Using Interactive Technology to Disseminate Research Findings to a Diverse Population

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Abstract

This paper demonstrates how case stories can be used to disseminate the findings of several case studies on negotiating accommodations in the workplace. It highlights the power of interactive technology and of the partnership between the researchers and the Canadian Council for Rehabilitation and Work (CCRW). The paper describes the process of designing an interactive web-based case story for the purpose of disseminating research findings. The interactive case story is an extension of both the case study and the narrative case story. As part of a larger research project, it is our goal to use interactive case stories to investigate the impact of essential skills training on workers with disabilities who negotiate with employers for workplace accommodations.

Résumé

Le présent article montre comment les histoires de cas peuvent être utilisées pour diffuser les conclusions de plusieurs études de cas sur la négociation entourant l’aménagement du milieu de travail. Il met en évidence le pouvoir de la technologie
interactive et du partenariat entre les chercheurs et le Conseil canadien de la réadaptation et du travail (CCRT). L’article décrit le processus de conception d’une histoire de cas interactive en ligne visant à diffuser des résultats de recherche. L’histoire de cas interactive est un prolongement à la fois de l’étude de cas et du récit de l’histoire de cas. Dans le cadre d’un plus vaste projet de recherche, notre but est d’utiliser des histoires de cas interactives pour étudier l’impact de la formation sur les compétences essentielles chez les travailleurs handicapés qui négocient avec leur employeur pour l’aménagement de leur milieu de travail.

**Introduction**

In 2004, a team of researchers from Queen’s University and Dalhousie University received a SSHRC and HRSD\(^1\) grant to study Essential Skills Training to Enhance Negotiations of Workplace Accommodations for Workers with Disabilities (referred to as ESTA). One of our desired outcomes for this research project was to use non-traditional forms of disseminating findings to reach a wider audience. Without ignoring traditional methodologies such as published papers and conference presentations, we set out to develop a complementary method, that is, interactive case stories for the dissemination of this work. This paper provides an overview of what interactive case stories are, what they can be used for, and how they be designed based on our experiences within ESTA in so that others might use this methodology for their own dissemination needs.

**Rationale for Interactive Case Stories**

Businesses (Jonassen & Hernandez-Serrano, 2002) and professional development programs (Ackerman & Maslin-Ostrowski, 1995; Maslin-Ostrowski & Ackerman, 1997) have used the narrative case story method as a means of sharing knowledge. Narrative is a specific genre of qualitative research methods that offers the opportunity for enhanced understanding of an event or phenomenon through story. Case story as a narrative form of personal experience blends the power of narrative analysis with the meaning and potential for theory construction of cases (Ackerman & Maslin-Ostrowski, 1995). Case stories are a generative, evolving medium which are works in progress and interactive case stories provide the opportunity for readers to contribute to these works in progress.
However, little educational research has used interactive case stories as a methodology, and as such little is written about how to create interactive case stories. For example, within our ESTA community, the first author brought the concept of interactive case stories as a potential form of dissemination to the research group at the grant writing stage.

Our discussions within the research team determined that this model would be an ideal approach for our group to reach a wider audience as we planned to work with partners external to academia and to communicate with individuals who have disabilities. The first author learned about the online interactive case story method through her previous work with the Cooperative Learning Object Exchange (CLOE) that used online interactive case stories to disseminate the use of learning objects across post-secondary institutions (Refer to www.cloe.on.ca).

The interactive case story method was taught to CLOE partners through a workshop approach that demonstrated the steps involved in completing an interactive case story. This approach is consistent with learning in a community of practice. And as part of our knowledge building on interactive case stories, Palmer (2003) sent the ESTA team a copy of her thesis that demonstrated how an interactive case story can be used within her discipline.

**Theoretical Framework**

The theoretical framework for the interactive case story approach is situated cognition, which informs a growing body of research that explores how learning derives from participating in social worlds. Situated learning focuses on the community and the relationships between group members and contexts, which include the social and material contexts in which members find themselves. The learning community is formed through members working collaboratively on shared situations. Individual members contribute personal expertise, experience, and skills that develop an individual’s understanding and also construct new knowledge as a community. Thus social participation leads to the acquisition of knowledge. This framework also presents opportunities to discuss the relationships between newcomers and existing members, for activities, identities, artifacts, and communities of knowledge and practice (e.g., Brown, Collins, & Duguid, 1989; Cobb &

This theoretical framework provides a lens for discussing the process through which an interactive case story is created as the story is both informed by situated cognition and is also an instance of a community of practice. For example, the interactive case story is situated as an individual needs to be part of an existing community of practice to learn the steps to create a story through an apprenticeship unlike other dissemination approaches wherein a person could learn a particular methodology through a review of the literature. Novice members benefit from the expertise of existing members and learning is relevant and meaningful. Our goal within the ESTA community is to describe the methodology and rationale for interactive case stories, and to shift this methodology away from a grassroots approach where one needs to know someone who has done it before.

Historical Roots of Interactive Case Stories

An examination of the literature provided minimal research regarding the interactive case story method. However, interactive case stories are grounded in qualitative methodologies, as this method finds its roots in both paper-based case studies and narrative case stories. A brief introduction to each of these is highlighted below as they are the building blocks for the development of interactive case stories.

Case Studies

Glaser and Strauss’s (1967) work indicated that case studies can provide rich and detailed information about focal participants as a researcher purposely chooses to study one among many. Stake (2000) furthered this work and recommends that each study be designed to optimize the understanding of the case rather than focus on generalization beyond the case. On their own, cases may not appear to be widely applicable to situations besides the one that is presented. However, this limitation may be minimized by Stake’s approach to assembling “a population of cases,” in which each case probes deeply into the focal participant’s experiences with a particular topic. As the population of cases
grows, comparisons become meaningful and patterns emerge. It is also possible to amalgamate a number of case studies in order to create an in-depth story. In the current program of research, several case studies were conducted and a composite of these cases forms the basis of the interactive case story prepared by ESTA.

**Narrative Case Stories**

A narrative case story is a combination of the traditional case study, the online environment, the learning history, and educational media (Ackerman & Maslin-Ostrowski, 1995). The narrative case story is non-interactive wherein the person reading story online reads but does not use technology to contribute to building knowledge or to engage with the material.

This combination of the case study method and the creative nature of storytelling provides a rich narrative that engages the reader to learn more about a given topic. Ackerman and Maslin-Ostrowski (1995) wrote that “a case story is both a written and oral description of a real life, ‘close-to-the bone’ situation” (p. 3). Narrative case stories are a way to share knowledge which if not recounted may be lost. An additional advantage of using this approach is that stories are compelling, easy to listen to, easy to learn from, and easy to retell. Furthermore, both explicit and tacit information can be revealed through stories because the researcher can choose to highlight different aspects of the research findings. Finally, narrative case stories can:

Help people understand what happens to them; meaning is found not only in the story, but in the experience of relationship which makes meaningful the events of the story and the teller of the story it joins; and group meaning-making breaks the fragmentation in talking that often occurs and helps people arrive at a kind of “real talk” that deepens their understandings of each other’s experiences. (Ackerman & Maslin-Ostrowski, 1996, p. 15)

In developing narrative case stories, Ackerman and Maslin-Ostrowski (1995) suggest using a five step model for development:

Step 1: the writing of the case story,
Step 2: the telling and listening of the story,
Step 3: small group reflection on the case story process,
Step 4: whole group reflection, and
Step 5: the drawing of a conclusion.

Before developing a narrative case story using the above five steps, a simple question needs to be addressed: is the story worth telling? Ackerman and Maslin-Ostrowski (1995) would argue yes, and compared the efficacy of case study teaching methods to that of narrative case stories. They found that narrative case stories were considered to be engaging, and that they helped bridge the gap from theory to practice. Evolving stories “should not just tell what happens to them, but [should include] their conscious understanding of and response to what happens” (p. 14). It was found that the main difference between the two methods was that narrative case stories are an evolving medium that capture greater emotion, drama, and feeling.

In workplaces, narrative case stories are used by professionals to develop a sense of community. As Jonassen and Hernandez-Serrano (2002) explain, through narrative case stories professionals can solve problems, reach decisions, and understand why co-workers act as they do. In a study by Ackerman and Maslin-Ostrowski (1996), educational administrators noted that they used narrative case stories to understand and improve their profession by “thinking and rethinking their past, present, and future administrative endeavors” (p. 6). Narrative case stories are also a continual work in progress (Jenlink & Kinnucan-Welsch, 2001). Through the process of story telling people are able to learn from other case stories and help make sense of their own lived experiences.

Although narrative case stories can be a unique way to bring about dialogue, problem solving, and understanding about a topic, they also have drawbacks. In most instances, a narrative case story is based on a particular situation or person, which can make generalization to the greater population difficult (Carter, 1993). Similar to case studies, if readers are unable to draw connections between the stories being told and their own life experiences, then the meaning and purpose of sharing the story may be lost. From a research perspective, it may also be difficult to find organizations and individuals willing to share their stories with others for fear of their identity being discovered. Based on this concern it might be difficult to collect enough rich and in-depth information to create a story. Nevertheless, and
with these limitations in mind, narrative case stories can be especially useful tools for dealing with specific situations, conflicts or obstacles, motives, and causality (Carter, 1993).

**Interactive Case Stories**

The interactive case story is an extension of both the case study and the narrative case story approaches that are commonly described in the literature. However, interactive case stories differ as end-users accessing the online story can add to the story through a discussion tool. It is our belief, that when stories are combined with learning activities that are situated, they challenge the learner to try out authentic tasks that deal with real people and real situations.

The interactive case story is a composite of several case studies (in our story we used the ESTA cases). Based on the instructions found on the ESTA website, end-users are encouraged to review the story and respond to it, adding their own experience and perspectives. The interactive case story provides knowledge building and discourse opportunities beyond the scope of the project as individuals can respond at any time and access the responses of other individuals.

Interactive case stories can help develop a sense of community among end-users and strengthen the knowledge base of that community. Understanding beyond that afforded by textbooks can be shared, discussed, and reworked in order to generate personal and more global conclusions. Interactive case stories provide a valuable resource for the community to access and to contribute to further development. Furthermore, because a wider audience can tap this resource, knowledge dissemination is enhanced, reducing the gap between researchers and members of the community in general.

**Context for the ESTA Interactive Case Stories**

Our ESTA research focuses on accommodations in the workplace that are both successful and unsuccessful. Our population includes employees with disabilities, employers, and researchers. The interactive case story provides an ideal approach to target all three groups. The following provides a description of our research on accommodations (the contextual background to the ESTA case story).
Workers with disabilities are entitled to have their needs accommodated, short of undue hardship to the organization, in a manner that respects their dignity and allows them to perform the essential duties of their job (Canadian Human Rights Act, section 15.2, 1985). Accommodation has been described as “the delicate point” at which the needs of the person with a disability “must harmonize with the workplace policies and procedures and the needs of supervisors and coworkers to insure that the gaps in functional capacity caused by the disabling condition do not interfere with meeting job requirements” (Gates, 2000, p. 86). This perspective assumes that the onus is on workers with disabilities to harmonize with the needs of the workplace and to overcome their functional limitations.

An enabling workplace demands access, that is, features that enable one to enter the workplace, and also depends upon workers disclosing the nature of their disabilities (Madaus, Foley, McGuire, & Ruban, 2002). Structural affordances refer to specific changes made in the physical layout or the organization of the workplace or the work day which closes the functional gap between what is required and what one is able to do (Gates, 2000). The research on social context highlights the importance of social support from coworkers and supervisors (Robinson, 2000). The negotiation of accommodations is enhanced and acceptance more likely when a collaborative, cognitive problem-solving process is used to generate appropriate accommodations and to identify roles in the workplace (Gates, Akabas, & Oran-Sabia, 1998). Motivation, particularly goal-setting, characterizes persons with disabilities who achieve career success, including negotiating accommodations and thriving in enabling workplaces (Gerber, Ginsberg, & Reiff, 1992). Understanding of policy guides the actions of individuals and organizations in negotiating and enabling (Smith, Oczkowski, Macklin, & Noble, 2003).

Based on an extensive review of literature in a number of related fields (including education, social work, rehabilitation science, and psychiatry), our research group has developed a model with six factors that contribute to the negotiation of accommodations that in turn makes workplaces enabling for workers with disabilities (Hutchinson, Berg, Versnel, Wintermute, Munby, Chin, & Stockley, 2005). The six factors that contribute to negotiating the accommodations necessary for an enabling workplace are: (a) access and disclosure, (b)
structural affordances, (c) social context, (d) cognitive problem solving, (e) motivation, and (f) understanding of policy.

This model focuses on the responsibilities of the workplace organization and all members of the organization including workers with disabilities. Each of these six factors was used in the framework for the ESTA interactive case story and all were represented in the composite story. Specifically, we used this model to organize the substance of the interactive case stories. We created examples of successful and unsuccessful accommodations using the population of cases we had developed in the group’s research on workplace learning and negotiating accommodations over the past ten years, including case studies conducted during the ESTA project.

Developing ESTA Interactive Case Stories

This section of the paper describes the process we followed in designing the interactive case story. Our purpose in describing our methodology is to provide a process for others to follow and to create their own interactive case story based on their area of interest. The interactive case story can be adopted in many situations aside from ours on workplace accommodations.

Goals for the ESTA Interactive Case Story

Individuals can access the interactive case story on the ESTA website and add to it, building the knowledge base, in our instance, on accommodations (refer to project website – http://esta.educ.queensu.ca/) We have made the case story an interactive composite, a staged story involving actors to protect anonymity. The online interactive case story encourages users to read text, view a video or listen to the case story and respond to the interactive questions on the website and in the discussion space.

Our primary goal was to communicate our results using an accessible technology that would ensure we reached a wider audience. Websites often provide the channel for researchers and stakeholders to disseminate information throughout the project. However, the interactive case story provides an avenue for dialogue, to communicate practical and current information for and from researchers to other researchers, the general population, and anyone who might find it of interest.
First Steps

Our starting point was a one-day workshop facilitated by the first author on the interactive case story approach, modeled after the workshop that Palmer gave to the CLOE group mentioned earlier in this paper. This workshop was designed to provide an overview of the methodology and to determine how we would incorporate this approach into our research. An initial step was for the ESTA case story team to discuss the overall purpose for the ESTA website, which included the interactive case story that will be made available for researchers, employers, and employees with disabilities.

Early on in the process the team consulted with the partner (CCRW) to ensure that the interactive case stories could easily migrate to the CCRW website to ensure the longevity of the research beyond the scope of the grant. In addition, the project went through formal ethical review to ensure that safeguards were in place for individuals responding to the cases for when the project was publicly accessible.

The ESTA group met regularly to plan and organize the content that would be needed for each section of the ESTA interactive case story and to appoint people to tasks. At all stages (from conceptualization to the final product), the ESTA community (graduate students and researchers) were involved in the interactive case story process.

Universal Instructional Design

A primary goal for communicating results through accessible technology is to ensure that a wider audience is reached. Therefore, the interactive case story is based on the principles of universal instructional design (UID) and all aspects of the ESTA website are accessible to the general population regardless of ability. For those less familiar with UID, Burgstahler (2007) describes the seven principles as:

1. **Equitable Use.** The design is useful and marketable to people with diverse abilities.
2. **Flexibility in Use.** The design accommodates a wide range of individual preferences and abilities.
3. **Simple and Intuitive.** Use of the design is easy to understand, regardless of the user’s experience,
knowledge, language skills, or current concentration level.

4. **Perceptible Information.** The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

5. **Tolerance for Error.** The design minimizes hazards and the adverse consequences of accidental or unintended actions.

6. **Low Physical Effort.** The design can be used efficiently and comfortably, and with a minimum of fatigue.

7. **Size and Space for Approach and Use.** Appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility.

Within the ESTA project each of these principles was taken into account during the design phase of the interactive case stories.

**Content for the ESTA Interactive Case Story**

The content for the ESTA interactive case story is based on numerous case studies collected by the researchers on accommodations in the workplace. We decided early on to create a dynamic template (database driven) for the interactive case story, therefore making it easier to develop multiple interactive case stories. Our goal was to describe different disabilities with both successful and unsuccessful accommodations and based on the pool of available case studies we decided the first interactive case story would focus on learning disabilities and the second on physical disabilities.

For the first interactive case story on learning disabilities, a population of cases (as described by Stake, 2000) was developed, establishing an information-rich base from which the in-depth and realistic interactive case story was created. Our purpose was to create a composite lead actor referred to as Kim in the story that represented a number of the case studies therefore not identifying any one individual. By doing this, we are hoping to reach a wider audience as many people with learning disabilities should be able to identify with different parts of the story.

It was decided by the ESTA team that the case story would feature an employee who faced challenges with learning disabilities in their workplace. Using the research model from
the ESTA group, one of the researchers found quotations from an array of research participants that were embedded into the fictional case story. The challenges, successful and unsuccessful accommodations, and recommendations for the case story were also based on the research of the ESTA group. The case story was brought to the group for more direction and feedback. Another ESTA member was then appointed to the case story to assist with the interactive additions and edits. The first author was involved throughout the process, coordinating and unifying the various steps and stages, in the role of the project manager for the case stories. All members of the ESTA group provided feedback throughout.

The six factor model (Hutchinson et al., 2005) described above “Context for the ESTA Interactive Case Stories” was used to frame the stories. For example, the story was written to describe Kim’s perspective around each of the each the six factors (a) access and disclosure, (b) structural affordances, (c) social context, (d) cognitive problem solving, (e) motivation, and (f) understanding of policy. In addition, definitions for each of these factors are provided and opportunities to test the end-users’ understanding of these terms through interactive methods (e.g., learning objects). All future ESTA interactive case stories will be based on the integration of these six factors which will ensure consistency across the stories.

**The Design Process for the ESTA Interactive Case Story**

A computer science undergraduate student was hired as a designer to build the templates for the ESTA interactive case story using UID principles. Based on the discussions at the ESTA meetings about content the designer started to plan the overall look of the interactive case story. He began to organize the content, using the storyboard method for each of the pages. A storyboard is a visual plan for a website. The storyboard consists of a series of pages that include a rough sketch outlining the content, navigation, and design elements of a website [http://www.gamequarium.com/edweb/storyboarding.htm]. A storyboard was used for the ESTA interactive case story to organize the layout, and to decide on the type of text, graphics, symbols, links, and content for the interactive website. We also decided how we would like people to navigate through our story.
After the designer had developed the initial layout with colours, symbols, text and examples of how the interactive sections would be displayed, we arranged for a prototype meeting with the larger ESTA group. The prototypes that were demonstrated at that meeting were based on a series of screen shots of non-interactive pages showcasing how the pages would look. Based on this meeting, the challenges, accommodations, and recommendations were refined and embedded into the electronic templates.

The next large group meeting demonstrated the interactive pages that were developed based on the storyboard process. At this point, the story was again discussed in detail by the group and additions and edits were made to the content and to the interactive portions of the website. This design process was truly an example of situated cognition in practice, as each member of the ESTA community helped to build the interactive case story and therefore build their own and others’ knowledge.

The publicly available site is dynamic and we hope it will engage end-users by offering text, video, simulations, learning objects, and a discussion space. On this site a visitor can find the online interactive case story that encourages users of the site to read text or listen to a video case story and respond to the case in the discussion space. The online interactive case story provides knowledge building and discourse opportunities beyond the scope of the traditional case study and narrative case story as individuals can respond to the interactive case story at any time and any place.

Quick Fact Sheet from the ESTA Interactive Case Story

The following figure provides an example of the quick fact sheet that provides a clickable snapshot for the end-user to use to navigate the interactive case story.

**Quick Fact Sheet**

<table>
<thead>
<tr>
<th>Name</th>
<th>Kim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>A bakery</td>
</tr>
<tr>
<td>Disability</td>
<td>Learning Disabilities</td>
</tr>
<tr>
<td>Challenges</td>
<td>Sequencing (doing things in the right order), time management, and reading difficulties.</td>
</tr>
</tbody>
</table>
Accommodations

A list of tasks in order of priority, a timer that signals the end of the baking, clear and specific instruction, focusing on one task at a time, taking shorter and more frequent breaks, and a binder that shows the words most often written on cakes.

Recommendations

Disclose disability at the start of work and be straightforward about challenges faced; the worker supervisor and co-workers should all be involved in the problem solving process; tasks should be itemized and prioritized; and short and longer term goals should be set.

**Figure 1. Quick Fact Sheet**

**Future Applications and Discussion**

Other researchers may find the design process used within the ESTA project applicable in planning and implementing their own website or online course. This process provided opportunities to think through who the end-user will be and what content should be available online. Designing a web project by committee or group can be a difficult process but the end results are enriched by the different perspectives of the various members.

The development of the ESTA interactive case story provides a “lived” example of situated cognition. The process we followed was both facilitative and collaborative in nature and all members of the team shared in the building of knowledge regarding the ESTA interactive case story. In this sense the knowledge was distributed across the entire ESTA community.

The development of the interactive case story has helped to address our research goals of creating an alternative form of dissemination and providing a resource for individuals making accommodations in the workplace. This interactive forum provides a unique method for validating the data-driven but highly accessible case stories. This site provides a rich and dynamic avenue for dialogue, practical information for and from our primary stakeholders, highlighting our research findings and the existing resources already provided by our partners. Further, interactive case stories provide another avenue to disseminate research findings via the world-wide web using a
non-traditional approach.

References


Canada.


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