ABSTRACT

This paper offers a brief review of the emergence of video-based teaching cases in education over the last two decades. It is proposed that cases are an instance of “packages of situated knowledge,” the creation and transmission of which describe the teaching community. Education borrows its case methodology from medicine, law, and management as part of an increasing recognition of classroom teaching as a complex cognitive terrain that requires subtle and dynamic articulation within the teaching community if new-comers are to learn from veterans. A short history of video and video-based cases is presented with case examples that range from broad-based domain-independent contexts to highly specific work with individual teachers in their own classrooms. The author provides a brief review of three tools used for creating video-based cases. Finally, implications of the proliferation of cases is discussed with particular reference to funding possibilities geared towards the evolution of and support for digital libraries in education in the near future.

INTRODUCTION

Learning to teach is a process of learning to become a teacher, in the sense that “becoming” means transforming one’s identity with respect to the systems of relations that reside within the community one wishes to enter (Lave & Wenger, 1991). Becoming a teacher means gaining greater access to the possibilities within the relations that exist among teachers within the school walls and beyond. The process of gaining access unfolds, in stages, through experiences of what Lave and Wenger (1991) describe as “apprenticeship learning,” in which the novice learns from a mentor within the context of a specialized situation.
One of the principal phases that newcomers pass through as they approach the center of a community is that of *legitimate peripheral participation*. In contrast to the position of a stranger, the legitimate peripheral participant is made legitimate in the community of practice by their status as an apprentice. They are peripheral relative to the center because they are not yet the equals of their mentors, but they are participating in the community as they learn how to join it. This theory of legitimate peripheral participation is based on an understanding of learning as situated within a multiplicity of relations that exist within the community itself and between the community and the world (Lave & Wenger, 1991). One of the ways in which new teachers approach the center of their community of practice is through learning to talk about the practice: “apprenticeship learning is supported by conversations and stories about problematic and especially difficult cases” (Lave & Wenger, 1991, p. 108). The stories that are told about the practice inform their understanding of the practice and consequently their identity within the community changes. Perceiving the meaning of the stories, their suitability to explain various situations, and further – how to create and relate stories of their own experiences, is an important aspect of joining the community of practice.

What happens is that as difficulties of one kind or another develop, stories of similar cases are offered up by the attendants [at a birth], all of whom, it should be remembered, are experts, having themselves given birth. In the ways in which these stories are treated, elaborated, ignored, taken up, characterized as typical and so on, the collaborative work of deciding on the present case is done… These stories, then, are packages of situated knowledge… To acquire a store of appropriate stories and, even more importantly, to know what are appropriate occasions for telling them, is then part of what it means to become a midwife (1989, p. 935) (Jordan, in Lave & Wenger, 1991, p. 108)

These “packages of situated knowledge” are transmitted from the experts to the novices as ways of communicating understandings about problematic episodes in the practice of the community (in the instance above, childbirth).
Studying these packages is useful for helping a community understand how new members join; it is also useful for helping the community to understand itself. “Legitimate peripherality is important for developing ‘constructively naïve’ perspectives or questions” (Lave and Wenger, 1991, p. 117). In this way a community can see itself and its practices through the naïve eyes of the novice. This is why it is of interest to the teaching community to study not only the production of cases that transmit the community’s understanding of enigmatic episodes, but also to study how they are received by the newcomers. The reception and transformation of these stories through the interpretation of the peripheral participants foretells the future of that community and tells us all something about the experience of this knowledge transmission in our own lives. As Lave and Wenger (1991) note, everyone is to some degree peripheral to a community of practice.

**CASE METHODOLOGY**

Case methods have their origin in medicine, law, and management, but have become widely accepted in education over the last twenty-five years because the nature of our understanding of teaching and learning to teach has changed. The Professional Development Schools (PDS) movement is one indication of the widespread recognition that classroom teaching takes place in a dynamic environment that demands subtle and adaptive skills. The PDS model advocates that teachers in training spend much more time on-site in their school placements, working alongside mentors and colleagues. The use of case methods in teacher education is another branch of this same understanding that values teachers’ knowledge for its perception of nuance and variation in the classroom learning environment. Cases allow for the study of a domain of knowledge that is
unwieldy. In cognitive terms, teaching has increasingly come to be perceived as an "ill-structured domain" (Spiro et al., 1991). Cases allow for a viable mapping of this enigmatic and unstable terrain.

The classroom defies general principles or rules and inverts relations of dominance and subsumption from case to case. Prototypes are misleading, and features assume new patterns of significance as they are reassembled (Spiro et al., in Sykes & Bird, 1992). Any medium that seeks to represent the classroom for extended study must respect its complexity of character. Cases, which may present themselves as instances of theory in practice – “cases of something” (L. Shulman, 1992) – provide one method for distilling some of the messiness of teaching.

Cases show little respect for disciplinary boundaries. They are messy and recalcitrant. They rarely admit of a single right answer. They are therefore ideal for inducting the neophyte into those worlds of thought that are themselves characterized by unpredictability, uncertainty, and judgment. (p. 8)

The absence of a single answer is what draws in the reader, who will, with the guidance of a facilitator, spend time unraveling the dilemma facing the teacher (Wasserman, 1994). Some have argued that a case should ideally be “an actual instance of practice presented in much of its complexity, rather than an episode constructed to illustrate a point” (Merseth, 1996, p. 728).

There are important conceptual distinctions to make between the design and content of these video-based teaching cases and traditional cases in medicine, law, and management. One has to do with the researcher’s desire to capture actual instances from classrooms in communities familiar to the target audience. Another involves the particularities of using video in a classroom setting. As Merseth (1996) suggests, capturing “actual instances” is different from constructing
episodes. Quite apart from the use of video as a medium, if the writer of a classroom observation case wanted to create a narrative equivalent, they might use observer’s enthographic notes to reconstruct a classroom episode, recounting moment by moment the actions of the teacher and students around a particular object of study. In doing so, they would be confined to the content of that particular observation. While they would certainly present relevant contextual information about the students, community, and curriculum, the boundaries of the case would be determined by the amount of time they spent observing in the classroom. This is substantially different from traditional case writing, which draws together case material over time and often fictitiously merges issues and circumstances for effect. (For examples of traditional cases in education, see Cooper, 1995; Pitton, 1998; Rand & Shelton-Colangelo, 2003.)

There is power in a video-based case that is not found in a traditional narrative case. It is powerful because it is by its very nature grounded in the video data that it presents the reader. Readers of video-based cases have access to the same data from which the writer formed the case. This sharing of data may give rise to a kind of “video reality,” in which the use of video can be so persuasive – in many ways the camera lens itself is no less subjective a technology than the writer’s pen – that it has the effect of eclipsing portions of a case that are not video-based. Consider the effect on the reader of a case that makes two kinds of claims – one based on video and one not. Though both claims might originate in truth, it is more likely that the reader will question the validity of the second type, as it may appear to be groundless. In this way, cases that use video become video-based. This is not the same as reality-based. However self-effacing these images may appear, these images do not speak for themselves, nor if they did, would they
tell the entire story. Both in their decisions to film and to edit, the author exercises a great deal of subjectivity in the creation of a video-based case.

In this sense, writers of video-based cases face challenges similar to those faced in writing traditional text-based cases. Any attempt to distill a teaching experience for transfer to someone who was not present themselves involves mediation, and with this mediation comes subjectivity.

As McDonald (1992) writes

\[ \text{[A]ll access to teaching is mediated. The observers’ eyes are not a neutral challenge, as every watched teacher suspects… An access to teaching that is mediated by teachers themselves offers opportunities not only to see what is shown but to study how and why it is shown, and thereby to glimpse what teachers value, what they choose to frame and fail to frame, what they know, and what deep forces influence them… The recurrence of images, motives, and themes across multiple texts offers the study of teaching a resource of great value, though its validity remains local rather than universal.} \] (p. 16)

As McDonald suggests, some of the most intriguing educational cases are written by teachers themselves about episodes with which they have a firsthand familiarity. Recognizing and empowering the subjectivity of a teacher’s “professional vision” (Sherin, 2001) allows researchers to learn about classrooms by looking at what teachers choose to represent about their classroom, and by extension – as McDonald mentions above – what they value. One often-cited example of a useful subjectivity is the groundbreaking work by Lampert and Ball (1998) in the NSF-funded Mathematics and Teaching Through Hypermedia (MATH) Project. For an entire year, the two teacher-researchers documented through video, audio and text, their teaching in third and fifth grade classrooms in Michigan. The goal was to re-approach teacher education by creating a set of materials that would be based on their teaching experience, records that would help them – and others – to make sense of events in the classroom. This work, performed in the
1989-90 school year, is acknowledged as the first in-depth use of multimedia to record and analyze “real teaching” – classroom episodes that are not orchestrated for the camera.

**VIDEO IN EDUCATION**

Video cameras were in classrooms long before they were used by Lampert and Ball, but their purpose in education has changed over time. Researchers, filmmakers and reporters have captured and disseminated images of the American system of education for decades. Only recently, however, has there been shift towards the use of video to create a text of teaching that can be shared by participants, observers, and analysts. In particular, the advent of cheaper digital video technology has spurred the growth of communities of practitioner filmmakers like Lampert and Ball. Video has several affordances that make it suitable for studying classrooms: it can be replayed (viewers can perform multiple “readings” from different perspectives); it can be paused (viewers can suspend reading, reflect on what they know to this point and what they might predict will happen based upon what they know); digital video can be distributed easily in many formats (reproduction and distribution of text leads to the formation of formal and informal communities of practice across temporal and spatial distances). The similarity of these textual features suggests the applicability of similar theories of reading to the act of watching video. In this regard, video cases have been compared to literature (Lampert & Ball, in Sykes & Bird, 1992). One theory considered here is the notion of texts as a mutual construction of multiple authors.

A text in textual criticism is a meaningful construction whose meaning arises from the interplay of several forces: an author’s intentions, a reader’s response, the echoes of other texts alluded to deliberately or not, the frictions and connections and collisions that occur among all the signs within the text, and the ideologies inescapably present below the surface of these signs. (McDonald, p. 15)
Reading a video-text requires developing some facility with the visual medium. Sherin and Van Es (2002) describe the importance of preservice teachers “learning to notice” the ideas of their students in reform-minded science and math classrooms, where teachers are encouraged to adapt instruction based upon the unfolding understandings of their students. “Noticing” meant that teachers “called-out” (Frederiksen, 1992, in Sherin & Van Es) from a teaching episode those events that were most meaningful. Noticing also meant that they made “connections between specific events and broader principles of teaching and learning” and used what they knew about the context to form a reasoned interpretation about a situation.

The action of “calling out” suggests an ability to foreground certain episodes and leave others in the background. The literary criticism practice of “reader-response” (see, e.g. Miall, 1996) discusses a practice similar to foregrounding in the context of textual narrative. It is based in part on the postmodern notion that there is no objective text, but rather that readers as subjects create texts through their interaction with the world around them. More advanced readers generate more powerful readings of texts in part because they possess an expert eye for passages that can be assembled in ways that will be useful to a reader. Learning to perform literary interpretation is in part a process of learning the reasons why certain audiences find certain readings more or less useful. Generally speaking, a reading is considered useful if the community of readers can – by means of applying a literary interpretation articulated in a reading – use the ideas to better understand some other concept apart from the text and its interpretation. One learns to perform useful readings by reading many examples of useful texts created by preceding literary critics. Each of these models a textual reassembly that has been acknowledged (through publication and references) as useful. Learning to notice and call-out events in the text of teaching can be
understood as a skill that must be taught through modeling, practice, and reflection in much the same way as literary critics learn this skill over a career and apply it – and the aggregate knowledge of texts from every prior readings – to each new text they encounter.

With video, the manipulation of the images affords viewers a whole new perspective on classroom teaching, and this perspective, in turn, enables investigatory readings of its own. Professionals bring to a case within their field a “professional vision” (Sherin, 2001) informed by years of practice. In Sherin’s experience, a researcher brings one perspective to a video and a teacher brings another. When the two worked together, Sherin found that the perspective of the researcher influenced that of the teacher. Given time to reflect, the teacher saw things in the video of the lesson that were not accessible in the immediacy of real-time classroom decisions.

When teachers get together to look at video, the power they gain from it to stop and reflect on what they see also enables them to better reflect on what each is saying about the case (Sherin, 2002). Facilitated video study groups, such as those described by Tochon (1999), have the ability to focus teachers’ attention on an area of interest and explore it dynamically to help them collaborate in reflecting on their classrooms. In a study of facilitated video club meetings, Sherin and Van Es (2002) noticed that the subject of the discussions changed over time, evolving from a teacher-oriented discussion to a student-oriented discussion, where the majority of time and energy was spent analyzing student learning as captured on video. Additionally, the dynamic of the discussion also evolved from being led primarily by the facilitator/researcher to being led by the teachers, suggesting that as they grew comfortable with the medium they exercised increasing ownership over the process.
In his video study groups, Tochon describes a “video pedagogy” (1999) that offers participants feedback on their reflection that helps them to articulate aspects of their teaching practice. This pedagogy uses feedback that is interactive and supported by video as a mediating force, helping each practitioner connect his/her own real-life experience to a theoretical professional development framework. The facilitator of such a group is a sensitive listener who speaks little, generally only to help participants make connections among their own contributions and occasionally to draw out analogies or parallels to the video under discussion.

**VIDEO-BASED CASES**

In recent years, video and case methodology have been united in a new genre of curriculum: the video-based case. Video-based teaching cases have gained popularity in the last ten years, brought on by the advent of advanced digital technologies. Now it is possible for non-experts not only to read video cases, but also to write them. Tufts University, Pepperdine University, and the University of Bristol (UK) are among several programs in teacher education that have their students create video-based cases to articulate and represent their own professional visions.

Within video-based cases, it is useful to divide the application of this genre into two approaches within teacher education and professional development: video anthologists and video constructivists. The video anthologists pursue the creation of useful video and videocase collections (on CD, DVD, or online); their research concerns the criteria for inclusion in these digital libraries and investigations into the behavior of their patrons. One notable library of cases at the University of Wisconsin uses an approach inspired by Spiro et al.’s (1991) theory of
cognitive flexibility to accelerate the acquisition of experience and to help users to acquire transferable knowledge. Using the “Knowledge Web Cases,” students of the STEP System\(^1\) (Derry, 2001) develop patterns of thought that avoid common errors of reductive bias and become useful beyond a particular case to other contexts.

The video constructivists for their part are interested in the power of new technologies to enable the amateur authoring of video cases as exercises in classroom observation (Beck, King, & Marshall, 2002), meaning making by preservice teachers (Copeland & Decker, 1996) and reflection (Beardsley, Cogan-Drew & Olivero, in press; Bowers, Keneman, Sale & Doerr, 2000; DiMattia, 2002; DiMattia & Cogan-Drew, 2003; Olivero, 2004). This approach recognizes that novices and experts have different “professional visions” (Sherin, 2001) of the classroom and that the creation of video cases may help new teachers to articulate their own perspectives, represent these to their peers and mentors, and receive feedback through interactions grounded in scenes from their teaching. One of the hallmarks of a good video case is the quality of data it offers from classroom episodes. Tochon (in press) argues that “video editing is a research process,” a “search for authentic data” (p. 17). It has been documented (Nemirovsky & Galvis, 2003) that effective discussion of video cases must likewise be grounded in references to the video. References to such video data may substantiate or refute claims in much the same way text in a literature discussion might serve to validate or dismiss theoretical interpretations.

As a medium, the videocase continues to evolve and no one format yet predominates. Not all designs have been found to achieve the same results, however. In a survey of 38 nationally-

\(^1\) For more information, see [http://www.wcer.wisc.edu/estep/](http://www.wcer.wisc.edu/estep/) For direct links to the case library intro page, see [http://estepweb.org/](http://estepweb.org/) (However, access to the cases is password-protected.)
recognized experts in video and web technologies, Perry and Talley (2001) found that certain case characteristics were highly preferable over others. Respondents gave strong preference to cases that could “help new teachers develop options to their current experiences and a repertoire of choices they can make” (p. 28). The need for students to develop such a repertoire is reinforced by Fetters (1997) who describes a similar inability of students in a study on video cases in science education to generate teaching strategies: “Students were very quick to say what the teacher had done wrong – but when pressed for alternatives they had difficulty responding” (p. 2). Perry and Talley (2001) recommend that “the case study be more of a dilemma or a problem, something without a correct answer, a basis for reflection and dialogue” (p. 30). Cannings and Talley (2003) conclude that the video footage need not be of “best practices” but of “interesting practices”; the most effective discussions include both online and face-to-face components (p. 4). In sum, effective cases present teachers with realistic scenarios, assist them in identifying alternatives in decision-making, and ask them to articulate their own choices.

TOOLS FOR CREATING VIDEO-BASED CASES

One way to think about defining a video-based case is to examine the tools by which they are created. Three tools are briefly reviewed here: DIVER, Video Traces, and VideoPaper Builder.

1. The Digital Interactive Video Exploration and Reflection (DIVER) Project\(^2\) at Stanford University has three goals:

   a) harness panoramic digital video to overcome selective capture;
   b) develop user interface mechanisms to support exploring the same event from different perspectives;
   c) develop digital video collaboratories – communities for sharing perspectives on video records.

\(^2\) For more information on DIVER, see [http://diver.stanford.edu/](http://diver.stanford.edu/)
2. The Video Traces Project\textsuperscript{3} at the University of Washington

is a system that makes it easy to capture a piece of rich digital media, such as video or a digital image, and to annotate that media both visually (using a pointer to record gestures) and verbally. The resulting product is a “video trace”: a piece of media plus its annotation--in essence, a recorded “show & tell.” Traces can be viewed by their creator, exchanged with others, and further annotated for a variety of teaching and learning purposes.

3. The Videopaper Builder (VPB) Project\textsuperscript{4} through TERC and Concord Consortium has created

an alternative genre for the production, use, and dissemination of educational research. In a VideoPaper, classroom or interview-filmed episodes can be displayed and synchronized with interpretations, transcriptions, closed captions, images of student work, clarifying diagrams, or other pieces of information that expand the events, portraying their full complexity. The project conjectured that teachers, researchers and other communities interested in education could use VideoPapers to make their conversations more grounded in actual events, more insightful, and more resistant to oversimplifications.

These three projects identify goals and challenges in similar ways. Each recognizes commentary and annotation as the mode of discourse for the sharing of video analysis, open to multiple divergent interpretations. Each considers how these commentaries may be displayed, shared, and further elaborated as new readers build open prior readings. In this sense, all three projects implicitly consider the video a data source that is not in and of itself authoritative; it does not speak for itself but instead requires analysis and interpretation. Because the video “data” is at the center of the case creation process, each project aims to capture as wide a swathe of the content as possible. DIVER proposes panoramic, 360 video featuring access to multiple perspectives. Video Traces offers audio annotation as a way to expand possibilities for the presentation and sharing of commentary, providing access to an orally-based critical community. Finally, VPB

\textsuperscript{3} For more information, see http://depts.washington.edu/pettt/projects/videotraces.html
\textsuperscript{4} For more information on VideoPaper Builder, see http://vpb.concord.org
contextualizes the use of video by allowing for the inclusion of supplemental materials such as video still images, diagrams, and closed captions.

**CONTEXTS FOR THE USE OF VIDEO-BASED CASES IN EDUCATION**

One of the most popular contexts for using video cases is in inservice or professional development. Three examples of this provide an interesting comparison of approaches: Annenberg/CPB, Teachscape, and Lesson Lab. From the first of these to the third, these organizations take an increasingly active part in establishing the relevance of the circumstances of the video to the lived experience of the audience of teachers. Annenberg/CPB’s approach is to provide high quality content that suggests examples of great ideas in unique contexts. Using it much as a traditional library, paying visitors will customize its use to their own needs. Teachscape goes a step further by partnering with the school district to learn about and gear their content to the particular interests expressed by teachers. Lesson Lab meets teachers in their own classrooms by making its services available to them to help them create cases of their own teaching.

The Annenberg Foundation and the Corporation for Public Broadcasting\(^5\) offer “video workshops,” collections of one-hour video programs built both around specific content areas (the arts, mathematics, literacy) and around the challenges of teaching these. The programs are meant to provide teachers with new ideas for approaches to their curriculum, while offering examples of successful innovation in classroom around the country. An example of a typical offering is

\(^5\) For more information, see: [http://www.learner.org/](http://www.learner.org/)
“The Arts in Every Classroom: A Video Library K-5,” which offers cases from Georgia, Brooklyn, New Orleans and Connecticut, among others. One of the challenges faced by this and any library of existing cases is bridging the gap between the context of the schools depicted and those in which the audience teaches. Despite its geographic diversity, any one school from this sampling of ten different cases across the country is unlikely to match closely the circumstances of the audience’s school. The use of these cases is meant to be an abstract suggestion of interesting ideas; it will be up to the teacher to close the gap themselves.

Founded in 1999, Teachscape is a private company that specializes in creating professional development packages that are customized expressly to meet the needs of a particular school district. One component of the package is a library of “video teaching cases.” The “Seeing Math Project” at the Concord Consortium partnered with Teachscape to produce a series of cases that “use both real-life video narratives and guided inquiry to craft a unique learning experience. [The cases go] into real teachers’ classrooms and [present] the problems they face and the solutions that grow from imperfect situations” (Lu & Rose, 2003). This growing library of cases offers teachers professional development through a sharing of classroom narratives, “packages of situated knowledge” (Jordan, in Lave & Wenger, 1991, p. 108) that may be used by teachers to understand more about the current problems they face in their own classrooms. These cases are created for a broad audience, so the cases provide for translation from the abstract online context to the local context of the teacher’s own situation. The math cases, for instance, “provide a common body of classroom events for participants to study and discuss, in order to foster a reflective attitude among participating teachers about their own teaching practices.”

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6 See http://www.learner.org/resources/series165.html
Like Teachscape, Lesson Lab\(^8\) works with individuals to tailor responsible approaches to their professional development needs. One of services they offer is the creation of video-based cases around a customer’s classroom setting. Lesson Lab does this because they recognize the need for authenticity in classroom video. The thinking is that if a teacher watches a video in which the population of students or other aspects of the context for the lesson are incongruous with their own everyday teaching experience, they are less likely to find elements of value in the case describing the teaching. Although the creation of cases has been documented as a process of education and reflection in its own right (see, eg. Beardsley et al., 2005; Beck et al., 2002; J. Shulman, 1992), the process of assembling a case can be time-consuming and the need for knowledge of digital technologies can distract from the benefits of using a case to reflect on and share classroom experiences. Therefore Lesson Lab offers technical expertise in working with the video, transcript, images of student work, assessment tools, and commentaries.

**PROSPECTS FOR THE FUTURE: DIGITAL LIBRARIES OF VIDEOCASES**

It is widely recognized that one of the challenges for the future use of video-based teaching cases is the thoughtful aggregation of cases and analysis of the implications of sharing cases across wide communities of readers, or “collaboratories.” An early example of such a collection from 1999 highlights the difficulty of making such a collection useful to a broad audience. The Integrating New Technologies Into the Methods of Education (INTIME) Project\(^9\) at the University of Northern Iowa begins the description of a fourteen-step process for creating

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\(^8\) For more information, see: [http://www.lessonlab.com/](http://www.lessonlab.com/)

\(^9\) Funded by the Federal Department of Education Preparing Tomorrow’s Teachers to Use Technology (PT3) grant program. For more information on INTIME, see [http://www.intime.uni.edu/](http://www.intime.uni.edu/)
INTIME videocases by warning that “[t]he process of creating an INTIME video is quite complex.” Clearly, the INTIME collection was not built to receive new videos or video commentaries from readers. It will be a challenge for such a collection that can receive new volumes from only a very limited number of sources to remain a part of future discussions. The utility of a lending library is in part a function of its democratic medium. As inexpensive, user-friendly digital media make available the power of authorship to newly literate practitioner-researchers, collections that do not open their doors to new submissions risk irrelevance.

Thus arise two central questions in the design of video-case collections: how does one accommodate readers who 1) want to submit contributions to the library and/or 2) want to comment on the library’s collection? These questions mark the intersection of the video constructivists and the video anthologists. The vitality of the dialogue in this emerging community lies in the recognition that readers of cases must also be empowered as writers. It has been argued by Judith Shulman (1992) that there is great value to creating cases – not only for the audience but for the writer. Assembling a case requires the ability to generalize from examples, to abstract larger themes and reapply them as powerful models for ways of knowing. Judith Shulman advocates the use of case creation as a teaching method itself for precisely the reason that creating what Lee Shulman (1992) calls a “case of something” teaches the creator a great deal about the breadth and depth of knowledge in their discipline.

Digital technologies make possible the aggregation and wide dissemination of video images that could otherwise not be shared. The communities that form around these technologies demand that current notions of libraries, borrowing, and contributing be re-examined. For the last several
years, the National Science Foundation has funded a Digital Libraries Initiative aimed at establishing “a national digital library that will constitute an online network of learning environments and resources for science, technology, engineering, and mathematics (STEM) education at all levels.”\(^{10}\) It is likely that a significant component of these digital libraries will take the form of videocases. Determining the criteria for useful submissions and identifying the behavior of borrowers are two concrete examples of the work that remains to be done if these digital collections are to come within sight of their potential. It is indeed a brave new world for video in education.

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\(^{10}\) For more information about the NSF Digital Libraries Initiative, see [http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5487&org=EHR&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5487&org=EHR&from=fund)


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