

# Chapter 14

## One Plus One Doesn't Always Equal Two

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### ABSTRACT

*Web 2.0 applications have exploded onto the scene in the past 2 years resulting in an impressive number of interactive tools and Web services. These online Web services and applications can be integrated into the pedagogical mix to energize student learning and provide participatory learning experiences. Educators can pick and choose favorite applications and online Web services, include user created data, and combine them in unique ways through data mashups. Mashups involve the reuse, or remixing, of works of art, music, content, or data for purposes that usually were not planned or anticipated by the original creators. This chapter will explore the concept, techniques, and strategies of data Web mashups. Educational data mashups are in their infancy. Several significant ethical issues of concern to educators and students are explored including possible mitigating strategies to allow educators to leverage the teaching and learning potential of data mashups in the classroom.*

### INTRODUCTION

Business Week proclaimed 2007 the Year of the Mashup. Mashups involve the reuse, or remixing, of works of art, music, video, content, or data for purposes that usually were not intended or even imagined by the original creators (EDUCAUSE Learning Initiative [ELI], 2006; Johnson, Levine, & Smith, 2008; Lamb, 2007). In the New Media Con-

sortium's (NMC) 2008 Horizon Report, mashups were reported to be 2 to 3 years from ideal time-to-adoption by the masses (Johnson et al., 2008). Even so, Web 2.0 applications have exploded onto the educational scene in the past 2 years resulting in an impressive cadre of learning tools and Web services including data mashups. This may be the time to explore the integration of these online Web services and applications into the pedagogical mix. With data mashups educators can pick and choose favorite applications and online Web services, in-

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clude their own data, and combine them in unique ways to energize student learning and provide an integrated learning experience for students.

At the heart of the data mashup are characteristics that make the Internet a compelling educational resource: collaboration, participation, aggregation, innovation, visualization, participation, and representation. The mashup creation process accentuates the pedagogical flexibility and potential learning opportunities possible through the remixing, repurposing, and reimagining of the plethora of online resources available. In this chapter the concepts, techniques, and strategies of data or content data mashups will be explored.

Through this chapter the reader will explore the following:

- Characteristics of today's student to discover some of the reasons teaching strategies such as data mashups may be compelling pedagogical tools;
- Mashup history;
- Mashup technology and processes to provide a basis for understanding this powerful tool and provide a conceptual framework;
- Types, characteristics, educational uses, and examples of data mashups and where they might be integrated into teaching and learning further underscoring the potential of mashups to personalize learning experiences for students;
- A discussion of scholarly mashups and examples of integrating data mashups into learning experiences;
- Several popular and accessible mashup editors that allow educators to seamlessly remix existing online Web services, application programming interfaces, tools, and widgets for new and unique applications relevant to the learners' needs and goals;
- A discussion of the potential drawbacks to the promising educational inclusion of data mashups including intellectual property rights, copyright, the dynamic nature

of resources on the Web, assessing new Web technologies, and cultural and ethical considerations;

- And finally, future research concerns and questions.

## **LEARNER AND DATA MASHUP BACKGROUND**

### **Today's Learner**

As a society, we spend countless hours engaged in classes, training, workshops, seminars, and other educational venues that fall short of providing a truly enriching, engaging, and efficient learning experience or don't result in meaningful changes in behavior. Students tune out if they find the learning environment or experience irrelevant, boring, or frustrating (Prensky, 2005). Often, this ineffective learning experience is not a result of boring or inconsequential content or a reflection of the knowledge of the instructor but of the delivery, collaborative, and instructional design strategies employed for that particular student. Adapting to a student's prior experience, personal learning goals, and other student characteristics within the framework of the course content can make a compelling difference in the overall impact of the learning experience (Bransford, Brown, & Cocking, 2000).

The way our students prefer to learn has fundamentally changed. The singular difference between the Digital Natives' (DNs) and Digital Immigrants' (DIs) relationship with current and emerging digital technology profoundly influences the teaching and learning process. DN's are used to accessing and receiving data at what Prensky (2001) calls "twitch speed" (p. 3). Digital Native students expect a certain level of interactivity, instant feedback, and parallel processing or multitasking. DN's have grown up with hypertext and non-linear access to information. The DN's give new meaning to Barabasi's (2003) notion of be-

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