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Video production in content-area pedagogy: a scoping study of the research literature

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ABSTRACT
Video production offers a way for students to learn content-area knowledge while simultaneously developing technology skills deemed important in contemporary society. Yet, the research has not been examined in a systematic way to reveal how these types of projects are oriented to align to instructional goals or how learning is investigated when they are implemented as part of content-area pedagogy. A scoping study was conducted to review the research literature on implementation of student video production in content-area classrooms. A total of 61 studies published from 2006 through 2017 were selected and analyzed through a systematic process. Findings suggest that video production projects were conducted to meet information, performance, composition, literacy, or creativity learning goals in content-area classrooms. Strategies used to investigate student learning included evaluation of learner perceptions, analysis of the process of creating video, assessment of the final video project, or a combination of these approaches.

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Digital video; videomaking; video production; learner-generated video; media production

Introduction – the shift toward video production in education

Creation of digital media has been promoted as a strategy for both learning and for demonstrating learning (Hobbs 2017; Norton and Hathaway 2010). When learners create videos, they engage in digital authorship through which they become active creators rather than passive consumers of digital media. In content-area classrooms, which cover subject matter specific to a discipline, there is an opportunity to integrate student video production and subject matter knowledge simultaneously. Yet, little is known about how video production has been implemented across content areas in formal learning contexts and how student learning has been investigated. The aim of this paper is to present an overview of the research literature and illuminate current practice in this area.

Motion pictures have a long history as educational media with more than a century of use in classroom instruction (Saettler 2004; Snelson and Perkins 2009). From the beginning, the representational properties of motion pictures, such as films and videos, made them valuable for giving learners access to a motion picture display of processes, places, or events that might otherwise be difficult to understand or inaccessible in the classroom. Academic interest in educational video has not waned over the years, despite its long-time role in classroom practice. If anything, there has been an upsurge of activity as indicated by recent literature reviews (Kay 2012; Winslett 2014). A review of video-based learning research conducted by Giannakos (2013) found that the number of papers published from 2007 through 2012 was more than double that of the quantity published from 2000 through 2006. The increased attention to video in education, and more recently
video production, coincides with the advancement of affordable digital video technologies and growth of user-generated video shared online through social media (Duggan 2013). In conjunction with this societal trend, there has been ongoing interest in the educational use of sites like YouTube for both curation and creation of video content (Snelson 2016).

Advocates have argued for the value of video for student-centered learning that involves watching, analyzing, and creating video (Bull and Bell 2010). The act of creating a video, as opposed to watching, is a substantially more involved process that integrates skills such as use of digital video equipment, ethical acquisition of media assets, design and editing of the video, and distribution of the completed product. The process of video production occurs in multiple stages defined in some practitioner guides as pre-production, production, and post-production (Artis 2014; Steiff 2005). Pre-production includes initial planning activities such as background research of the topic, storyboarding, and script writing. The production phase involves recording video and acquiring media assets for the project. Post-production is where the video is created with video-editing software for output in a form that can be displayed or shared with others. Student learning can be assessed at any part of the videomaking process as part of a rich and authentic learning experience. In fact, Kearney (2011) has proposed a pedagogical framework for digital storytelling (i.e., storytelling in video form) and video production (i.e., making videos) that generally follows the pre-production, production, post-production stages, but breaks the process down to suggest how and where teaching and learning strategies might occur at each stage.

Video production skills correspond to knowledge and skills deemed important in an increasingly media-rich society. The Framework for twenty-first century learning (Partnership for Twenty-First Century Learning, n.d.) suggests that creation of media products supports development of communication and media literacy skills in multiple content areas including English, reading or language arts, mathematics, economics, science, geography, history, government, and civics. In addition, student video production has been linked to authentic real-world learning in K-12 education (Kearney and Schuck 2006), meaningful learning in problem-based learning coursework (Hakkarainen 2011), the development of media literacy and civic engagement competencies (Hobbs et al. 2013), and positive learning outcomes in content-area classrooms (Norton and Hathaway 2010).

**Video production in content-area pedagogy**

The potential for classroom video production has prompted educators to begin exploring it as part of content-area pedagogy whereby student video projects are integrated as a strategy for teaching and learning subject matter within an academic discipline. Hafner’s (2014) concern about the importance of addressing digital media literacies in formal language education led to the development of a ‘pedagogical approach which embeds digital literacy practices alongside more traditional literacy practices in a university course in English for science’ (656). Students in Hafner’s study created a documentary video to report the findings of a scientific experiment for a general audience. The project integrated digital literacy, language learning, and science knowledge. In another example, student video production was integrated in a course on Agricultural Communication to develop students’ digital competencies (Loizzo et al. 2016). The videomaking project was described as important for preparing learners for a changing profession that requires knowledge of digital media platforms and communication technologies. These examples show some of the ways, but certainly not all the ways, that educators are integrating video production as part of content-area pedagogy.

A student video production project, at the broadest level of conceptualization, involves videomaking under the guidance of a teacher. This application of student video production aligns to Beetham and Sharpe’s (2013, 2) description of pedagogy as ‘guidance-to-learn: learning in the context of teaching, and teaching that has learning as its goal.’ Video production builds on the concept of production pedagogy through which learners are ‘enabled to engage (multi)literacy, artistic, and/or practical design challenges and aptitudes through the making of authentic cultural artefacts – and with correspondingly real audiences similarly enabled to witness such acts of art and knowledge
production’ (Thumlert, de Castell, and Jenson 2015, 797). When students create videos, they can develop multiliteracies, engage in design challenges, and develop authentic products that can be presented to an audience, which could include classmates, teachers, friends, or the worldwide online public through social media sites like YouTube.

**Rationale and research questions**

Previous literature reviews have been conducted to examine trends in educational video research, but offer little guidance for informing student video production as part of formal content-area classroom practice (Giannakos 2013; Kay 2012; Winslett 2014). A review of literature on the related topic of video podcasts in education indicated sparse attention given to pedagogical strategies for either using or creating them (Kay 2012). Digital video production in education is relatively new, under-reported, and under-theorized in contexts such as teacher education (Kearney 2013), higher education (Hakkarainen 2011) and K-12 education (Winnie 2010). Despite the potential of student video production in content-area learning, the research has not been systematically examined to reveal emerging trends that inform practice and research endeavors. Questions about how content-area educators are finding a good fit for student video production, when the benefits for learning subject matter through videomaking may be unclear, and how to approach assessment of student learning, to ensure that videomaking projects promote attainment of instructional outcomes, are compelling as a point of departure for exploring trends in the literature. Therefore, this study draws from the research literature to answer the following questions: (1) What purpose does video production serve as part of content-area pedagogy? (2) What strategies have been used to investigate student learning in video production projects?

**Method and study design**

A scoping study approach was used to conduct a literature review through a systematic process (Arksey and O’Malley 2005; Levac, Colquhoun, and O’Brien 2010). The five stages of a scoping study literature review are to (1) identify the research question, (2) identify relevant studies, (3) select the studies, (4) chart the data, and (5) collate, summarize and report the results’ (Arksey and O’Malley 2005, 22). These stages were followed in the present study. Scoping studies are applicable when exploring the nature and extent of a research area, examining results from studies with diverse research designs, and identifying gaps in the literature. This was a good fit for a review of classroom video production given the limited information available about research trends in this area and the inclusion of studies conducted with diverse research approaches (Booth, Sutton, and Papaioannou 2016). This review adds to the knowledge of learning through classroom video production by examining common themes that emerged across multiple content areas.

**Search and selection procedure**

Articles were selected for inclusion based on the criteria that they were published in peer-reviewed journals, were available in full-text English, and presented the results of a research study emphasizing student video production in the context of a formal content-area K-12, college, or university classroom. Studies implemented outside of formal classroom settings are beyond the scope of this review. Articles were included if they were published anytime through 2017 so that studies published through the year prior to data analysis were considered.

The databases that were searched were Academic Search Premier, Education Research Complete, *ERIC* (Education Resource Information Center) and the Web of Science Core Collection, which included the Science Citation Index Expanded (1900-present), Social Sciences Citation Index (1900-present), Arts & Humanities Citation Index (1975-present), and Emerging Sources Citation
Index (2015-present). Collectively, these databases offered access to a wide spectrum of multidisciplinary and educational research journals.

A compound search phrase was piloted and refined through a series of search tests. The following compound search phrase was used when searching in each database: ‘classroom video production or classroom video project or student video production or student video project or student-generated video or learner-generated video not “game”’.

Search results were exported directly from each database into EndNote Basic (Thompson Reuters, n.d.). Next, a two-stage process was used to identify articles that matched the selection criteria. First, titles and abstracts were reviewed to identify and eliminate articles that could be excluded based on obvious evidence that they did not meet the selection criteria (e.g., not a research study, not focused on student videomaking). The next step was to obtain full-text copies of the remaining articles, which were read to identify additional studies that could be excluded. A total of 61 studies, published from 2006 through 2017, were identified for analysis.

**Article analysis**

Analysis of the studies was conducted through qualitative content analysis (Schreier 2012). This process began with development of a coding frame that was used to label information one would expect to see in research studies such as purpose, participants, methods, and findings (American Psychological Association 2010). Full-text copies of the articles were imported into NVivo 11 for Windows (QSR International, n.d.) where they were read and coded in three sequential cycles (Saldana 2016). In the first cycle, concept-driven categories from the coding frame were applied while reading all the articles in depth. Analytic memos were written during the coding process to capture ideas about possible data-driven categories that were emerging from the articles. During the second coding cycle, the data-driven categories were defined, and the articles were coded with these new categories. A third coding cycle was conducted as a verification phase to review all coding and promote consistency. After coding, a content-analytic summary table (Miles, Michael Huberman, and Saldana 2014) was created in a spreadsheet to summarize key information extracted from the article coding into a single page of information. This table was used to chart the data (Arksey and O’Malley 2005) and made it easier to filter, sort, and identify themes across the set of articles during analysis.

**Results**

Overall characteristics of the studies are discussed first followed by findings pertaining to the purpose of video production and how student learning was investigated across the studies.

**Overall characteristics of the studies**

The 61 studies sampled for this scoping review were published from 2006 through 2017 as shown in Figure 1. Eleven of the studies (18%) were conducted at the K-12 level and the remaining 50 studies (82%) were conducted at the university level.

There were 20 content areas represented in the sample. Most of the studies (48) were conducted in seven content areas: World languages (i.e., foreign language learning), health sciences (e.g., medical, nursing, pharmacy, dentistry), teacher education, science, language arts, engineering, and writing as shown in Figure 2. The remaining 13 content areas, collectively represented by the ‘Other’ category in Figure 2, included one study from each of the following: agricultural communication, civic education, critical media literacy, fashion design, human resource management, information technology, liberal studies, literacy, marketing, physical education, service learning, social work, and technical communication.

The research studies were implemented in fifteen different countries. Most of the studies originated from the USA, followed by Australia, China, Malaysia, South Africa, Taiwan, Canada, Finland,
Figure 1. Publication years and education levels.

Figure 2. Content areas represented in the studies.
Japan, Spain, and the UK as shown in Figure 3. The remaining countries, New Zealand, Oman, Slovakia, and South Korea had one study per country.

Researchers used case study, qualitative inquiry, ethnography, evaluation, mixed method, action research, descriptive research, pilot study, and pre-posttest designs (see Figure 4). Many studies did not specify an overarching research design such as case study or ethnography. These studies were categorized as implementation studies since they reported findings from the implementation of a student video project.

**Purpose of video production in content-area teaching**

Five modes of video production projects were identified during analysis of the research articles that define a purpose for videomaking in alignment with content-area pedagogy and instructional goals. These modes are listed and briefly defined in Table 1 in decreasing order of magnitude based on article count for each mode. Space limitations prohibit discussion of all 61 articles within the

<table>
<thead>
<tr>
<th>Mode</th>
<th>Purpose of video project</th>
<th>Number of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information oriented</td>
<td>Present course-related information</td>
<td>28 (46%)</td>
</tr>
<tr>
<td>Performance oriented</td>
<td>Document, reflect, or critique performance</td>
<td>18 (30%)</td>
</tr>
<tr>
<td>Composition oriented</td>
<td>Develop multimodal composition</td>
<td>7 (11%)</td>
</tr>
<tr>
<td>Literacy oriented</td>
<td>Develop some form of literacy</td>
<td>7 (11%)</td>
</tr>
<tr>
<td>Creativity oriented</td>
<td>Develop or document creativity</td>
<td>1 (2%)</td>
</tr>
</tbody>
</table>

Figure 3. Countries where studies were implemented.
body of this paper, but a summary chart and bibliography are available online (see Snelson 2018). Selected examples of studies that were categorized under each mode are discussed after Table 1 to illuminate the meaning of each mode and how it might manifest in real-world practice.

**Information-oriented projects**

Information-oriented video projects required students to present course-related topics through informational video. Students take on a teaching or explaining role in these types of projects. For example, in the field of health sciences, pharmacy students created short informational videos to teach peers, faculty, and community pharmacists about common self-help topics or non-prescription medications (Frenzel, Skoy, and Eukel 2013). The rationale for this project focused on how pharmacists need to have knowledge of and be able to communicate health care and medication information to the public. In another project, final-year engineering and multimedia students created animated videos to explain how mathematics are applied in professional engineering when constructing a building or improving a car (Loch and Lamborn 2016). A goal for this project was for students to learn how to effectively convey the relevance of mathematics in engineering to first-year engineering students through an informational video. In elementary education, fifth-grade students video recorded scientific inquiries involving chemical reactions and then composed documentary-style digital stories to ‘inform or instruct their audience about the execution of the experiment’ (Penttilä et al. 2016, 22). This project aligns to the standards-based practice of Constructing Explanations and Designing Solutions in science and engineering education (National Science Teachers Association 2014).
Performance-oriented projects
Performance-oriented video projects emphasized the use of video production to document, reflect on, or critique performance skills. This video project mode was particularly relevant in world languages when students were learning a foreign language. For example, video blogs were recorded by students learning English as a foreign language to develop their performance on presentation skills including projection, pace, intonation, diction, posture, eye-contact, gesture, and language use (Hung and Huang 2015). In another study, groups of Russian language learners video recorded themselves engaged in role-play conversations to develop their pronunciation, grammar, and vocabulary skills in the new language (Nikitina 2010). Oriented projects were found in other content areas as well. Music education students, who were studying to become teachers, performed in music videos that they created and showed in class while learning about informal music learning pedagogies (Cayari 2015). In the health sciences, video diaries were recorded by students working in an anatomy dissection laboratory within a college of dentistry to document their work and facilitate formative feedback of their laboratory skills and collaborative behaviors (Doubleday and Wille 2014).

Composition-oriented projects
Composition-oriented video projects emphasized multimodal composition with images, text, and sound. In these projects, student composition was expanded beyond traditional print to promote exploration of video production as a form of expression. In English language arts courses for teacher education, for example, students composed video poems with a combination of still and/or moving images, text, audio, and special effects while learning how print and digital video compositional processes were associated (Bruce and Chiu 2015). Similarly, students in a first-year undergraduate writing course composed a research-based video with multiple media assets to explore self-chosen inquiry questions and reflect on rhetorical, ethical and critical issues in video composing (Adsanatham, Garrett, and Matzke 2013). In another study, adolescent students in a high-school English course engaged in multimodal composition of radio and video documentaries (Doerr-Stevens 2016). These students created multimodal compositions through which they engaged in critical expression of their stance on social issues.

Literacy-oriented projects
Literacy-oriented video projects emphasized development of one or more literacies through the videomaking process. Literacy is a shifting and contested term (Potter and McDougall 2017), but studies were categorized under the literature-oriented mode when authors specifically stated that their student videomaking projects were implemented to develop some type of literacy. For example, one study in this category focused on the development of literacy and language skills through video documentary production with middle school students who had fallen two or more years behind and were at risk of dropping out of school (Goodman 2010). Critical media literacy was the focus of another study where eighth-grade students created video advertisements designed to challenge gender stereotypes (Markowitz and Puchner 2016). Winnie (2010) examined meaning representations and the types of literacies that could be identified when secondary school students created documentary, drama, and photostory video projects about a contemporary issue in the community. These studies revealed some of the ways that various literacies might be practiced and developed through student video production.

Creativity-oriented projects
Creativity-oriented projects emphasized development and expression of creativity through video production. There was only one study that was clearly oriented to creativity, but it was different enough from the other studies to warrant its own categorical designation. Loveless, Burton, and Turvey (2006) examined the classroom video production while developing a conceptual framework for creativity that integrated elements of information and communications technology, creative
practices, and teacher learning. The study focused on teacher education students who worked with groups of children to create videos in the classroom. Findings from this study revealed close alignment of creative practices and learning during video production.

**Investigating student learning**

Data collected to investigate student learning was drawn from similar types of sources regardless of study design, content area, research questions, or video production mode. Data came from learner perceptions, the process of video production, assessment of learner-generated video products, or a combination of these sources.

**Learner perception**

Student perceptions of classroom video production were obtained through surveys, questionnaires, interviews, or focus groups. An example of the use of perception data is in a qualitative case study of pre-service elementary education students who created advocacy-style videos to evoke emotions on an educational topic (Kearney 2013). Views about experiences with the project were collected through a survey completed by students and their lecturer together with follow-up focus group interviews with the students. Findings indicated that students deepened their understanding of the topics covered in the videos, developed knowledge of relevant pedagogical approaches for classroom use of digital video, and gained confidence using technology to create their own videos. Another study involved medical students who produced videos to demonstrate surgical procedures (Kwan et al. 2011). Survey results indicated that students agreed that the project gave them leadership experience, practical skills in creating educational resources, a chance to explore careers in surgery, and an opportunity to develop digital video editing skills. Overall, students in the studies that included perception data tended to have positive reactions when asked if they had benefited or learned from the experience. Students perceived video production as valuable for a variety of purposes including deepening content-area knowledge (Frenzel, Skoy, and Eukel 2013; Hung and Huang 2015; Loizzo et al. 2016), gaining digital video production skills (Cayari 2015) or developing and expressing creativity (Loveless, Burton, and Turvey 2006).

Perceived challenges were also reported, albeit to a lesser extent, such as the amount of time and work required (Frenzel, Skoy, and Eukel 2013), technical problems encountered (Bruce and Chiu 2015; Loizzo et al. 2016), conflicts between members of videomaking teams (Shapiro, Tomasa, and Koff 2009), anxiety about appearing on camera (Hung and Huang 2015), or disagreement about relevance of the student-generated videos (Loch and Lamborn 2016).

**Process of video production**

Information about student learning through the process of video production was obtained through observations, recording of class sessions, students’ written reflections about the process, interviews, and questionnaires. In Bruce and Chiu’s (2015) study of video composition in English language arts teacher education, data about the process came from an anonymous open-ended questionnaire in which students described their digital video composing experiences. Findings indicated that learners made meaningful associations between traditional and video composition processes involving purpose, audience, planning, drafting, editing, and conventions. In another study, researchers used an ethnographic approach to observe the videomaking process of inner-city high school students who were creating videos on political topics (Dunsmore and Lagos 2008). Data were collected through observations of the process and student interactions during video production. A key outcome from this study was that students demonstrated richer awareness of civic and political issues than had been documented through prior survey research with this population of youth. The process of learning through video production has also been explored through mixed method research. Jensen, Mattheis, and Johnson (2012) used a scoring rubric to evaluate the process of student video production in a university course on nutrition and healthy eating. The numerical data obtained from
evaluating student behaviors in the videos was coupled with qualitative data from student and focus group interviews. Analysis of these data indicated that the group videomaking process was a viable approach for learning accountability and responsibility, appreciation of differences, effective communication, citizenship, and lifelong learning.

**Learner-generated products**
Students produced videos in a wide variety of genres including animated video, advertising, digital storytelling, documentary, drama, informational video, music video, photostory, public service announcement, role play, video diary, video blog, and video poem. Assessment of student video projects was the least common source of data related to student learning. Furthermore, it was rare for researchers to provide the assessment instruments used to evaluate student videos, although there were some notable exceptions. Hung and Huang (2015) provided an informal peer feedback sheet and rating scale that had been used in their study to evaluate foreign language speaking performance in video blogs. McCaslin and Young’s (2015) study included a rubric used to evaluate video laboratory reports for content, clarity, organization, format, and creativity in a mechanical engineering course. Overall, many of the studies included in this review did not provide clear evidence of valid and reliable assessment of student video products, offered only descriptive or qualitative information about the videos, emphasized perspective or ratings of the student-generated videos, or did not discuss assessment of the product at all.

**Conclusions**
The potential value of student video production in the classroom has been promoted by advocates who see opportunities for learners to engage in authentic and meaningful learning (Kearney and Schuck 2006; Hakkarainen 2011) while developing knowledge and twenty-first century skills in multiple content areas (Norton and Hathaway 2010; Partnership for Twenty-First Century Learning, n.d.). The focus of this review was on both the purpose of video production as part of content area pedagogy and how student learning is investigated. Findings indicate that video production has been used to meet information, performance, composition, literacy, or creativity learning goals as part of content-area instruction. Data gathered from learner perceptions, the process of creating video, assessment of the final video project, or a combination of these approaches has indicated mostly positive results. A key implication is that educators from multiple disciplines have found a meaningful fit for student-generated videos as part of content-area coursework and have identified feasible strategies to evaluate student learning. This suggests that learning through videomaking is a viable option as part of content-area coursework.

**Limitations**
A limitation of this scoping study is that research articles meeting the selection criteria may have been left out of the review. A systematic process was used to search for, retrieve, screen, and select articles meeting study criteria, but articles could have been missed. Nevertheless, the studies included in this review reveal some general trends in student video production that should be of value to practitioners and researchers. The results adhere to the nature of a scoping study to provide a snapshot of an evolving area of study and identify areas where further research is needed (Arksey and O’Malley 2005; Levac, Colquhoun, and O’Brien 2010).

**Directions for further research**
During this review, an attempt was made to identify trends in learning theories that have been applied as part of the theoretical framework for video production pedagogy. Across the collective group of studies, theoretical frameworks were diverse, inconsistent, or sometimes missing entirely.
Because of this, it was not possible to identify clear and obvious trends that might suggest consensus about the role of learning theory as it applies to videomaking in the classroom. Constructivism was given the most attention, albeit limited, to explain how students might construct knowledge during video production projects (for example, Jensen, Mattheis, and Johnson 2012; Nikitina 2010). The lack of theoretical consensus makes it challenging to tie the results of this literature review together into a cohesive framework based on existing learning theory. Additional research is needed to develop a robust theoretical framework for student video production as part of content-area pedagogy.

In closing, it should be noted that there is evidence of interest in video production as part of content-area pedagogy, and some indication of potential effectiveness, but this area of study needs more development and research. With additional work, video production pedagogy could be developed into an authentic and real-world instructional approach that integrates both content area and technological skills deemed important in contemporary society.

**Disclosure statement**

No potential conflict of interest was reported by the author.

**Notes on contributor**

*Chareen Snelson* is an Associate Professor in an online Educational Technology program at Boise State University. Her scholarly activity and research publications focus on topics in educational video production, educational applications of **YouTube**, and media literacy.

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