included references to Don’s seminal paper on the instructional design in his Organic Chemistry courses. This provided some redress to Ken’s concerns about setting up his contributions as exemplars in their own right. Tom and I felt strongly that including some of Ken’s problem sets would add value to the case story. However, based on the usage data, observations and evaluations conducted to date we would not attach the same value to their inclusion. The limited adaptation of these resources is part of a much larger phenomenon of faculty who adapt a new teaching approach without taking advantage of the re-usability of open educational resources. [McGill et al, 2008]

The dynamic relationship described in this section, between the three complementary roles concerned with the content and format of the case story, continues to be a source of both strength and challenge amongst our partner institutions developing digital case stories [Carey et al 2008]. Digital case story reflects the distinctive context of course, teachers and learners.
7. Related Work and Future Developments

Digital case stories and virtual classroom visits have been used extensively for STEM teachers in the K-12 sector [Pointer Mace, 2009]. We also had a precedent within our sponsoring organization, the MERLOT community of institutions collaborating on online resources for teaching and learning. MERLOT Author Highlights had been developed as a way for the creators of a learning resource to share their instructional rationale and some tips on using the resource. While this was a valuable resource for teachers considering using the resource, the stories reflected more on the creation of new objects than on the re-use of exemplary resources from others. They often did not address the primary concerns of other faculty about how they could adopt the resource and teaching method for their own contexts.

Another precedent for digital stories on exemplary teaching in higher education is the Windows on Learning project, in which faculty teams documented their experiences with improving student learning and success in courses to strengthen student readiness for college credit courses. These stories provided compelling examples of virtual classroom visits and teacher reflections to engage other faculty using the case stories to review innovative teaching methods. We extended this model by involving faculty developers in the design, development, review and distribution channel for these stories, and in determining which themes or topics would be most readily shared and applied across institutions.

These precedents led us to the project definition for ELIXR in the context of the MERLOT community: Engaging Learners in ‘X’ with ‘R’, where X is a learning outcome in the topic area or discipline and R is a learning resource or teaching method. This focus broadened out over time, as faculty development units identified high priority areas for their faculty and developed sets of case stories on a broader range of themes beyond our original vision around reusable open education resources. As of the time of writing, there are ELIXR digital case stories in STEM disciplines about a variety of teaching approaches beyond Active Learning: Assessment Rubrics, Knowledge Surveys, First Day of Class, Integrative Learning, Course Redesign, Concept Tests, Just-in-Time Teaching and Technology-Enhanced Learning.

Future directions

One of the Chemistry teachers we tested with Ken’s story had a multitude of comments and questions. In a faculty development event, these could be addressed partially by interaction with the cohort group. However, input from other Chemistry teachers would have been most helpful; also, for individual teachers accessing case stories online, a way to engage further idea sharing would be of value. This highlights the need for the case stories to be linked to a community of colleagues who can provide such responses and leverage the value created as teachers reflect on their own experiences, adaptations and evaluations of a method or resource. Some of these considerations are being explored in other projects, including the VIPER community for teachers in Inorganic Chemistry [Benetan et al, 2009a and 2009b].

Another future direction is the use of student teams in the digital media production process. One of our institutional partners, San Francisco State University, used this method with success for several digital case stories in a cost-effective way: the students received credit in a digital media course for their contributions to case story development. A similar approach has been used in the past for development of shareable learning resources, with the beneficial side effect that the student teams learned a lot about learning and teaching in higher education during the process [Carey et al, 1999].

9 http://taste.merlot.org/snapshots.html
11 See http://elixr.merlot.org for the list of current ELIXR theme topics and discipline-specific case stories.
Acknowledgements

Ken: I am grateful to Don Paulson for many things, in particular for his teaching method which aided greatly in my own regaining of a sense of joy again in the teaching process. More essential than the specifics I learned about teaching organic chemistry was the demeanor and attitude with which he approached his profession. I sensed that he treated each student in his course with the same courtesy and respect day in and day out, regardless of what that student’s individual standing in his course happen to be. He seemed to bring no preconceived notions about a student to each lecture, just matter-of-factly going about addressing each of their questions and correcting each of their mistakes along the way. In this way, he showed by example how a compassionate instructor can bring these qualities to the classroom experience.

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References


