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Abstract

This paper describes a research study that adopted the model of design-based research (DBR) outlined by Reeves (2006) to design and implement an online community of language learners within the context of an Italian as a second language university class. An online community of learners that included a group of second and third year students of Italian, their teacher and seven native speakers facilitators was developed and implemented according to the principles that guide community development, the use of authentic and situated activities, and according to Vygotsky's sociocultural theory applied to second language learning. This paper describes the four phases of this study according to the model of DBR outlined by Reeves, and discusses the theoretical principles that inform the development of the online learning environment.

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Abstract:

This paper describes a research study that adopted the model of design-based research (DBR) outlined by Reeves (2006) to design and implement an online community of language learners within the context of an Italian as a second language university class. An online community of learners that included a group of second and third year students of Italian, their teacher and seven native speakers facilitators was developed and implemented according to the principles that guide community development, the use of authentic and situated activities, and according to Vygotsky's sociocultural theory applied to second language learning. This paper describes the four phases of this study according to the model of DBR outlined by Reeves, and discusses the theoretical principles that inform the development of the online learning environment.

Introduction

One of the main limitations of learning Italian, and generally any foreign language, in Australia is the physical distance from the target language country and the lack of direct experience of engaging in meaningful, authentic communication with native speakers of the target language. This is especially problematic in a context where the majority of learners may not have the opportunity to travel or spend some time in the country where the target language is spoken. This sense of isolation can cause a decrease in motivation, as learners may feel that they are unable to create a meaningful connection with the target language culture.

My desire to address the problem of limited direct contact with the target language culture and to provide learners of Italian at the University of Wollongong with an opportunity for authentic and meaningful communication with native speakers, especially at intermediate and advanced level, provided a reason for designing and implementing an online community of language learners and enable students' interaction through participation in authentic activities in a collaborative and learner-centred environment.

Design-based research

The term *design experiments* or *design-based research* (DBR) was first introduced by Ann Brown (1992) and Allan Collins (1992) to refer to the study of learning in context through the design and development of instructional strategies and innovative educational environment based on the theoretical principles derived from prior research. The Design-Based Research Collective (2003) have indicated that *design-based research* refers to the combination of empirical research carried out in an educational context and the design driven by theory of innovative learning environments (The Design-Based Research Collective, 2003). Researchers agree that DBR should have a strong theoretical foundation (Reeves, 2000; The Design-Based Research Collective, 2003; diSessa & Cobb, 2004; Collins, et al., 2004; Wang & Hannafin, 2005; van den Akker, Gravemeijer, McKenney, & Nieveen, 2006). It should be based on and benefit from

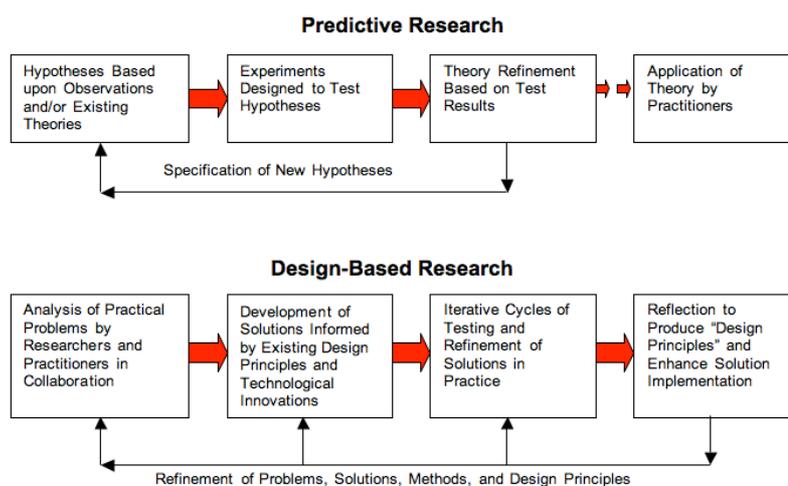
the theoretical principles derived from prior research, and should address theoretical questions and issues.

Reeves (2006) outlined the main characteristics of DBR, based on the studies by Brown (1992) and Collins (1992). According to Reeves design based research aims at:

- Addressing complex problems in a real context in collaboration with practitioners
- Developing and implementing plausible solutions informed by existing design principles and technology-based innovations to these complex problems
- Conducting rigorous and reflective enquiry to test and refine the innovative learning environment developed and to define new design principles that could guide other practitioners interested in solving similar problems within their educational context and could inform future decisions.

Reeves (2006) proposed a model that illustrates the four phases of DBR and exemplified the differences between research conducted with traditional empirical goals and research inspired by developmental goals.

Figure 1: Reeves' 2006 model of design-based research



The travel project: learning Italian in a community of learners

In the particular context of this study I aim to address the practical educational problem of lack of opportunities to engage in meaningful and authentic interaction with native speakers of the target language in a second language classroom. The solution proposed is informed by existing theories and design principles and involves developing and implementing an online community of learners to enable students' interaction through participation in authentic activities in a collaborative and learner-centred environment.

Design-based research is a useful method for the development and implementation of the online learning environment of this study because it has a pragmatic goal and a strong theoretical foundation.

DBR aims at solving a practical educational problem through the development and implementation of an innovative intervention that is based on and benefits from the theoretical principles derived from prior research. A final reason for adopting DBR as a methodology for this study is that the iterative nature of this approach allows the researcher to design and implement an online learning environment and to progressively test it and refine it through a number of successive implementations. The four phases of the study are described below using the model outlined by Reeves (2006). The first, third and fourth phase of the study are briefly discussed. Particular emphasis is placed on the second phase, which describes the theoretical principles that inform the development of the online environment.

Phase 1: Analysis of practical problems by researchers and practitioners in collaboration

The initial phase consisted in identifying and analysing a practical problem within the context of a second language university classroom, which was the lack of authentic exposure to the target language through authentic and meaningful interaction with native speakers. During this phase previous research studies that have attempted to address this problem and have provided successful solutions have been evaluated and analysed. In particular, case studies that have implemented a community of practice approach for collaborative learning in an online environment have been described to evaluate the main problems and benefits related to those designs.

Phase 2: Development of solutions informed by existing design principles and technological innovations

The second phase of the study involved the development of possible solutions to the initial problem as described in the first phase. During this phase an online learning environment was designed and developed according to the principles that guide the development of a community of practice (Lave & Wenger, 1991; Wenger, 1998) and the use of situated and authentic activities (Brown, Collins & Duguid, 1989; Collins, Brown & Newman, 1989; Herrington & Oliver, 2000; Herrington, Reeves, Oliver & Woo, 2004; Herrington & Herrington, 2006). The development of the learning environment drew upon Vygotsky's sociocultural theory (Vygotsky, 1978) applied to second language learning (Lightbrown & Spada, 1999; Donato, 2000; Pavlenko & Lantolf, 2000; Warschauer, 2000).

A learning management system was used to allow the members of the online community to interact and collaborate with each other through a number of online communication tools and resources that included online threaded discussion forums, email and chat. Two authentic activities were designed to incorporate the defining characteristics of authentic tasks as defined by Herrington & Oliver (2000), Herrington, Reeves, Oliver & Woo (2004) and Herrington & Herrington (2006). The first activity required students to plan and organise a trip to Australia for a group of visiting Italian students, and to produce an itinerary and a travel guide to assist them with the travel. The second activity required students to plan and organise a trip to Italy for the whole class. During this phase, the native speaker participants or expert community members acted as facilitators and provided learners with the appropriate scaffolding to assist them completing the tasks.

Sociocultural theory applied to second language learning

Vygotsky's sociocultural theory (1978) recognised that ideas have social origins and that they are constructed through a process of social interaction and communication with others. According to Vygotsky (1978), the range of skills that learners can develop with guidance and assistance from a teacher or more capable peers exceeds what they can achieve by themselves. Social interaction and collaborative learning, either between teacher and learners or among learners, are essential in assisting learners in advancing through their zones of proximal development (ZPD). Vygotsky defined the ZPD as 'the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers' (Vygotsky, 1978, p. 86).

A number of researchers have applied Vygotsky's sociocultural theory to second language learning and have emphasised the importance of the social and cultural context in which a second language is learned and of the relations that learners' develop with other learners within a community, as well as the role of meaningful social interaction with more advanced speakers of the target language such as teachers, peers and native speakers (Lightbrown & Spada, 1999; Donato, 2000; Pavlenko & Lantolf, 2000; Warschauer, 2000). In second language learning the ZPD has been defined as: 'the difference between the second language (L2) learner's development level as determined by independent language use, and the higher level of potential development as determined by how language is used in collaboration with a more capable interlocutor' (Otha, 1995, p. 96).

Vygotsky's sociocultural theory applied to second language learning provides a useful framework for understanding the importance of participating in collaborative and meaningful interaction in the second language classroom and for designing online language learning environments that support learners' interaction and collaboration with more advanced speakers of the target language.

Communities of practice and legitimate peripheral participation

According to the definition proposed by Lave and Wenger (1991) the concept of community of practice refers to a group of people who engage in a common activity, interact with each other and share knowledge about a particular topic. Through a process of increasing participation and engagement in the activities of a community, newcomers or learners become involved and absorbed in the practices of a community, develop social relations with other community members and learn from them. These new members acquire the skills required to take part in the activities of a community by interacting and collaborating with expert members, rather than through explicit instruction and isolated acquisition of knowledge.

The process of gradually becoming part of a community of practice takes place under the conditions of legitimate peripheral participation (Lave & Wenger, 1991). The notion of "peripheral" refers to the different ways in which a learner or newcomer engages in social practice with expert community members and gradually moves from the periphery of the community to its centre. This concept can be applied to a second language learning context where learners, by engaging in social interaction and community activities with expert

community members or native speakers, gradually become part of a community of speakers of the target language. Through interaction and collaboration with native speakers learners eventually reach the level of expertise of the members closer to the core of the community and therefore move from its periphery to its centre.

Situated and authentic learning

The concepts of community of practice and legitimate peripheral participation are closely related to the theory of situated learning proposed by Lave (1988) and later incorporated into sociocultural theory. According to this theory, learning is viewed as a process of social and personal development that is situated in the practices of a particular community. It does not occur through independent and isolated acquisition of knowledge but through social interaction and collaboration with other learners. Brown, Collins, & Duguid (1989), have further developed the theory of situated learning and have emphasised the concept of cognitive apprenticeship. They maintain that cognitive apprenticeship supports learning by enabling students to acquire, develop and use cognitive tools in an authentic and situated context. Through a process of cognitive apprenticeship learners are able to take part in the culture of practice and undertake activities that are authentic and meaningful as well as coherent with the culture in which they take place. In other words, the activities of a domain are framed by its culture and are socially constructed through negotiations among the members of a particular domain. Collins, Brown & Newman (1989) point out that situated learning represents an opportunity for students to carry out meaningful tasks and solve complex problems in an environment that reflects their own personal interests as well as ‘the multiple uses to which their knowledge will be put in the future’ (p. 487). In other words, situated learning provides learners with the opportunity to understand and appreciate the uses of what they learn and to actively apply their knowledge rather than passively receiving it.

In the specific context of foreign language learning, situated learning occurs when learners engage in the types of authentic communication that are likely to take place in a real world context and when they have the opportunity to develop their communicative skills through authentic and meaningful interaction with native speakers of the target language. In authentic language learning situations learners are active agents and acquire the target language through the using the language itself.

Phase 3: Iterative cycles of testing and refinement of solutions in practice

The third phase of the research involved the implementation of the solutions proposed in the second phase of the study. During this phase, two iterative cycles of testing and refinement of the solutions proposed were implemented within the specific context of a second and third year Italian language university classroom.

The first iteration

The first iteration of the study was conducted in the second semester of 2006. The participants were 13 second-year and 3 third-year students of Italian at the University of Wollongong, four Italian native-speaker facilitators and the researcher, who was also the class teacher. Students were required to complete the first of the two

activities described in phase two of the study over the first six weeks of the semester, and to collaborate and communicate their ideas with other community members using the communication tools and the resources of an online learning management system. In order to complete the activities, students divided themselves into small collaborative groups, and each group was assigned to a native speaker facilitator who assisted them for the duration of the task and provided feedback and support as required. The activity had to be carried out entirely in the target language and in week seven of the semester each group presented the final product of their work to the rest of the class.

During the course of the first iteration, data was collected through recording, note taking, class observation and focus group interviews with the students. The data analysis began at the commencement of the data collection process and was aimed at determining the effectiveness of the online learning environment developed, and to identify any issues or problems related to the design of the authentic activity, the presence of the native speakers facilitators, the collaborative work among community members and the technology used to support this collaboration. The findings of the first iterative cycle assisted with the refinement of the second cycle of the study. A number of changes were made to the learning environment and all of the problems encountered were addressed before the commencement of the second cycle.

The second iteration

The second iteration of the study was conducted from week eight to week thirteen of the second semester of the same Italian language subject. The participants were the same group of students of Italian, five Italian native-speaker facilitators and the researcher. Students were required to complete the second of the two activities described in phase two, over the last six weeks of the semester and to collaborate and communicate with other community members through the online resources provided, as they did during the first iteration. As with the first iteration, the activity had to be carried out in the target language and each group was assigned to a different facilitator. As with the first iteration, data was collected through recording, note taking and class observation. At the conclusion of the cycle individual interviews with the students and with the facilitators were also conducted, and a questionnaire to obtain background information was completed by the participating students at the time of the interview.

Phase 4: Documentation and reflection to produce Design Principles

The final phase of the study is the documentation and reflection phase. In this phase the data collected in phase three of the research was documented and reflected upon in order to produce a new set of design principles and guidelines that could be referred to and followed by other language instructors interested in addressing a similar problem within their specific educational context.

Conclusion

This paper described the four phases of a study that used the model of design-based research proposed by Reeves (2006) to design and implement an online community of learners of Italian in a second language university class. According to Reeves, the aim of DBR is to

solve a practical educational problem through the development and implementation of an innovative intervention that is based on theoretical principles derived from prior research. This study drew on Vygotsky's sociocultural theory applied to second language learning, theories of situated and authentic learning and the concepts of community of practice and legitimate peripheral participation to develop an online learning environment that provided learners with opportunities for authentic and meaningful communication with native speakers of the target language and enabled students' interaction through authentic activities in a collaborative and learner-centred environment.

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