

Original Paper

Maximizing Learning Potential with Multimodality:

A Case Study

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Abstract

In today's increasingly fast-moving digital world, learners are immersed in multimodal online communication environments in their daily life, through Facebook, Twitter, Instagram, Snapchat and others. This requires educators to reflect the environment in which these learners live, and thus design instructional practices from a multimodal perspective. Multimodality offers new opportunities for digital learners to express themselves, analyze problems and make meaning in multimodal ways as they interpret knowledge differently according to their various educational needs (Kalantzis & Cope, 2015). In this paper we will discuss the significance of integrating multimodality in e-Learning contexts to make meaning and improve learning. The paper will also present a case study of an online course from the College of Education at the University of Illinois Urbana Champaign to show how multimodality works in practice to cater to learner differences by offering a range of activity options and modes of meaning. We will also examine learners' perceptions of adopting such an approach in the online course. We used survey techniques for data collection and quantitative and qualitative methods for data analysis. Results revealed illuminating insights about the importance of multimodality approach to increase learning potential for digital learners and provided suggestions for future iterations.

Keywords

multimodality, e-learning, higher education

1. Introduction

The benefits of employing audio-visual resources when presenting in public or delivering a speech are acknowledged and widely employed as speakers and educators to supplement their delivery with aids that enhance understanding. Within the classroom setting the multimedia and multimodal teaching aids employed mainly assist the educator to better inform and lucidly demonstrate a concept or a process to learners by ensuring that the content is adequately and clearly targeted to the student audience. There are numerous reasons for adopting a variety of different resources that include gaining audience attention, inducing an inspiring effect, vividly illustrating a point, or having a rhetorical impact. An obvious motive for the use of multimodal resources within e-learning courses is to optimize their impact and ensure that the online medium is at least equivalent to its face-to-face counterpart.

From a different perspective learners are also encouraged to employ and take full advantage of multimodal knowledge making tools available in order to better express themselves and deliver top quality evidentiary work in the form of knowledge artefacts. Digital learners have the advantage of having at their disposal multiple tools for multimodal knowledge representations. This helps learners to generate and produce digitally rich artefacts that become an academic portfolio. Furthermore, e-learning environments enable learners to share, curate, and regenerate additional multimodal resources that form part of a healthy educational ecosystem. In the process of employing and generating multimodal resources the learner is indirectly enriching essential creative and critical thinking skills. These creative skills and acquired digital proficiencies empower learners not only to generate quality knowledge artefacts but to master academic topics in the process through the variety of potential representations at their disposal. The benefits of having the availability of a plethora of modalities, plus the dexterity to shift from one to another according to needs, offers a strong and powerful learning experience.

This paper will focus mainly on how multimodal resources acquire elevated significance as an e-learning affordance adding value within the e-learning domain. We have adopted this strategy within a number of online courses delivered over our e-learning portal, called Common Ground Scholar (CGScholar) (Cope & Kalantzis, 2017), that has been meticulously deployed to incorporate and empower learners to makes use of semantically-designed capabilities that are grounded within a reflexive pedagogical rationale. The objective is to ensure that learners intuitively and successfully master the educational content as recommended by Bloom in his learning for mastery theory (Bloom, 1968). This forms part of an educational model of new learning affordances (Kalantzis & Cope, 2012), as made possible by new media. The multimodal meaning affordance assists digital diverse learners maximize their academic potential as they enrich their cognitive awareness. Educational researchers have shown (Carlin-Menter, 2013) that such practices that focus on varying semantic architectures assist students to better understand the metacognitive tasks required to express themselves and represent their thinking.

2. Background

The advent of technology innovations and digital media tools is fundamentally changing the notion of knowing, communication and knowledge representation, and thus a new mindset of teaching and learning must emerge to shift the way how students learn. The larger context is the rise of an open education era, such as MOOCs that are readily available (Daniel, 2012; Yuan et al., 2013).

In the didactic education model, text, images and lectures are frequently separated into fragments. These separated fragments may hinder the process of understanding and meaning making for diverse learners that come from different backgrounds, learning style, cultural values, ideological beliefs, and more specifically those digital learners that are born with technology in their hands (Gee, 2013; Haniya & Roberts-Lieb, 2017; Kalantzis & Cope, 2012). Traditional print-based textbooks are not enough to disseminate knowledge by itself, when students are immersed in social networking sites to create, design and produce multiple models of knowledge instantly and easily via YouTube, Weebly, and others (Cope & Kalantzis, 2016). Lecturing a particular lesson in front of the students cannot stand by itself to make meaning. Assessments are confined to alphabetic expressions that can be collected from a one-time test and graded by the instructor alone (Cope & Kalantzis, 2015). While digital diverse learners make judgments every day via peer-to-peer interaction as they articulate news in Twitter and other media sites in different areas in the world (Siemens, 2005; van Dijck, 2013). Or they may play Pokéon Go at a large scale to solve real problems while interacting with the virtual ecology and manipulating characters or objects in augmented learning environments (Dunleavy & Dede, 2014). This brings the question of how can we create a learning environment that is transparent to learners in the digital age?

To expand beyond these boundaries of traditional learning and limited notions of knowledge representation and meaning making, we need to innovate instructional practices via the lens of multimodality (Kalantzis & Cope, 2017). According to Kress and Selander (2012), multimodality is simply putting together multiple modes of communications in instructional practices, learning activities and assessments in order to maximize learning potential while honoring learner differences and offering scope for creativity. It allows of combining text, images, sound tracks, gestures, lectures and video altogether in one place. Incorporating such multimedia elements in any educational setting makes it more appealing, viable, engaging, interactive and productive for digital diverse learners to create more meaningful learning experiences (Kalantzis & Cope, 2012). These digital effects together help to connect and reconnect all of learning items to promote better understanding. Adopting multimodality would also shift the role of learners from knowledge recipients to knowledge producers and meaning designers as they design their own work with the support of the instructor and peers (Kalantzis & Cope, 2017). In return, this shows a shift in assessments and an increase of personalization and optimization for all learners to reach mastery level of learning (Cope & Kalantzis, 2015).

In this paper, we explore the potential of employing multimodal principles in an education online course at the University of Illinois Urbana Champaign and delivered via the software CGScholar.

Multimodality was integrated in the learning activities and assessment to maximize learning potential and increase understanding according to learner differences. More details about the course design and data analysis will be discussed below.

3. The Case Study

In this paper, we present a case study of a graduate level course that was taught during the first 8 weeks of Fall Semester 2018 in the College of Education at the University of Illinois, Urbana-Champaign. The main topic of the course was “Ubiquitous learning” and 38 enrolled students were enrolled.

The course was designed and delivered using the social learning platform CGScholar (Figure 1), created by Dr Bill Cope and Dr Mary Kalantzis. The functionality of this platform is based on the term “reflexive pedagogy”, in which learners are active participators of the learning process (Kalantzis & Cope, 2017). Students are not just listening to the instructor delivering the course content, but they are producing knowledge themselves, they interact with each other and thus, knowledge is constructed collaboratively (Kalantzis & Cope, 2017). In an online environment, reflexive pedagogy can be constructed with a view to optimizing the 7 affordances of the digital, introduced by Cope and Kalantzis (2016), as follows:

- Ubiquitous learning (learning anywhere, anytime);
- Active knowledge making (learner as knowledge producer);
- Multimodal meaning (use of multiple digital media in texts and representations);
- Collaborative intelligence (peer-to-peer learning);
- Metacognition (thinking about thinking);
- Differentiated learning (addressing all students’ needs);
- Recursive feedback (formative and constructive assessment).

The screenshot displays the CGScholar interface for the course 'EPS 506 FA18'. The main content area features a video titled 'The Science Behind Pixar - Now ...' with a play button overlay. Below the video, there is a URL: <https://www.msiichicago.org/explore/whats-here/exhibits/the-science-behind-pixar/> and a short paragraph: 'The Musuem of Science and Industry is such an innovative museum and has been for years. Currently, they have a great exhibit showcasing the Pixar and how they have made innovative technology.' The right sidebar contains a 'Recent Activity' section with several entries, including 'You created the update Summer 1, 2019 Course Announcement.' and 'Lorraine Reid commented on an update Update 2: Tropes vs. Women.' Below this is a 'PUBLICATIONS (51)' section with entries like 'Cell Division and Cancer' and 'An Examination of Scratch ...'. A red box highlights the 'COMMUNITY ADMIN (12)' section in the left sidebar.

Figure 1. Course Website in CGScholar

This paper focuses on the affordance of multimodal meaning and how it was realized in this graduate level course in CGScholar to improve learning for diverse digital learners. To understand this, it is necessary to mention first the main structure and terminology used in the course.

In the beginning of each week the instructor shared the weekly topic through an Update, which was like a post on a social media platform, in a place called “Community”, which was similar to a social media group with a focus on the course content. This instructor Update, called “admin Update”, contains the content of the week presented through videos and supporting texts. Students needed to comment on this admin Update, based on a prompt question. Then, they were also required to create and post their own weekly “Updates” in the “Community”. These Updates are based on the topic of the week and they need to contain at least one piece of multimedia, e.g., a video, a diagram, an audio file, a podcast, an image, etc. Through this requirement of creating an enhanced multimodal text, learners could better communicate the topic of their Updates to their peers. Afterwards, learners needed to comment on each other’s Updates giving feedback or discussing the topic mentioned.

Moreover, students need to create two pieces of multimodal Works, one theoretical and the other practice-oriented. These Works were created in a space in CGScholar called “Creator” (Figure 2). Creator is not a simple word processor. Students can create multimodal pieces of Work through this space, by adding within the body of their text digital elements such as image, audio, video, text, math, live links, dataset and embedded external media, from YouTube videos to GitHub code. In the course presented here, learners were required to add at least 7 media elements in these works to better communicate their opinion and also, enhance their experience and understanding. These works were peer-reviewed and then revised before the final submission and review by the instructor. The peer-reviews were based on rubrics, created by the instructor, and they guided students both in the requirements of their Works, but also in the reviewing process of peer Works. This idea of peer reviewing the Works and commenting to Updates creates an environment of knowledge creation and sharing that benefits both students and instructors in a multimedia learning environment. Multimodality was not only employed in the learning activities, but also in the assessments. Students had the chance to keep track of their works through the analytic tool which visualize their performance instantly and push them to work harder to reach the mastery level.

4. Data Analysis

This part contains two different methods of quantitative and qualitative analysis as we will explain below.

4.1 Quantitative Analysis

Text; A total of 22 students responded to the survey questions out of 38 students who were enrolled in the course. We are reporting here the results from three survey questions about the students’ experiences on multimodality element integrated in CGScholar.

Q1: The inclusion of multimedia (videos, images, infographics, etc.) by my instructor(s) helped me improve my understanding of the subject better than a traditional face-to-face classroom setting (see

Figure 2).

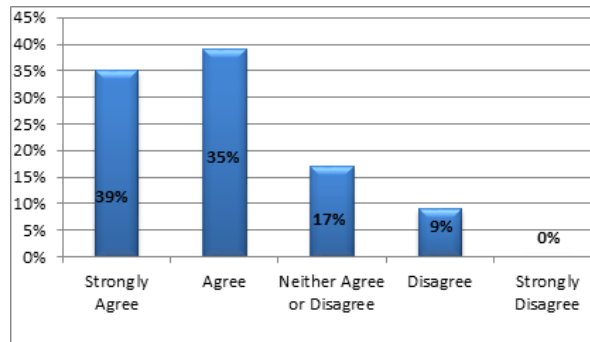


Figure 2. The Use of Multimedia by the Instructor

Findings have shown that almost 74% (39% strongly agree and 35% agree) of students in this course agreed that the inclusion of multimedia elements in CGScholar by the instructor to facilitate learning activities and assessment was helpful to improve their understanding of the subject matter better than a traditional face-to-face classroom setting and old ways of knowledge representation. Only, 9% of the learners disagreed with this statement and 17% had neutral opinions.

Q2: The inclusion of multimedia (videos, images, infographics, etc.) by my peers helped me improve my understanding of the subject better than a traditional face-to-face classroom setting (see Figure 3).

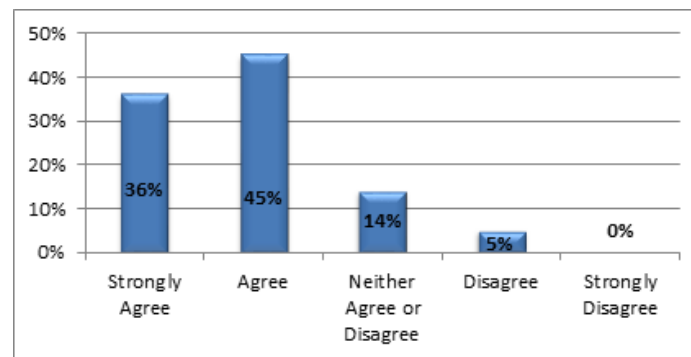


Figure 3. The Use of Multimedia by Peers

The peer review feature of CGScholar is created to offer students a new way of learning via receiving and giving feedback and observing other works with multi modal elements, with an assumption that this approach will improve students' learning. As students review other's work, they will have a chance to rethink of and assess their own work and make it more meaningful and presentable. Results indicate that nearly 81% of the survey respondents agreed that the inclusion of multimedia (videos, images, infographics, etc.) by their peers helped them improve their understanding of the subject better than a traditional face-to-face classroom setting. Only 5% of the participants were in disagreement with this statement and 14% were neither agree or disagree.

Q3: Including multimedia (videos, images, infographics, etc.) in my own Updates and Works helped me improve my understanding of the subject better than a traditional face-to-face classroom setting (see Figure 4).

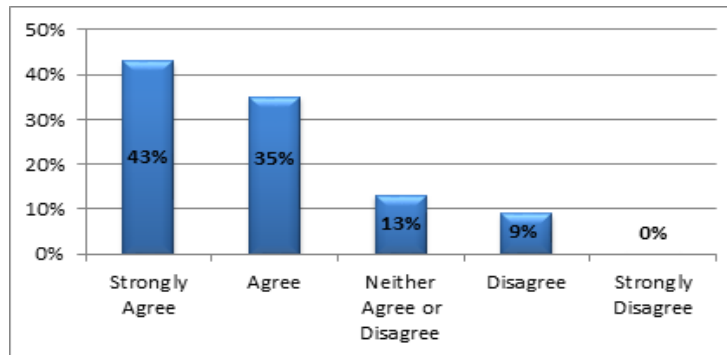


Figure 4. The Use of Multimedia by One's Own Work

Additionally, findings indicate that 78% (A total of 43% of strongly agree and 35% agree) of the survey respondents admitted that including multimedia (videos, images, infographics, etc.) in their own Updates and Works helped them improve their understanding of the subject better than a traditional face-to-face classroom setting. The statistics show that 13% of the participants had a neutral opinion and 9% were in disagreement.

4.2 Qualitative Analysis

In addition to the quantitative analysis, the study incorporated qualitative analysis of the open-ended questions of the survey. We aimed to gain a broad understanding of students' perception using multimodality in the software CGScholar. Data analysis of this section has shown illuminating results as of why students liked this feature. Also, students indicated some concerns and challenges relevant to the use of the software, made their recommendations for further development that can be taken into consideration in future implementations. The qualitative results are separated into two main sub-sections: opportunities and challenges.

4.2.1 Opportunities

One of the students commented:

"In an age where we have so many more communication tools, why would we limit ourselves to one? Scholar opens the door to better communication. In addition, I like the peer interaction in the updates. I like sharing and learning new and interesting information with peers".

A second respondent wrote:

"Love the updates [which was full of content designed with multimodal elements]! As a teacher, I liked reading about new features and resources that are popular or trending in education today".

A third student added:

"The update thread, Analytics tool [Provides visualization of the assessments on the go], and Creator

functions are the best things”.

A fourth student replied:

“I enjoy using the Creator tool and collaborating with peers”.

A fifth one mentioned:

“I like the peer reviews and annotations on work submitted through Creator”.

These results indicate the significance of incorporating multimodality into online courses to increase motivation and maximize learning potential for diverse learners in digital spaces.

4.2.2 Challenges

Student A wrote:

“An intro video tutorial for the class structure like a screencastify video showing you how to get to the class, check updates, etc.”.

Student B wrote:

“Initially, creating a learning module was difficult. However, the tutorials helped immensely”.

Student C wrote:

“I think the platform definitely needs more embedding features. I should be able to embed a NY Times article or something of that nature. Mashups with embedly or a homegrown tool is very much needed”.

Student D wrote:

“Using the creator tool was a challenge. A bigger challenge was attempting to troubleshoot my own hurdles”.

Student E wrote:

“I would recommend that students take the tutorial. It is intimidating at first, but makes so much sense after you get used to it”.

These quotes suggest the needs of including instructional guide and tutorial in how to use the software and its different features which encourage multimodality. This is especially helpful for first time users to make the best out of learning through the different capabilities the software offers.

5. Discussion

The inclusion of multi-media elements was important to improve students’ own work. Students have appreciated the use of multimedia by the instructors and their peers. Using these tools helped students to understand the educational content better than not using them. Our premise is that deep understanding comes when connecting illustrations, images, audio files, datasets and hyperlinks and videos to the lessons students learn and the work they do. Previous researchers have discussed the usefulness of these tools to empower students’ learning and their thinking (Dunleavy & Dede, 2014). As students see multiple knowledge representation from peers and instructors, it encourages them to think critically of their own work. Specially in the peer review process, students were asked to review the works of their peers. Having them being the evaluators and assessing the integration of multi-media elements along with assessing the work overall, gave the students (as reviewers) the opportunity to increase their

understanding, rethink their own work and thus increased their motivation to maximize their learning. Overall, we suggest a need of pedagogical innovations with the integration of digital media and multimodality to enrich teaching and learning.

6. Conclusion

This paper aimed to shed lights on the significance of incorporating multimodality elements in instructional practices and assessments to maximize learning potential for diverse digital learners at a higher education level. We articulated the needs of new learning that is transparent to learner differences in the digital age. The case study we analyzed indicated that multimodality plays an important role to motivate learners and push them to their maximum level to make meaning in multiple ways. The study calls for further development of instructional guide to direct students to make full use of multimedia elements in their work while using the platform CGScholar. Future studies will investigate the use of multimedia in different higher education contexts, such as medicine, veterinary medicine and engineering.

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