INSTRUCTIONAL INTERACTIONS AND ONLINE COURSE EFFECTIVENESS AT A LARGE MEXICAN ORGANISATION

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Instructional interactions and online course effectiveness at a large Mexican organisation

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ABSTRACT

This research focused on the relationship between online interactions and course effectiveness in a corporate setting. The research questions were: How do learners interact with the content, the teacher and other learners in online courses? How effective are online courses characterised by high levels of different types of interactions? Which online course design (i.e., emphasising learner-content, learner-teacher or learner-learner interactions) results in the highest levels of effectiveness?

The research was conducted in a large Mexican organisation, involving 163 students, 30 teachers and 3 academic assistants. Three versions of an online course were designed, each emphasising a single type of interaction, delivered online, thoroughly evaluated and compared. The researcher used a mixed-methods approach, combining quantitative and qualitative data. She collected data through surveys, server logs, think aloud protocols, interviews, messages in discussion forums, exams, observations, sales records and a focus group. Thematic analysis was used across all sources of qualitative data.

Results showed that course design does not dictate the type of interactions that students use. In corporate settings, an online course can be effective in terms of satisfaction, learning, knowledge transfer, business results and return on expectations, as long as one of three types of interaction (learner-content, learner-teacher or learner-learner) features prominently in the design, and delivery is consistent with the chosen type of interaction.

The main contributions to knowledge of this thesis are: an in-depth understanding of interactions in the design and delivery of online courses in a large organisation; a comprehensive evaluation of online course effectiveness; the expansion of the interaction equivalency theorem; and how the above contributions can add value for learners and make online programmes a powerful lever for organisational change.

Conclusions may be valuable for academics and practitioners interested in corporate e-learning. This study also provides evidence-based recommendations for online learning in organisations.
ACKNOWLEDGEMENTS

This PhD study was only possible thanks to those who helped me personally, professionally, academically and spiritually throughout this journey. I am grateful for your comments, feedback and support. My sincere thanks to all of you.

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I dedicate my thesis to my main supervisor, Alejandro Armellini. His support and guidance throughout my studies was invaluable.
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PROLOGUE

My interest in designing effective online courses to help organisations provide accessible and efficient training to their staff has been present since the beginning of my professional career. I focus on Mexico because it is my home country and I am aware of our limitations, compared to more developed countries. I acknowledge the potential of technology to facilitate learning. I believe that employees who have suitable development opportunities and feel well-prepared to do their jobs are happier and more productive. Contributing to this area is my way of creating a better world. I am passionate about education and learning technologies.

While the value of online learning is widely accepted, in corporate settings, especially in developing countries such as Mexico, doubts remain. Some of these lingering questions relate to bad practices. I have personally experienced some awful, page-turner online courses. I decided to make it my mission to find engaging ways of fostering online learning.

Since 2006 I have worked in the field of corporate e-learning. I started in a large Mexican company. I was in charge of managing an online training system in the e-learning platform Moodle. I used to help managers develop the courses and support online students. I had no freedom to change the learning design. I was given a template, which had to be completed. Courses were text-based. There were no embedded interactions with other people. Every tool that fostered collaboration was blocked, due to security concerns. Communications with the teachers were infrequent, via email. I found the courses static, uninspiring and boring.

In 2009 I began working on my own as a learning consultant and realised that many organisations excluded social interactions from their online courses (e.g., Padilla Rodriguez & Armellini, 2013a; Padilla Rodriguez & Fernandez Cardenas, 2012). I found that most employees took for a fact that online courses were isolating experiences. I have had conversations with Human Resources staff in which learning designers share their beliefs that virtual courses are mostly online reading materials available for self-
study that require no human support. Participants’ expectations of online courses seem to be tainted by these preconceptions.

On the other hand, I have also come across reports of online students stating that they learn more from other people and that sometimes online content cannot answer their specific questions. At organisations, usually, only one or two people require any particular training at a time. It does not make sense to have a group of students. It is unfeasible. I can understand that. Yet, I am intrigued. Are content-based online courses in organisations really effective? The organisations I worked with claimed they are. However, evaluations are often limited to satisfaction surveys and exam performance without an agreed baseline.

I am a psychologist and my master is in education and cognition. I am familiar with learning theories such as constructivism, which emphasises the role of peers and experienced others in learning. In the academic contexts I have been acquainted with, I have constantly heard of the value of team work and sharing of experiences. Animated discussions with people can make any topic exciting. Are online courses that foster social interactions effective, then? The universities I worked with claim they are. However, as in organisations, evaluations often lack a pre-post systematic approach.

The contrast between companies and academic institutions suddenly made sense when I found Anderson’s (2003a) interaction equivalency theorem and its thesis about how learning can be supported if one of three types of interactions is present at a high level. If it was supported by empirical evidence, it would explain why organisations and universities claim that their online courses are effective in spite of their differences. It could also lead the way for effective online learning designs. I decided to test this thesis. This research was conducted in a large Mexican organisation and aimed to explore the relationship between online interactions and course effectiveness.

1 From now onwards I refer to myself as “the researcher”.

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CHAPTER 1
INTRODUCTION

E-learning is an umbrella term that refers to the use of technology for education (electronic learning). It covers a wide set of applications and processes, such as the delivery of content via web, blended (hybrid or mixed) courses and digital collaboration (ASTD, 2013), but it is commonly used to refer to online learning (Ally, 2008; Guri-Rosenblit & Gros, 2011). E-learning in corporations is important and in constant growth. Its benefits have been documented frequently, and include reduced expenses, time-savings, increased access, standardisation of courses and flexibility (Ally, 2008; Bonk, 2002; Hamtini, 2008; Rivera, Trierweiler & Sugrue, 2005). Employees are often under the impression that e-learning contributes to their personal development (Skillsoft, 2004; Vaughan & MacVicar, 2004).

In 2004, the International Labour Organisation actively encouraged the use of information and communication technologies in workplace learning (ILO, 2004). Increased adoption of online and blended education has followed (Kim, Bonk & Teng, 2009; Kim, Bonk & Zeng, 2005; Scott-Jackson, Edney & Rushent, 2008; Skillsoft, 2007). However, sometimes online learning platforms are used as content repositories (e.g., Armellini et al., 2012). Some web-based courses limit themselves to replicating face-to-face teaching methods or to uploading reading texts, offering no advantage in the use of technology (Cotton & Gresty, 2007). A number of managers still hesitate to accept online education as an adequate means to obtain professional credentials (Adams, 2008). Yet, e-learning is currently becoming more of a fixed reality than a choice, and enhancing the effectiveness of online programmes remains an important challenge (Woo & Reeves, 2008). This thesis is part of this quest for knowledge and research-based guidelines for designing and developing more effective online courses.
This chapter introduces a PhD research project conducted in a large Mexican organisation and aimed at evaluating the relationship between different types of online interactions (learner-content, learner-teacher and learner-learner) and course effectiveness (satisfaction, learning, behaviours in the workplace, business results and return on expectations). Key terms are presented and defined. The justification of this project is based on five main areas: 1) online interactions, 2) evaluation of course effectiveness, 3) relationship between the previous two, 4) situational specificity, and 5) mixed methods research design. A description of the contribution to knowledge is also provided (see Figure 1).

**Figure 1 Chapter structure: Introduction**

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<td>• Thesis structure</td>
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<td>• Chapter summary: Introduction</td>
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**Background**

In business settings there is a current trend to drift away from training and move towards learning. The first term is usually related to content-based and instructor-led interventions focused on skills; the second one is broader and involves the acquisition and application of knowledge, skills or attitudes resulting from formal or informal developmental and educational opportunities (V. Anderson, 2007, p. 1). However, between practitioners,
there is still no consensus on the demarcation between these terms. Words such as education, training, development and learning are part of the organisational vocabulary and tend to refer to the same process: the enhancement of human potential and talent (Wilson, 2005). In this thesis, all of the mentioned concepts are present, but the term learning is the one most frequently used to describe processes related to the acquisition of knowledge and skills.

Learning is commonly conceptualised as a social, collaborative process, in which people communicate with each other and actively build knowledge. Within educational theories such as constructivism, learning is viewed as the results of complex interactions (Benbunan-Fich, Hiltz & Harasim, 2005), which can be formal (planned, designed into the course) or informal (unplanned, not designed). Students who work together and share ideas with others are generally more motivated and display better academic performance than those who do not (Beaudoin 2002; Swan 2002). They tend to value both formal and informal interactions, as factors determining the quality of the learning experience (Rhode, 2009).

Interaction was originally conceived as a classroom-based dialogue between students and teachers. The incorporation of technologies in learning has modified this concept, which has now been expanded to include computer-mediated discussions. Despite the limitations on face-to-face interaction, blogs, chats and online communities provide evidence that the Internet is very much a social space (Servage, 2005). It facilitates synchronous and asynchronous communications, and people can interact with others and with multimedia resources (Anderson, 2003b; Jung, Choi, Lim & Leem, 2002).

A wide range of technological resources is available to suit different educational needs. Communication tools such as discussion forums, blogs, wikis, voice boards and social media foster a sense of connectedness between members of a group (Beldarrain, 2006). Nowadays learners can have more control over their interactions (Means, Toyama,
Murphy, Bakia & Jones, 2010), and training programmes can be customized according to students’ preferences (O’Leonard, 2004).

Technology has the potential to help enhance the effectiveness of online courses. In a study with an expert panel of learning designers, participants reported that an ideal, generic web-based learning environment should provide as many interactive functions as possible (Chou, 2003). It has also been argued that the quality of interactions can only be as good as the digital tools built into the delivery medium (Beldarrain, 2006). Although the advantages of technology should be maximised in support of educational outcomes, goals should not be set to obtain the maximum use from technology (Brown, 2009). The focus should remain on learning outcomes. We must not forget that “technology does not build fruitful, productive working relationships; people do” (Servage, 2005, p. 313).

This research project focuses on learners’ experiences in online courses, in which embedded, formal, instructional interactions and effectiveness were evaluated. These concepts are defined next.

Interaction
In spite of the large body of research on interactions (e.g., Bernard et al., 2009; Kellogg & Smith, 2009; Means et al., 2010; Sher, 2009), there is still a lack of consensus over the meaning of the concept. Few authors explicitly define it. For example, in an early editorial, which was later published as a book chapter and has been cited over 2200 times in academic articles, Moore (1989) described three types of interaction, without stating the meaning of the term. As Anderson (2004, p. 43) points out, “it is surprisingly difficult to find a clear and precise definition of this concept in the education literature”.

Two main perspectives are applicable in the definition of interaction: One focuses on human participants, while the other one includes inanimate objects. In the first, authors like Vrasidas and Mclsaac (1999) regard interaction as a people-oriented process that
consists of the reciprocal actions of at least two actors within a given context. It is also called \textit{social interaction}. Within this approach, if a course does not provide opportunities for dialogue among learners or between teachers and learners, it is not perceived as interactive. When a study reports that some students do not want to have much interaction in their courses (e.g., Su, Bonk, Magjuka, Liu & Lee, 2005), it might be referring exclusively to human interaction.

In online settings, a different word describes the involvement of a person and a machine: interactivity. Although interaction and interactivity are occasionally used as synonyms (e.g., Clark, 2002; Sidhu, 2008; Swan, 2002), some academics argue that they are not. For example, Wagner (1994) states that interactivity could be considered as a machine attribute. There are also authors that seem to prefer the term interactivity to discuss people’s involvement with technology, even if they do not make a clear distinction between interaction and interactivity (e.g., Chou, 2003; Lustria, 2007).

The second approximation to defining interaction is broader and includes nonhuman participants. Wagner (1994) explains the concept as reciprocal events with at least two actions and two objects/actors mutually influencing one another. Caladine (2008) specifies that an interaction can be the reciprocal action between learners, and between a learner and an object, like a computer or the content. Anderson (2003b) agrees with the inclusion of machines in the description of the term, alluding to the impossibility of determining with certainty the exact combination of human and nonhuman interaction that is needed for effective education.

This second broader definition might be preferred as it is more inclusive. Nonetheless, one may wonder how exactly a learner can influence an inanimate object. Understanding how a person’s response to a technological task (e.g., pressing a key) can have an effect on software (e.g., displaying text) is not too complicated. It is different when considering course content. If a student reads an explanation and takes notes, how does that change
in any way the material? Although no author was found to address this matter directly, a possible answer is that when interacting with the content, a person is modifying their internal representation of such content and thus, influencing it.

Related concepts have emerged in this debate. Woo and Reeves (2007) argue that not every interaction (e.g., idle chatting or mindlessly clicking webpages) has an influence on educational goals. They claim that current definitions fail to acknowledge the importance of the learning that occurs during interactions (Woo & Reeves, 2008). Therefore, these authors use the term meaningful interaction to describe a type of interaction that directly influences students’ learning. However, they leave unanswered questions: How can we know if a certain interaction is directly influencing learning? What if a certain interaction influences the learning of one student but not of another? Before a designed interaction takes place and is evaluated, how can we know if it will be meaningful? If we cannot, what is the practical advantage of distinguishing meaningful interactions from the rest?

Perhaps a more reliable term is instructional interaction. Wagner (1994) uses it to refer to an event that takes place between learners and their environment with the purpose of helping them change their behaviours toward an educational goal. Instructional interactions are embedded in the learning design of a course. Although this term might seem very similar to Woo and Reeves’ (2008) description of meaningful interactions, there is a slight difference. An instructional interaction is designed to help achieve an educational objective. It is effective (meaningful) if it results in modifying learners’ behaviours toward the goal.

In this thesis, interaction is defined according to Wagner’s (1994) statements: reciprocal events that require at least two actions and two objects/actors that mutually influence one another. The focus is on instructional interactions, as they are within the control of course designers. Table 1 summarises key terms in the area of educational interactions and their definitions, as considered in this thesis.
Table 1 Definition of interaction and related terms

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<th>Concept</th>
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<td>Interaction</td>
<td>Reciprocal events that require at least two actions and two participants (human or nonhuman) that mutually influence one another</td>
<td>Wagner (1994)</td>
</tr>
<tr>
<td>Social interaction</td>
<td>People-oriented process that consists of the reciprocal actions of at least two actors within a given context</td>
<td>Vrasidas &amp; McIsaac (1999)</td>
</tr>
<tr>
<td>Interactivity</td>
<td>Interaction of a person with a technological tool</td>
<td>Wagner (1994)</td>
</tr>
<tr>
<td>Meaningful interaction</td>
<td>Type of interaction that directly influences students' learning</td>
<td>Woo &amp; Reeves (2007)</td>
</tr>
<tr>
<td>Instructional interaction</td>
<td>Event between the learner and their environment for the purpose of helping the learner change their behaviour toward an educational goal</td>
<td>Wagner (1994)</td>
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Effectiveness

Researchers commonly use terms such as effectiveness (Bates, 2004), efficiency (Ruiz, Mintzer & Leipzig, 2006), achievement, and performance (Bernard et al., 2009) without explicitly defining them. For example, Donald Kirkpatrick developed a widely used model to evaluate corporate training effectiveness. This framework includes four levels (reactions, learning, behaviours and results). Yet, Kirkpatrick (1979, 1996, 2007) did not explain what he meant by effectiveness. If students are satisfied with their course, is the programme considered effective? If the satisfied participants did not learn, is the programme still considered effective? If the participants hated the course but they learned and applied the knowledge in their workplace, is the programme considered effective? These questions emphasise the ambiguity of the term effectiveness, as the criteria for judging it may change from case to case.
There have been attempts to establish a common language for different stakeholders, including teachers, course designers, researchers, and managers. The American Society for Training and Development (ASTD, 2013) has created a learning glossary, openly available online. Assessment is “the process used to systematically evaluate a learner's skill or knowledge level”. Evaluation is “any systematic method for gathering information about the impact and effectiveness of a learning offering”. The European Centre for the Development of Vocational Training (Cedefop, 2011) provides similar definitions, explaining that the term assessment generally refers to appraisal of individuals and evaluation, of education and training methods or providers. Nonetheless, according to the Merriam Webster thesaurus (2014), these terms are synonyms, and in practice they are used interchangeably (e.g., Mandinach, 2005).

Although the ASTD (2013) provides useful guidelines, it does not define the concept effectiveness. The Cedefop (2011) does, describing it as the extent to which the objectives of an intervention are achieved. The term implies the comparison of obtained results versus expected ones (Peak & Berge, 2006). Therefore, effectiveness is an indicator of the value and usefulness of a course. It should be differentiated from efficiency, which refers to the relationship between outcomes achieved and resources used (Cedefop, 2011).

The terms achievement and performance are often used in academic contexts to refer to the accomplishment of learning outcomes. In business settings, these concepts can be applied to workplace behaviours. Achievement and performance do not necessarily indicate effectiveness. In this thesis, evaluating effectiveness implies the systematic measurement of the results of a course and their comparison with planned, expected outcomes (Cedefop, 2011). These results can relate solely to learning, they can include knowledge transfer, or they can aim to impact bottom-line organisational measures, such as sales or production quality. If they are achieved, the programme is effective.
**Problem statement**

A large commercial food organisation (+6000 employees) with 30 distribution centres and offices in Mexico participated in this PhD project. It had an online training system, which served mostly as a content repository and was an inactive space. Most staff members were unaware of this system. Some of the few employees who had experience with it were not convinced about its value (see Padilla Rodriguez & Fernandez Cardenas, 2012).

The management of the Human Resource department (HR) was interested in improving their learning practices by taking real advantage of their technological resources. They wanted to innovate, create engaging development opportunities for the staff, and increase the educational offer by designing and delivering online courses. Yet, they lacked research-based guidelines suitable for their context. By participating in this PhD project, they hoped to implement a high-impact programme, which could provide solid data that validated the effectiveness of e-learning amongst different stakeholders in the organisation. This required a thorough understanding of the interactions occurring within online courses, a comprehensive evaluation of course effectiveness and the identification of the most successful approach to course design.

Four one-week courses (or modules) within an existing face-to-face Leadership Programme were selected for redesign, development, online delivery and evaluation. Different learning designs, each emphasising a different type of interaction (learner-content, learner-teacher or learner-learner), were tested. Course effectiveness was evaluated in terms of student satisfaction, learning, knowledge transfer, business results and return on expectations. This research project yielded valuable lessons for relevant stakeholders, such as teachers and managers, which can be useful for practitioners in similar contexts, as well as academics researching course design in corporate settings.
**Justification**

This project adds to existing knowledge by filling gaps in the areas of online interactions and evaluation of course effectiveness. The situational specificity of the study and its mixed methods research design provide additional benefits.

**Online interactions**

Interactions are considered an essential element for any educational environment, independently of the delivery means (e.g., Clark, 2002; Miyazoe & Anderson, 2010a; Wilson & Stacey, 2004; Woo & Reeves, 2007). Their value in online contexts has been reported by teachers (Su et al., 2005) and learners (Rhode, 2009). Online interactions have been associated with increased satisfaction rates (Chang & Smith, 2008; Swan, 2002) and decreased course dropouts (Lee & Choi, 2011). Ally (2008) even defines online learning as using the Internet to access educational resources, and to interact with content, teachers or peers. Anderson and Garrison (1998) recommend the inclusion of collaborative learning activities whenever practical, not as optional assignments but as tasks directly related to the educational goals.

However, there are a number of gaps in the knowledge of this field. For example, research-based principles for designing interactions in online courses are still lacking (Woo & Reeves, 2007). Academics have posed different questions that are still waiting for evidence-based answers: What types of interaction are the most meaningful for online learning (Woo & Reeves, 2008)? What types of interactions are online learners seeking from their peers (Chang, 2009)? How can we innovate in the use of technologies to promote interactions in online learning (Chang & Smith, 2008)?

Searching for answers to these questions could help learning practitioners facilitate student involvement online. Moreover, it could reveal strategies that foster successful educational programmes (Anderson, 2003b; Chang, 2009; Woo & Reeves, 2008). This thesis aims to benefit key stakeholders, such as learners, teachers, designers and
managers, by increasing the understanding of online interactions and providing research-based guidelines for course design.

**Evaluation of course effectiveness**

Providing evidence of the value of online educational programmes is crucial for Human Resource departments. During an economic crisis, training budgets are among the first to be cut in organisations (Kirkpatrick & Kirkpatrick, 2010). Evaluating course effectiveness can help to:

- Demonstrate the value of training;
- Determine the future of HR staff;
- Improve human resource development options in the future;
- Decide with evidence if a specific course or workshop should continue to be offered;
- Maximise the potential of training by assuring its alignment to business strategies;
- Validate the job of education professionals in organisations;
- Justify the investment of time, money and required resources, especially when a particular technological infrastructure is needed (J. Kirkpatrick, 2007; Kirkpatrick, 1979, 1996; Ruiz et al., 2006);
- Promote participation in the training, as employees who feel a course is not effective are likely to spend less time studying online and skip future courses (Garavan, Carbery, O’Malley & O’Donnell, 2010).

While there is general agreement on the importance of effectiveness measurement, comprehensive evaluations are uncommon in companies. The current perception of the quality of corporate online learning is related to narrow and ambiguous evaluation criteria (e.g., Lim, 2007). Sometimes the value of the training is calculated using consumption metrics like the number of programmes offered and the duration of completed courses (Kirkpatrick & Kirkpatrick, 2010; Macpherson, Elliot, Harris & Homan, 2004). Some organisations lack proper monitoring of training (V. Anderson, 2007; Kim et al., 2009) and
do not even track which employees completed which course (Bonk, 2002; Vaughan & MacVicar, 2004). Reasons for this include budgets focused on course development and teachers’ salaries; management caring only for completion rates; and lack of knowledge about practical ways to conduct effective evaluations (Peak & Berge, 2006).

Research on the effectiveness of online courses in organisations is scarce and often limited (DeRouin, Fritzsche & Salas, 2005). Evaluations usually focus on student satisfaction and learning (Kim et al., 2009; Machperson et al., 2004; Vaughan & MacVicar, 2004). Yet, business executives tend to value the acquisition of knowledge and skills less than their application in the workplace and their translation into organisational results (Kirkpatrick & Kirkpatrick, 2010). This thesis focused on the evaluation steps described by Kirkpatrick (1979). It went beyond the usual measurements of satisfaction and learning, addressing the need for a systematic and comprehensive evaluation of online courses in organisations (DeRouin et al., 2005; Macpherson et al., 2004; Macpherson, Homan & Wilkinson, 2005; Woo & Reeves, 2007). This evaluation considered changes in workplace behaviours (i.e., knowledge transfer), achievement of business results and return on expectations.

Relationship between online interactions and course effectiveness

Studies conducted in schools and universities (Chang & Smith, 2008; Su et al., 2005) have emphasised the importance of social interactions (i.e., between people) to foster learning. In business settings, however, it is not always possible to generate such interactions in online courses, even if employees consider these contacts important (e.g., Vaughan & MacVicar, 2004). This may be due to the lack of focus on successful pedagogical design models (Macpherson et al., 2004) or just-in-time, just-for-me demands (i.e., a single person requiring training at a given time). It is common for organisations to have programmes with limited opportunities for social interactions (Welsh, Wanberg, Brown & Simmering, 2003; Padilla Rodriguez & Armellini, 2013a; Padilla Rodriguez & Fernandez Cardenas, 2012).
How do different types of interactions relate to online course effectiveness? The interaction equivalency theorem (Anderson, 2003a) provides a probable answer for this question by claiming that meaningful learning can be supported as long as one of three types of interactions (learner-content, learner-teacher and learner-learner) is available at a high level. This thesis tests this idea by comparing the effectiveness of online courses with learning designs with low and high levels of different types of interactions. It also expands on the theorem by applying it in a corporate context and including other indicators of course effectiveness: satisfaction, knowledge transfer, business results and return on expectations.

This thesis addresses requests for further research on the relationship between online interactions and course effectiveness. Questions raised by academics in the field include: What are the effects of interactions on learning outcomes (Picciano, 2002)? What types of interactions are the most meaningful for students learning online (Woo & Reeves, 2008)? Do increased interactions enhance the achievement of learning outcomes (Chang & Smith, 2008)? What is the relationship between learner-content interaction and course success (Zimmerman, 2012)? What are the differences in terms of satisfaction and learning in courses with and without interaction opportunities (Beaudoin, 2002; Jung, 2001; Sher, 2009)? Do working adult students learn more by working with other students than they would without interaction with peers (Kellogg & Smith, 2009)? Specifically, this thesis addresses the question: Which type of online interaction (learner-content, learner-teacher or learner-learner) results in the highest levels of course effectiveness?

Situational specificity
Most research on online courses is conducted in schools and universities. Few articles on this topic focus on corporate settings (Macpherson et al., 2004). Studies on e-learning applications in training and development are limited (Hung, 2012). Although effective course design strategies tend to be situational (Stone, 2011), companies that develop and
implement online courses often take for granted conclusions drawn from academic contexts and apply them to their own setting, hoping that they will be equally applicable.

Companies in developing countries, such as Mexico, have access to little research specific to their context, as most studies are conducted in the United Kingdom and the United States of America (Hung, 2012). There are differences in relation to online learning preferences (Furner, Mason, Mehta, Munyon & Zinko, 2009) and technical literacy levels (Brewer et al., 2006; Koponen, Tedre & Vesisenaho, 2011). The technological scenario in Mexico is different from that in developed countries. While the use of the Internet in the country has been increasing over the past years, reaching 40% of the population in April 2012, access is still restricted. According to 2012 statistics, for members of the Organisation for Economic Co-operation and Development (OECD), the average percentage of households with an Internet connection is 71.6%. In Mexico, it is 25.9%. Only 15.6% of Mexicans get online daily, and 31% of all users surf the web with an educational purpose (INEGI, 2013).

This thesis was conducted in a large Mexican organisation, thus, addressing the need of research on online interactions and course effectiveness in different contexts (DeRouin et al., 2005; Hung, 2012; Jung et al., 2002; Miyazoe & Anderson, 2010b; Swan, 2002; Woo & Reeves, 2008) and providing the benefit of situational specificity (Stone, 2011; Wagner, 1995).

**Mixed methods research design**

Many studies conducted in business contexts (e.g., Scott-Jackson et al., 2007; Skillsoft, 2007) are quantitative and use descriptive statistics to provide a general overview of e-learning practices. However, as Grandzol and Grandzol (2010) point out, this type of analysis might be unable to portray the depth of learners' experience in online courses. Several authors (Caliskan, 2009; Chang & Smith, 2008; Jung et al., 2002) have emphasised the importance of a qualitative approach and the use of mixed methods (Zimmerman,
Learning practitioners and managers have also indicated “that quantitative data alone does not adequately reflect the intangible value of learning processes” (V. Anderson, 2007 p. 30).

In Mexico, corporate online learning research mostly takes the form of consultancy reports elaborated for organisations’ internal use and conference papers (e.g., Garcia Sanchez, Castillo Rosas & Aguilera Terrats, 2007), rather than peer-reviewed articles. In line with this, Clark (2002) claims that much of what passes for theory in this field is rather non-empirical. Few investigations into online education discuss their findings in the light of pedagogical theories (Jung, 2001). Woo and Reeves (2007) acknowledge that designers tend to lack sound theoretical foundations for determining what good online learning quality is. They further express that design guidelines relating to interactions tend to be closer to heuristics than to research-based principles. This highlights the need for a formal, systematic approach that yields evidence-based conclusions.

This thesis addresses the above issues by incorporating quantitative and qualitative data in a systematic mixed methods approach. Triangulation of the information and a more holistic understanding of corporate online learning are related benefits (see Jick, 1979).

**Contribution to knowledge**

This thesis contributes to knowledge by increasing our academic understanding of online interactions, considering course effectiveness indicators beyond learning and satisfaction (knowledge transfer, business results and return on expectations), empirically testing and expanding the interaction equivalency theorem (Anderson, 2003a), focusing on a corporate setting and incorporating a mixed methods approach. It also provides research-based answers to the following research questions within the context of a large Mexican organisation:

1. How do learners interact with the content, the teacher and other learners in online courses?
2. How effective are online courses characterised by high levels of different types of
interactions (learner-content, learner-teacher and learner-learner)?

3. Which online course design (i.e., emphasising learner-content, learner-teacher or
learner-learner interactions) results in the highest levels of effectiveness?

This project presents the additional benefit of highlighting the importance of informal
interactions beyond the course boundaries, providing insight on how to successfully
implement corporate e-learning and discussing how online courses can be used as a lever
for organisational change. The lessons derived from this research offer relevant
implications for practice that can guide learning designers, teachers and educators to
design, develop, implement and evaluate effective online courses.

**Thesis structure**

This thesis comprises eight chapters, plus a prologue and epilogue, appendices and
references. The following chapters provide an overview of the literature on the field, the
steps taken to prepare the participating organisation for the main study, the pilot of the
online courses, the research methodology, the results, the discussion of the findings and
the conclusions (see Table 2).

**Table 2 Thesis structure**

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Topic</th>
<th>Purpose</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>To introduce and justify a PhD research project aimed at evaluating the relationship between different types of online interactions (learner-content, learner-teacher and learner-learner) and course effectiveness (satisfaction, learning, behaviours in the workplace, business results and return on expectations) in a large Mexican organisation.</td>
</tr>
<tr>
<td>2</td>
<td>Literature review</td>
<td>To provide a theoretical framework for the research based on the analysis of earlier studies.</td>
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<tr>
<td>Chapter</td>
<td>Topic</td>
<td>Purpose</td>
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<tr>
<td>3</td>
<td>Preparation for the main study</td>
<td>To describe the steps taken to develop the best possible conditions to conduct the main study at the participating organisation.</td>
</tr>
<tr>
<td>4</td>
<td>Pilot of online courses</td>
<td>To identify potential improvements to the instruments and methods for subsequent embedding in the main study by testing the learning designs for the online courses.</td>
</tr>
<tr>
<td>5</td>
<td>Methodology for the main study</td>
<td>To explain and document the methodology for the main study, including the research questions, design, participants, data sources, procedure and ethical implications.</td>
</tr>
<tr>
<td>6</td>
<td>Results</td>
<td>To articulate the results of the main study, grouping them in terms of the research questions.</td>
</tr>
<tr>
<td>7</td>
<td>Discussion</td>
<td>To analyse the results in the light of the literature review.</td>
</tr>
<tr>
<td>8</td>
<td>Conclusions</td>
<td>To identify the main contributions and conclusions of this research, discussing its limitations and providing recommendations for practice and for future studies.</td>
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</table>

**Chapter summary: Introduction**

This chapter introduces a PhD research project conducted in a large Mexican organisation interested in expanding and improving its offer of online courses. This required a study to understand how learners interact online with content, teachers and peers; to evaluate course effectiveness comprehensively, including measurements of satisfaction, learning, workplace behaviours, business results and return on expectations; and to identify the relationship between different types of online interactions (learner-content, learner-teacher and learner-learner) and course effectiveness. This project contributes to filling current gaps in knowledge in the areas of online interactions and evaluation of course effectiveness. It also provides the benefits of situational specificity, a mixed methods research design and evidence-based recommendations for practice. The implementation of this research was based on the conceptual framework described in CHAPTER 2.
CHAPTER 2
LITERATURE REVIEW

This chapter focuses on two concepts important in corporate e-learning: online interactions and course effectiveness. Drawing on the literature, it analyses related empirical data, describes associations among variables of interest and provides a conceptual framework for the research study. This chapter has three main sections: 1) online interactions, 2) course effectiveness, and 3) relationship between online interactions and course effectiveness (see Figure 2). The first two aim to describe and analyse two important concepts in corporate e-learning. The third seeks to integrate different findings from the literature to gauge the relationship between online interaction and course effectiveness.

Figure 2 Chapter structure: Literature review

<table>
<thead>
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<tr>
<td>• Search strategy</td>
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<td>• Online interactions</td>
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<td>o Learner-content interaction</td>
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<tr>
<td>o Learner-teacher interaction</td>
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<tr>
<td>o Learner-learner interaction</td>
</tr>
<tr>
<td>o Limitations of Moore's taxonomy</td>
</tr>
<tr>
<td>o Other types of interaction</td>
</tr>
<tr>
<td>o Summary: Types of online interaction</td>
</tr>
<tr>
<td>• Course effectiveness</td>
</tr>
<tr>
<td>o Level 1: Reactions</td>
</tr>
<tr>
<td>o Level 2: Learning</td>
</tr>
<tr>
<td>o Level 3: Behaviours</td>
</tr>
<tr>
<td>o Level 4: Results</td>
</tr>
<tr>
<td>o Limitations of Kirkpatrick’s four-level model</td>
</tr>
<tr>
<td>o Level 5: Return on investment</td>
</tr>
<tr>
<td>o Alternative level 5: Return on expectations</td>
</tr>
<tr>
<td>o Summary: Levels of course effectiveness evaluation</td>
</tr>
<tr>
<td>• Relationship between online interactions and course effectiveness</td>
</tr>
</tbody>
</table>
Three frameworks guided this literature search and analysis: Moore’s (1989) taxonomy of types of interaction (learner-content, learner-teacher and learner-learner), Kirkpatrick’s (1979) four levels of course effectiveness (reactions, learning, behaviours in the workplace and business results) and Anderson’s (2003a) interaction equivalency theorem. The analysis of previous studies helped to identify areas of interest (see Figure 3) in which this research might make a contribution to knowledge. This chapter discusses relevant research findings and limitations of each framework.

Figure 3 Areas of interest
Search strategy

This literature review draws together research in the fields of workplace learning and higher education. In spite of their contextual limitations, findings from academic settings were also included because they represent one of the main sources of e-learning knowledge (Hung, 2012). Whenever possible, results from studies carried out in organisational contexts were discussed. Consulting groups that provide e-learning solutions (e.g., Skillsoft) could have a possible conflict of interests when presenting their case study reports, which are not peer-reviewed. Caution when reading these outcomes is, thus, advised.

Most e-learning studies have been conducted in developed countries, specifically in the United Kingdom and the United States of America (Hung, 2012). To obtain a more international perspective, an attempt was made to include research from Mexico (e.g., Torres Velandia, Barona Rios & Garcia Ponce de Leon, 2010) or with participants from different countries (e.g., Kim et al., 2009).

Google Scholar was the main search engine used to conduct this literature review. While controversial since its origins, Google Scholar offers suitable coverage for systematic reviews (Gehanno, Rollin & Darmoni, 2013), and is scholarly in terms of accuracy, authority, objectivity, currency, inclusion and relevance (Howland, Wright, Boughan & Roberts, 2009). The digital library of the University of Leicester served as a secondary search engine, providing access to papers with no open access.

Keywords related to the areas of interest were used, as well as variations (see Table 3). These search terms were combined with words related to organisational contexts (e.g., workplace learning) or relevant topics (e.g., evaluation + course effectiveness), or with other keywords (e.g., learner-content interactions + satisfaction). The researcher checked titles, abstracts and numbers of citations to determine the relevance of each source to this thesis. Some references of strategic articles (those cited widely or closely related to
the objectives of this project) were also included in the search, as well as a number of books not available electronically.

### Table 3 Search terms

<table>
<thead>
<tr>
<th>Topic</th>
<th>Main Search Terms</th>
<th>Sample Variations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online interactions</td>
<td>learner-content</td>
<td>student-content</td>
</tr>
<tr>
<td></td>
<td>learner-teacher</td>
<td>student-teacher</td>
</tr>
<tr>
<td></td>
<td>learner-learner</td>
<td>student-learner</td>
</tr>
<tr>
<td>Online course effectiveness</td>
<td>evaluation</td>
<td>Assessment</td>
</tr>
<tr>
<td></td>
<td>reactions</td>
<td>Satisfaction</td>
</tr>
<tr>
<td></td>
<td>learning</td>
<td>knowledge acquisition</td>
</tr>
<tr>
<td></td>
<td>behaviour improvement</td>
<td>knowledge transfer</td>
</tr>
<tr>
<td></td>
<td>business results</td>
<td>organisational results</td>
</tr>
<tr>
<td></td>
<td>return on expectations</td>
<td>ROE</td>
</tr>
</tbody>
</table>

Initially, the researcher classified the available sources in an Excel spreadsheet, using the criteria described in Table 4. The Mendeley reference management system was also used to store files and create annotations. Yet, the Excel spreadsheet was valuable for its capacity of sorting the information according to different criteria, such as the type of participants and the methods used for data collection. It also provided a general overview of key trends in the literature at a glance.

### Table 4 Criteria for reference classification

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference type</td>
<td>To specify if the source was a book chapter, literature review, meta-analysis, consulting report, or an empirical article using quantitative, qualitative or mixed methods.</td>
</tr>
<tr>
<td>Authors</td>
<td>To identify key authors.</td>
</tr>
<tr>
<td>Year of publication</td>
<td>To enable a chronological view of the references.</td>
</tr>
<tr>
<td>Title</td>
<td>To serve for identification purposes.</td>
</tr>
<tr>
<td>Journal/conference/publisher</td>
<td>To identify main journals, conferences and publishers.</td>
</tr>
<tr>
<td>Index and/or peer-review</td>
<td>To give an orientation about the research rigour of the publication.</td>
</tr>
<tr>
<td>Number of citations</td>
<td>To provide an idea of the relevance of the source based</td>
</tr>
<tr>
<td>Criteria</td>
<td>Purpose</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Main topic and variables of interest</td>
<td>To organise the sources</td>
</tr>
<tr>
<td>N</td>
<td>To offer guidance on what is generally considered a suitable sample size for different methods.</td>
</tr>
<tr>
<td>Participants</td>
<td>To indicate who were the participants (students, teachers, course designers, managers or others).</td>
</tr>
<tr>
<td>Methods</td>
<td>To mention which instruments or data collection methods (e.g., surveys, interviews, literature review, etc.) were used.</td>
</tr>
<tr>
<td>Main results</td>
<td>To list briefly the key findings.</td>
</tr>
<tr>
<td>Gaps</td>
<td>To identify suggestions and requests (if any) for further research.</td>
</tr>
<tr>
<td>Quality</td>
<td>To rate sources from one (highest quality) to three (least quality). Sources with incomplete results, potential conflict of interests or methodological problems were rated two or a three, and used with caution or omitted from the analysis.</td>
</tr>
<tr>
<td>Notes</td>
<td>To include additional information, such as associations with other sources, unanswered questions and reflections.</td>
</tr>
</tbody>
</table>

While this review is not exhaustive (e.g., papers in languages unknown to the researcher were not considered), it does represent a broad search for relevant journal articles, conference papers, books and consulting reports. It helped develop, describe and explain associations among variables of interest and, thus, contributed to the creation of the conceptual framework of this thesis, which is described next.

### Online interactions

In this thesis, interactions are reciprocal events that require at least two actions and two objects/actors that mutually influence one another (Wagner, 1994). The conceptual framework for their study emerges from Moore’s (1989) classification of educational interactions, which is prominent in the literature (Grandzol & Grandzol, 2010). As of
January 2014, it has been cited over 2200 times in scholarly papers according to Google Scholar statistics. It has also been referred to as the first systematic use of interaction as a defining characteristic of distance education (Miyazoe & Anderson, 2013b).

Moore’s (1989) taxonomy identifies relevant interactions for online learning, focusing on learners and their exchanges with materials and others in educational environments. It thus fits within the theory of constructivism and constructionism, which assert that learning is created as a result of complex interactions. Learners actively interpret and process what is received through the senses to create knowledge. When people experience something new, they compare it with internalised previous knowledge and modify their constructs accordingly (Ally, 2008; Benbunan-Fich et al., 2005; Kidd, 2010; Piaget 1964/1991; Vygotsky, 1978).

The terms constructivism and constructionism are used inconsistently (Raskin, 2002), probably due to the similar underlying ideas of these theories. However, there are slight differences. Supporters of constructionism assert that learning is particularly effective when people are creating something for others to experience (Moodle, 2012), while in constructivism this is not necessarily the case. Both constructivism and constructionism are described as social, when they are extended to settings where knowledge is built in groups and based on social interactions (see INTRODUCTION chapter). Academics have recommended using social constructivism to conceptualise interactions (Woo & Reeves, 2007) and to interpret related research findings (Kellogg & Smith, 2009).

Moore (1989) described three types of interaction, based on participating objects and actors: learner-content, learner-learner and learner-teacher. Each of the elements of this taxonomy is described next, as well as related empirical findings.
Learner-content interaction

Learner-content interaction is regarded as crucial for education. It is fundamental because sometimes learners have no communication with their peers or the teacher, and they only have the course materials to work with (Sutton, 2001). Moore (1989) described it as an intellectual process that results in changes in learners’ perspective, understanding, or cognitive structures. This implies processes such as analysing the material, relating it to previous knowledge or applying it to problem solving; in other words, using the content to perform activities that can enhance learning (Abrami, Bernard, Bures, Borokhovsky & Tamim, 2011).

In online environments, powerful computers and the Internet present numerous opportunities for engaging learners in activities. These include answering multiple-choice questions and checking the automatic feedback provided, replaying sections of an audio or video recording, searching for information and following links to glossary entries (Caladine, 2008). Exercises that require observable, active responses (e.g., answering a poll) offer opportunities for the learners to evidence that they have interacted with the content. Other design recommendations include promoting frequent interactions throughout the course, keeping texts brief and clear, providing explanatory feedback regardless of the correctness of answers and allowing personal identification with the materials by making them contextually relevant (Abrami et al., 2011; Clark, 2007; Moreno, 2004).

Students tend to agree with the relevance of learner-content interaction. In a self-paced learning environment, participants reported that they interacted frequently with the course material, and they ranked it highly, in terms of importance (Rhode, 2009). MBA students perceived they learned the most from interaction with the content (Kellogg & Smith, 2009). A sample of university students considered this type of interaction the primary element in assuring the quality of online activities (Miyazoe & Anderson, 2010a).
In industrial and commercial organisations, learner-content interaction is particularly relevant, especially when training has to be delivered to only one or two employees at a time. Welsh, Wanberg, Brown and Simmering (2003) provide an example of a course with a strong focus on this type of interaction. They present the case of Dow Chemical’s Interviewing Training. To promote engagement with the programme, several resources fostered learner-content interaction. These included hyperlinks, buttons, multiple choice questions and “drag and drop” exercises. The system gave students immediate feedback, and allowed them to save their work and finish later, and to take a post-test at any time.

In a case study undertaken at HP, a technology solutions provider, online assessments with matching exercises and board games also aimed to promote learner-content interaction (O’Leonard, 2004). In the Gilbane Building Company, interactive activities and testing with feedback are used in online courses (Skillsoft, 2010b).

Learner-content interactions can be designed to perform functions traditionally facilitated by teachers (Anderson, 2003b; Rowntree, 1994), such as suggesting a learning pathway and providing certain feedback. They can foster flexibility by enabling participants to work independently, at their own pace and in their own time, without requiring the input of others to move forward. Thus, online courses emphasising interactions with the content constitute an option for organisations (e.g., Padilla Rodriguez & Armellini, 2013b).

However, students may be tempted to browse through the content at speed, avoiding the difficult areas and thus reducing potential educational benefits (Cotton & Gresty, 2007). The lack of guidance is often evident in content-based courses, which can be an isolating and confusing experience for students when there is no one available to answer questions (Padilla Rodriguez & Fernandez Cardenas, 2012). Working solely with educational materials might not carry the same qualitative impact as contact with people (Anderson & Garrison, 1998). A study of 102 online postgraduate students found that most respondents wanted more communication with their peers and with the teacher to create meaningful learning experiences. They also wanted interactions other than academic
topics (e.g., getting to know each other better) in order to create a learning community (Su et al., 2005).

**Learner-teacher interaction**

Learner-teacher interaction is viewed as essential for education. Teachers new to online environments sometimes consider their role to be that of a content provider (Conrad, 2004). However, their functions include more complex tasks, such as e-moderating and facilitating online learning (Salmon, 2011). Teachers explain concepts, give examples, answer questions, evaluate performance, stimulate critical thinking, identify misconceptions, provide constructive feedback, guide students and motivate them to learn (Anderson & Garrison, 1998; Moore, 1989). The teacher is widely regarded as the expert on the subject.

Technology facilitates communications between students and teachers, allowing them to be asynchronous, and to use text, images, audio and video. Exchanges can happen in a number of ways, including questions and answers in discussion forums, emails, videoconferencing, chat sessions and feedback on assessments (Caladine, 2008; Chang & Smith, 2008; Su et al., 2005). Dennen, Darabi and Smith (2007) identified teacher practices that foster this interaction: maintaining contact (e.g., responding to learners’ communications and providing feedback in a timely manner), having a regular presence in online discussions and clarifying desired outcomes (e.g., providing examples of completed assignments and models of expected participation behaviours). Other basic skills for online teachers include weaving (i.e., keeping conversations going when that is beneficial) and summarising to close a discussion (Salmon, 2011).

Learner-teacher interaction has a high perceived value amongst learners (Anderson, 2003a; Moore, 2008) and is usually included in online programmes (Su et al., 2005). In a self-paced course, students reported engaging frequently with the teacher, both formally and informally, and they adjudged this to be of high importance (Rhode, 2009). In another
study, learners and teachers agreed that learner-teacher interactions create meaningful learning experiences (Su et al., 2005). Indeed, contact with the teacher is an important factor in the success of online education (Swan, 2002). Over 40% of changes in online student activity can be explained by teacher performance. When teachers participate regularly (as measured by server logs), learners tend to be active as well (Estrada, Shih, Martinez Molina & Muñoz, 2011).

Teachers may sometimes feel overwhelmed by the number of contact requests and by learners’ expectations of them for fast responses (Anderson, 2004). However, frequent communication with the whole group is preferable to in-depth contact with particular individuals (Dennen et al., 2007). Also, automating learner-teacher interactions and translating them into learner-content interactions can reduce teachers’ workload (Anderson, 2003a). For example, if students repeatedly ask the same questions via email, instead of answering every individual message, teachers could benefit from including a frequently asked questions (FAQ) section in their course, or they could use audio podcasts to provide support in dealing with recurrent issues, in a clear, friendly, efficient manner, which learners perceive as personalised (Nie, Armellini, Harrington, Barklamb & Randall, 2010).

Providing learner-teacher contact opportunities in organisations can be a challenge. When solving technical problems in the workplace is prioritised over encouraging employees’ online learning (as reported in Gunawardena, Linder-VanBerschot, LaPointe & Rao, 2010), limited participation and exchanges between teachers and students may result. However, there are successful examples of online courses with learner-teacher interactions. In the Gilbane Building Company, regular two-hour question and answer sessions with course teachers were implemented via a chat function (Skillsoft, 2010b). In EMBARQ Corporation, a communications services company, online live lectures were incorporated into the training. Two three-hour classes were given per week. During these lessons, students were able to actively engage in dialogues with the teachers. Recorded versions were made
available for review and as a backup for people who missed the live lecture (Skillsoft, 2010a).

In the described cases, having a live teacher worked, most likely because of the high number of employees involved in the training at a given time. When there are schedule problems, asynchronous communication tools, such as discussion forums, may be better options to foster learner-teacher interactions. When only a couple of students are enrolled in the course, having a teacher available may not be possible due to budget constraints, but activities fostering learner-learner interactions may constitute an option for engagement with the online course.

**Learner-learner interaction**

Learner-learner interaction is based on communication between students. It can happen in different contexts, with or without the presence of a teacher (Moore, 1989). It is supported by technology in synchronous or asynchronous environments, and may include audio, text, images and video. It can be formal, when learners work as a team on a project for assessment, or informal, when students talk casually about their learning (Caladine, 2008). Tools and activities, such as discussion boards, chat sessions and group assignments, can promote the exchange of ideas between peers (Chang & Smith, 2008).

Salmon’s (2002) e-tivities, or online learning activities, provide a useful framework to foster learner-learner interactions. The template to create an e-tivity includes four basic components: 1) the ‘spark’, which is a resource (e.g., image, video or audio) that aims to generate interest in the topic of the e-tivity; 2) the purpose of the e-tivity; 3) the task, which includes instructions, useful links and the ‘place’ where products are expected (e.g., discussion forum, wiki or blog); and 4) the response section, which requires learners to comment on the work of others (thus generating further interactive loops) or answer additional questions. Other sections (such as time normally required to complete the task, extra online resources, etc.) can be added if necessary. This simple model has been
successful in generating effective learner-learner interactions and peer collaboration (e.g., Armellini & Aiyegbayo, 2009). Figure 4 provides an example of an e-tivity.

Figure 4 Example of an e-tivity

<table>
<thead>
<tr>
<th>Purpose</th>
<th>To identify what constitutes effective communication online, and be aware of the potential for misunderstanding.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task</td>
<td>The second stage of Gilly Salmon’s Five Stage Model of E-Learning is about fostering online socialization.</td>
</tr>
<tr>
<td></td>
<td>Search online for a document or webpage that gives guidelines for good online behaviour (netiquette).</td>
</tr>
<tr>
<td></td>
<td>With your team, identify one aspect of the guidelines that you feel is the most important. Write it in your wiki page, briefly explaining why you consider it relevant. Post the link to the original guidelines.</td>
</tr>
<tr>
<td>Response and Feedback</td>
<td>Keep a watch on the wiki pages of the other teams. Give your feedback by posting a reply in the “Comments” section of their wiki pages.</td>
</tr>
<tr>
<td></td>
<td>Please remember to write a couple of lines in your blog with your reflections.</td>
</tr>
<tr>
<td>Timing</td>
<td>Approximately 60 minutes, including post e-tivity discussion.</td>
</tr>
</tbody>
</table>

Image by [XKCD](https://xkcd.com/) licensed under a Creative Commons Attribution-Non Commercial 2.5 license.
The importance of learner-learner interaction is a subject of debate. While it is critical for programmes based on constructivism, it is not so for those that use behaviourist approaches (Anderson, 2003a). Anderson (2003b) points out that participating effectively in teams, establishing personal, professional and academic relationships with peers, and generally demonstrating highly developed communication skills are crucial for vocational and personal success. Also, students may take the facilitator’s role in online discussions, guiding the conversations using strategies that fit their own profile as learners. Students can, thus, help motivate their peers to participate, explore others’ opinions and generate innovative ideas (Baran & Correia, 2009).

Nonetheless, the design of learner-learner interactions in online courses does not guarantee participation or meaningful dialogue. Moore (2008) once stated that learner-learner interaction is only appreciated for its contribution to mastering course content. Sometimes students limit their contributions due to time pressures, fear of posting something wrong or lack of motivation (Mason, 2011; Vrasidas & McIsaac, 1999). In corporate settings, solving technical problems may be a priority, over learning online, resulting in little student participation or increased dropout rates (Gunawardena et al., 2010).

Research on the perceived relevance of this type of interaction provides inconsistent results. Some studies have found that online course participants appreciate opportunities to work and share ideas with their peers. Su and colleagues (2005) did a survey with teachers and students. The majority of participants agreed that learner-learner interactions create meaningful learning experiences, and that more communication opportunities were needed. Chang and Smith (2008) found that learners at university level
responded positively to discussion boards and chat sessions with their peers. Students showed high participation rates, posting comments on the work of others. Additionally, 97% of respondents (n=855) expressed their appreciation of the opportunity to learn collaboratively on case study projects and to become acquainted with their course mates.

Other research has reported that online students feel learner-learner interaction to be tangential, unnecessary to achieve desirable outcomes and less important than other types of interaction. In an analysis of an online MBA course, Kellogg and Smith (2009) found that working adult students perceive they learn the least from interaction with their peers and the most from interaction with the content. In a study based on a self-paced environment, participants consistently ranked course elements involving interaction with other learners as the least important in comparison to all other possible options (Rhode, 2009).

Several explanations have been offered for the lack of support for learner-learner interaction. They include time inefficiency (e.g., the activity was not time well spent), interaction dysfunction (e.g., free-rider problems and lack of consensus building) and flexibility intrusion (e.g., schedule constraints to meet and work together) (Kellogg & Smith, 2009; Rhode, 2009). The inconvenience of learner-learner interaction should be weighed against knowledge acquisition and learning outcomes. Kellogg and Smith (2009) also argue that one benefit of this type of interaction involves connecting socially and emotionally with other students. Adult learners that work full time can be expected to have well-established family relationships and more extensive professional networks than young undergraduate students. Thus, their building of knowledge may occur more with their job colleagues than with their student peers, diminishing the motivation and the perceived value of interacting with course mates. In their qualitative analysis, Kellogg and Smith found no comments about a need for a social or professional connection with other students.
Perhaps learner-learner interaction is more important for certain students (e.g., full-time university undergraduates) than it is for others (e.g., employees at a company). This could be a reason why some online programmes aimed at working adults have low levels of this type of interaction. In an international study with 674 employees, few respondents foresaw that collaborative learning tools would be used often. The authors associated this result with corporate security restrictions (Kim, Bonk & Teng, 2009). In an analysis of instructional activities used in 27 MBA courses, it was found that less than half (11) had small team discussions, and fewer used evaluations between peers (5), inter-team feedback (4) and student introduction forums (2) (Su et al., 2005). In a study of managers, most of the ones who classified their training experience as mainly virtual learning agreed that there was a lack of online social interactions (Scott-Jackson, Edney & Rushent, 2008). Learner-learner interaction has been considered an important obstacle to distance learning in organisations (Berge, 2002) and a concern for corporate e-learning professionals (Welsh et al., 2003).

In organisations, some courses have to be delivered to only a couple of employees. Other training is distributed to a group, but not everyone takes it at the same time. Thus, providing learner-learner communication opportunities can be complicated. The relevance of having this type of interaction has to be evaluated taking into consideration the fact that students may be able to talk with their supervisors and co-workers about the content of their course. They could also have informal social interactions related to their programme even if they do not contact other learners online.

**Limitations of Moore’s taxonomy**

Moore’s (1989) taxonomy has a number of limitations. First, it focuses on participants, leaving aside other relevant criteria for categorisation, such as the functions that interactions serve (Jung, 2001), or technological capabilities and supporting media (Anderson, 2004). Second, learner-content, learner-teacher and learner-learner interactions are not completely independent. Communication between students may be
supported by teacher facilitation, which can relate to content. Statistically significant correlations have been found between perceived interactions with teachers and with peers (Swan, 2002). Third, although Moore (1989) discussed the importance of each category, his taxonomy does not provide guidance as to which interaction type should be prioritised in designing an effective online course (Miyazoe & Anderson, 2013).

In spite of the limitations outlined above, Moore’s (1989) types of interaction constitute a seminal contribution to the field of distance education. His categories describe key elements for success in online courses (Swan, 2002) and are, thus, a focus of this thesis. Other types of interaction are discussed in the following section.

**Other types of interaction**

Moore’s (1989) original list of interaction types has been expanded several times. Hillman, Willis and Gunawardena (1994) added learner-interface interaction. The researcher complemented this with teacher-interface interaction. Anderson and Garrison (1998) included teacher-teacher, teacher-content and content-content interactions. Sutton (2001) argued that vicarious interaction should also be considered.

While the mentioned categories may seem peripheral in comparison to Moore’s (1989) taxonomy, neglecting them may affect the educational experience in a negative way. Imagine the following scenarios. Learners or teachers are not comfortable with the interface, refrain from using the technology and thus, limit their social interactions. A teacher has a question when delivering an online course but does not find the opportunity to talk about it with a colleague. A teacher experiences time constraints in developing effective materials for their online students. An intelligent agent is used to personalise the content, but it is not working properly. These situations refer to types of interactions that may compromise the potential learning benefits of an online course. It is therefore important to consider and adequately manage all types of interactions when designing and delivering an online course. These categories are described next.
**Learner-interface interaction**

In online settings, the interactions between learners and the technologies used to deliver a course are usually referred to as learner-interface interactions. Learner-interface interaction emerged as a new category when Hillman, Willis and Gunawardena (1994) pointed out that in distance education success may depend on how comfortable students feel working with the delivery medium. They defined this type of interaction as the “process of manipulating tools to accomplish a task” (p. 34). They explained that learners need certain skills to operate the interface before they can effectively interact with content, teacher or peers. Unskilled students must first learn how to deal with the technology necessary to retrieve information and participate with others online, before they can learn the content of an online course. Hillman and colleagues argued that people studying non-technical subjects are actually taking two courses: one about the content and another about the interface.

Is learner-interface interaction an independent type, or is it a part of other categories? Anderson (2003b) claims that all forms of interaction in distance education are by definition mediated, and therefore, learner-interface interaction is not a unique category. However, Hillman, Willis and Gunawardena (1994) emphasise the importance of distinguishing between the interface as the basis for an independent type of interaction and the interface as a mediating element of interaction. For example, when a student is videoconferencing with another, this is considered learner-learner interaction. When a student is attempting to figure out how the videoconference system works, that is learner-interface interaction. While this example might be easy to understand, the concept is rather ambiguous. For example, imagine a course in which students prefer communications via email over discussion boards and online chats (as in Chang, 2009). Some might consider that learner-interface interaction. Others might regard it as a tool preference.
Moreover, technologies are being increasingly accessible, even in developing countries like Mexico (INEGI, 2013), and their use is becoming more intuitive. Although young people’s appreciation and knowledge of technology are not uniform (Bennet, Maton & Kervin, 2008), new generations are expected to have few difficulties using technologies (Prensky, 2001). In an early study Vrasidas and McIsaac (1999) found that students who were new to computer-mediated communications felt uncomfortable participating in online synchronous chats. In a more recent study, 97.5% of 855 respondents reported that WebCT features in online courses were easy to learn (Chang & Smith, 2008). In this scenario, even if learner-interface interaction is accepted as an independent type, it is likely to decrease in importance in coming years.

In organisational settings, companies should aim to avoid interface related problems, which may cause frustration in students (Welsh et al., 2003). Not knowing how to use the learning management system is a reason for failing to complete an online course. Learners’ confidence in using technology to interact also predicts course satisfaction (Gunawardena et al., 2010). Students with computer anxiety tend to show worse knowledge transfer results than peers who are more confident (Park & Wentling, 2007). As technological developments appear and become a stable part of corporate infrastructure and people feel more comfortable using the technology, learner-interface interaction will become less of an issue.

**Teacher-interface interaction**

Teacher-interface interaction in online learning is rarely mentioned or discussed in the literature (Vrasidas, 2003). However, the same arguments that support the existence of learner-interface interaction are valid for this category. Teachers need certain skills to operate the interface before they can effectively interact with students. Inexperienced teachers might give up on communicating using technology, affecting the learners’ educational experience.
Without naming it teacher-interface interaction, there is empirical research about faculty’s incorporation of technology in their pedagogical practices. However, contrary to what could be expected, although newer generations have been more exposed to technology, this does not necessarily translate into higher levels of technology use in classrooms (Russell, Bebell, O’Dwyer & O’Connor, 2003). Teachers may acknowledge the benefits of using interactive online resources, without actually using them (Torres Velandia et al., 2010).

Technical support (e.g., description of tools and examples of good practice) can help teachers who may have problems mastering the technological interface. Additionally, focused learning design interventions can also be beneficial, such as Carpe Diem (Armellini & Aiyegbayo, 2009), which is a team-based workshop that helps educators feel comfortable with web-based tools and willing to use them effectively in their practice.

**Teacher-content interaction**

Teacher-content interaction consists of the development of resources and learning activities by teachers, who are being increasingly exposed to materials created by others, such as open educational resources (OERs; see Nikoi & Armellini, 2012). This contact can promote reflection and communication. For example, using OERs can save time and trigger new ideas on how to create engaging educational materials. However, it can also be challenging to match the variety and quality of content provided by other teachers and educational institutions (Anderson, 2004; Anderson & Garrison, 1998).

**Teacher-teacher interaction**

Anderson and Garrison (1998) introduced the concept of teacher-teacher interaction. Differing from Moore’s (1989) original classification, this category broadens the perspective by which education is conceived to include the teacher’s point of view (Miyazoe & Anderson, 2010a). Teacher-teacher interaction usually takes place in a context of professional development, where teachers communicate with each other, sharing ideas...
and experiences about their teaching practice. These interactions can help improve the quality of online courses and minimise prejudice against certain emerging technologies (Su et al., 2005).

While teacher-teacher interactions used to be confined to infrequent gatherings at conferences and seminars, technology has created a wide range of contact opportunities. For example, via Twitter educators from all over the world participate in weekly discussions sharing resources and experiences using the hash tag #edchat (Terrell, 2009). This type of social networking is changing how teachers improve their skills, answer questions, provide suggestions and offer peer support (Davis, 2010).

Content-content interaction

In 1998 Anderson and Garrison stated that content interacting with content was almost in the realm of science fiction. They accurately foresaw that technology would allow this to happen. Nowadays there are programmes, called intelligent agents, which can retrieve information from other programmes, dynamically update themselves, monitor resources online and acquire new capabilities (Anderson, 2003b, 2004; Anderson & Garrison, 1998; Kidd, 2010). These processes are referred to as content-content interactions.

Content-content interactions are relevant in settings where intelligent agents can help achieve learning outcomes and the technological infrastructure required is available in the institution. An example is an RSS (rich site summary) feed, which publishes frequently updated information about blog entries. This tool can also foster learner-learner interactions if it shows students when a peer has commented or posted on others’ blogs (Hain & Back, 2008).

Another example is the Geoweb, or Geographic web, which implies the merging of location data with a range of web content (Baudry, 2008). Imagine a weather tutorial that identifies the learner’s location and automatically gathers its data from meteorological
servers (Anderson, 2004). This content-content interaction enables learners to access up-to-date information that is specific to their context and thus, promotes learner-content interactions.

Vicarious interaction
Sutton (2001) described the concept of vicarious interaction, claiming that it happens when a learner actively observes and processes an interaction between others, without directly participating in it. There is some evidence of the relevance of this type of interaction. For example, Su and colleagues (2005) found that instructors hoped students would read messages in the discussion forums and learn through the observation of their peers’ responses to problems (i.e., that they would interact vicariously). Beaudoin (2002) argued that being less participatory does not imply being less engaged in meaningful learning, which is understandable if silent or “invisible” students are interacting vicariously. However, Anderson (2003a) has claimed that high levels of interaction usually require participants to be directly active. “Vicarious interaction is a variation on all forms of interaction and is not really a distinct form in that it necessarily occurs in combination with other forms and requires the active interaction of other players to be realized” (Anderson, 2003b, p. 132).

**Summary: Types of online interaction**
Moore (1989) described key types of interaction in educational settings: learner-content, learner-teacher and learner-learner. Table 5 describes guidelines for implementation of these categories and related research findings.

<table>
<thead>
<tr>
<th>Type of Interaction</th>
<th>Sample Guidelines</th>
<th>Research Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner-content (LC)</td>
<td>• Include exercises that require observable, active responses (e.g., answering a poll).</td>
<td>• Students tend to agree on the relevance of LC interactions for success in online courses.</td>
</tr>
<tr>
<td>Type of Interaction</td>
<td>Sample Guidelines</td>
<td>Research Findings</td>
</tr>
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<tr>
<td></td>
<td>• Promote frequent interactions throughout the course.</td>
<td>• LC interactions can foster flexibility by enabling participants to work independently, at their own pace and in their own time.</td>
</tr>
<tr>
<td></td>
<td>• Keep texts brief and clear.</td>
<td>• Having solely LC interactions in an online course can lead to superficial readings, unanswered questions and an isolating learning experience.</td>
</tr>
<tr>
<td></td>
<td>• Provide explanatory feedback regardless of the correctness of answers.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Allow personal identification with the materials by making them contextually relevant.</td>
<td></td>
</tr>
<tr>
<td>Learner-teacher (LT)</td>
<td>• Maintain frequent contact with the whole group (e.g., regular posts on discussion forums), rather than only giving occasional in-depth feedback to individuals (e.g., private emails).</td>
<td>• LT interaction has a high perceived value amongst learners.</td>
</tr>
<tr>
<td></td>
<td>• Weave, or keep conversations going when beneficial.</td>
<td>• Communications between teachers and students can create meaningful learning experiences.</td>
</tr>
<tr>
<td></td>
<td>• Summarise contributions to close a discussion.</td>
<td>• Teacher performance is related to student activity in an online course.</td>
</tr>
<tr>
<td>Learner-learner (LL)</td>
<td>• Use Salmon’s (2002) e-tivity framework to create activities that foster interactions between learners.</td>
<td>• The importance of LL interactions is a subject of debate.</td>
</tr>
<tr>
<td></td>
<td>• Require learners to comment on the work of others or answer further questions.</td>
<td>• Exchanges between students can help establish professional and academic networks, develop communication skills and generate innovative ideas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Student participation may be limited due to time pressures, fear of posting something wrong or lack of motivation.</td>
</tr>
</tbody>
</table>

Additional interaction types include learner-interface, teacher-interface, teacher-content, teacher-teacher, content-content and vicarious interaction. While these categories are not
central to success in online courses, they should be considered and managed because if neglected, they can impact the learning experience negatively.

**Course effectiveness**

In this thesis, course effectiveness refers to the achievement of planned, expected outcomes (Cedefop, 2011). The conceptual framework for the evaluation of course effectiveness in business settings relies on the four-level model of Kirkpatrick (1979; 1996). Although Kirkpatrick’s work was developed over 50 years ago, it is still considered functional and valid. It is by far the most widely used perspective in corporate e-learning (DeRouin et al., 2005; Peak & Berge, 2006; Strother, 2002). It is considered that any training programme, face-to-face or online, can be evaluated using this model (Peak & Berge, 2006; Strother, 2002). While evaluation alternatives do exist (e.g., Hamtini, 2008; Holton, 1996), most of them are based upon Kirkpatrick’s four levels (Goldwasser, 2001), and their use is not as widespread.

The popularity of Kirkpatrick’s (1979) model relates to its simplicity and pragmatism. It provides a straightforward, systematic way of evaluating training effectiveness. It represents a guide of questions and criteria to consider (Bates, 2004). In the words of its creator:

> Many trainers aren’t much interested in a scholarly, complex approach. They want something they can understand and use. The model doesn’t provide details on how to implement all four levels. Its chief purpose is to clarify the meaning of evaluation and offer guidelines on how to get started and proceed (Kirkpatrick, 1996, p. 55).

D. Kirkpatrick (1996, 2007) has declared more than once that his original work was on steps and techniques. Apparently the terms *levels* and *model* were adopted by the community and not by him. Nowadays it is commonly accepted to refer to this approach as “Kirkpatrick’s four-level model”, and so it is called in this thesis. This framework
identifies four levels to measure training effectiveness: reactions, learning, behaviours and results. Evaluating course effectiveness becomes more complicated and expensive as the process advances but also more meaningful (Kirkpatrick, 1996).

The evaluation steps are described next. While an effort was made to focus on workplace research, most evaluations of online learning programmes have been conducted in university settings with undergraduate participants (Bernard et al., 2009). Results of studies in academic contexts are included in the following review.

**Level 1: Reactions**

The first step in training effectiveness evaluation is to identify participants’ reactions. This implies measuring satisfaction and how well learners like a particular programme. It is important to assure that students are interested and motivated. People should have positive reactions to pay attention, put in an effort, learn and obtain the maximum potential of a training programme. This type of evaluation can be easily applied in the form of a “happy sheet” or a survey. Items that can be tabulated and quantified are often used (Kirkpatrick, 1979, 1996). While in certain organisational contexts learners may feel worried about reporting their perceptions (Gunawardena et al., 2010), honesty can be promoted by allowing anonymous responses. Participants can also be invited to write additional comments to cover aspects left out by the items.

In academic contexts, learners’ reactions towards online learning are usually positive (e.g., Kuo, Walker, Belland & Schroder, 2013). Most university students enrolled in virtual courses express satisfaction with their online programmes (93.2% of 855 in Chang & Smith, 2008; 83% of 51,600 in Moskal, Dziuban, Upchurch, Hartman & Truman, 2006; and 88% of 1,406 in Swan, 2002). Being able to find information easily, having orientation sessions to explain the functioning of online learning and promoting an active acquisition of knowledge have been associated with high levels of satisfaction (Chang & Smith, 2008).
In organisational settings, online students also express positive reactions (e.g., Joo, Kim & Park, 2011). Employees appreciate the flexibility of online learning, even if completing a course implies a time investment sometimes difficult to make (Gunawardena et al., 2010). A study with 3,456 finance sector employees found that most of them were satisfied with their online courses (Ozturan & Kutlu, 2010). In a survey with 697 respondents from non-profitable organisations, 88.1% declared they were from somewhat to very satisfied with their online educational programmes (Isoph & N-TEN, 2004). In another study with 204 e-learning users from different areas, work hierarchies and ages, 93.5% reported enjoying their online courses, independently of their computer knowledge. Additionally, 98% would recommend participation on online learning, which implies an adequate satisfaction with this instruction modality (Skillsoft, 2004). While most students appear to be satisfied, there is still a minority that is either neutral or unsatisfied. Additionally, reactions can be independent of the delivery means and related to instructional design issues (McFarland & Hamilton, 2006), such as interaction opportunities.

Satisfaction measurements indicate how an online course is perceived, accepted and valued by students (Gunawardena et al., 2010). However, they can say little about learning. Kirkpatrick (1979, 1996) has claimed that positive reactions to a programme do not assure knowledge acquisition or behavioural improvement. Yet, he has also stated that people must enjoy a course to obtain the maximum benefit from it and that “the more favorable the reactions to a program, the more likely trainees are to pay attention and learn” (Kirkpatrick, 1979, p. 82).

Although positive relationships between satisfaction and the final grade in an online course (McFarland & Hamilton, 2006), and between satisfaction and perceived learning (Swan, 2002) have been found, there could be inconsistent situations. For example, a well-structured course could be considered difficult and therefore rated as unsatisfying by students. Likewise, a shallow but entertaining subject could foster a favourable reaction
(Ruiz et al., 2006). Thus, measuring the second level, learning, is relevant for evaluating course effectiveness.

**Level 2: Learning**

The second step implies the objective determination of the acquisition of knowledge or skills. The basic question is: What principles, facts and techniques were understood by learners? Within the constructivist perspective, learning can be an individual process, focused on the acquisition of conceptual knowledge or a social one, requiring the participation of others (Paavola & Hakkarainen, 2005; Phillips, 1995). These approaches to learning have distinct assumptions. Yet, they are not mutually exclusive. Both can help to capture the essence of the learning process, as they answer different kinds of questions regarding how people learn (Paavola & Hakkarainen, 2005).

In this level, it is recommended to conduct a quantitative evaluation, use a pretest-posttest approach to relate the learning to the course, compare findings with those of a control group and analyse results statistically (Kirkpatrick, 1979, 1996). The assessment of learning outcomes is conducted using a range of instruments, such as assignments and exams. Grades are considered to be a measure that is available and common across different subjects, levels, and areas (Moskal et al., 2006).

In higher education institutions, students tend to have an adequate academic performance in online courses. Moskal and colleagues (2006) found that 84-88% of 51,600 learners completed different online programmes with passing grades. In a study with 1,406 participants, most of them declared they had learned either as much as expected (41%) or more (47%) in their web-based courses (Swan, 2002). Graduate students have also reported perceiving that they have acquired the required knowledge from their online classes (Kellogg & Smith, 2009). Learning tends to be independent of gender, age, work status and previous experiences with virtual courses (Lu, Yu & Liu, 2003). It is consistent across different contents and levels (Means et al., 2010).
In organisations, online learning results seem to be better than those obtained in academic institutions (see review by DeRouin et al., 2005). Learners, teachers and course designers perceived an international online corporate programme to be a viable means for updating knowledge and skills (Gunawardena et al., 2010). Learning appears to be independent of gender, socioeconomic status, previous experience using computers (Yang & Lin, 2011) and course completion. Sometimes students just want to refresh existing skills, to reference particular topics or to find specific information. They may leave the course right after learning what they need to do their jobs (Skillsoft, 2004; Welsh et al., 2003). In a study with 204 users of online training, 92.5% considered that they had learned what they needed (Skillsoft, 2004). Employees of an organisation in Mexico (22 out of 26) also considered that they had learned from their online courses (Padilla Rodriguez & Armellini, 2013a).

When comparing online to face-to-face education, the literature suggests that there is no significant difference in the achievement of learning outcomes (e.g., McFarland & Hamilton, 2006; Yang & Lin, 2011). In a research bibliography, Russell (2010) concluded that learning does not depend on the delivery method. It is important to consider that medium and course design are different concepts that seem to be confounded often in comparison studies (Bernard et al., 2009). Curriculum, pedagogy, social interaction opportunities and time spent reviewing the content might have a greater impact on students’ performance (Means et al., 2010) than the delivery method (i.e., teaching the course via web or face-to-face).

In academic contexts the ultimate goal of online education is usually learning. However, in corporate courses there is an emphasis in the third level of training effectiveness: the application of knowledge in the workplace.
Level 3: Behaviours

Kirkpatrick’s third level implies the translation of the acquired knowledge into performance in the workplace, commonly referred to as transfer of training (Kirkpatrick, 1996) or knowledge/learning transfer. Changes in job behaviours are the main objective of most programmes (Strother, 2002), as “most executives do not care about level 1 and level 2 indicators” (Kirkpatrick & Kirkpatrick, 2010, p. 81). Yet, this evaluation step is mediated by factors out of the control of course designers (Kirkpatrick & Kirkpatrick, 2010). For example, students may find it difficult or unfeasible to apply what they learned if they lack encouragement from line managers and work colleagues (e.g., Joo et al., 2011). Organisational support is a predictor of learners’ ability to transfer learning to the workplace (Gunawardena et al., 2010).

The evaluation of in-the-job behaviours is more complicated than that of reactions and learning (Kirkpatrick, 1979, 1996). To measure this level, a three-month wait between the end of the programme and the start of the evaluation is recommended to give students an opportunity to put into practice what they learned. Also, a reference point should be established, so changes can be related to the training. A control group can be used, or measurements before and after the course (Phillips, 1999; Kirkpatrick, 1979). Results should be statistically analysed. When using a pretest-posttest approach is not possible, the evaluation can be based on perceptions of the improvement in the students’ performance. Participants can be asked to identify changes of their behaviour at the workplace (Kirkpatrick, 1979; Joo et al., 2011), or to discuss how they have integrated in their job the new abilities acquired (Strother, 2002). This can be done through personal interviews or focus groups from 8 to 12 people. Other ways to evaluate knowledge transfer include asking relevant others (e.g., line manager, colleagues or peers) to assess behavioural changes (Kirkpatrick, 1979), observing the employees in their job activities, and using follow-up assignments or action plans (Phillips, 1999).
Online learning can improve job-related behaviours (see review by DeRouin et al., 2005). Not surprisingly, one of the main reasons for taking a virtual course is to be more competent and efficient at the workplace. Employees tend to perceive that their online programmes help them improve their job performance. In a study with 204 participants, 87% reported applying in their work the skills and knowledge acquired in their online courses, and they could even give examples of how they applied this learning. These behaviours referred to tangible business benefits (e.g., increased sales), better processes (e.g., more efficient project management), more effective communications (with other departments and with clients), development of interpersonal skills (e.g., assertiveness), and technological and computer knowledge (Skillsoft, 2004). Nurses taking a web-based course considered that their programme helped them to develop and evaluate their administrative and writing abilities, consequently improving their job performance (Korhonen & Lammintakanen, 2005). Employees from a Mexican organisation also reported having applied what they learned online in their jobs (Padilla Rodriguez & Armellini, 2013a).

Evaluating behaviours in the workplace is important. Yet, in order to consider that a course has been effective, many executives require these behaviours to be translated into improved business results, which is the focus of the next evaluation level.

**Level 4: Results**

The fourth step involves the measurement of organisational level results, such as increased sales, improved quality, higher productivity, reduced costs and less employee turnover (Kirkpatrick, 1979, 1996). This level usually focuses on financial measures (Bates, 2004), although this is not a must (Peak & Berge, 2006).

The evaluation of the direct impact of a programme on the macro results of the company is complicated due to a wide range of confounding variables. For example, sales may be affected by the economic scenario and competitors’ marketing strategies, not only by the
training retailers participate in. For some types of training, it is impossible to do the evaluation (Kirkpatrick, 1979; Peak & Berge, 2006). This is as true for traditional, face-to-face courses and for those delivered online (Strother, 2002). Some learning professionals may feel uncomfortable measuring success with indicators that are outside the area of control of the courses and only within their area of influence (Kirkpatrick & Kirkpatrick, 2010).

Benefits of online learning may be intangible. Some managers believe staff training and development can help the overall achievement of business targets, even if this is difficult to track (V. Anderson, 2007). Another potential issue when trying to evaluate step four is deficient communication between the HR department and the top management, which may result in programmes that are not designed to directly address business level objectives (Bates, 2004). Before conducting the evaluation, monetary and time costs should be compared against potential benefits. As in the other levels, a control group should be used, or assessments before and after the training. It is also recommended to wait long enough for the training results to be achieved (Kirkpatrick, 1996).

Literature on the evaluation of business results is scarce. Kirkpatrick (1979) argues that HR directors cannot use organisational results from others; they can only borrow assessment methods. This could explain the lack of information. Other reasons include the difficulty of conducting the required measurements, and the fact that some companies consider these data sensitive and do not publish them.

Yet, online learning seems to influence business results positively (see review by DeRouin et al., 2005). Case studies shed light on this. At Koch Industries, an online programme focused on health and safety helped to reduce the rate of injuries in the workplace (Skillsoft, 2010c). In the Gilbane Building Company, online safety training resulted in a decrease of the accident rate to half the average rate in the construction industry (Skillsoft, 2010b).
Limitations of Kirkpatrick’s four-level model

Kirkpatrick’s (1979) model has received several criticisms. Bates (2004) considered it an oversimplified vision of training effectiveness that disregards individual and contextual influences. However, Kirkpatrick (1979) did accept that many variables are involved in the evaluation process and even commented on the derived complications when measuring the last levels. Holton (1996) pointed out that Kirkpatrick’s framework is not really a model but a taxonomy that does “not fully identify all constructs underlying the phenomena of interest, thus making validation impossible” (p. 6). Kirkpatrick (1996) responded in a very straightforward way: “I don’t care whether it’s a model or taxonomy as long as training professionals find it useful in evaluating training programmes” (p. 55). Also, he did not call his work a “model”. He talked instead about steps (D. Kirkpatrick, 1996; J. Kirkpatrick, 2007).

A well-acknowledged limitation of Kirkpatrick’s model is that the evaluation rarely includes all the steps. Measurements tend to decrease as the levels advance. Most assessments only consider participants’ satisfaction and learning (Saks & Burke, 2012). In a study with 674 training and HR development professionals from five different countries (China, South Korea, Taiwan, United States and United Kingdom), 43% of respondents indicated that their organisation evaluated student reactions; 39%, learning; 22%, behaviours; and 19%, organisational results (Kim et al., 2009). This is understandable, as most programmes (e.g., one-day courses) have little capacity to affect level four directly (Bates, 2004). Also, 60% of learning practitioners (n=392) consider that training benefits are too difficult to measure (V. Anderson, 2007). This lack of measurements may not be due to limitations of Kirkpatrick’s model but to the perceived applicability of the evaluation and its influence on future decisions (V. Anderson, 2007; Pulichino, 2007). D. Kirkpatrick’s son and daughter-in-law urge learning executives to reach beyond the first two levels to create value (Kirkpatrick & Kirkpatrick, 2010).
The correlation and causality between the levels represent another topic of debate. Bates (2004) considers that Kirkpatrick’s model assumes that the evaluation steps represent a causal chain, in which positive reactions lead to a better learning, which in turn produces a higher knowledge transfer, and subsequently the achievement of organisational results. He argues that Kirkpatrick has been ambiguous on this matter. While some correlations have been reported (e.g., Joo et al., 2011; Park & Wentling, 2007; Saks & Burke, 2012), it is not possible to assume a correlation between the results of each level (Pulichino, 2007). Holton (1996) claims that if there is no association between the levels, it is impossible to know whether it is because a part of the training effort was not effective or because the underlying evaluation model is not valid. Being taxonomy, Kirkpatrick’s framework merely classifies levels, without defining causal constructs.

Kirkpatrick’s (1979) model emphasises the importance of relating changes in learning, behaviours and business results to the training. However, establishing a cause-effect relationship may not be necessary. V. Anderson (2007) considers that a strategic, integrative evaluation approach concerns the collective outcome of interrelated factors that underpin organisational performance and the creation of value. The focus should be on the aggregated contribution made by a dispersed range of learning process that could happen in formal training settings or in informal spaces.

Despite its limitations, even its critics (e.g., Bates, 2004; Holton, 1996) admit that Kirkpatrick’s model is by far the most used approach in companies. It is pragmatic. It is simple. It has been considered valid for decades without any considerable modifications (Pulichino, 2007). It is currently a suitable option to evaluate corporate online education.

Kirkpatrick’s (1979) model has evolved with the introduction of technologies to learning practices, as executives require concrete proof of the economic potential of online learning (V. Anderson, 2007; Peak & Berge, 2006). Thus, a new level of course effectiveness evaluation has emerged: return on investment.
**Level 5: Return on investment**

Philips (1999) developed the fifth level of course evaluation, which aims to calculate the return on investment (ROI). Its purpose is to convince the team of a company’s HR department that training can make a difference (Phillips, 1999). When technology is incorporated into educational programmes, the decision to invest in the required infrastructure may depend on ROI calculations, as measures in financial terms are usually of interest to corporations (Homan & Macpherson, 2005).

ROI is achieved through comparing the economic benefits of the training against its costs (Skillsoft, 2005; Phillips, 1999). Business results from the evaluation of level four are converted to monetary values, which is relatively easy when data refer to quantities, costs or time. For more qualitative information, financial estimates made by participants, line managers, specialists or external studies can be used. Afterwards, the costs of the programme are considered, and the ROI is calculated with the following formula (Phillips, 1996):

\[
ROI(\%) = \frac{Benefits - Costs}{Costs} \times 100\%
\]

A 0% result means that the benefit is equal to the cost. A bigger than zero ROI implies that there was an extra gain. The value of the training benefits must be increased or the costs reduced to improve the ROI (Skillsoft, 2005).

Calculating ROI and ensuring its credibility are not easy tasks. Servage (2005) warns that if implemented in the wrong context, tracking employee performance to measure ROI can create hostility and suspicion among workers. The variables involved can be numerous, making it difficult to determine the exact proportion of change that is related to a particular course (V. Anderson, 2007; Philips, 1999). Phillips (1999) suggests an annual measurement, trying to isolate the effects of training with a pretest-postest design or a control group. This evaluation is rather ineffective when one tries to apply it to a group of courses, because cause-effect relationships become more confusing (Phillips, 1996).
Although ROI calculations are not very precise, they are as accurate as other estimations done by organisations (Phillips, 1999).

Due to the economic savings related to the reduction of travel and face-to-face training logistic costs (Bonk, 2002; Welsh et al., 2003), the ROI of online learning is often considered positive. In HP, a technology solutions provider, training on production flow was designed using an interactive content and a modular approach that reduced redundancy, facilitated updates and enhanced flexibility. Estimated savings were $3,500 USD per learner. Courses improved clients’ experience (level 4) by helping sales representatives provide the right solution to meet their requirements (level 3). HP considered that more skilled, independent employees, less time to solve customer issues and savings on classroom training, taken together, substantially exceeded the course development costs (O’Leonard, 2004).

Evaluating ROI may not be a suitable option for many organisations (Skillsoft, 2005). The measurement process is sometimes as expensive as the training (Goldwasser, 2001). ROI requires the training to be completed and the costs known. It, thus, presents problems of timeliness. It also fails to consider future benefits (V. Anderson, 2007). In a study with three large companies, one argued that ROI was “a short-sighted view of e-learning and more significant was the impact on competitiveness and the development of a learning culture” (Homan & Macpherson, 2005, pp. 85-6). An alternative level five emerged in the form of return on expectations and addressed these concerns.

*Alternative level 5: Return on expectations*

It is unclear who first proposed the concept of return on expectations (ROE). While Kirkpatrick and Kirkpatrick (2010) own the service mark (SM), ROE was described over ten years before as a method to acquire information to determine the extent to which a programme has met clients’ expectations (Hodges, 1999). V. Anderson (2007) found that there is an evident shift from ROI to ROE in organisations. While ROE is still not as
common in the business literature as ROI, it is considered a concept less cold, less financial and more relevant to other employees apart from high-level managers (Kirkpatrick & Kirkpatrick, 2010).

Calculating ROE is considered easier than calculating ROI (Goldwasser, 2001). ROE implies taking the data of previous course evaluation levels and checking if expected outcomes have been achieved. It is important to clarify and negotiate expectations. Key questions to ask are: What were the original expectations for the course? Have there been any changes in these expectations? To what extent have these expectations been met? (V. Anderson, 2007) Relevant stakeholders may not know what they need or want. As Kirkpatrick and Kirkpatrick (2010) point out, the motivation for an online programme may be simply that a competitor is doing it! Also, some expectations may not address directly any of the evaluation levels. For example, V. Anderson (2007) found that most interviewees (senior manager and learning executives) of 12 organisations expected development interventions to contribute to the strategic readiness of employees (i.e., being ready for the future).

Expectations vary depending on the stakeholder group. Sometimes they only correspond to some levels of the model. Others, they include all of them, even ROI. Business executives tend to focus more on behaviours, results and ROI, and less on satisfaction and learning (Kirkpatrick & Kirkpatrick, 2010). In a study that compared the perceptions of senior managers and learning executives of 12 organisations, the first reported their expectation that educational programmes would contribute value through performance improvement more frequently than the latter (V. Anderson, 2007). Also, expectations may change as an online course is progressing, making teachers and instructional designers unsure about desired outcomes (Gunawardena et al., 2010).

While several authors (V. Anderson, 2007; Kirkpatrick & Kirkpatrick, 2010) have emphasised the importance of the alignment between expectations of the HR
development department and the top managers, misalignments are common. It can be problematic if students, teachers, learning designers and managers have different expectations regarding online courses. Thus, potential outcomes of the courses must be negotiated and agreed (V. Anderson, 2007). These expected outcomes are later compared with the actual results of an online course to determine if expectations were met.

Considering ROE in the evaluation of course effectiveness is important because online learning will only be perceived as successful if decision-makers in organisations believe it produces value (V. Anderson, 2007). Moreover, it has been suggested that ROE findings tend to support the results of ROI impact studies (Goldwasser, 2001). When defining course effectiveness as the objective achievement of planned, expected outcomes (Cedefop, 2011), ROE becomes the most important level of course evaluation. In this thesis, ROE is used instead of ROI.

**Summary: Levels of course effectiveness evaluation**

The next example illustrates the application of the five levels of course effectiveness evaluation. Imagine an organisation that delivers an online programme on sales techniques. Measurements include: 1) Reactions (did the participants like it?); 2) Learning (did they learn the sales techniques?); 3) Behaviours (did they apply the sales techniques at their workplace?); 4) Results (did sales increase?); 5) ROI (is the sales profit higher than the training cost?), ROE (have the clients’ expectations been met?).

Table 6 summarises the guidelines to conduct course effectiveness evaluations based on Kirkpatrick’s four-level model with the fifth level addition, as well as key findings in corporate online learning research.

**Table 6 Levels to evaluate course effectiveness**

<table>
<thead>
<tr>
<th>Level</th>
<th>Sample Guidelines</th>
<th>Research Findings</th>
</tr>
</thead>
</table>
| 1. Reactions - Satisfaction | • Measure satisfaction.  
• Use items that can be satisfied with online training | • Students tend to be satisfied with online training |
<table>
<thead>
<tr>
<th>Level</th>
<th>Sample Guidelines</th>
<th>Research Findings</th>
</tr>
</thead>
</table>
|       | tabulated and quantified.  
- Promote honesty by allowing anonymous responses.  
- Provide a space for additional comments.  
- Apply a survey or “happy sheet”. | programmes.  
- Reactions can depend more on the characteristics of the course design (e.g., instructional interactions) than on the delivery means of the course. |
| 2. Learning -  
Acquisition of knowledge or skills |  
- Check objectively if students have acquired the expected knowledge or skills.  
- Do a quantitative evaluation.  
- Use a pretest-posttest approach.  
- Compare results with a control group.  
- Apply an exam. |  
- Online courses help students learn.  
- Learners, teachers and course designers consider online programmes an adequate means for updating knowledge and skills.  
- Completing a course is not necessary to learn what is needed. |
| 3. Behaviours  
– Application of knowledge and skills in the workplace (knowledge or learning transfer) |  
- Measure the translation of the acquired knowledge into behaviours in the workplace.  
- Wait three months after the end of the course before evaluating.  
- Use a pretest-posttest approach.  
- Compare results with a control group.  
- Evaluate students’ perceptions on their own behavioural change.  
- Observe the employees in their job activities. |  
- Changes in workplace behaviours are the main objective of most training programmes.  
- Line manager, peer and organisational support impact knowledge transfer.  
- Online learning can improve job performance.  
- Students perceive that online courses help them improve their workplace behaviours. |
| 4. Results –  
Organisational level outcomes |  
- Measure organisational outcomes such as sales, quality, productivity, costs and employee turnover. |  
- Indicators in this level are usually beyond the area of control of the courses and only within their area of |
<table>
<thead>
<tr>
<th>Level</th>
<th>Sample Guidelines</th>
<th>Research Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Wait enough time for the results to be achieved.</td>
<td>influence.</td>
</tr>
<tr>
<td></td>
<td>• Compare the cost of the evaluation against the potential benefits.</td>
<td>• This evaluation implies time and money.</td>
</tr>
<tr>
<td></td>
<td>• Use a pretest-posttest approach.</td>
<td>• The wide range of variables involved complicates the measurement of the direct impact of a training programme in the macro results of the company.</td>
</tr>
<tr>
<td></td>
<td>• Compare results with a control group.</td>
<td>• Online learning can positively influence business results.</td>
</tr>
<tr>
<td>5. Return on Investment (ROI) – Economic benefits of the course against its costs</td>
<td>• Compare the economic benefits of the training against its costs.</td>
<td>• The numerous variables involved in ROI calculations can make it difficult to determine the exact proportion of change that is related to a particular course.</td>
</tr>
<tr>
<td></td>
<td>• Convert business results data from the previous level into monetary values.</td>
<td>• Sometimes ROI measurement is as expensive as the training.</td>
</tr>
<tr>
<td></td>
<td>• Use estimations of the participants, line managers, specialists, or external studies to obtain more qualitative information.</td>
<td>• Due to the economic savings of online learning, ROI is often considered positive.</td>
</tr>
<tr>
<td></td>
<td>• Use a pretest-posttest approach.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Compare results with a control group.</td>
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</tr>
<tr>
<td>5 (alternative). Return on Expectations (ROE) – Extent to which a course has met clients’ expectations</td>
<td>• Identify, clarify and negotiate stakeholders’ expectations.</td>
<td>• ROE is not a common concept in business literature.</td>
</tr>
<tr>
<td></td>
<td>• Remember that expectations might correspond solely to some levels of course effectiveness evaluation or to all of them.</td>
<td>• ROE tends to support ROI findings.</td>
</tr>
<tr>
<td></td>
<td>• Acquire information to determine the extent to which a programme has met clients’ expectations.</td>
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</table>
Relationship between online interactions and course effectiveness

Corporate online learning can be effective. However, the delivery method (i.e., the means used to provide education) should not be confused with instructional or learning design (i.e., the way a course is created in order to help the learner achieve the expected outcomes). Elements of the learning design, such as available interaction opportunities, may have a greater impact on student performance than the medium of the course (Means et al., 2010). Instead of asking on whether online training has the potential of being effective, we should ask: How can we design effective online courses?

This thesis focuses on how online interactions relate to course effectiveness in business settings, specifically addressing the following question: Which online course design (i.e., emphasising learner-content, learner-teacher or learner-learner interactions) results in the highest levels of effectiveness? The interaction equivalency theorem (Anderson, 2003a) provides a possible answer for this question and is an important part of the conceptual framework of this research.

**Interaction equivalency theorem**

Anderson (2003a) proposed the interaction equivalency theorem, which applies Moore’s (1989) taxonomy of interactions to course design, relating it to learning. Drawing from the literature debate and his own observations, Anderson formulated two theses (see Figure 5), which challenge the traditional approach that favours a high level of interactions to achieve learning outcomes (Miyazoe & Anderson, 2010a): 1) Deep, meaningful learning can be supported as long as one of three types of interaction (learner-content, learner-teacher or learner-learner) is present at a high level. The other two forms can be offered in a minimal degree, or omitted, without decreasing the quality of learning. 2) High levels of more than one type of interaction are likely to provide more satisfying educational
experiences. However, the cost and design time requirements of these experiences might make them less efficient (Anderson, 2003a).

**Figure 5 Visual representation of the interaction equivalency theorem**

![Visual representation of the interaction equivalency theorem](image)

Note: Open access image reproduced from Miyazoe and Anderson (2010b)

The first thesis of the interaction equivalency theorem essentially states that Moore’s (1989) types of interactions are equivalent. Equivalent does not mean equal. Nonetheless, equivalent learning experiences cover the same area, even if the experiences are unique (Anderson, 2003b). One type of interaction alone can support learning as long as it is present at a high level. For example, “a student achieves a quality learning experience through intense interaction with other peers […], although the instructor was not available and the course content was not appropriate” (Miyazoe & Anderson, 2010b, p. 95). Anderson (2003a) explains that low and high levels can be differentiated by counting the number of times course participants are engaged with others or with the content. Determining the level of interactions is, thus, mostly a quantitative exercise.

This first thesis represents an interesting starting point for studying the relationship between educational interactions and course effectiveness. It is an attractive idea for organisations wanting to expand their offering of online programmes, as it addresses limitations in learner-teacher interactions by suggesting that meaningful learning will occur if another type of interaction can be maximised (Rhode, 2009). If proven accurate, the first thesis could guide effective learning designs (Padilla Rodriguez & Armellini, 2013a).
However, empirical research is still needed to support this idea. Few studies have addressed it and framed their results within this framework. Bernard, Abrami, Borokhovski, Wade, Tamim, Surkes, and Bethel (2009) reviewed 74 studies with different interaction treatments, defined as conditions designed to encourage interactive behaviours. They considered learner-content, learner-learner, and learner-teacher categories. They reported that all three are important for students’ academic achievement, and that high and moderate levels of treatment strength were better than low levels. This finding is encouraging, as it is consistent with the notion that high levels of one type of interaction support meaningful learning. Yet, when the authors checked effect sizes considering each type of interaction treatment, they found that only strengthening learner-content interaction made a substantial difference in terms of academic performance. A possible explanation is that social interactions are more difficult to happen consistently across samples. An implication is that having low levels of learner-content interaction and high levels of another type may not result in meaningful learning. The authors do not discuss this possibility.

A different result was found in a meta-analysis of 45 studies. Learning effect sizes were larger when there was online learner-learner or learner-teacher interaction than when students worked independently. In other words, the use of tools that foster learner-content interaction (e.g., videos and online quizzes) did not influence the quantity of learning, but social interactions did (Means et al., 2010). Unlike Bernard and colleagues’ review (2009), this project was not framed within the interaction equivalency theorem. Thus, implications under the light of this approach were not addressed.

Studies on learners’ perceptions (Padilla Rodriguez & Armellini, 2013a; Rhode, 2009) do not support the first thesis of the interaction equivalency theorem. Students of a self-paced online course considered that learner–teacher or learner–content interactions could not be “diminished or eliminated and compensated by other forms of interaction” (Rhode, 2009, p. 14). Similarly, employees at a Mexican organisation agreed that Moore’s
types of interaction are not equivalent and thus, not interchangeable. They “did not consider that high levels of one form of interaction would necessarily compensate for low levels of another” (Padilla Rodriguez & Armellini, 2013a, p. 8). Nonetheless, perceptions may be different from actual behaviours and results (e.g., Caslikan, 2009; Picciano, 2002).

Stronger support for the first thesis can be found in an empirical study that compared four variations of an online course (Russell, Kleiman, Carey & Douglas, 2009). Group 1 had a teacher who provided detailed feedback, and a facilitator who encouraged and guided discussions between students. This course had a high level of learner-teacher and learner-learner interactions. Group 2 had a facilitator who encouraged students to participate, but did not answer content-related questions. This course focused on learner-learner interactions. Group 3 had a teacher and a facilitator but no embedded means for communications between students. Learner-teacher interactions happened via email. Group 4 was self-paced, with no discussion forums and minimum human support available. This course had a high level of learner-content interactions. As Anderson (2003a) predicted, outcomes were comparable across all four course variations. Participants rated the quality of all courses highly and achieved the expected objectives. The authors of this study did not consider the interaction equivalency theorem to interpret their findings.

The second thesis of the theorem focuses on the resources needed for design and delivery. If a course has many interaction opportunities with the content, the teacher and peers, it is likely to provide a very satisfying learning experience. However, the cost of producing high-quality materials and activities and the time required from participants to engage in interactions are likely to make the course unsustainable (Miyazoe & Anderson, 2010b). Although this idea complements the first thesis, it is beyond the scope of this research, which focuses on the relationship of interactions and online course effectiveness.
A third and fourth theses of the theorem were later developed to incorporate other relevant types of interaction focused on teachers and content (Anderson & Garrison, 1998): 3) Deep, meaningful formal teaching can be supported as long as one of three types of interaction (teacher-learner, teacher-content or teacher-teacher) is present at a high level. The other two forms can be offered in a minimal degree, or omitted, without degrading the educational experience. 4) Deep, meaningful formal teaching and learning can be supported as long as one of three types of interaction (content-learner, content-teacher or content-content) is present at a high level. The other two forms can be offered in a minimal degree, or omitted, without degrading the educational experience (Miyazoe & Anderson, 2010b).

These theses still require supporting empirical evidence. It seems unlikely that a course with a high level of communications between teachers but little teacher-learner interactions will yield meaningful teaching. How can a teacher teach without interacting with students? Likewise, the idea that content-content interactions can support deep learning and teaching even if there are no learner-content interactions (or content-learner interactions) seems unfounded. What would be the value of content-content interactions if there was no one (i.e., learners or teachers) to benefit from them? These theses are subject to debate and beyond the scope of this research.

**Limitations of Anderson’s interaction equivalency theorem**

The first thesis of interaction equivalency theorem (Anderson, 2003a) has four main limitations. First, it focuses on the number of interactions, failing to consider their quality. It is unlikely that high levels of meaningless interactions (e.g., mindlessly clicking links or idle chatting) will promote deep learning (Woo & Reeves, 2007). Thus, enhancing the quality of interactions may be more important than increasing their quantity (Bernard et al., 2009).
Second, Anderson (2003a) did not clearly define what deep and meaningful learning is and how it can be objectively evaluated. Miyazoe and Anderson (2010b) consider that clarifying this concept in measurable ways is a line for future research. Yet, some answers have already been provided by academics, such as Entwistle, Hanley & Ratcliffe (1979) and Marton & Säljö (1976), who have differentiated between surface and deep-level approaches to learning. Surface learning happens when students focus on obtaining and memorising facts without much analysis. Deep learning, on the other hand, occurs when students aim to understand information and concepts, integrating them with previous knowledge or experience and reaching their own conclusions.

Third, the first thesis of the interaction equivalency theorem (Anderson, 2003a) disregards the role of individual differences. Imagine a course that has a high level of learner-learner interaction and low levels of all the other types. Is deep, meaningful learning supported for shy students who understand concepts better when engaged in independent activities? The educational experience may be degraded for them. As Rhode (2009) explains, not all students interact meaningfully with peers or content; some may require or prefer communication with the teacher, or vice versa.

Fourth, empirical research supporting the theorem is still scarce, and probably non-existent in corporate settings. The theorem focuses on learning, which is considered the ultimate goal of academic education. Yet, most business executives favour other indicators of course effectiveness, such as knowledge transfer and organisational results (Kirkpatrick & Kirkpatrick, 2010). Could the first thesis of the theorem be articulated in such a way that it acknowledges the importance of satisfaction, behaviours in the workplace, business results and return on expectations as part of course effectiveness? If so, would empirical evidence support it?

While studies specifically addressing the interaction equivalency theorem (Anderson, 2003a) are limited, some of them have explored the relationship between online
interactions and different levels of course effectiveness, mostly those of satisfaction and learning. This research sheds light on the potential application of the theorem in organisational contexts and is discussed next.

**Interactions and satisfaction**

In academic institutions, high levels of interactions seem to lead to positive reactions towards online courses. Different studies have reported that participants’ perceptions of their interactions with content, teachers and peers have a positive relationship with course satisfaction and can even predict it (Chang & Smith, 2008; Kuo et al., 2013; McFarland & Hamilton, 2006; Swan, 2002).

However, there are differences depending on the specific type of interaction considered. Online learner-content interactions are relatively stable and standardised for all course participants. This form of interaction has been found to explain the largest unique variance in student satisfaction (Kuo et al., 2013). In contrast, the meaningfulness of social interactions depends on the quality of participants’ contributions. Thus, sometimes learner-teacher interactions contribute more significantly to satisfaction than peer exchanges (e.g., Gunawardena et al., 2010; Kuo et al., 2013). Other times, it is quite the opposite. For example, using objective measures (i.e., the number of posts in a discussion forum) instead of perceptions, a study found that satisfaction was more strongly related to interaction with other learners than with the teacher (Jung et al., 2002).

In samples of working adults, learner-learner interactions do not appear to increase course satisfaction. Kellogg and Smith (2009) checked 19 courses of an online MBA and found a lack of correlation between peer communications and satisfaction. A study with employees of a large international corporation reported that the higher the levels of interaction with other learners, the less satisfied students were with the online course. Nonetheless, participants also mentioned their desire to increase social interactions and exchange ideas with teachers and course mates (Gunawardena et al., 2010). In this
context, enhancing the quality of social interactions may be of greater importance than increasing their quantity (Bernard et al., 2009).

**Interactions and learning**

As described earlier in this chapter, learning can be an individual process, in which case learner-content interactions become crucial for learning to happen. Students who engage frequently with course content tend to achieve better grades than those who seldom interact with the materials (Zimmerman, 2012).

On the other hand, when other participants (i.e., peers or teachers) are involved, learning may rely on social interactions. Related research yields mixed results. Considering three levels of social interactions (low, average and high), Beaudoin (2002) reported that students who communicated regularly with peers and the teacher had the highest grades of the group. However, those with minimal social interactions performed better than average students. The author considered learners could have been dedicating more time understanding course material than to exchanges with other participants, which translated into high-quality assignments. Picciano (2002) found strong, positive relationships between students’ perceptions of their interactions and of the quantity and quality of their learning. Actual participation in the course, as measured by student posts replying to the teacher or peers, was significantly correlated to the grade obtained on a written assignment but not to exam scores. In Swan’s (2002) study, participants who reported high levels of interaction with their teachers tended to perceive higher levels of learning. Students also indicated difficulties in meeting with their teammates to work, and there was a significant, negative correlation between the percentage of the grade based on group assignments and the perceived learning. In another study, teamwork did not contribute to increased learning achievement (Jung et al., 2002). In line with this, Kellogg and Smith (2009) found that adult students perceive they learn the most from the content and the least from their peers.
Interactions and other levels of course effectiveness

Establishing the impact of a course on the last levels of training effectiveness is a complicated task, as many external variables are involved (Kirkpatrick, 1979). Determining if the quantity of interactions in an online course makes a difference in terms of behaviours in the workplace, organisational results, ROI and ROE is even harder. Research on this matter is, thus, very limited.

A study that compared four variations of an online course, with different levels of different types of interaction, provides some insight on this relationship between interactions and effectiveness. Participants were middle school teachers who were teaching algebra at the time of the study. Expected outcomes included that students applied the knowledge and skills acquired in the online course in their regular classrooms (i.e., learning transfer). The evaluation used a pre-post approach. It triangulated the information of several instruments: 1) survey on instructional practices; 2) teacher logs that helped capture information about daily pedagogical practices; and 3) surveys administered to students in teachers’ algebra classrooms. These different data sources provided consistent findings. All four versions of the online course had similar effects on teachers’ practices, i.e., behaviours in the workplace (Russell et al., 2009).

Some case studies also suggest there is a positive association between interactions and the last levels of training effectiveness. For example, the Gilbane Building Company implemented an online safety course with an emphasis on learner-content and learner-teacher interactions. This resulted in the achievement of organisational outcomes, translated into a decrease of the accident rate to half that of the construction industry (Skillsoft, 2010b). In HP, courses that fostered learner-content interactions were considered to have successfully helped to attain knowledge transfer (level 3), business results (level 4), and ROI (level 5) (O’Leonard, 2004).
Summary: Interaction equivalency theorem

To study the relationship between online interactions and course effectiveness, this research project focuses on the first thesis of Anderson’s (2003a) interaction equivalency theorem: Deep, meaningful learning can be supported as long as one of three types of interaction (learner-content, learner-teacher or learner-learner) is present at a high level. The other two forms can be offered in a minimal degree, or omitted, without decreasing the quality of learning. This idea represents an interesting pathway for organisations unable to offer all three types of interactions at a high level due to time and budget constraints.

Some studies suggest that an increased number of online interactions will lead to higher levels of course effectiveness. Yet results are mixed. More research is needed to support the application of the interaction equivalency theorem in business settings.

Chapter summary: Literature review

This chapter describes and analyses relevant literature on online interactions and course effectiveness. It gauges the relationship between these two concepts. It thus provides a conceptual framework for this thesis, focusing on Moore’s (1989) three types of interaction (learner-content, learner-teacher and learner-learner), Kirkpatrick’s (1979) four levels of course effectiveness (reactions, learning, behaviours in the workplace and business results) plus return on expectations (Kirkpatrick & Kirkpatrick, 2010) and Anderson’s (2003a) interaction equivalency theorem. Figure 6 shows the conceptual framework of this thesis.
Some lingering questions are: Is the interaction equivalency theorem applicable in a business setting? Can it incorporate other indicators of course effectiveness apart from learning? Would it be supported by empirical evidence? Emphasising which type of interaction results in the highest levels of effectiveness? This thesis addresses these issues by focusing on a study conducted in a large Mexican organisation interested in improving its offering of online courses (see CHAPTER 3).
CHAPTER 3
PREPARATION FOR THE MAIN STUDY

Before the implementation of the main study aimed at answering the research questions, a number of challenges required attention, including selection of an organisation to work with, elaboration of a risk analysis, management of the technology, and training of the participants. This chapter describes steps taken to develop the best possible conditions to conduct the main study (see Figure 7).

Figure 7 Chapter structure: Preparation for the main study

<table>
<thead>
<tr>
<th>Chapter 3 Preparation for the Main Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Selection of the participating organisation</td>
</tr>
<tr>
<td>• Risk analysis</td>
</tr>
<tr>
<td>• Identification of e-learning perceptions</td>
</tr>
<tr>
<td>• Technology management</td>
</tr>
<tr>
<td>• Recruitment of participants</td>
</tr>
<tr>
<td>• Training of teachers and academic assistants</td>
</tr>
<tr>
<td>• Training of students</td>
</tr>
<tr>
<td>• Chapter summary: Preparation for the main study</td>
</tr>
</tbody>
</table>

Selection of the participating organisation

Before selecting an organisation to work with, the researcher defined criteria that could help identify the ideal scenario for the study (see Table 7). The researcher considered three organisations based on the likelihood of obtaining access to potential participants and relevant sources of data. Using different information sources, such as the companies’ websites, newspaper articles and intelligence through contacts, the researcher evaluated the advantages and disadvantages of working with each potential participating organisation, trying to meet as many criteria as possible.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Potential Pros</th>
<th>Potential Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness to innovation</td>
<td>The organisation is likely to agree to experiencing different ways of designing and delivering courses.</td>
<td>The organisation may have expectations beyond the scope of the research project.</td>
</tr>
<tr>
<td>Ease of access</td>
<td>The researcher may obtain support to invite potential participants and obtain data sources.</td>
<td>None.</td>
</tr>
<tr>
<td>Large size (+1000 employees)</td>
<td>A large sample of potential learners may be available to participate in the study.</td>
<td>The organisation may have a high adherence to established, standardized procedures, which may need modification to suit the requirements of the study.</td>
</tr>
<tr>
<td>E-learning experience (+1 year)</td>
<td>The organisation is likely to have few infrastructure problems. Employees are probably familiar with online studying/teaching.</td>
<td>Staff from the Training department may be reluctant to try new formats and course designs. There may be limitations of the platform or its configuration (e.g., messaging system deactivated due to security policies).</td>
</tr>
<tr>
<td>Usage of Moodle</td>
<td>The researcher is familiar with this platform.</td>
<td>None.</td>
</tr>
<tr>
<td>Training need for at least 30 people</td>
<td>The availability of at least 30 students enables the use of groups, whose results can be compared and contrasted to test the effectiveness of online courses with different levels of different types of interaction.</td>
<td>None.</td>
</tr>
<tr>
<td>Existing, modifiable course (online or face-to-face)</td>
<td>Course materials available for redesign imply time-savings, as they will not have to be created from scratch.</td>
<td>If the course already exists, it is likely that some people in the organisation will have already studied it, which reduces the</td>
</tr>
</tbody>
</table>
The researcher approached the organisation that best fitted the criteria. From 2006 to 2008, the researcher had worked as an intern and conducted the study of her Master’s degree in this same organisation. She had maintained a friendly relationship with several key stakeholders in different departments, which facilitated negotiations with the gatekeeper (who was a senior learning designer at the organisation) controlling access to participants.

The participating organisation is a large commercial Mexican company (+6000 employees) with 30 food distribution centres and offices, all in Mexico. It is a subsidiary of a parent corporation that in 2007 launched a content-based online training system available through the e-learning platform Moodle. Due to security concerns, the parent company blocked tools that foster communication and collaboration (i.e., private messages, chats, discussion forums, wikis and blogs). Online courses consisted of a table with columns for objectives, activities and resources (see Table 8).

### Table 8 Sample course table of old content-based online training system

<table>
<thead>
<tr>
<th>Objective</th>
<th>Activity</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Check sales indicators.</td>
<td>Enter the sales programme with your login information [outside the e-learning platform]. Obtain the indicators A, B and C. Filter results based on sales areas X and Y.</td>
<td>Sales software programme</td>
</tr>
<tr>
<td>1.2 Create sales reports.</td>
<td>Create a sales report using the data obtained in the previous activity.</td>
<td>Sales report format</td>
</tr>
</tbody>
</table>
Students were expected to learn independently. They had to complete the activities, such as reading an article or filling in a report, and whenever applicable, send the resulting product via email to the teacher, who was usually their line manager as well. This educational offering was available for the areas of Marketing, Innovation and Development, Education and Sales, but only for certain job positions, usually those at the top of the hierarchy. Most employees were unfamiliar with e-learning at their organisation as it was not available to them.

This training system slowly ceased being used. By 2011, it was a dead, inactive space. However, the organisation was keen to resume online learning. It was interested in improving and expanding the e-learning offered to staff. It had recently equipped sales supervisors (i.e., potential online students) with netbook computers with Internet access. It wanted to maximise the benefits of these resources by fostering their use for online learning. It agreed to install a parallel Moodle platform that, unlike the previous one, enabled interaction between participants. It had an existing face-to-face Leadership Programme available for adaptation and redesign to a virtual environment. The management needed over 150 people to take this programme and was willing to commit to the requirements of the study.

At the start of the project, the researcher had a first interview with a senior learning designer, who was also the gatekeeper and was in charge of continuing the online learning initiative if it was deemed successful. Topics covered included the available technology at the organisation, managers’ expectations and timeline for implementation. The researcher helped the gatekeeper articulate desired outcomes in concrete terms that could be checked after the end of this research project. Expectations included general and intangible benefits, which could not be paired up to Kirkpatrick’s levels (as in V. Anderson, 2007). For example:

- Being pioneers (the Human Resources area) in the widespread implementation of
well-designed online education at the organisation.

- Challenging myths about online education in the organisation.
- Implementing a high-impact learning programme at the organisation.
- Taking advantage of the technological resources of the organisation.
- Evidencing the benefits of technology and online learning.
- Obtaining “hard” data about the effectiveness of online training.

After this initial conversation, two more meetings were arranged, one with the HR manager and another with the HR director. They both expressed their expectations in general terms: Do something great, innovative. All conversations were characterised by excitement and enthusiasm towards the project, and assurance of support.

To prepare the context, before the official start of the project, three employees from Human Resources (HR director, Human Capital and Communication manager and Education coordinator) visited the different offices around Mexico to talk face to face to potential participants (mostly sales managers and directors who would take the role of teachers of the online courses). They explained the organisation’s involvement in the project, asked for cooperation and obtained explicit agreement to participate. The researcher neither requested nor was aware of this until later stages of the project. This unplanned initiative exemplifies the commitment and the enthusiasm of the management towards the research project and the implementation of online learning at the organisation.

**Risk analysis**

The researcher identified potential problems and challenges. She graded their probability of occurrence (P) and severity (S) using a Likert scale, from 1 (less) to 5 (more). The product of P X S was calculated to identify the highest risks (those closer to 25). The researcher also determined actions to avoid or manage these risks. The results of this analysis (see Table 9) guided future steps.
Table 9 Main study risk analysis

<table>
<thead>
<tr>
<th>Risk</th>
<th>Probability (1-5)</th>
<th>Severity (1-5)</th>
<th>P x S</th>
<th>Actions to Prevent or Manage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers might be unfamiliar with ways of facilitating online learning.</td>
<td>5</td>
<td>3</td>
<td>15</td>
<td>Provide training on how to facilitate online learning.</td>
</tr>
<tr>
<td>The researcher might have to deal with issues that are common to early implementation stages (e.g., reluctance to study online, technology problems, etc.).</td>
<td>4</td>
<td>3</td>
<td>12</td>
<td>Assess the available technology. Use freeware to fill the gaps. Test the technology before involving students and teachers. Ensure that participants have training on the use of the technology before the start of the course.</td>
</tr>
<tr>
<td>Participants may feel compelled to provide socially desirable responses (i.e., socially or culturally acceptable replies) even if they are false (Gunawardena et al., 2010; Sekaran &amp; Bougie, 2013).</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>Whenever applicable, ensure participants’ anonymity in their responses. Articulate questions in a neutral tone. Emphasise that the research is more about finding the best way of designing online courses than about evaluating people’s performance. Explain that the research aims to contribute to the body of knowledge, not to judge the people or the organisation.</td>
</tr>
<tr>
<td>Risk</td>
<td>Probability (1-5)</td>
<td>Severity (1-5)</td>
<td>P x S</td>
<td>Actions to Prevent or Manage</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>-------------------</td>
<td>----------------</td>
<td>-------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The participating organisation might be reluctant to agree to have</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>Emphasise the benefits of the research project, such as obtaining evidence-based guidelines to design effective online courses. Validate learning designs and materials with the Education staff and external academics.</td>
</tr>
<tr>
<td>the same content with three different course designs, as required</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for the main study.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The organisation might not have the necessary data to evaluate the</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>Although it is not the ideal scenario, it could be accepted as a limitation that has been frequently mentioned in the literature (Kirkpatrick &amp; Kirkpatrick, 2010).</td>
</tr>
<tr>
<td>five levels of training effectiveness.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students might feel uncomfortable engaging in learner-learner</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>Teach potential students effective ways of communicating online.</td>
</tr>
<tr>
<td>interactions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students might interact with each other, even if it is not</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>Focus on instructional interactions (Wagner, 1994), which are created and controlled by the learning designer.</td>
</tr>
<tr>
<td>mandatory for them to do so, increasing the level of learner-learner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interactions and biasing the comparison of course designs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation might be withdrawn before the study is completed.</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>Keep field notes with detailed information of the project, including meeting summaries, agreements and observations, in order to have data available for analysis in case of dropout.</td>
</tr>
</tbody>
</table>
The three main risks are: 1) unprepared teachers, 2) early implementation stages issues and 3) unauthentic but socially desirable responses. While important, these risks have been reported in the past (e.g., Conrad, 2004; Gunawardena et al., 2010; Macdonald, Bullen & Kozak, 2010), and in this study they were considered and managed in subsequent preparation steps.

**Identification of e-learning perceptions**

To further inform the risk analysis, the researcher applied an online survey to potential participants in the Leadership Programme (n=105, 84 sales supervisors, and 21 sales managers and directors). This instrument aimed to evaluate respondents’ perceptions and concerns on the implementation of online courses at the organisation. It included information about this study and a note stating that participation was voluntary and anonymous (see Appendix 1). Its application helped to introduce the general project to a broader audience, to identify issues before they happened and to get people involved, as it invited participants to continue contributing in additional ways.

Most respondents (90%) reported being interested or very interested in taking part in an online course at their organisation. They provided positive comments on the initiative and identified several potential benefits, such as easier access to training, being updated, innovating, self-pacing, enrolling in standardised courses, learning about technology and...
saving time through flexibility to study whenever convenient. Forty-one participants shared their email addresses to become involved in further stages of the project. This enthusiasm matches the HR management’s interest on the implementation of online learning at the organisation.

While views were mostly positive, respondents also raised some concerns, which had not been considered in the previous risk analysis and were addressed at this stage (see Table 10).

**Table 10 Concerns and actions to prevent or manage**

<table>
<thead>
<tr>
<th>Concern</th>
<th>Example</th>
<th>Action to Prevent or Manage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectivity restrictions</td>
<td>Slow internet connection</td>
<td>Prefer text-based activities. Have a text alternative (i.e., a transcript) to videos and podcasts.</td>
</tr>
<tr>
<td>Limited digital literacy</td>
<td>Not knowing how to use the technology</td>
<td>Design and deliver a course on how to use the learning tools available in Moodle.</td>
</tr>
<tr>
<td>Lack of time available to study</td>
<td>Being too busy with other job tasks</td>
<td>Create brief materials and activities that can be carried out in 15 minutes or less.</td>
</tr>
</tbody>
</table>
| Unanswered questions             | No one to provide support    | Train Education staff, so they can answer common questions. Define support channels:  
|                                  |                               | • A general discussion forum available in all courses  
|                                  |                               | • An email account for questions and comments regarding e-learning at the organisation  
|                                  |                               | • Help Desk (a service regularly provided by the organisation) in charge of solving technical issues |
| Low motivation                   | People not participating in the course | Create a sense of belonging via involvement in preparation courses (Moodle Features, Effective Online Students and Teaching How to Teach Online), aimed at helping students and teachers to participate effectively in online environments. |
Technology management

The researcher worked with Information Technology (IT) staff of the Systems department to create the required technical conditions for successful implementation of the research project. Sales managers and directors all had either a personal or a laptop computer with internet access. In September 2011, nine months before the start of the main study, all sales supervisors had received a Lanix LT netbook computer with a connection speed of 1.5 megabytes per second. Since internet access was restricted to the intranet and specific websites, the researcher requested that the URL of the online survey provider (FreeOnlineSurveys.com) was added to the list of permitted websites.

IT staff installed the online learning platform Moodle (build 2.2) on the servers of the organisation. The use of Moodle presented several advantages: 1) the organisation had previous experience with it, and had already validated its security measures and technical capabilities; 2) Moodle is an open-source learning management system (LMS), and it was, therefore, available at no extra cost for the organisation; 3) the underlying learning theory that informs the design of Moodle is social constructionism (Moodle, 2012), which extends constructivism into social settings and is consistent with the theoretical framework of this thesis (see CHAPTER 2); and 4) Moodle is a suitable LMS.

The installation process took three months due to structural changes within the Systems department and technical problems. The researcher configured the platform. Aware that some students (≈29%) would be completely unfamiliar with online learning, she decided to prevent confusions by limiting the options available; for example, participants could not choose their own user interface theme. The researcher also created demo users to test different roles and permissions.

The researcher provided participants with a PowerPoint presentation of the steps needed to access the platform. To acknowledge the importance of learner-interface (Hillman et
al., 1994) and teacher-interface interactions, she also developed a two-hour course, Moodle Features, which provided an introduction to the technological tools available in Moodle. This course attempted to help participants feel more comfortable in online environments. A note in the objectives resource stated what digital literacy was assumed and that support was available for those who required extra help.

The Moodle Features course included a general help forum, a glossary with e-learning vocabulary (e.g., wiki) and an ethics note reminding students about this research project. It had a number of short reading texts about basic topics (e.g., what is e-learning and how to navigate an online course) and an example of the different tools used in online courses (e.g., discussion forums and surveys). Since many participants (≈71%) had experience with online learning and were familiar with the tools shown in the course, the only requirement for passing it was to complete at least one of the nine available activities, each of which explored a different tool (see Figure 8).

Figure 8 Screenshot of Moodle Features course

Note: Tool-related activities available included uploading files, chatting, posting a message in a discussion forum, answering a poll, checking a lesson, editing a wiki, adding a glossary entry, answering a questionnaire and completing an online survey available on an external website (FreeOnlineSurvey.com).

To simplify course navigation, the researcher activated the follow-up function, which enables students to easily identify the activities they are missing. This tool adds a box that gets ticked when participants complete activities or check resources. Subsequent
participants’ comments provided evidence of the benefits of this function (e.g., *I am not done yet; I don’t have all the ticks!*).

Before delivery, the Moodle Features course was pilot tested by a Mexican academic with experience in e-learning, two people working in HR in other companies and three Education staff members at the participating organisation. Comments were positive and minor improvements were made where applicable.

At this stage, Education and IT staff at the organisation had little experience of using Moodle. Most of them had not experienced the old training system. Those who did use it had not had access to communication tools in Moodle and were not familiar with them. Thus, the researcher was the facilitator of the Moodle Features course, which was available for learners (sales supervisors), teachers (sales managers and directors) and academic assistants (Education staff). The latter were trained first, so they could help to guide other participants. When the delivery started, the researcher received an email from one of the participants, who asked: *Could you please forward me the Moodle Features course? Thank you.* This message emphasised the need for training on how to use the technology.

Throughout the course, it became evident that a number of students were having a hard time adapting to the new learning environment. Some had problems balancing their usual job responsibilities with learning online. Others did not log in. The researcher discussed with the Education staff how to constantly remind people of the online courses, at least during the initial stages, without seeming too intrusive. The answer came in the form of e-learning tips. The researcher created a list of 28 brief suggestions to help participants learn online (see Appendix 2). For example:

- *Be constant.* Several activities require you to interact with other participants. If you take too long to enter your course, you will participate little with others, you will lose a valuable learning opportunity, and here, in Human Resources, we will be
sad... 😔 Have you entered your course today?

- *Use lower and upper case letters when writing.* In online environments, WHEN YOU TALK LIKE THIS, people interpret that you are shouting (out of excitement or anger). Unless that is your intention, it is better to use lower case letters too. How do your words sound?

An email account to deal with questions and comments regarding online learning at the organisation was created and allocated to an HR intern, who also participated in this research as an academic assistant. Via this means, e-learning tips were sent daily. As participants became more used to the idea of learning online, emails became less frequent.

These tips were useful in several ways. They reminded participants to log into Moodle, while also helping to modify bad practices such as writing with capital letters only. Tips usually ended with a question and were welcomed by participants, who would sometimes reply to the emails answering that question.

**Recruitment of participants**

Before the start of the project, HR and sales managers identified bad practices of sales supervisors and agreed that there was a training need in terms of leadership competences such as communicating, planning and supervising. They wanted all sales supervisors to study the Leadership Programme and thus, be involved in this research project.

Recruiting participants was a challenging task. The organisation had different databases with inconsistent information. Throughout the preparation stage participants seemed to randomly appear (e.g., a retailer had been promoted to sales supervisor without notification to HR) and disappear (e.g., a sales supervisor had left the organisation, but HR had no record of it). While this stage was subject to numerous changes in the sample, for the main study a relatively stable group of 146 students participated in the Leadership
Programme. A control group of 17 sales supervisors, who were not enrolled in the programme, were also part of the main study.

The organisation created 18 groups of students, ranging from 5 and 16 participants, with a median of 8. Thirty teachers participated. The average student:teacher ratio was 5:1. Twelve groups had two teachers. The Education staff paired up people assumed to have more difficulties with teaching online (e.g., directors were expected to have less time available for teaching) with people potentially more at ease (e.g., one of the managers was an online teacher at a university and was thus expected to perform well).

**Training of teachers and academic assistants**

All participating teachers (30 sales managers and directors) and academic assistants (3 Education staff members) had access to the Moodle Features course described in the section of Technology management. Twenty-five teachers and all academic assistants completed the course.

Before the start of this research project, the organisation had provided training on how to be face-to-face teachers via a face-to-face course titled Teaching How to Teach. To complement this, the researcher created an online version: Teaching How to Teach Online. This course was based on the Barefoot E-Moderator initiative, developed by the ADELIE (Advanced Design for E-Learning: Institutional Embedding) project team at the University of Leicester. Key elements of good practice applied in the Barefoot E-Moderator, such as keeping texts on screen brief, using short paragraphs and creating simple, intuitive navigation (Salmon & Whitehead, 2007), were considered in Teaching How to Teach Online.

Teaching How to Teach Online also provided an opportunity for future online teachers to meet each other and create a network available to foster teacher-teacher interactions (Anderson & Garrison, 1998). The course required approximately eight study hours,
distributed throughout a two-week period. It aimed to help participants understand the potential of online learning, manage online groups of students and communicate effectively in online environments. It included a note stating that the course focused on teaching online, not on developing digital literacy. Materials were adapted to suit the context of the organisation and to build upon the concepts delivered in the face-to-face Teaching How to Teach course.

Previous steps informed the design of the Teaching How to Teach Online course. For example, the Moodle Features course provided evidence of some bad habits when communicating online, such as using only upper case letters and posting brief, shallow messages. Reading texts incorporated specific suggestions and examples aimed at preventing these practices.

A common concern was that there would be no one to answer questions, suggesting that people thought that online learning implied an isolating experience. This is consistent with studies conducted in similar contexts (e.g., Padilla Rodriguez & Armellini, 2013a; Padilla Rodriguez & Fernandez Cardenas, 2012). To challenge this idea and other potential misconceptions, the Teaching How to Teach Online course started with a text on myths and realities about e-learning, and a brief ice-breaker activity where participants could share their thoughts on this topic.

The results of the survey about e-learning perceptions (see previous section on Identification of e-learning perceptions) were made available to participants. They included information about how each of the identified concerns would be managed. This approach sent out a clear message to participants: The management was willing to listen and act to enhance provision. Thus, participants were encouraged to share their thoughts on this new online learning initiative.
The Teaching How to Teach Online course also had a general help forum, a glossary with e-learning vocabulary and an ethics note to remind participants about the research project. It had ten brief reading texts, six activities that fostered interactions between participants (see Figure 9) and a final evaluation survey. Participants had to complete at least 70% of the activities to pass the course.

**Figure 9 Screenshot of an activity in the Teaching How to Teach Online course**

![Screenshot of an activity](image)

**Objective**

Objetivos: Desarrollar estrategias para apoyar a estudiantes con baja motivación.

**Task**

Tarea: Escucha la opinión hipotética de una estudiante en línea.

**Follow-up**

Sigue: Lee los mensajes de tus compañeros. ¿Cómo crees que la estudiante se sentiría? ¿Qué otros métodos se podrían usar para motivarla a participar? Responde a si menos un mensaje con tus reflexiones y comentarios sobre las sugerencias de los demás. Cuestiona. Eso ayudará a tus compañeros a construir su aprendizaje.

Note: In line with the e-tivity framework (Salmon, 2002), this activity includes an objective, a task and a follow-up section. A full translation to English is available in Appendix 3).

This course also represented an opportunity for future online teachers to meet each other and create a community. The researcher expected that having access to the contacts of other managers in a similar situation, participants could engage in teacher-teacher interactions (Anderson and Garrison, 1998) if they had a question during the implementation of the Leadership Programme.

Before delivery, two people working in HR in other companies checked course materials and two Education staff members at the organisation piloted the course. Besides minor
suggestions, such as keeping the font sizes consistent across resources, comments were positive:

- I enjoyed checking it [the course].
- I liked a lot this online course. I think it achieves its objectives.
- The course is easy.
- The course is friendly, easy to navigate, easy to find information, easy to understand.

All three academic assistants passed the Teaching How to Teach Online course. All thirty teachers but one started the course. However, only 14 completed it; 17 answered the final evaluation survey. Even if participation was limited, Education staff assumed teachers would perform adequately when teaching online because “it was their job to do so” and sought alternatives, such as sending email reminders, to encourage them to resume their studies.

Training of students

Months before the start of this research project, the Education staff weekly delivered twenty modules on basic digital skills. Sales supervisors learned about varied topics, such as taking care of a netbook computer, understanding the Windows environment, using storage devices, accessing the organisational resources and using Open Office software (Writer, Calc and Impress).

To develop other basic technical skills, sales supervisors had the opportunity of familiarising themselves with the online learning environment via the Moodle Features course. Of 137 people who had access, 113 completed it. Seventy students posted 152 messages in one optional discussion forum. Main topics included jokes (e.g., What did a chicken tell another chicken? Meow, meow... They were in a costume party!), greetings (e.g., Hello to everyone from the land of goats and the future [football] champion),
excitement of learning online (e.g., *this is interesting*) and encouragement (e.g., *it is time to demonstrate the [great] team we are*).

The researcher also created the Effective Online Students course, which was an adaptation of the Teaching How to Teach Online course. The course required approximately four study hours, and participants had a week to complete it. It aimed to help participants feel more comfortable in online environments, understand the potential of online learning, communicate online and manage time effectively. It included a note stating that the course focused on how to learn online, not on developing digital literacy.

The Effective Online Students course had four brief reading texts, five activities that fostered interactions between participants and a final evaluation survey. It also incorporated the following elements:

- A text on myths and realities about e-learning and a brief ice-breaker activity where participants could share their thoughts on this topic
- The results of the survey about e-learning perceptions with information about how each of the identified concerns would be managed
- A general help forum
- A glossary with e-learning vocabulary
- An ethics note to remind participants about this research project

Materials also included suggestions and examples aimed at preventing bad practices when communicating online, identified in the Moodle Features course.

Before delivery, the senior learning designer of the organisation validated the resources and activities. A sales manager pilot tested the course. In a previous step, he answered the survey of e-learning perceptions, mentioned that he was an online university teacher and offered his support. His comments about the Effective Online Students course were positive. He praised the simple language used and the clear structure.
To pass the course, participants had to complete at least 50% of the activities and answer the final evaluation survey. Ninety-seven sales supervisors had access to the course, and all of them completed it. In average, each learner posted approximately 10 messages. Sixty students considered that the best part of the course was interacting with their peers. Seventy learners wanted to be part of a directory of former students available to support new students.

Chapter summary: Preparation for the main study

This chapter described the steps taken to develop the best possible conditions to conduct the main study. An organisation with no experience of delivering interactive online courses was selected to participate in this study. The researcher identified potential issues and established actions to manage them. She contributed to the creation of adequate technical conditions at the organisation and worked with different stakeholders (students, teachers, academic assistants, managers and technical staff), helping them prepare for the research project. Figure 10 summarises the findings and lessons learned at this stage.

Figure 10 Summary of preparation stage
This preparation stage provided the foundation for a comprehensive pilot study of online courses emphasising different types of interactions (see CHAPTER 4), which itself paved the way to the main study (see CHAPTER 5).
CHAPTER 4
PILOT OF ONLINE COURSES

Since 2004, Education staff at the participating organisation had designed the original face-to-face version of a Leadership Programme, which was composed of eight five-hour courses. After jointly evaluating the topics covered in each course, the materials available and the potential advantages and disadvantages of the medium for participants, the organisation and the researcher selected four courses to be redesigned and delivered online:

1. Situational Leadership
2. Empowering Beliefs
3. Effective Performance
4. Feedback on Performance

The first three courses (Situational Leadership, Empowering Beliefs and Effective Performance) served as a pilot of three learning designs, each one with high levels of a single type of interaction (learner-content, learner-teacher or learner-learner) and low levels of the other two types. The last course, which had three versions, was used in the main study, as will be explained in CHAPTER 5.

This pilot stage had an exploratory approach aimed at identifying potential improvements to resources, instruments and methods for subsequent embedding in the main study (Van Teijlingen & Hundley, 2001). It is not the purpose of this chapter to provide a full and detailed account of the pilot study, which was a stand-alone but preparatory piece of research. This chapter aims to outline the key features of the piloting of three online courses, including the redesign and development process, the implementation and the evaluation (see Figure 11). The lessons learned shaped the design of the main study (CHAPTER 5).
Participants

The researcher developed a stakeholder analysis to determine the relevance of different people, groups and organisations for the main study. She used as a basis the e-learning stakeholders’ responsibility matrix (Wagner, Hassanein & Head, 2008), which describes the roles that learners, teachers, institutions, content and technology providers, accreditation bodies and employers have in the enhancement of the overall learning experience in academic contexts. The researcher adapted this matrix by dividing content and technology providers into two groups (i.e., learning designers and technical staff) and by excluding stakeholders that were not relevant to the context of the participating organisation (i.e., institutions, accreditation bodies and employers). She also included other relevant stakeholders in business settings, such as line managers, senior management, workers’
trade unions, training partners (Guerci, Bartezzaghi & Solari, 2010) and support staff (usually part of Human Resources).

Drawing on her experience at the participating organisation, the literature and discussions with two e-learning academics, the researcher mapped each stakeholder in terms of their potential influence on online interactions and on course effectiveness. This process resulted in Figure 12. Stakeholders with high influence on both areas (i.e., learners, teachers and learning designers) were considered more relevant for this thesis.

Figure 12 Stakeholder analysis

Originally the researcher planned to obtain a comprehensive, in-depth view of online interactions and course effectiveness, including the perspectives of students, teachers, learning designers, support staff, line managers and senior management. However, time and resource constraints made this plan unviable. The researcher decided to focus on learners, who provided most of the data.
In the pilot of the online courses, 180 people participated: 147 learners (sales supervisors), 30 teachers (sales managers and directors) and 3 academic assistants (learning designers, or Education support staff).

**Learners**
Sales supervisors (n=147) were students of an online Leadership Programme. While participation in the study was optional, the organisation made it a requirement for them to enrol in the programme. Learners’ ages ranged from 25 to 57 with a mean of 38 years. Their average tenure at the organisation was five years. Their average time in their current job was four years. Most of them (=62%) had some university studies. Others (=31%) had only completed high school (9-12 years of formal education). Few (=7%) had only secondary education (6-9 years).

In their daily jobs, sales supervisors were usually out in the field, visiting supermarkets and convenience stores, negotiating sales and talking to retailers in their teams. Most of them were not used to office work. Their level of digital literacy tended to be quite low. Nine months before the study, sales supervisors had received a Lanix LT netbook computer with internet access. They had had weekly compulsory training to learn the basics of using this technology. Most learners (=71%) had some knowledge of online education, having studied at least one course via web.

Learners belonged to six different sales areas distributed across Mexico. They were divided into 18 groups of 5-16 participants and a median of 8. The average student::teacher ratio was 5::1. The Education staff of the organisation created the groups according to learners’ sales areas. In spite of the researcher’s concerns about this distribution as it was not randomised, the organisation insisted on it, arguing that students from the same sales area had worked together in the past and that it would be better for them to be in the same group.
**Teachers**

Sales managers and directors (n=30, 2 women and 28 men) participated as teachers of the Leadership Programme. They were selected for this role mainly due to their experience in and knowledge of the topic. The Education staff believed that the best people to teach how a leader should behave in the specific context of the organisation were those with job positions that required managing teams and deploying effective leadership skills (i.e., managers and directors). Also, sales managers and directors had previously studied a comprehensive, face-to-face leadership programme, provided by an external supplier.

In most cases, the teachers were also the direct bosses of the students, as the organisation wanted them to serve as a role model. The researcher was aware of the potential implications (e.g., learners feeling compelled to express themselves positively about their teachers’ performance). She tried to manage these (see Risk analysis in CHAPTER 3, and Ethics and the role of the researcher in CHAPTER 5) and accepted this situation as a limitation of a field study with high ecological validity.

Teachers’ age ranged from 27 to 55 with a mean of 41 years. Their average tenure was 6 years. Their average time in their current job was three years. All but two of them had at least some university studies. Most of them (≈62%) had some knowledge of online education, having studied at least one course via web. A sales manager mentioned being also an online teacher at a local university.

Each teacher was in charge of guiding groups of 3-8 students. Before the start of this project, the organisation had offered them a course on how to be face-to-face teachers. During the preparation stages of this thesis, sales managers and directors also received training on how to use Moodle and how to be online teachers (see CHAPTER 3).
Academic assistants / Learning designers

Three members of the Education staff (senior learning designer, learning designer and intern) participated as academic assistants of the online courses of the Leadership Programme. They were part of the Human Resources area, and the Human Capital and Development department. They all had university-level psychology studies and experience of corporate education. One of their job responsibilities at the organisation was designing face-to-face courses for sales staff.

Their main role in this project was to monitor the course activities and to provide general support for participants. The researcher provided them with a manual containing suggestions such as checking learners’ progress daily to identify those who required special attention, following-up on teachers who were not performing adequately (e.g., not entering the course) and answering questions in the general discussion forum. The organisation requested academic assistants to prepare a weekly progress report, and share it with all course participants (i.e., sales supervisors, managers and directors).

Redesign and development

Based on the original materials and objectives, the researcher redesigned the first three courses of a Leadership Programme, each emphasising a different type of instructional interactions (see Figure 13). Considering the topic and desired outcomes (see Table 11), the senior learning designer of the participating organisation and the researcher decided which learning design to use for each pilot course. All courses, regardless of the type of interaction they fostered, were expected to be equally effective, at least in terms of learning, in keeping with the first thesis of Anderson’s (2003a) interaction equivalency theorem.
Table 11 Learning design rationale for pilot courses

<table>
<thead>
<tr>
<th>Course Topic</th>
<th>Predominant Interactions</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situational Leadership</td>
<td>Learner-content (LC)</td>
<td>This course was suitable for independent study because it focused on theoretical concepts, and aimed to foster the competences of planning and self-development.</td>
</tr>
<tr>
<td>Empowering Beliefs</td>
<td>Learner-teacher (LT)</td>
<td>The objective of this course was to encourage sales supervisors to believe in their own potential and feel like leaders. The organisation wanted teachers, who were also students’ line managers, to motivate and provide emotional support in this area.</td>
</tr>
<tr>
<td>Effective Performance</td>
<td>Learner-learner (LL)</td>
<td>This course focused on generating strategies to improve the performance of retailers, who were</td>
</tr>
</tbody>
</table>
During the redesign and development process, the researcher faced several challenges. For example, the general objective of the original face-to-face Leadership Programme was to develop leadership competences, which were not specified and remained undefined throughout the courses. In collaboration with the Education staff, the researcher identified five leadership competences that were covered in the topics of each course: planning, self-development, teamwork, supervision and communication. She made sure that there was an alignment between competences, objectives, topics and evaluations, and that these were consistent with the gatekeeper’s expectations.

The original course materials had been created under the assumption that the teachers (sales managers and directors) would complement the available PowerPoint presentations with their own knowledge and experience. Thus, most information was in the form of bullet points and not self-explanatory. Drawing from her previous involvement in the organisation and her experience as a learning designer, the researcher transformed key ideas to full texts, adding examples, descriptions and explanations. Some employees at the organisation collaborated in the creation of materials (e.g., videos and podcasts) and by providing real examples of the topics raised in the courses.

All learning designs incorporated five non-assessed activities and a non-assessed final project that fostered a particular type of interactions (learner-content, learner-teacher or learner-learner). In each online course, the researcher attempted to design high levels of only one type of interaction and low levels of the rest, as shown in Figure 14. In some cases it was not possible to completely omit the other types of interactions. For example, courses with social interactions included reading texts, which enable learner-content

<table>
<thead>
<tr>
<th>Course Topic</th>
<th>Predominant Interactions</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>subordinates of students. Peer exchanges were expected to help learners obtain practical ideas and specific context-based suggestions.</td>
<td></td>
</tr>
</tbody>
</table>
interactions. Table 12 details the specific resources and activities available in each pilot course.

Figure 14 Levels of different types of interactions in pilot courses

![Levels of different types of interactions in pilot courses](image)

PILOT COURSES

Table 12 Materials and activities of pilot courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Main Type of Interaction</th>
<th>Materials/Activities that Foster Instructional Interactions</th>
<th>Learner-Content</th>
<th>Learner-Learner</th>
<th>Learner-Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situational Leadership</td>
<td>Learner-content</td>
<td>• 8 reading texts with self-reflection questions, images and hyperlinks to glossary entries</td>
<td>None.</td>
<td>None.</td>
<td>None.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2 personal wikis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multiple choice questions with automated feedback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 polls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 podcast and its transcript</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Main Type of Interaction</td>
<td>Materials/Activities that Foster Instructional Interactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------</td>
<td>------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empowering Beliefs</td>
<td>Learner-teacher</td>
<td>• 4 videos and their transcripts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6 reading texts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 discussion forums</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 wikis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective Performance</td>
<td>Learner-learner</td>
<td>9 reading texts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6 discussion forums</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 group assignment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderation by exception, only in case students got the wrong idea</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All pilot online courses helped to test resources and instruments that were common to all designs (see Table 13). Their design was guided by the literature (see Table 5 in CHAPTER 2). To clarify materials and activities for teachers, the researcher prepared a Teacher Manual with recommendations drawn from the Teaching How to Teach Online course described in CHAPTER 3 and information about the courses (e.g., objectives and structure). This document also included a description of the role of teachers and specific examples of how to respond to the different activities. At the end, there was information about this research project (see Appendix 4). This manual was available for all courses.

**Table 13 Course resources**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General discussion forum</td>
<td>It served as an open space for questions and comments, and was monitored by the academic assistant of the course (i.e., Education staff).</td>
</tr>
<tr>
<td>Recommendations</td>
<td>This brief section drew on key themes presented in previous courses (Teaching How to Teach Online and Effective Online Students), while reminding participants of the available support channels (i.e., general discussion forum, email and help desk).</td>
</tr>
<tr>
<td>Ethics note</td>
<td>The front page of the courses had a note stating that participants’ contributions could be used for research</td>
</tr>
</tbody>
</table>
purposes. A contact email to answer questions and concerns was also included.

Objectives

While these were different for each course, they all matched Kirkpatrick’s (1996) levels of training effectiveness (satisfaction, learning, behaviours and business results). Communicating them to students was a way of ensuring that they knew what was expected of them.

Structure

This section informed participants of the recommended structure of the course.

Diagnostic survey

It gauged course expectations, previous knowledge on the topic and perceived competence.

Reading materials

While their characteristics were different depending on the type of interaction emphasised in each course, they all shared the same style: simple language, short paragraphs and examples.

Non-assessed activities

They attempted to foster a specific type of interactions (learner-content, learner-teacher or learner-learner).

Non-assessed final project

It encouraged students to apply what they learned in their workplace.

Final exam

It had closed questions and was used to assess knowledge acquisition after the course.

Evaluation survey

It consisted of closed questions about the study hours spent, perceived engagement with the activities, and students’ evaluation of the course in terms of satisfaction, learning, behaviours in the workplace and fulfilment of expectations. Open questions explored learners’ perceived responsibility in relation to their own performance, their favourite aspect of the course and their suggestions to improve the course.

Different people helped validating all materials and instruments, which were in Spanish. Two external Mexican academics provided guidance and comments. The senior learning designer of the organisation was also crucial in using her work experience to ensure texts and activities were clear and suitable for sales supervisors. Education staff tested the courses and expressed themselves enthusiastically, for example:

- *I am excited. It is beautiful [...]. Easy to digest. Fun. Down-to-earth. It motivates*
reflection. You get engaged. You want to move forward. It’s very easy to navigate in the platform.

- Congratulations!!!! And I am not done yet. ;-) 
- Very good!! I have a big smile. 😊
- …from here to fame... world-wide... he he, so they will know over there [in the United Kingdom] that you don’t do trifles!!!

The details of the redesign and development process of each pilot course are described next.

**Situational Leadership: Learner-content interactions**

The Situational Leadership course (see Figure 15) emphasised learner-content interactions. Its design incorporated five non-assessed activities that required explicit, observable responses from the students (e.g., providing an answer to a question instead of reflecting internally on a topic) and a non-assessed final project focused on the application of knowledge in the workplace. Besides the general discussion forum, there were no other embedded communication tools. While the course had a teacher assigned, their role was to monitor student progress without directly intervening. If required, teachers could use the general discussion forum to answer questions and clarify tasks.
The design and development of this course required a high time investment. Since sources of human support would be kept to a minimum to avoid encouraging social interactions (and thus, increasing their level in the course), the content needed to be self-explanatory. The researcher tried to think of all the possible questions students could have when navigating through the course and to provide answers. Education staff at the organisation helped improve resources by identifying where more clarity was needed.

As in Macdonald, Bullen and Kozak’s study (2010) in a South African company, internet connection issues were anticipated. Media and applications requiring high bandwidth (e.g., videos and audio) were used with caution and always had a text alternative (i.e., transcript). Online tools included two personal wikis, which served only as a space for
students to write their reflections and were chosen over other tools because of their easy access (blogs were blocked); multiple choice questions with automated feedback for both correct and incorrect answers; and three polls, which allowed students to see the responses of the group. There were also eight reading texts, which incorporated hyperlinks to glossary definitions, images and self-reflection questions (e.g., *Think about three of your collaborators and their main tasks. How would you describe them? What is their maturity level?* [One of the concepts students had to learn was “maturity level”]).

To add a human touch, a two-minute podcast (Nie et al., 2010) and four brief videos (<1 minute long), with their respective transcripts, were made available. People from the organisation helped in the creation of these resources. A sales manager participating as a teacher in this project recorded the podcast under the guidance of the researcher. He was happy to be involved and surprised by the low time investment required. Retailers and factory workers were actors in the videos. All of them explicitly agreed to be recorded. They were assured that their participation was voluntary and that refusing to participate would not affect their job at the organisation. However, at least one of the actors seemed uncomfortable when recording. The researcher reflected that perhaps people felt more at ease sharing their voice, which would be difficult to trace back to them, than sharing their image, which could be easily identifiable. Bearing in mind also that in places with slow internet connections students might feel that they were missing something by reading only the transcript of videos, the researcher decided to omit videos in the main study.

**Empowering Beliefs: Learner-teacher interactions**

The Empowering Beliefs course fostered learner-teacher interactions. Its learning design incorporated five non-assessed activities, which followed Salmon’s (2002) e-tivity framework, and a non-assessed final project. All activities had a clarifying example of expected responses. Online tools included three discussion forums and three wikis. There were also six reading materials, with only text (no multimedia).
A risk when designing the Empowering Beliefs course was inadvertently fostering peer exchanges, which could change the emphasis on learner-teacher to learner-learner interactions. In an attempt to prevent this situation, activity instructions referred specifically to teacher feedback. Sometimes teachers were asked to reply to each student (see Figure 16), and at other times they would address the whole group by summarising the contributions. The minimum requirements of expected teacher behaviours were specified in the Teacher Manual, which also included research-based suggestions on key practices, such as maintaining contact and having a regular presence in online discussions (Dennen et al., 2007).

**Figure 16 Example of activity fostering learner-teacher interactions**

<table>
<thead>
<tr>
<th>Activity 2.2 My story</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective:</strong> To acknowledge your own achievements.</td>
</tr>
<tr>
<td><strong>Task:</strong> Check the text 2.2 Empowering Beliefs. Now share your story. Post a message in which you describe an achievement you feel proud of. It can be personal, social, work-related, or family-related. What happened? What did you do? What did you achieve?</td>
</tr>
<tr>
<td><strong>Response:</strong> Read your teacher’s feedback. How do you feel? Share your reflections in a message (you have click on “reply” in your teacher’s message).</td>
</tr>
</tbody>
</table>

**Effective Performance: Learner-learner interactions**

The Effective Performance course fostered learner-learner interactions. This learning design incorporated five non-assessed activities (see Figure 17), which followed Salmon’s (2002) e-tivity framework, and a non-assessed final project. All activities had a discussion forum and a clarifying example. Participants were expected to post at least two messages in each activity, one with their solution to the task and a second one replying to others’ contributions. There were also nine brief reading materials, with only text (no multimedia). While this course had teachers available, the Teacher Manual advised them...
to moderate by exception, only in case students got the wrong idea. Teachers were expected to stand back and let students interact between themselves.

**Figure 17 Example of activity fostering learner-learner interactions**

<table>
<thead>
<tr>
<th>Activity 3.1 SMART Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective:</strong> To practice elaborating objectives using the SMART methodology.</td>
</tr>
<tr>
<td><strong>Task:</strong> Consider the text 3.1 SMART goals. Write three objectives you have in one of the following areas:</td>
</tr>
<tr>
<td>- Sales</td>
</tr>
<tr>
<td>- Execution standards</td>
</tr>
<tr>
<td>- Work environment</td>
</tr>
<tr>
<td>- Employee turnover</td>
</tr>
<tr>
<td>These objectives may be ones that you have established for a previous activity. Remember to use the formula:</td>
</tr>
<tr>
<td>Active verb + area of the objective + achievement level + commitment date</td>
</tr>
<tr>
<td>Post a message with this information.</td>
</tr>
<tr>
<td><strong>Response:</strong> Check the objectives of a course mate. Verify that they meet the SMART criteria (specific, measurable, attainable, relevant and time-bound). Post a message in which you indicate the results of your evaluation (i.e., which criteria are met). If not all the criteria are met, include a suggestion to meet them.</td>
</tr>
</tbody>
</table>

**Delivery**

This pilot study enabled participants to have at least one experience of studying a course with a high level of one of three types of interaction (learner-content, learner-teacher or learner-learner). Different groups had access to the courses in six different sequences, as shown in Table 14. Learners had one week to finish each course, with a commitment of approximately five study hours. To prevent biasing their expectations, students were not told which type of interaction was emphasised in each course. An academic assistant, who
had a manual describing her role, was assigned to each group of students and was in charge of monitoring their progress.

Table 14 Sequence of access to pilot courses

<table>
<thead>
<tr>
<th>Sequence 1</th>
<th>Sequence 2</th>
<th>Sequence 3</th>
<th>Sequence 4</th>
<th>Sequence 5</th>
<th>Sequence 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC</td>
<td>LC</td>
<td>LT</td>
<td>LT</td>
<td>LL</td>
<td>LL</td>
</tr>
<tr>
<td>LT</td>
<td>LL</td>
<td>LL</td>
<td>LC</td>
<td>LC</td>
<td>LT</td>
</tr>
<tr>
<td>LL</td>
<td>LT</td>
<td>LC</td>
<td>LL</td>
<td>LT</td>
<td>LC</td>
</tr>
</tbody>
</table>

Notes: LC = Situational Leadership, learner-content interactions; LT = Empowering Beliefs, learner-teacher interactions; LL = Effective Performance, learner-learner interactions

The implementation of the pilot study took a month, three weeks for three courses, with a one-week break. The organisation motivated sales supervisors to participate by making the completion of the courses a requirement to attend a conference in Cancun, a popular holiday destination. The researcher was not directly involved in this reward initiative. This event took place after the first two pilot courses ended. There was no course during that week, which could be used to complete pending activities of previous courses. This pilot period also provided time for participants to complete preparation courses (Moodle Features and Effective Online Students). This was especially useful for sales supervisors who enrolled late in the Leadership Programme.

Expressions of enthusiasm were common during the pilot courses, as they had been during the preparation stage of this project (see CHAPTER 3). For example, one student sent a message saying: *Online courses for people who work have a great advantage. When you have [available] time, you can study.* Another learner (referred to as Student X in CHAPTER 6) sent an email to the researcher and the Education staff to inform them about a presentation he had made for his retailers. It was based on course materials. He wanted to show that he was applying what he was learning.

During the delivery of the pilot courses, some issues arose and were managed. Some participants were confused. For example, one sent an email with the answer to an activity,
instead of posting it in the corresponding discussion forum. Whenever a situation like this was detected, the Education staff (i.e., academic assistants) attempted to provide further clarification and support.

A number of participants were not logging in. Reasons varied. Some did not have access to a computer (even if the organisation had expected them to have one). Others were afraid of technology and thus, reluctant to post messages. A few joined the Leadership Programme after the start of the pilot courses and still had to learn the basics, such as how to communicate online. Each case was dealt with individually. Sample strategies include sending e-learning tips (see CHAPTER 3 and Appendix 2), calling them via phone, and asking teachers or local HR staff to provide support.

A brief account of the delivery of each specific pilot course is next.

**Situational Leadership: Learner-content interactions**

The Situational Leadership course, focused on learner-content interactions, was delivered without any significant problems. Materials and activities seemed to be clear enough for students to move forward. In the evaluation survey at the end of the course, participants reported spending an average of four hours and 40 minutes on the course, out of the suggested study time of five hours. Most students (86%, n=131) considered they were engaged or very engaged with the activities, and 95% of them agreed that the materials fostered their reflection on the course topics.

One learner mentioned that his favourite aspect of the course was the participation of other course mates. This was an interesting finding, as the Situational Leadership course had no embedded communication tools that could foster peer interactions, with the exception of the general discussion forum that was seldom used.
Empowering Beliefs: Learner-teacher interactions

The delivery of the Empowering Beliefs course, which emphasised learner-teacher interactions, was challenging. Firstly, there was little participation in wikis. In spite of the training available (see CHAPTER 3), some students and teachers struggled to understand how to collaborate in wikis. Time constraints made it unfeasible to provide further training on how to use wikis. Thus, activities with wikis were reduced in number, from three to one, in the main study. Secondly, some teachers confused their role with that of learners. Ten (out of 30) answered diagnosis and evaluation surveys that were meant for students. By the time of the main study, this was no longer a problem. Thirdly, it seemed that teachers were not reading their manual. They were not following suggestions and instructions on how to moderate online learning. The Education staff began sending emails to teachers with a brief summary of the information contained in the Teacher Manual.

Finally, only eight teachers gave an adequate performance in terms of the quality of their messages (e.g., followed good practices described in the Teaching How to Teach Online course) and their regularity (i.e., logged in at least three times during the course and had an online presence). Sometimes students needed to wait for teacher input to be able to move forward. In groups with two teachers, a disengaged teacher was not too disruptive for progress, as long as the other one performed adequately. When learners had no available teacher to provide support and show interest in their progress, participation tended to decrease.

The researcher interviewed three teachers to gain further insight into their experience while delivering the course. One of them was highly committed to her role as an online teacher and described herself as autodidact. She was co-teaching her course with another colleague. She felt a bit upset because she considered she had no moral authority to push forward students who were not directly her subordinates. To those learners who were in
her sales team, she would do a follow up via phone calls, ensuring that they were moving forward in the course and offering guidance.

The other two teachers were disengaged and participated little. One explained that at the beginning he had had problems managing the technology, as he was unfamiliar with it, and that he did not have enough time available to figure it out: *I regularly dedicate half of my Saturday to the [Leadership] Programme. [...] There were times at the beginning when I was there for two hours without moving forward much. That was at the beginning. I was struggling.*

The third teacher commented that the online learning project at the organisation was the answer to recurrent requests from the Sales department to obtain training in an easily accessible way. He praised the course materials (e.g., *it is a very enriching material*). He was in favour of making the courses mandatory for sales supervisors, as he could see the value of their study. However, he had logged in infrequently and had not performed adequately. When asked how the Education staff could help him to fulfil his online teacher duties, he replied:

> With this visit and this talk, I am so embarrassed. [...] That’s all the help I need. I have the obligation [to moderate the course], not because I am being forced to do it. I like the topic. I need to be consistent, and [...] I am failing. I need to catch up.

Yet, he did not log in after that.

When noticing the lack of teacher participation, the Education staff decided to phone regularly those who were not logging in. This was a complement to the reports of student progress sent weekly to all course participants.

In the evaluation survey at the end of the course, participants reported spending an average of four hours and 37 minutes on the course, out of the suggested study time of five hours. Most students (87%, n=136) considered being engaged or very engaged with
the activities, and 78% of them agreed that the teachers helped them to understand the topics of the course.

Three participants mentioned that their favourite aspect of the course was exchanges with peers (e.g., *knowing about my course mates’ experiences and talking about mine*), even though learner-learner interactions had not been intentionally embedded into the course.

**Effective Performance: Learner-learner interactions**

During the delivery of the Effective Performance course, the researcher noted that some participants provided brief and superficial contributions, and failed to follow instructions. To tackle these bad practices, targeted e-learning tips were sent:

- *Find your point of balance.* Not so much and not too little. [...] Neither an essay nor a one-word response (“yes”). Find the communication style that makes you feel comfortable. How do you like to express yourself?
- *Follow instructions!* We have noticed that some people complete the activities without reading task instructions. How do we know? Easy... Instructions ask for one thing, and students do something else. Following the instructions will help you achieve the objective of the activity. ;-) How closely do you follow instructions?

A second issue was that many messages were left unanswered, and thus, communications were limited to certain participants. To address this, a note was added to the follow-up section of activities fostering learner-learner interactions in the main study: Reply to a course mate who has not received an answer.

Finally, one of the activities in this course required students to create teams, work together and define strategies to increase the maturity level (i.e., in skills and motivation) of their collaborators. This activity was mostly unsuccessful, as students could not effectively organise themselves online to work in teams. Time constraints made it
unfeasible to provide further training on how to collaborate online. Thus, this sort of group task was excluded from the main study.

In the evaluation survey at the end of the course, participants reported spending an average of four hours and 50 minutes on the course, out of the suggested study time of five hours. Most students (82%, n=139) considered they were engaged or very engaged with the activities, and 89% of them considered that they had shared valuable learning experiences with other participants.

**Evaluation of effectiveness**

The senior learning designer and gatekeeper of this project helped establish the expectations for the three pilot courses. Kirkpatrick’s (1979) and Kirkpatrick and Kirkpatrick’s (2010) levels of training effectiveness were considered in the evaluation. Before delivery, a reference point, or baseline, was established to relate changes to the courses (Philips, 1999; Kirkpatrick, 1979, 1996). Diagnostic surveys helped to assess initial course expectations, perceptions of previous knowledge on the topic and current behaviours in the workplace. At the end of the courses, students were required to complete an exam and an evaluation survey, which gauged their perceptions on the fulfilment of their expectations, their learning and their preparation to apply new knowledge and skills to their job. These instruments are further described in CHAPTER 5.

**Situational Leadership: Learner-content interactions**

The Situational Leadership course yielded high levels of effectiveness. Students’ initial expectations (n=140) related mostly to learning (82%), business results (81%) and behaviours in the workplace (72%). Previous knowledge of the topic was self-assessed by learners as 6.8 (out of 10), on average.

The evaluation survey was answered by 131 participants. Comments were mostly positive (e.g., *It is a very complete course*). Most participants (98%) were satisfied or very satisfied
with the course, and 99% of them claimed that their expectations had been met. The majority of students (98%) reported having learned a lot or very much and feeling prepared to apply the new knowledge in their workplace. The average exam grade was 9.3 out of 10 (n=133).

**Empowering Beliefs: Learner-teacher interactions**

In spite of the inconsistent teacher participation, the Empowering Beliefs course yielded high levels of effectiveness. Students’ initial expectations (n=147) related mostly to learning (82%), business results (82%) and behaviours in the workplace (78%). Previous knowledge on the topic was self-assessed by learners as 5.3 (out of 10), on average.

The evaluation survey was answered by 136 participants. Comments were mostly positive (e.g., *Everything [was] very good. Thank you and congratulations*). Most participants (96%) were satisfied or very satisfied with the course, and 99% of them claimed that their expectations had been met. The majority of students reported having learned a lot or very much (99%) and feeling prepared to apply the new knowledge in their workplace (96%). The average exam grade was 9.5 out of 10 (n=137).

**Effective Performance: Learner-learner interactions**

In spite of superficial contributions and unanswered messages, the Effective Performance course yielded high levels of effectiveness. Students’ initial expectations (n=145) related mostly to business results (84%), learning (77%) and behaviours in the workplace (76%). Previous knowledge on the topic was self-assessed by learners as 7.3 (out of 10), on average.

The evaluation survey was answered by 139 participants. Comments were mostly positive (e.g., *I liked [the course] because it made me learn how I can perform [better and achieve] objectives and [improve] my relationship with my collaborators*). Most participants (96%) were satisfied or very satisfied with the course, and 97% of them claimed that their
expectations had been met. The majority of students reported having learned a lot or very much (96%) and feeling prepared to apply the new knowledge in their workplace (98%). The average exam grade was 9.3 out of 10 (n=139).

**Implications for main study**
The redesign, development, delivery and evaluation of three pilot courses (Situational Leadership, Empowering Beliefs and Effective Performance) provided valuable information about materials, activities and instruments. These findings shaped the methodology for the main study (see CHAPTER 5). Table 15 summarises the lessons learned and their application.

<table>
<thead>
<tr>
<th>Redesign and development</th>
<th>Situational Leadership: Learner-Content Interactions</th>
<th>Empowering Beliefs: Learner-Teacher Interactions</th>
<th>Effective Performance: Learner-Learner Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redesign and development</td>
<td>Employees helping in the creation of course materials seemed more comfortable sharing their voice for podcasting instead of their image for filming videos.</td>
<td>Course redesign and development took place without significant problems.</td>
<td>Course redesign and development took place without significant problems.</td>
</tr>
<tr>
<td>Delivery</td>
<td>Course delivery took place without significant problems.</td>
<td>Some students and teachers did not participate in activities requiring the use of wikis.</td>
<td>Some participants provided brief and superficial contributions, and failed to follow instructions.</td>
</tr>
<tr>
<td></td>
<td>One student mentioned peer exchanges, which were not embedded in the design, as his favourite aspect of the course.</td>
<td>Some teachers were confused about their role.</td>
<td>Many messages were left unanswered.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some teachers had an inadequate performance, ignoring suggestions available in the Teaching</td>
<td>Students failed to organise themselves effectively to work online</td>
</tr>
<tr>
<td>Implications for main study</td>
<td>How to Teach Online course and in their Teacher Manual.</td>
<td>in teams.</td>
<td></td>
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<tr>
<td>-----------------------------</td>
<td>-------------------------------------------------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Three students mentioned peer exchanges, which were not embedded in the design, as their favourite aspect of the course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluation</td>
<td>The evaluation of course effectiveness took place without significant problems.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effectiveness was high in terms of satisfaction, learning, perceived knowledge transfer and return on expectations.</td>
<td></td>
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<tr>
<td></td>
<td>The evaluation of course effectiveness took place without significant problems.</td>
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<td></td>
<td>Effectiveness was high in terms of satisfaction, learning, perceived knowledge transfer and return on expectations.</td>
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<tr>
<td></td>
<td>Effectiveness was high in terms of satisfaction, learning, perceived knowledge transfer and return on expectations.</td>
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</tr>
<tr>
<td>Podcasts and public domain low resolution images were used instead of videos.</td>
<td>The number of wikis was reduced to one in the main study.</td>
<td>Monitoring and follow-up practices were enhanced (e.g., e-learning tips were sent to participants).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education staff attempted to improve communications with teachers by sending emails summarising the information in the Teacher Manual and calling teachers who did not log in.</td>
<td>A note was added to activity instructions: Reply to a course mate who has not received an answer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activities requiring the creation of teams were excluded from the main study.</td>
<td>Activities requiring the creation of teams were excluded from the main study.</td>
<td></td>
</tr>
<tr>
<td>Situational Leadership: Learner-Content Interactions</td>
<td>Empowering Beliefs: Learner-Teacher Interactions</td>
<td>Effective Performance: Learner-Learner Interactions</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>References to interactions that were not fostered in the courses led to a change in the evaluation surveys. Students were asked to rate interactions with the content, teacher and peers, regardless of whether these interactions were embedded in their course or not.</td>
<td></td>
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</tbody>
</table>

**Chapter summary: Pilot of online courses**

The researcher redesigned and developed three courses of an existing Leadership Programme (Situational Leadership, Empowering Beliefs and Effective Performance). She used each course to test a different learning design, each emphasising a different type of instructional interactions (learner-content, learner-teacher or learner-learner). She validated course materials, activities and instruments with learning designers at the organisation and with academics with experience in e-learning.

Participants included 147 learners (sales supervisors), 30 teachers (sales managers and directors) and 3 academic assistants (learning designers, or Education support staff). This pilot study enabled participants to have at least one experience of studying a course with a high level of one of three types of interaction.

Problems during delivery, such as inadequate participation in activities, were analysed and managed. All courses yielded high levels of effectiveness, in terms of satisfaction, learning, perceived knowledge transfer and return on expectations. Findings shaped the design and implementation of the main study, whose methodology is described in **CHAPTER 5**.
CHAPTER 5
METHODOLOGY FOR THE MAIN STUDY

This thesis provides a contribution to knowledge by focusing on relevant gaps in the literature of online interactions (Chang, 2009; Woo & Reeves, 2007; Woo & Reeves, 2008) and evaluation of course effectiveness (De Rouin et al., 2005; Macpherson et al., 2004; Macpherson et al., 2005; Woo & Reeves, 2007). The main study was conducted in a large Mexican organisation, thus, addressing the need for research in contexts different from schools and universities (DeRouin et al., 2005; Swan, 2002; Woo & Reeves, 2008) and providing the benefit of situational specificity (Stone, 2011; Wagner, 1995). It undertook a rigorous approach by having a conceptual framework based on previous research (see CHAPTER 2), collecting data from quantitative and qualitative sources, triangulating and thus, broadening the common quantitative approach to corporate e-learning (Caliskan, 2009; Chang & Smith, 2008; Grandzol & Grandzol, 2005; Sekaran & Bougie, 2013).

A preparation stage (see CHAPTER 3) contributed to the creation of the required technical and organisational conditions to implement the main study. A pilot of online courses followed (see CHAPTER 4) to identify potential improvements to resources, instruments and methods for subsequent embedding in the main study. This chapter explains and documents the methodology for the main study, including the research questions, design, participants, data sources, procedure for instrument application and analysis, and ethical implications (see Figure 18).

Figure 18 Chapter structure: Methodology for the main study

<table>
<thead>
<tr>
<th>Chapter 5 Methodology for the Main Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Research questions</td>
</tr>
<tr>
<td>• Design</td>
</tr>
<tr>
<td>• Participants</td>
</tr>
<tr>
<td>• Learners</td>
</tr>
<tr>
<td>• Teachers</td>
</tr>
</tbody>
</table>
Research questions

The main study focused on the last course of the Leadership Programme to be delivered online: Feedback on Performance. The researcher created three versions of this course, all with the same topics and objectives, but each emphasising a different type of instructional interactions (learner-content, learner-teacher or learner-learner). The objectives were to understand how students interact online, to evaluate how effective were the different course versions and to identify the differences in the effectiveness levels. Specifically, the following research questions guided data collection and analysis:

1. How do learners interact with the content, the teacher and other learners in online courses?
2. How effective are online courses characterised by high levels of different types of interactions (learner-content, learner-teacher and learner-learner)?
3. Which online course design (i.e., emphasising learner-content, learner-teacher or
learner-learner interactions) results in the highest levels of effectiveness?

The first two questions focus on the main elements of interest in this thesis: instructional interactions and online course effectiveness. The third question explores the relationship between these two areas.

**Design**

The above research questions guided the research design (see Figure 19), which is a blueprint for the collection, measurement and analysis of data. The concepts used to describe this research design are defined as in Sekaran and Bougie (2013).

The main study was correlational, as the interest was in revising the associations amongst types of instructional interactions (learner-content, learner-teacher and learner-learner) and levels of online course effectiveness (satisfaction, learning, behaviours in the workplace, business results and return on expectations).

The context of the main study was non-contrived because it was conducted in the natural setting of a large Mexican organisation interested in improving and expanding their offer of online courses for staff. It was a field study. The focus on the natural social setting enhances the ecological validity of the research, as it is closer to people’s every day experiences than studies conducted in laboratories (Bryman, 2012).
The participating organisation wanted to deliver online four courses of a Leadership Programme to over 150 sales supervisors. The researcher interfered moderately in the natural environment because she altered the usual process of the organisation by redesigning these courses (Situational Leadership, Empowering Beliefs, Effective Performance and Feedback on Performance). She used the first three courses as a pilot of learning designs emphasising a single type of instructional interaction (see CHAPTER 4). The researcher created three versions of the fourth, and main, course to evaluate differences in effectiveness. Her interference was not extreme because, apart from the work on course preparation, design and delivery, the researcher made no other changes to participants’ usual work conditions (e.g., participants were not taken to a laboratory to be part of the main study).

The eighteen groups of students enrolled in the Leadership Programme were classified in four broad units of analysis. The first three correspond to the version of the main course participants were in (i.e., emphasising learner-content, learner-teacher or learner-learner interactions). The fourth unit of analysis is formed by a control group composed of sales supervisors who did not complete the Leadership Programme. The sample was non-
probabilistic because participants were neither randomly selected nor assigned to the different groups, but it was purposive, as it was confined to participants with high influence on instructional interactions and course effectiveness (see Figure 12 in CHAPTER 4).

The main study was longitudinal, as it comprehended an extended period of time. Data was collected before and after the implementation of the main course, Feedback on Performance (see Figure 20). The researcher first established a baseline of different indicators of effectiveness (learning, behaviours in the workplace, sales quota coverage and course expectations). Upon completion of the main course, which also marked the end of the Leadership Programme, effectiveness was evaluated. Different instruments and methods were used to collect quantitative and qualitative data, including surveys, documents, observations, interviews and think aloud protocols. The resulting data were analysed statistically or using thematic analysis, and then triangulated to answer the research questions.
The research strategy focused on mixed methods, using both qualitative and quantitative approaches (Creswell & Plano Clark, 2007). This strategy has been increasingly accepted and used in social sciences (Anderson, 2009; Bryman & Bell, 2011). Mixed-methods research provided a number of advantages, including:

- Satisfying the participating organisation’s requirement for “hard”, quantitative data (e.g., percentages of satisfied students, exam grades, average sales quota coverage), without neglecting the need for qualitative information (e.g., think aloud sessions, interview, messages in discussion forums) that provided a deeper
insight on participants’ experience in online courses (Teddle & Tashakkori, 2009).

- Looking at an issue at micro and macro levels, thus achieving a well-rounded view of the situation (V. Anderson, 2009).
- Enabling the use of various methods to address a research problem, and thus providing strengths that can counterbalance the weaknesses of quantitative and qualitative approaches (Creswell & Plano Clark, 2007).
- Triangulating the information to obtain a more holistic understanding of corporate e-learning (see Jick, 1979), and increasing research rigour and confidence in the results (Sekaran & Bougie, 2013).

The researcher adopted a pragmatist posture, which is associated to the use of mixed methods. Mainstream paradigms (positivism and interpretivism) represent opposing views of reality. While positivists study reality as something external objective and fixed, interpretivists consider it something subjective, which depends on the perspectives of relevant actors. While positivists use quantitative methods, interpretivists favour qualitative ones. Pragmatists reject such either/or choices associated with paradigm wars (see Teddle & Tashakkori, 2009). They understand truth as a tentative, evolving entity, acknowledging that different people interpret situations in different ways. They focus on solutions to problems, on “what works” (Sekaran & Buogie, 2013). The researcher considered pragmatism a suitable paradigm for conducting a project in an organisation that seeks a practical approach to improve its processes. For a further discussion on pragmatism, see Padilla (2013).

Participants
Over 200 people participated in the main study, including 163 sales supervisors (146 learners and 17 members of the control group), 30 teachers (sales managers and directors) and 3 academic assistants (learning designers or Education support staff). Table 16 summarises the participants in each version of the Feedback on Performance course.
Table 16 Participants in each version of the Feedback on Performance course

<table>
<thead>
<tr>
<th>Course Version</th>
<th>Groups</th>
<th>Learners</th>
<th>Dropouts</th>
<th>Teachers</th>
<th>Academic Assistants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner-content</td>
<td>6</td>
<td>47</td>
<td>4</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Learner-teacher</td>
<td>6</td>
<td>43</td>
<td>10</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Learner-learner</td>
<td>6</td>
<td>56</td>
<td>8</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
<td><strong>146</strong></td>
<td><strong>22</strong></td>
<td><strong>30</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

Employees in different job positions and areas also facilitated the development of this study. HR personnel from offices around Mexico participated by conducting observations of students that helped detect behavioural changes. Administrative staff from the Sales department provided access to sales records. Staff of the Systems department (IT services) offered technical support.

**Learners**

Sales supervisors (n=146, 28 women and 118 men) formed a non-probabilistic, purposive sample for the main study. All of them participated as students in the pilot of three online courses of the Leadership Programme (see CHAPTER 4) and thus, had experience with different types of instructional interactions (learner-content, learner-teacher and learner-learner). They were enrolled in one of the three available versions of the main course, Feedback on Performance. The 18 groups of students used in the pilot study remained constant. Six groups were randomly assigned to each version of the main course, Feedback on Performance.

Twenty-two students dropped out of the Leadership Programme at different stages and/or failed to complete it within the allocated time. When available, their sales records were taken on board and compared to those of students who successfully finished the programme. Seventeen sales supervisors (5 women and 12 men) who did not participate...
in the Leadership Programme formed a control group and provided an additional comparison point for the results of course participants.

**Teachers**
The same sales managers and directors (n=30), who participated as teachers in the pilot of online courses of the Leadership Programme (see CHAPTER 4), remained assigned to their groups for the main study. Their role depended on the course version they were working with. Only eleven teachers were assigned to the version that emphasised learner-teacher interactions. They were expected to be an active part of the course, moderating online learning and providing guidance for students. Ten teachers worked in the course with predominant learner-learner interactions and, thus, were asked to only moderate in case of exception (if students had the wrong idea). The remaining nine teachers were part of the course with learner-content interactions and could step back, monitoring student progress without directly intervening. If required, all teachers could use the general discussion forum, available in all versions of the main course, to answer questions and clarify tasks. All teachers had a Teacher Manual with specific information about their expected role in the main course.

**Academic assistants / Learning designers**
The senior learning designer, learning designer and intern of the Human Capital and Development department (also referred to as Education staff), who performed as academic assistants in the pilot study, participated in the main study, monitoring course activities and providing general support for participants. Each academic assistant was in charge of the follow-up of six groups of learners.

**Data sources**
Eleven data sources contributed to answering the research questions (see Table 17). Qualitative data sources were assigned a code for identification purposes. Instruments were applied in Spanish, the native language of the participants and of the researcher.
Table 17 Data sources

<table>
<thead>
<tr>
<th>Data source</th>
<th>Purpose</th>
<th>Linked to Research Question</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic surveys</td>
<td>To evaluate initial course expectations, previous knowledge on the topic and perceived communication competence.</td>
<td>2</td>
<td>DS</td>
</tr>
<tr>
<td>Activity logs</td>
<td>To establish the amount of interactions with content, teacher and peers according to students’ clicks in the online course.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Think aloud sessions</td>
<td>To identify learning strategies students used when interacting with the content.</td>
<td>1</td>
<td>TA</td>
</tr>
<tr>
<td>Interview with teacher</td>
<td>To obtain a teacher’s perspective on course interactions and effectiveness.</td>
<td>1, 3</td>
<td>TI</td>
</tr>
<tr>
<td>Messages in discussion forums</td>
<td>To gauge social interactions in the course.</td>
<td>1</td>
<td>DF</td>
</tr>
<tr>
<td>Evaluation surveys</td>
<td>To gather feedback on students’ perceptions on engagement with course activities, interactions with content, teacher and peers, satisfaction, learning, readiness to transfer knowledge, fulfilment of expectations and suggestions for course improvement.</td>
<td>1, 2</td>
<td>ES</td>
</tr>
<tr>
<td>Exams</td>
<td>To assess knowledge acquisition after the course.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>To detect behavioural changes in the workplace.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Sales records</td>
<td>To calculate students’ average sales quota coverage before and after the Leadership Programme.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Follow-up surveys</td>
<td>To determine students’ course preferences and their reasons.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Focus group with academic assistants</td>
<td>To obtain impressions, interpretations, and opinions about the implementation of the online courses at the organisation.</td>
<td>1, 2, 3</td>
<td>AA</td>
</tr>
</tbody>
</table>
Throughout the whole project, the researcher observed different areas of the participating organisation and engaged in informal (face-to-face and online) conversations with people from different departments. She kept a written record, in the form of field notes, of main themes, lessons learned and interesting points raised. This information complemented the data obtained from the applied instruments, which are further described next.

**Surveys**

Surveys are one of the most frequently used data collection tools in business settings (Sekaran & Bougie, 2013). They provide insight into individual perceptions and tendencies within groups (Baruch & Holtom, 2008). When applied via web, they represent a low-cost, time-saving method.

Three online surveys, created via FreeOnlineSurveys.com, were used in this study:

1. **Diagnosis** (see Appendix 5). It had an informed consent form at the beginning. It consisted of closed questions that gauged initial course expectations, previous knowledge of the topic and perceived communication competence (i.e., behaviours in the workplace). Students’ perceptions of their own knowledge and performance served as a reference point to compare with learning and behaviours after the course.

2. **Evaluation** (see Appendix 6). It included closed questions (5-point Likert scales) about perceived engagement with the activities, interactions with content, teacher and peers, and students’ evaluation of the course in terms of satisfaction, learning, behaviours and expectations. Open questions explored the number of study hours spent, learners’ perceived responsibility in relation to their own performance, their favourite aspect of the course and their suggestions to improve the course.

3. **Follow-up** (see Appendix 7). It aimed to determine students’ course preferences and their reasons. It asked participants to compare their experience in the different online courses of the Leadership Programme and to select the one they
had liked the most and the least. An additional question asked if they had used the private messaging system of the online learning platform.

Three researchers with experience in online learning (two Mexican and one Uruguayan) provided comments to improve the instruments. A senior learning designer based at the organisation validated the surveys before application. The diagnosis and evaluation surveys were checked during the pilot stage (see CHAPTER 4). Minor modifications were made where necessary.

**Activity logs**
The Moodle log system provides interesting information about participants’ online behaviours and activities within a course (Estrada et al., 2011). Each log entry contains an action and an information field, which indicate that a click happened and specify what the user did. Course logs helped to establish the number of interactions with content, teacher and peers according to students’ clicks.

**Think aloud sessions**
The researcher organised individual think aloud sessions with eight students taking the course version emphasising learner-content interactions. These sessions helped identify strategies learners use when navigating the course content, as well as strengths and weaknesses of learner-content interactions.

The think aloud method is recommended for the study of learner-content interactions (Anderson, 2003b) and for e-learning research (Cotton & Gresty, 2007). Data is collected during the actual event of interest, providing reliable and accurate information. This method prevents problems associated with memory failure, which may occur when data is collected after the conclusion of the activity, and artificiality, which may happen if participants are asked to report on a hypothetical situation (Young, 2005).
**Interview with teacher**

The researcher conducted a 50-minute semi-structured interview to collect data from a teacher’s perspective, regarding course interactions and effectiveness. This type of interview was chosen because it allows participants’ experiences, thoughts and feelings to guide the dialogue, while staying within the framework of the research aim (O’Donnell & Tobbell, 2007). Topics covered included student interactions, challenges for online teachers and views on the different courses of the Leadership Programme.

**Messages in discussion forums**

Participants’ messages in discussion forums provided insight into salient features of learner-teacher and learner-learner interactions.

**Exams**

A final exam with ten multiple-choice, matching and true/false questions evaluated knowledge acquisition at the end of the course. Five items related to a case that students had to analyse. The senior learning designer validated this instrument. After answering, participants could check their grades and feedback. A slightly different version of this exam, which included a brief information consent form and could be answered anonymously, was available for members of the control group.

**Observation guides**

The researcher created an observation guide (see Appendix 8) to evaluate behaviours in the workplace before and after the main course. Observations provided a second, more reliable measure than mere perceptions of knowledge transfer (Park & Wentling, 2007). To design this instrument, the researcher attended a monthly sales meeting with retailers. A potential student of the Leadership Programme, a sales supervisor, led this meeting. The researcher identified and created a list of key behaviours that evidenced communication skills and could be assessed during other sales meetings. Four people checked the instrument and provided feedback: two Latin American academics (one Mexican and one
Uruguayan) with vast experience in e-learning, a senior learning designer of the organisation and a Human Resources manager.

This observation guide, as well as instructions for use and information about this thesis, was sent via email to HR staff in the different offices around Mexico. The HR personnel regularly attended monthly sales meetings and watched the performance of sales supervisors. For this research project, they did the same, but this time they followed and completed the observation guide, evaluating behaviours using a 10-point scale. Sales supervisors (also students of the online course) were aware of this observation, as it was mentioned as part of the evaluation of the course. Considering that some HR staff were friends of the observed participants, evaluators were not required to provide their names in the observation guides.

Sales records
The organisation facilitated access to sales records from 2011 and 2012, before and after the main course. These documents provided information about business results (level four in Kirkpatrick’s effectiveness evaluation model, 1996).

Focus group with academic assistants
At the end of the project, the researcher ran a focus group with the Education staff who participated as academic assistants. The session lasted an hour and a half. It aimed to obtain their impressions, interpretations, and opinions about the implementation of the online courses (Sekaran & Bougie, 2013). The researcher asked participants to reflect about their experience on different aspects of the project and identify the lessons learned. Then they shared and discussed their opinions. Topics covered included performance of different stakeholders (learners, teachers and themselves as academic assistants), management support, learning designs and evaluation of course effectiveness.
Procedure
Data collection and analysis for the main study comprised four main steps:

1. Course redesign and development of three different course versions
2. Identification of instructional interactions (learner-content, learner-teacher and learner-learner) and their characteristics
3. Evaluation of course effectiveness (satisfaction, learning, behaviours in the workplace, business results and return on expectations)
4. Comparison of outcomes of each version of the online course

Each step is described next.

**Course redesign and development**
The topic of the main course was Feedback on Performance. The main competence to develop was communication. All versions of the course incorporated elements tested during the pilot study (see Table 13 in CHAPTER 4), including a general discussion forum, recommendations, an ethics note, objectives, structure, and diagnosis and evaluation surveys. They also had ten reading texts, five non-assessed activities, a non-assessed final project and a final exam. Table 18 describes the specific materials and activities that fostered instructional interactions in each version of the course.

**Table 18 Materials and activities of main course versions**

<table>
<thead>
<tr>
<th>Course Version</th>
<th>Materials/Activities that Foster Instructional Interactions</th>
</tr>
</thead>
</table>
| Learner-content | • 10 reading texts with self-reflection questions, images and hyperlinks to glossary definitions  
• 1 personal wiki  
• Multiple choice questions with automated feedback  
• 1 polls | Learner-Learner | None.  
<p>| | Learner-Teacher | None. |</p>
<table>
<thead>
<tr>
<th>Course Version</th>
<th>Materials/Activities that Foster Instructional Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 3 podcasts and their transcripts</td>
</tr>
<tr>
<td>Learner-teacher</td>
<td>10 reading texts</td>
</tr>
<tr>
<td>Learner-learner</td>
<td>10 reading texts</td>
</tr>
<tr>
<td></td>
<td>Moderation by exception, only in case students got the wrong idea</td>
</tr>
</tbody>
</table>

The literature (see Table 5 in CHAPTER 2) guided the redesign of the Feedback on Performance course, which was subject to the same limitation present during the pilot study (see CHAPTER 4): incomplete materials from the original face-to-face version of the course. Drawing from her previous involvement in the organisation and her experience as a learning designer, the researcher transformed key ideas to full reading materials, adding examples, descriptions and explanations. Throughout this process, she validated the information with the senior learning designer. Two external Mexican academics with experience in e-learning also provided guidance.

As in the pilot study, the researcher attempted to design high levels of only one type of interaction and low levels of the rest. In some cases it was not possible to completely omit the other types of interactions. For example, all course versions included reading texts, which enable learner-content interactions. Yet, texts were different (see Figure 21 and Figure 22). In the versions emphasising social interactions (learner-teacher or learner-learner), texts were plain and did not include extra features, such as hyperlinks or embedded podcasts.
Figure 21 Example of text emphasising learner-content interactions

Glossary hyperlink

¿CÓMO TE PUEDO AYUDAR YO PARA QUE TÚ...?

Al retroalimentar el desempeño negativo, es común que algunos líderes sientan la necesidad de "regañar" a sus colaboradores. Una alternativa a los regaños es la pregunta: ¿Cómo te puedo ayudar yo para...?

Esta pregunta es muy positiva, ya que muestra deseos de ayudar. Al escuchar un regaño, las personas tienden a querer defenderse o justificarse. Al escuchar una pregunta, las personas tienden a reflexionar sobre su propia responsabilidad.

Revisa la diferencia de cuando regañas a cuando preguntas cómo ayudar. Puedes leer el diálogo, o escucharlo.

<table>
<thead>
<tr>
<th>Regaño</th>
<th>Pregunta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Líder: Berenice, tu uniforme está sucio. Es la tercera vez que te veo con el uniforme así.</td>
<td>Líder: Berenice, tu uniforme está sucio. Es la tercera vez que te veo con el uniforme así.</td>
</tr>
<tr>
<td>Colaborador: Es bien difícil estar limpia todo el tiempo. Me toca limpiar la cámara y los pisos. Pues claro que me ensucio.</td>
<td>Colaborador: Es bien difícil estar limpia todo el tiempo. Me toca limpiar la cámara y los pisos. Pues claro que me ensucio.</td>
</tr>
<tr>
<td>Líder: ¿Cómo te puedo ayudar para portes el uniforme limpio y des una imagen de higiene a los clientes?</td>
<td>Líder: Entiendo. ¿Cómo te puedo ayudar para portes el uniforme limpio y des una imagen de higiene a los clientes?</td>
</tr>
</tbody>
</table>

Figure 22 Example of plain text used in courses emphasising social interactions

¿CÓMO TE PUEDO AYUDAR YO PARA QUE TÚ...?

Al retroalimentar el desempeño negativo, es común que algunas líderes sientan la necesidad de "regañar" a sus colaboradores. Una alternativa a los regaños es la pregunta: ¿Cómo te puedo ayudar yo para...?

Esta pregunta es muy positiva, ya que muestra deseos de ayudar. Al escuchar un regaño, las personas tienden a querer defenderse o justificarse. Al escuchar una pregunta, las personas tienden a reflexionar sobre su propia responsabilidad.

Revisa la diferencia de cuando regañas a cuando preguntas cómo ayudar.

<table>
<thead>
<tr>
<th>Regaño</th>
<th>Pregunta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Líder: Berenice, tu uniforme está sucio. Es la tercera vez que te veo con el uniforme así.</td>
<td>Líder: Berenice, tu uniforme está sucio. Es la tercera vez que te veo con el uniforme así.</td>
</tr>
<tr>
<td>Colaborador: Es bien difícil estar limpia todo el tiempo. Me toca limpiar la cámara y los pisos. Pues claro que me ensucio.</td>
<td>Colaborador: Es bien difícil estar limpia todo el tiempo. Me toca limpiar la cámara y los pisos. Pues claro que me ensucio.</td>
</tr>
<tr>
<td>Líder: Entiendo. ¿Cómo te puedo ayudar para portes el uniforme limpio y des una imagen de higiene a los clientes?</td>
<td>Líder: Entiendo. ¿Cómo te puedo ayudar para portes el uniforme limpio y des una imagen de higiene a los clientes?</td>
</tr>
</tbody>
</table>

Note: Plain texts included the same information as texts emphasising learner-content interactions but excluded glossary hyperlinks and podcasts.
To clarify materials and activities for teachers, the researcher prepared a Teacher Manual similar to the one used in the pilot study. This document included a description of the role of teachers and specific examples of how to respond to the different activities. Teachers only had access to the manual that corresponded to the course version they were teaching.

Each version of the course lasted five hours, and participants had one week to complete it. At the beginning, all learners received information about the study and were requested explicit consent to participate. Seven sales supervisors decided to opt out.

During delivery, students were not told which type of interaction was emphasised in their course to prevent biasing their expectations. At this stage, the researcher did not intervene and was simply an observer.

**Identification of instructional interactions**

The identification and characterisation of instructional interactions helped answer the first research question: How do learners interact with content, teachers and peers in online courses?

Moodle log entries provided information about all types of interactions within the course. The researcher edited these activity logs to include the information of students only, as learners are the focus of this thesis (see Figure 12 in CHAPTER 3). She checked and categorised entries as passive or active. Viewing a resource (e.g., a discussion forum, a wiki or a reading text) was considered passive. Views of the front (landing) page of the course were excluded. Active contributions were clicks that resulted in an observable response (e.g., adding a message, editing a wiki or selecting a poll answer). Medians were obtained, and ranges (low, medium and high) were determined. The medium range was the one that included 50% of participants.
The researcher established a framework to characterise learners in terms of their online behaviours as measured by the number and type of clicks (see Figure 23). Task-focused students are those for whom finishing tasks take priority over reading support materials. Contributors are those typically considered “good students” who review resources, complete activities and share outputs. Average learners are those who fulfil requirements to a minimum acceptable level. Observers spend more time looking at resources and activities than responding to them. Sometimes they are referred to as lurkers (Beaudoin, 2002; Salmon, 2011). Finally, disengaged students are those who participate little or not at all. The percentage of each type of student was calculated.

**Figure 23 Student interaction style**

<table>
<thead>
<tr>
<th>Active Clicks</th>
<th>High</th>
<th>Task-focused</th>
<th>Contributor</th>
<th>Contributor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>Average</td>
<td>Average</td>
<td>Observer</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Disengaged</td>
<td>Average</td>
<td>Observer</td>
<td></td>
</tr>
<tr>
<td>Passive Clicks</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

To explore interactions with the content, the researcher used the think aloud method with a convenience sample of eight students located in two different cities. This method consisted of observing participants, while they verbally articulated their behaviours, feelings and thoughts as they engaged with their online course. At the beginning, the researcher provided information about the study and requested consent to continue, ensuring that participants’ identity would remain anonymous and that the data obtained during the session would be used for research purposes. Throughout the think aloud session, the researcher’s input was minimum, generally limited to prompts to keep talking when participants fell quiet (Young, 2005). Data was audio recorded and transcribed. Transcripts were coded and analysed using NVivo, a qualitative data analysis computer software package. Themes for categorization were based on learning strategies students used when interacting with the content.
To obtain an insight into learner-teacher interactions, the researcher conducted an interview with a teacher. This session was audio recorded and transcribed. Transcripts were coded and analysed using NVivo. Themes for categorization were based on teacher’s challenges during delivery.

To study social interactions (learner-teacher and learner-learner), after the end of the course, the researcher navigated through the discussion forums. She aimed to identify trends, salient features and unusual behaviours, keeping notes of findings.

The evaluation surveys provided information about perceived engagement with activities, interactions, aspects enjoyed about the course and suggestions for improvement. Closed questions (Likert scales) were easily quantified. Frequencies and percentages were calculated. Open questions were coded with NVivo, using emergent themes.

Additional information about interactions was obtained from the follow-up survey, which included a closed question that asked participants if they had used the private messaging system of Moodle, and a focus group at the end of the course, during which academic assistants shared their perceptions about learners’ interactions during delivery. Table 19 summarises the information provided by each data source, regarding instructional interactions, and how it was analysed.

**Table 19 Instructional interactions: Data analysis**

<table>
<thead>
<tr>
<th>Data Source</th>
<th>How Analysed</th>
<th>Information Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity logs</td>
<td>Categorisation and calculation of frequencies</td>
<td>Amount of interactions with content, teacher and peers according to students’ clicks in the online course</td>
</tr>
<tr>
<td>Think aloud sessions</td>
<td>Thematic analysis</td>
<td>Learning strategies students used when interacting with the content</td>
</tr>
<tr>
<td>Interview with teacher</td>
<td>Thematic analysis</td>
<td>Teacher’s perspective on course interactions</td>
</tr>
</tbody>
</table>
Data Source | How Analysed | Information Provided
--- | --- | ---
Messages in discussion forums | Thematic analysis, emergent themes | Trends, salient features and unusual behaviours in social interactions within the course environment
Evaluation surveys | Calculation of frequencies and percentages Thematic analysis, emergent themes | Feedback on students’ perceptions on engagement with course activities, interactions, favourite aspects of the course and suggestions for course improvement.
Focus group with academic assistants | Thematic analysis, emergent themes | Impressions, interpretations, and opinions about learners’ interactions during the online courses.

Evaluation of course effectiveness

The evaluation of course effectiveness helped answer the second research question: How effective are online courses characterised by high levels of different types of interactions? The literature guided data collection and analysis (see Table 6 in CHAPTER 2).

The senior learning designer and gatekeeper of this project helped establish the expectations that determined the objectives of the main course. Kirkpatrick’s (1979) and Kirkpatrick and Kirkpatrick’s (2010) levels of training effectiveness were considered in the evaluation. Whenever possible, a reference point, or baseline, was established to relate changes to the course. A control group served for comparison purposes (Philips, 1999; Kirkpatrick, 1979, 1996). Table 20 shows the goals for each level of course effectiveness, the data sources that helped evaluate them, and whether a pretest-posttest approach and control group were used.

Table 20 Description of course effectiveness evaluation

<table>
<thead>
<tr>
<th>Level of Effectiveness</th>
<th>Goal</th>
<th>Data Source</th>
<th>Pretest-Posttest</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>Satisfied students</td>
<td>Evaluation surveys</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Learning</td>
<td>Perception of having learned</td>
<td>Diagnostic and evaluation surveys</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Level of Effectiveness</td>
<td>Goal</td>
<td>Data Source</td>
<td>Pretest-Posttest</td>
<td>Control Group</td>
</tr>
<tr>
<td>------------------------</td>
<td>------</td>
<td>-------------</td>
<td>-----------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Exam grade above 9 (out of 10)</td>
<td>Exam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behaviours in the workplace</td>
<td>Perception of having improved communication skills</td>
<td>Diagnostic and evaluation surveys</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Observed improvement of communication competence</td>
<td>Observations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business results*</td>
<td>Increased sales</td>
<td>Sales records</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Return on expectations</td>
<td>Fulfilment of course participants’ expectations</td>
<td>Diagnostic and evaluation surveys</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

(*) Level 4 desired outcomes correspond to the whole Leadership Programme. Originally the organisation also wanted to impact other business results indicators. It expected the four online courses of the Leadership Programme to decrease employee turnover rate, enhance performance standards and improve the work environment. However, there was no data available in a format that could be used to identify changes after the courses, and so these goals had to be excluded from this research.

Before the delivery of the main course, participants answered a diagnostic survey, which gauged their initial expectations, their perception of previous knowledge on the topic and their self-evaluation of current communication skills (i.e., behaviours in the workplace). After finishing their studies, learners took an exam with closed questions that evaluated their knowledge acquisition. They also completed an evaluation survey, focused on their satisfaction, their perception of having learned, their feeling of being prepared to communicate more effectively with retailers in their team, and the fulfilment of their course expectations. As a point of reference, a control group (n=10), comprised of sales supervisors who did not study the online course, answered the final exam. The researcher calculated central tendency measurements and percentages of the results of these instruments, and compared results before and after the course, and between groups.
Before the start of the Leadership Programme, HR staff located in the different offices around Mexico attended the regular monthly sales meetings and conducted observations of the communication competence of sales supervisors, both students (n=49) and members of the control group (n=14). They sent their completed observation guides to the Education intern, who helped creating a database with information of each participant.

After the end of the Leadership Programme, observations were conducted again. The researcher compared the average grading of pre and post observations. Data was triangulated with students’ perceptions of their own improvement. The researcher also checked the sales records of learners who successfully completed the four online courses of the Leadership Programme (n=101) and a control group (n=38) who did not finish the programme. She considered the average sales quota fulfilment three months before and three months after the programme. As a further point of comparison, she examined the same data for the previous year. She conducted a Kolmogorov Smirnov test to check if differences between groups (i.e., those who completed the Leadership Programme versus those who did not) were statistically significant.

Figure 24 summarises the timeline of the application of instruments and data sources to evaluate course effectiveness.

**Figure 24 Timeline of evaluation of course effectiveness**

- **Observation**
- **MAIN COURSE**
- **Evaluation survey**
- **Sales records**

- Diagnosis survey
- Exam
- Observation
The focus group with academic assistants provided information about how management’s expectations had been met. Data was matched to the expectations described at the beginning of this research project (see CHAPTER 3).

**Comparison of outcomes of each version of the online course**

Data on interactions and course effectiveness obtained during previous steps helped answer the third research question: Which online course design (i.e., emphasising learner-content, learner-teacher or learner-learner interactions) results in the highest levels of effectiveness? The researcher compared and contrasted findings of each course version. She conducted a Kruskal-Wallis test to compare the exam grades of the learners who took the different course versions.

Additional information came from answers to the follow-up survey, which asked students about their course preferences, attempting to identify perceived advantages or disadvantages of the different types of interactions. The interview with the teacher and the focus group with the academic assistants also covered the topic of the comparison between online courses emphasising different types of interactions. Triangulating the information of these data sources, the researcher obtained an overview comprising the perspectives of key stakeholders: students, teacher and course designers.

**Ethics and the role of the researcher**

This research project was undertaken in accordance with the ethical guidelines of the University of Leicester, as established in the Research Ethics Code of Practice. At the start of the project, the researcher had a series of meetings with HR staff to discuss the expectations of the project. Originally, the researcher planned to have an informative session with potential participants to explain the details of the study and answer questions. However, this was not authorised by the gatekeeper, who considered it unnecessary and expensive due to the geographical dispersion of employees.
As an alternative, participants were informed about the study and its implications several times via different means, such as emails and introductory sections of instruments. In the main course, the initial diagnostic survey included an informed consent form with details of the study. Potential students were explicitly asked for their collaboration with the study. Participants’ collaboration was voluntary, and their answers were kept anonymous. The researcher also incorporated information about the study in the Teacher Manual.

The front page of every course had a note reminding participants that their contributions could be used for research purposes and adding a contact email address to answer questions and concerns. At the beginning of sessions providing qualitative information (i.e., think aloud, focus group, interviews), the researcher introduced herself as external to the organisation, provided information about the study and asked for participants’ consent.

To prevent participants from feeling compelled to portray e-learning in their organisation as ideal, questions were articulated in a neutral tone. The researcher emphasised that it was more about finding the best way of designing online training programmes than about evaluating specific employees’ performance. When appropriate, she also explained that this research aims to contribute to the body of knowledge, not to judge the people or the organisation. When conducting observations, evaluators (HR staff) were not required to provide their names.

Throughout the whole research project, several people helped to validate and pilot instruments and materials: senior learning designer, learning designer, Education intern, three external researchers with experience in online learning (two Mexican and one Uruguayan) and two people working in HR in other companies.

To prevent translation biases, a second translator did back-translations of quotes used to exemplify themes in CHAPTER 6, which were originally translated from Spanish by the
researcher. Both the original version and the back-translation were compared to ensure the same message was conveyed.

The researcher had several roles throughout this project. During the preparation stage (see CHAPTER 3), she acted as a facilitator, providing guidance on how to use the technology and how to create the required conditions for the successful implementation of online learning. She created resources and courses. As the organisation acquired experience, the researcher decreased her involvement with students. During the pilot of online courses (see CHAPTER 4), she had no official role in the courses but would answer questions if asked. By the time of the main study, she was an observer and performed as an external researcher.

Chapter summary: Methodology

This chapter presented the research questions of this thesis:

1. How do learners interact with the content, the teacher and other learners in online courses?
2. How effective are online courses characterised by high levels of different types of interactions (learner-content, learner-teacher and learner-learner)?
3. Which online course design (i.e., emphasising learner-content, learner-teacher or learner-learner interactions) results in the highest levels of effectiveness?

The research design applied to answer these questions is characterised by a focus on associations between instructional interactions and online course effectiveness, moderate researcher interference, a non-contrived setting, a mixed methods approach, a pragmatist paradigm and a non-probabilistic, purposive sample. Over 200 people participated in the main study, including 146 learners, 17 members of the control group, 30 teachers and 3 academic assistants.
Data sources included diagnosis, evaluation and follow-up surveys, activity logs, think aloud sessions, interview with teacher, messages in discussion forums, exams, observations, sales records and a focus groups with academic assistants. Table 21 characterises the research questions in terms of the data sources that helped answer them.

Table 21 Research questions and data sources

<table>
<thead>
<tr>
<th>Data Sources</th>
<th>RQ1: How do learners interact with the content, the teacher and other learners in online courses?</th>
<th>RQ2: How effective are online courses characterised by high levels of different types of interactions?</th>
<th>RQ3: Which online course design results in the highest levels of effectiveness?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity log</td>
<td>Diagnosis and evaluation surveys</td>
<td>All of the previous.</td>
<td></td>
</tr>
<tr>
<td>Think aloud sessions</td>
<td>Exams</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interview with teacher</td>
<td>Observations in the workplace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Messages in discussion forums</td>
<td>Sales records</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluation surveys</td>
<td>Focus group with academic assistants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus group with academic assistants</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Aiming to identify the most effective online course design, the researcher redesigned and developed a course on Feedback on Performance in order to create three different versions of it, each emphasising a different type of interaction (learner-content, learner-teacher or learner-learner). She then identified instructional interactions and their characteristics, evaluated course effectiveness (satisfaction, learning, behaviours in the workplace, business results and return on expectations) and compared the outcomes of each version of the online course. Results of the main study are presented in CHAPTER 6.
CHAPTER 6
RESULTS

Three versions of an online course on Feedback on Performance, each emphasising a different type of interaction (learner-content, learner-teacher or learner-learner), were designed, delivered and evaluated to identify differences in the effectiveness levels (satisfaction, learning, behaviours in the workplace, business results and return on expectations). Different data sources (see CHAPTER 5) provided information that helped answer the research questions. Table 22 lists these data sources and their corresponding sample.

Table 22 Participants per data source

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Interactions Emphasised in Course</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Learner-Content (n=47)</td>
<td>Learner-Teacher (n=43)</td>
</tr>
<tr>
<td>Diagnostic surveys</td>
<td>46</td>
<td>31</td>
</tr>
<tr>
<td>Activity logs</td>
<td>47</td>
<td>43</td>
</tr>
<tr>
<td>Think aloud sessions</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Interview with teacher</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Exams</td>
<td>43</td>
<td>33</td>
</tr>
<tr>
<td>Evaluation surveys</td>
<td>40</td>
<td>31</td>
</tr>
<tr>
<td>Observations</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Sales records</td>
<td>36</td>
<td>27</td>
</tr>
<tr>
<td>Follow-up surveys</td>
<td>22</td>
<td>18</td>
</tr>
</tbody>
</table>

This chapter (see Figure 25) articulates the results of the main study, grouping them in terms of the research questions (RQ):

1. How do learners interact with the content, the teacher and other learners in online courses?

2. How effective are online courses characterised by high levels of different types of interactions (learner-content, learner-teacher and learner-learner)?
3. Which online course design (i.e., emphasising learner-content, learner-teacher or learner-learner interactions) results in the highest levels of effectiveness?

Figure 25 Chapter structure: Results

Chapter 6 Results
- RQ1: How do learners interact with the content, the teacher and other learners in online courses?
  - Learner-content interactions
  - Learner-teacher interactions
  - Learner-learner interactions
  - RQ1 Summary: Interactions with content, teachers and learners
- RQ2: How effective are online courses characterised by high levels of different types of interactions?
  - Satisfaction
  - Learning
  - Behaviours
  - Business results
  - Return on expectations
  - RQ2 Summary: Effectiveness of different learning designs
- RQ3: Which online course design results in the highest levels of effectiveness?
  - RQ3 Summary: Most effective learning design
- Chapter summary: Results

The researcher is Mexican, a Spanish native speaker but with an excellent command of English. To exemplify findings, she translated some participants’ comments, focusing on substance over form. She used a word-by-word translation only when doing so would convey the same, or almost, meaning as the original words. In an attempt to reduce potential biases and mistakes, a second person, Mexican with work experience in English, did a back-translation of the quotes used, without looking at the original text. Both the original version and the back-translation were compared to ensure the same message was conveyed. Data codes assigned in Table 17, CHAPTER 5, are used for identification purposes of participants’ comments.
RQ1: How do learners interact with the content, the teacher and other learners in online courses?

The study of each online course version yielded valuable information on how learners interact. From the beginning it became clear that engagement levels with the activities varied. Using Moodle logs, the researcher identified the medians of participants’ active and passive clicks (i.e., those that resulted in an observable response versus those focused solely on viewing materials; see Table 23), established ranges of low, medium and high levels of clicks (see Table 24), defined interaction styles and classified students according to the framework described in Figure 23 in CHAPTER 5. In course versions with predominantly social interactions (learner-teacher or learner-learner), students tended to become observers, while more participants were contributors and task-focused in the course emphasising learner-content interactions. Table 25 shows this distribution.

Table 23 Medians of student clicks

<table>
<thead>
<tr>
<th>Type of Clicks</th>
<th>Interactions Emphasised in Course</th>
<th>All Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Learner-Content</td>
<td>Learner-Learner</td>
</tr>
<tr>
<td>Active</td>
<td>29</td>
<td>21</td>
</tr>
<tr>
<td>Passive</td>
<td>55</td>
<td>98.5</td>
</tr>
</tbody>
</table>

Table 24 Ranges of low, medium and high levels of clicks

<table>
<thead>
<tr>
<th></th>
<th>Active Clicks</th>
<th>Passive Clicks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>&lt;19</td>
<td>&lt;53</td>
</tr>
<tr>
<td>Medium</td>
<td>19-28</td>
<td>53-99</td>
</tr>
<tr>
<td>High</td>
<td>&gt;28</td>
<td>&gt;99</td>
</tr>
</tbody>
</table>

Note. The medium range includes 50% of all course participants.

Table 25 Distribution of learners according to their interaction style

<table>
<thead>
<tr>
<th>Interaction Style</th>
<th>Interactions Emphasised in Course</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Learner-Content</td>
<td>Learner-Teacher</td>
</tr>
<tr>
<td>Contributor</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Task-focused</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Observer</td>
<td>0</td>
<td>10</td>
</tr>
</tbody>
</table>
Students’ engagement in each particular type of instructional interaction (learner-content, learner-teacher and learner-learner) is described next.

**Learner-content interactions**

Participants (n=47) spent an average of four and a half hours on the course (the suggested duration was five hours). Most students (35/40; 88%) reported being engaged or very engaged with the activities. Half of the evaluation survey respondents claimed that there was nothing they could have done to further benefit from the course. Fifteen students said time had been an issue, but it was unclear whether they meant that senior management should provide them more time to study, or that they should organise their time more efficiently. Four learners failed to complete the course.

Reading texts were brief, between 350 and 1150 words. The language was kept as simple as possible. For most students these resources were easy to understand, as reported in evaluation survey comments: *What I like best of this course are* the examples, reading *[the materials]* is easy. Other learners found the materials complicated. There were no direct complaints about the difficulty of resources, only a comment in the evaluation surveys: *We need more time to read carefully the information.* However, one of the teachers, line manager of some of the students, explained it:

---

2 A version of this is also available in Padilla Rodriguez & Armellini (2013b).
I just have one [student], who has university studies. The rest have been retailers [...]. They just have secondary school education. I doubt they have any high school [studies]. Therefore, their reading comprehension level [...] well, it is bad.

[TI]

Think aloud data revealed that students used different strategies to make information more relevant or personalised. These included the following:

- Asking questions to themselves. Example: How often do I do this? [...] I am going to write it down...
- Taking notes. Example: When I am going through the course, I always try to have a piece of paper by my side, so I can write down what I feel can be useful for doing the activities. It is easier that way. If I have problems, here I have a source of answers.
- Relating the information to their own context. Example: I have a similar case with a retailer I supervise.
- Paraphrasing. Example: Certainly, I think that when we give feedback, when we ask for things in the clearest possible way, we promote good communication.

Some students read superficially, skimming through the text. However, activities (i.e., learner-content interactions) seemed to encourage them to go back and spend time on deeper readings. One participant explained it as follows:

Lots of times, [...] we read once and think, “I’ve read”, and we answer; and then we read again and think, “If I had read twice, I would have answered correctly”. You won’t gain anything by going too fast. It’s better to take the necessary time to read better.

[TA]

Students could self-pace throughout the online course, as they did not depend on others’ input to move forward. Thus, they could focus on the tasks. Activity logs provided
evidence of engagement with the content. Most participants had an average interaction style (21/47) or were contributors (12/47; see Figure 23 in CHAPTER 5). They had a median of 86 clicks throughout the course, 29 related to active contributions and 55 to passive viewings. Less than half of the students (19/47) checked optional resources such as glossary entries.

In spite of the researcher’s attempts to make course materials self-explanatory, during the think aloud sessions, six out of the eight participants had questions that were not answered by the content (e.g., Should I write it here?). Sometimes they would ask the researcher what to do. On other occasions they would read their own notes for answers. According to the activity logs, all but one student (46/47) checked the automated feedback received in at least one activity. Incorrect answers seemed to encourage students to read again (e.g., I think I have an incorrect answer… I am going to read again and then I will answer [again]).

In the evaluation surveys, 29 out of 40 respondents had no suggestions to improve the course, but three mentioned the importance of having embedded social interactions. Yet, students did not use the general discussion forum, which was available for questions and comments. Only six people viewed it during the course.

Although the course fostered no social interactions, the think aloud method provided some evidence of potentially meaningful peer exchanges happening outside the virtual learning environment. During all the sessions, either via phone calls or face-to-face interactions, work colleagues distracted students when they were navigating through the course. They interrupted to discuss job matters (e.g., retailers and sales), which were directly or indirectly related to the content of the course. Participants did not seem particularly bothered (or surprised) by these distractions. Colleagues seemed to represent a source of support, as evidenced by jokes and laughter that accompanied some of the interruptions.
Students were asked whether they had used Moodle’s private messaging system. Eighteen people answered this question. Fourteen of them had sent at least one private message to another participant. Ten had sent three or more messages. They had not been taught how to access the private messaging system.

**Learner-teacher interactions**

Students (n=43) spent an average of four hours and 24 minutes on the course (the suggested duration was five hours). Most students (28/31; 90%) reported being engaged or very engaged with the activities. More than half (20/31; 65%) claimed that there was nothing they could have done to further benefit from the course. Six learners said time had been an issue, but it was unclear whether they meant that senior management should provide them more time to study, or that they should organise their time more efficiently. Two mentioned that working more with peers could have helped them to further benefit from the course. Ten people failed to complete the course.

While 23 out of 31 participants had no suggestions to improve the course, three mentioned the importance of having more social interactions. Students were asked whether they had used Moodle’s private messaging system. Fourteen people answered. Eight of them had sent at least one private message to another participant. They had not been taught how to access the private messaging system.

The researcher had planned to analyse interactions between learners and teachers by conducting a thematic analysis of the messages in the discussion forums, and identifying key themes. However, in the sample of messages reviewed no real communication happened online, due to two main reasons:

1. **Lack of participation.** Most teachers (8/11) simply did not participate in the course. They did not foster communication, reply to messages or moderate discussions.
2. **Time delays.** Three teachers provided feedback but in an untimely manner (after
the course official period was over). The quality of these comments was generally high. Teachers referred to participants by their names, expressed their views concisely, provided examples, questioned, summarised, answered, etc. Yet, learners who had a response from the teacher did not reply, making it unclear if they had read and benefited from those comments.

Limited and untimely teacher participation was unexpected in the organisational context but foreseeable in terms of the research. Throughout the pilot stage (see CHAPTER 4), several teachers had been disengaged, and several strategies were deployed to encourage their participation, such as sending weekly reports of student progress, making follow-up phone calls and emailing summaries of the Teacher Manual. Replacing or excluding these teachers was not an option for the organisation. Staff from Human Resources assumed teachers would perform adequately because “it was their job”. After the end of this project, the previous assumption was finally reviewed. An academic assistant described it like this:

They [the teachers] didn’t get [personally] prepared [to deliver the course]. […] This was assigned by job position. You are their manager; thus, you are their facilitator. And, well, you need to have a vocation to teach. I don’t know if that was a very important factor in this, because there was something that did not work. […] They [the teachers] took an exhaustive leadership programme [face-to-face, provided by an external supplier]. […] I expected more from them.

[AA]

Several factors influenced the lack of online participation and time delays. Firstly, some teachers seemed to be confused about their role. This became apparent during the pilot of the online courses (see CHAPTER 4), when at least 10 teachers (out of 30) answered surveys meant for students. By the time the main course took place, teachers stopped participating as learners. Yet, the confusion seemed to remain, as described by the teacher who was interviewed:
Sometimes other colleagues, managers [who participated as teachers], ask me: Have you done the course? [...] But they talk like students. [...] I am not sure what my role as a teacher is...

[TI]

Secondly, teachers had difficulties managing their time and avoiding distractions in their workplace:

So I think: I will be here [in the online course] from 1 to 2 [pm]... but it is hard, because I can be concentrating and then someone comes to interrupt.

[TI]

Thirdly, communicating online was an issue for some teachers. None followed the Teacher Manual, which provided clear instructions on what to do in each e-tivity and included specific examples of how to moderate and give feedback. Some teachers also failed to take advantage of the available training opportunities to help them learn how to use the technology and to be online teachers. Other teachers simply needed more time and practice to become comfortable in online environments:

Those things that you don’t understand, you don’t do. [...] Over time, I’ve familiarised myself more [with the Moodle platform], but having an individual conversation, for example, without the discussion forum, I am not sure when I am doing that or not. [...] I am honestly not used to chat, or even use Facebook or something like that, online. [...] I am more used to emails.

[TI]

Finally, during the pilot stage (see CHAPTER 4), one of the teachers interviewed mentioned that she would do a follow up via phone calls. Some teachers shared the same physical space with students (i.e., they were located in the same office). Interactions outside the course environment could also explain the lack of online participation.
Course activities required students to obtain teachers’ feedback to move forward, thus preventing students from being self-pacing. Learners checked the discussion forums regularly, and some of them (10/43) took the role of observers (see Figure 23 in CHAPTER 5). They had a median of 91 clicks throughout the course, 20 related to active contributions (e.g., posting or editing messages) and 71, to passive viewings. On average, each student viewed the five activity-related discussion forums 53 times and sent eight messages in total (ten was the minimum required). Many messages were left unanswered (see Figure 26).

Even if task instructions did not require it, some students responded to the lack of support by taking the role of the teacher and responding to their peers. For example:

[Student A completes an activity task, by describing his strategy to provide feedback on the deficient performance of a collaborator.]
Student B: *I recommend you change [a part of the strategy]. There might be a better option.*

Student C: *Student A, I suggest that you directly ask what exactly is unclear and going wrong.*

[DF]

Other students responded to their peers in a shallow way and often just to agree. For example: *Excellent comment. That is a good example.* Either way, learners moved forward, regardless the lack of teacher participation.

Motivation decreased, as can be exemplified by Student X. At the beginning of the project, Student X was a typically enthusiastic learner. He would deliver more than what was required and expected. For example, in the preparation course Moodle Features (see CHAPTER 3), students were asked to try out the different tools available in the e-learning platform. They could gain accreditation for the course by just completing a single activity (e.g., editing a wiki, answering a poll or sending a contribution). Student X did all of the activities. He posted 16 messages in the discussion forum. He actively invited his peers to take advantage of the course (e.g., *Go for it. Click on everything, without fear. I swear that you won’t BREAK it. Only by doing, clicking, checking you will learn.*). He offered himself to provide support (e.g., *Whatever you need, please ask*).

During the preparation course Effective Online Students, Student X over-delivered again. Each of the five activities consisted of a task that required learners to post at least two messages in the discussion forums. Student X sent a total of 16 contributions. He replied to comments on his posts and challenged peers in a constructive way (e.g., *Student D, I think what you plan to do is worth of admiration […], but maybe it is overstretching it, don’t you think?*).
When the pilot of the online courses began (see CHAPTER 4), Student X was still surprising the researcher. During his first course, Empowering Beliefs (emphasising learner-teacher interactions), one of the two teachers in charge of his group was participating. Student X sent an email to the researcher and the Education staff to inform them about a presentation he had made for retailers in his team. It was based on the materials of the course. He wanted to show that he was applying in his daily job what he was learning online.

Nonetheless, as the pilot went on, his course mates decreased their participation and did not respond to Student X’s enthusiasm. Both teachers of his group became absent. By the time the main course started, Student X’s motivation seemed to be over. He stopped offering his support, questioning and commenting. His last messages were shallow and provide evidence of his discouragement (e.g., *Excellent communication with your team. Congratulations. Cheers.*).

The experience of Student X was not unique. Almost a third of students (12/43) was disengaged in the main course and reduced their efforts to the bare minimum (e.g., posting shallow messages and failing to complete activities). In the evaluation survey at the end of the course, one of the participants requested: *Let there be support from the facilitator.*

**Learner-learner interactions**

Students (n=56) spent an average of five hours and 18 minutes on the course (the suggested duration was five hours). Most students (44/46; 96%) reported being engaged or very engaged with the activities. Thirty-six students (36/46; 78%) claimed that there was nothing they could have done to further benefit from the course and had no suggestions to improve the course. Four learners said time had been an issue, but it was unclear whether they meant that senior management should provide them more time to
study, or that they should organise their time more efficiently. Eight people failed to complete the course.

The researcher had planned to analyse interactions between learners by conducting a thematic analysis of the messages in the discussion forums, and identifying key themes. However, no real communications happened online, due to three main reasons:

1. **Time issues.** Learners did not have specific time allocated in their daily work schedule to the study of the course. Sometimes they would only have one day available to study, which made it complicated for them to communicate asynchronously with their peers. Also, time delays in answering made it almost impossible for meaningful interactions to happen online.

2. **Shallow replies.** A high number of replies consisted of brief comments agreeing to other participants’ contributions (e.g., *Very good*) or telegraphic messages hard to interpret (e.g., *giving feedback*), as if students were just responding to fulfil the activities’ requirement and tick the box. Most of these contributions seemed to ignore task instructions.

3. **Lack of follow-up.** Learners who had a response from others would rarely (or never) reply (see Figure 27). It was thus unclear if they had read and benefitted from those comments.
Activities required students to respond to others and to check others’ comments on their contributions. This prevented learners from self-pacing. Participants checked the discussion forums regularly. Most students (30/56) took the role of observers (see Figure 23 in CHAPTER 5). Participants had a median of 119 clicks throughout the course, 21 related to active contributions and 98 to passive viewings. On average, each student viewed the six activity-related discussion forums 83 times and sent 12 messages, which is consistent with the minimum number of posts expected. Some messages were left unanswered.

Some participants did use the discussion forums to elaborate on the topic (e.g., *It may be very motivating to acknowledge the efforts of our collaborators, but it is more important the way in which we provide the feedback*), provide suggestions (e.g., *Your feedback is* ...
motivating, but you need to be more specific. If you generalise, you might neglect important details, and show support (e.g., You have the experience and skill to achieve [your goal]. Remember that each retailer has a different level of motivation and you have the way of making them be motivated.). Most contributions seemed to ignore task instructions. Teachers in this course version provided no clarification, although expected (i.e., moderation was supposed to happen in case students got the wrong idea). Academic assistants used e-learning tips to address confusions.

In spite of the problems, some learners found contributions from others beneficial. In the evaluation surveys, when asked about the aspect of the course they had enjoyed most, nine answers (out of 46) referred to learner-learner interactions:

- The comments of my course mates and the experiences we shared
- The participation of my course mates, which at the same time served me as feedback
- Interacting with my course mates

When asked whether they had used Moodle’s private messaging system, 10 students (out of 12 who answered) reported having sent at least one private message to another participant. They had not been taught how to access the private messaging system.

Online communications between learners in the main course contrast peer interactions in the preparation stage of this thesis project (see CHAPTER 3). In the course Moodle Features, 137 students were part of a single group. The only requirement for accreditation was to do at least one of the activities. Most participants did more than one. The discussion forum, while optional, was a lively space. Seventy students posted 152 messages, mostly expressing their enthusiasm and inviting others to participate.
In the second preparation course, Effective Online Students, the learning dynamic was different. There were five mandatory, non-assessed activities with specific instructions to follow. Each task required posting at least two messages (an initial one and at least one response to others’ contributions). The 97 participants performed adequately, posting 951 messages, approximately 10 per learner. In this course, 60 out of 97 students answered an open question about their favourite aspect in the same way: Interacting with others. In this research, it was found that the smaller the number of students in a course, the lower the participation rates and the quality of interactions.

In both the Moodle Features and Effective Online Students courses most of the exchanges were between peers. However, students had the support and guidance of the researcher, who helped moderating the discussions and providing feedback.

**RQ1 Summary: Interactions with content, teachers and learners**

This section described how students interacted with content, teachers and other learners in three online course versions, each emphasising a different type of instructional interactions. Different themes were addressed, including the average time dedicated to studying, course dropout rates, possibility to move forward independently (i.e., self-pacing), advantages of each type of interaction (learner-content, learner-teacher and learner-learner) and problems when interacting. Table 26 summarises the findings of this section, providing a comparison of the online course versions.

**Table 26 Comparison of online course versions**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Interactions Emphasised in Course</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Learner-Content</td>
</tr>
<tr>
<td>Average study hours</td>
<td>4:30</td>
</tr>
<tr>
<td>Dropout rate</td>
<td>9% (4/47)</td>
</tr>
<tr>
<td>Option to self-pace</td>
<td>Yes</td>
</tr>
<tr>
<td>Learners reporting</td>
<td>88% (35/40)</td>
</tr>
<tr>
<td>engagement with</td>
<td></td>
</tr>
<tr>
<td>Criteria</td>
<td>Interactions Emphasised in Course</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>course</td>
<td></td>
</tr>
<tr>
<td>Median active clicks</td>
<td>29</td>
</tr>
<tr>
<td>Median passive clicks</td>
<td>55</td>
</tr>
<tr>
<td>Main interaction style (excluding average)</td>
<td>Contributor</td>
</tr>
<tr>
<td>Learners sending private messages to other course participants</td>
<td>78% (14/18)</td>
</tr>
<tr>
<td>Main advantage of type of interaction</td>
<td>Activities encouraged learners to spend time on deeper readings.</td>
</tr>
<tr>
<td></td>
<td>Most learners made progress <em>despite</em> rather than <em>as a result of</em> teachers’ participation (i.e., they found ways to compensate the lack of teacher guidance and feedback).</td>
</tr>
<tr>
<td></td>
<td>Active communities of learners constitute potential learning opportunities.</td>
</tr>
<tr>
<td>Main problem when interacting</td>
<td>Questions not answered by course content</td>
</tr>
<tr>
<td>Consequence of main problem on learners</td>
<td>Confusion</td>
</tr>
<tr>
<td>Learners’ solution to main problem</td>
<td>Finding other sources of support, like colleagues to talk to or their notes</td>
</tr>
<tr>
<td></td>
<td>Stepping into the role of the teacher</td>
</tr>
<tr>
<td></td>
<td>Seeking other colleagues or means to communicate</td>
</tr>
</tbody>
</table>

Finally, all online courses seemed to trigger informal learning activities beyond the official requirements, on and offline, such as writing notes and sending private messages to other participants. In this sense, the design did not dictate the type of interactions that students actually used.
RQ2: How effective are online courses characterised by high levels of different types of interactions?

The effectiveness of the different versions of the Feedback on Performance online course was evaluated in terms of Kirkpatrick’s (1979) levels: satisfaction, learning, behaviours in the workplace and business results, plus return on expectations (Kirkpatrick & Kirkpatrick, 2010; V. Anderson, 2007). For clarity, when listing examples specific to a course version, the abbreviations LC, LT and/or LL are included in reference to the emphasis on learner-content, learner-teacher and learner-learner interactions, respectively.

**Satisfaction**

Regardless of the predominant type of interaction designed, 97-100% of participants reported being satisfied or very satisfied with their online course (see Table 27). Comments tended to be positive. For example:

- **LC**: Good course. I congratulate you.
- **LT**: Thank you for this course.
- **LL**: This course helps me very much to improve the performance of my retailers.

<table>
<thead>
<tr>
<th>Interactions Emphasised in Course</th>
<th>Learner-Content (n=40)</th>
<th>Learner-Teacher (n=31)</th>
<th>Learner-Learner (n=46)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction: Satisfied students</td>
<td>97.5%</td>
<td>100%</td>
<td>97.8%</td>
</tr>
</tbody>
</table>

In the course evaluation surveys, some optional positive comments seemed to relate more to the whole e-learning initiative than to the Feedback on Performance course. For example:

- **LC**: Just thank you for renovating and learning the activities we carry out every day.
- **LT**: It is very satisfying to work in companies that care about the preparation of their collaborators.
LL: Thank you for worrying about training day by day all the sales force.

Learning

Despite the issues that arose throughout the courses (e.g., unanswered questions, lack of feedback and shallowness of interactions), students managed accomplish the learning outcomes. The favourite aspect of the course for most participants was learning about the topic of the course (i.e., feedback on performance). Answers to the question, what did you like best from the course, include:

LC: Learning about non-verbal communication
LT: Knowing different ways of giving feedback
LL: Understanding how to give feedback

In the diagnostic survey, students’ average self-assessment of their own previous knowledge of the course topic was similar across the different groups and ranged from 7.2/10 to 7.6/10. This initial self-diagnosis is consistent with the exam average (7.1/10) of the control group, who completed the exam without doing the course. All course participants, but one, reported having learned a lot or very much. They had higher average exam grades than the control group, 9.5 versus 7.1 (see Table 28).

Table 28 Average exam grades

<table>
<thead>
<tr>
<th>Interactions Emphasised in Course</th>
<th>Control Group (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Learner-Content (n=43)</td>
<td>9.5</td>
</tr>
<tr>
<td>Learner-Teacher (n=33)</td>
<td>9.4</td>
</tr>
<tr>
<td>Learner-Learner (n=48)</td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td>7.1</td>
</tr>
</tbody>
</table>
**Behaviours**

Before the course started, participants answered a diagnostic survey where they self-assessed their communications skills. Average ratings ranged from 8.9 to 9.0 in the different groups. Initial observations conducted by the Human Resources staff during sales meetings were consistent with this, with average evaluations fluctuating between 8.6 and 9.1.

After the course, all learners (but four, two of the learner-content and two of the learner-learner groups) reported feeling more prepared than before to provide effective feedback to their collaborators. Eight students mentioned the applicability of the course as their favourite aspect:

LC: *It is practical, because I can apply it immediately.*

LT: *... the practical development*

LL: *Practical activities, focused on our daily work.*

Observations in subsequent sales meetings showed no significant improvements in terms of behaviours in the workplace. The differences between the average ratings of observed communication competence before and after the online course were minimal.

For those enrolled in the course version with predominant learner-teacher instructional interactions, there was a decline of 0.4 in the average overall rating. Learners on the courses designed with a focus on learner-content and learner-learner interactions deployed enhanced communication skills (average improvement of 1.8%, versus -2.0% in the control group).

Table 29 shows these findings as well as the evaluations of the control group.
### Table 29 Differences in workplace behaviours before and after the course

<table>
<thead>
<tr>
<th>Interactions Emphasised in Course</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner-Content</td>
<td>Learner-Teacher</td>
</tr>
<tr>
<td>Pre-course behaviour self-assessment</td>
<td>9.0</td>
</tr>
<tr>
<td>Pre-course observation</td>
<td>9.1</td>
</tr>
<tr>
<td>Post-course observation</td>
<td>9.3</td>
</tr>
<tr>
<td>Behaviour change</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

**Business results**

Every month students had a variable sales quota to meet. The researcher considered two periods of three months, before and after the delivery of the Leadership Programme, and calculated the average percentage of sales quota coverage (see Table 30). While all sales supervisors increased the quota coverage in the second three-month period, the ones who studied the four online courses of the Leadership Programme had a larger increase than the ones who did not complete the programme (control group), 7.6 versus 6.7 percentage points. A Kolmogorov Smirnov test revealed that this difference was not statistically significant.

Table 30 shows the average percentage of sales quota coverage before and after the Leadership Programme for students of the course versions emphasising learner-content, learner-teacher and learner-learner interactions. All learners also completed the three pilot courses. These results must be viewed with caution, as external factors, such as the competitors’ marketing strategies and the economic crisis, may influence customers’ behaviours and thus, sales.
Table 30 Average percentage of sales quota coverage 2012

<table>
<thead>
<tr>
<th>Interactions Emphasised in Course</th>
<th>Learner-Content (n=36)</th>
<th>Learner-Teacher (n=27)</th>
<th>Learner-Learner (n=38)</th>
<th>Learners who completed the whole programme (n=101)</th>
<th>Control Group (n=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr-Jun 2012: Before the programme</td>
<td>90.3</td>
<td>96.2</td>
<td>92.3</td>
<td>92.6</td>
<td>91.0</td>
</tr>
<tr>
<td>Sep-Nov 2012: After the programme</td>
<td>99.7</td>
<td>100.7</td>
<td>100.2</td>
<td>100.2</td>
<td>97.7</td>
</tr>
<tr>
<td>Difference in percentage points</td>
<td>9.4</td>
<td>4.5</td>
<td>7.9</td>
<td>7.6</td>
<td>6.7</td>
</tr>
</tbody>
</table>

To have a reference point in terms of the general sales quota coverage trend, the researcher analysed the same data, from the same people, but for the previous year, 2011 (see Table 31). As in 2012, all sales supervisors increased the quota coverage in the second three-month period. However, in 2011 the people who would later complete the Leadership Programme had a lesser increase than the ones who would later be part of the control group, 4.9 versus 7.4 percentage points.

Table 31 Average percentage of sales quota coverage 2011

<table>
<thead>
<tr>
<th></th>
<th>Learner-Content (n=36)</th>
<th>Learner-Teacher (n=27)</th>
<th>Learner-Learner (n=38)</th>
<th>Learners who completed the programme in 2012 (n=101)</th>
<th>Control Group (n=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr-Jun 2011</td>
<td>97.0</td>
<td>93.8</td>
<td>99.2</td>
<td>97.3</td>
<td>92.4</td>
</tr>
<tr>
<td>Sep-Nov 2011</td>
<td>100.4</td>
<td>105.0</td>
<td>103.0</td>
<td>102.3</td>
<td>99.8</td>
</tr>
<tr>
<td>Difference in percentage points</td>
<td>3.4</td>
<td>11.2</td>
<td>3.8</td>
<td>4.9</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Note: The headings “Learner-Content”, “Learner-Teacher”, “Learner-Learner” are used for reference only, as the cells below these headings include the data of the people who the next year studied the different versions of the main course reported on this thesis.
Return on expectations

At the beginning of the Feedback on Performance course, participants answered a diagnostic survey and identified their expectations. These were categorised in terms of satisfaction, learning, behaviours in the workplace, business results and return on investment. Table 32 shows the percentage of participants that selected each of these different types of pre-course expectations. While all levels of training effectiveness were relevant for most participants, the acquisition and application of knowledge and its translation to business results seemed to be the most important ones, with 81-88% of respondents selecting these options.

Table 32 Pre-course expectations

<table>
<thead>
<tr>
<th>Expectations</th>
<th>Interactions Emphasised in Course</th>
<th>All Groups’ Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Learner-Content</td>
<td>Learner-Teacher</td>
</tr>
<tr>
<td>Satisfaction: Experiencing an enjoyable online</td>
<td>63% (29/46)</td>
<td>51% (16/31)</td>
</tr>
<tr>
<td>course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning: Acquiring theoretical knowledge on</td>
<td>85% (39/46)</td>
<td>68% (21/31)</td>
</tr>
<tr>
<td>effective feedback.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behaviours: Providing feedback more effectively</td>
<td>85% (39/46)</td>
<td>81% (25/31)</td>
</tr>
<tr>
<td>to collaborators.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business results: Increasing sales, improving</td>
<td>91% (42/46)</td>
<td>90% (28/31)</td>
</tr>
<tr>
<td>the work environment, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return on investment: Obtaining economic benefits</td>
<td>52% (24/46)</td>
<td>55% (17/31)</td>
</tr>
<tr>
<td>higher than the cost of this course.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Percentages add up to more than 100% because participants could select more than one option.
At the end of the course, regardless of the type of interactions emphasised, all participants reported in the evaluation surveys that their expectations had been met. These data are in line with students’ perceptions of being satisfied with their course (see Satisfaction section), considering that they had learned (see Learning section) and feeling prepared to provide effective feedback to their collaborators (see Behaviours section).

At the start of the project, the researcher had an interview with a senior learning designer, who was also the gatekeeper and was in charge of continuing the online learning initiative if it was deemed successful by the management (see CHAPTER 3). She provided an overview of her specific expectations. After this initial conversation, two more meetings were arranged, one with the HR manager and another with the HR director. They both expressed their expectations in more general terms: Do something great, innovative. All conversations were characterised by excitement and enthusiasm towards the project, and assurance of support. After this research ended, expectations had been met, as there was evidence of their fulfilment. Table 33 summarises these data.

Table 33 Fulfilment of gatekeeper’s expectations

<table>
<thead>
<tr>
<th>Expectation</th>
<th>Evidence of Fulfilment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being pioneers (the Human Resources area) in the widespread implementation of well-designed online education at the organisation.</td>
<td>At the time of writing, 124 sales supervisors had completed the four online courses of the Leadership Programme and experienced different learning designs focused on learner-content, learner-teacher and learner-learner interactions.</td>
</tr>
<tr>
<td>Challenging myths about online education in the organisation.</td>
<td>In the preparatory courses, all participants, teachers and students, had access to a text on myths and realities about e-learning, and a related activity.</td>
</tr>
<tr>
<td></td>
<td>Throughout the project, interactive activities provided participants with numerous opportunities to refute some common misconceptions (e.g., that an online course is only reading materials online).</td>
</tr>
<tr>
<td>Expectation</td>
<td>Evidence of Fulfilment</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Implementing a high-impact programme at the organisation.</td>
<td>As planned, an existing Leadership Programme was redesigned and delivered online. Results were mostly positive (see Table 34), and the benefits exceeded what was planned. All online courses seemed to trigger informal learning activities beyond the official requirements, on and offline. This marks the shifting away from a paradigm in which workplace training is entirely a face-to-face formal activity, solely the responsibility of the HR department.</td>
</tr>
<tr>
<td>Taking advantage of the technological resources of the organisation.</td>
<td>The Moodle platform was installed in the servers of the organisation. Sales supervisors studied online using the netbooks they had received months before the start of the project.</td>
</tr>
<tr>
<td>Evidencing the benefits of technology and online learning.</td>
<td>At the time of writing, the organisation had capitalised on the lessons learned during this project to improve and expand their offer of online courses. New groups of employees were studying online. The decision to continue investing time and human resources in the development and delivery of online courses suggests that the management was convinced of the related benefits.</td>
</tr>
<tr>
<td>Obtaining “hard” data about the effectiveness of online training.</td>
<td>Evaluations included quantitative data of different indicators of effectiveness (see Table 34).</td>
</tr>
<tr>
<td>Doing something great, innovative.</td>
<td>More than 200 people were involved in the project, including sales supervisors, managers, directors, learning designers, and technologists. While it was not the first e-learning initiative at the organisation, it was the most widespread one. Innovative ways of designing online courses were tested as a result of this project. Interactions with the content, the teacher and other learners were key elements and changed the previous status of courses as repositories of materials.</td>
</tr>
</tbody>
</table>
**RQ2 Summary: Effectiveness of different learning designs**

This section described the effectiveness of different course versions in terms of student satisfaction, learning, changes in workplace behaviours, achievement of business results (i.e., sales) and return on expectations. In general, participants who took the course obtained better results than the control group. Table 34 summarises the findings of this section, providing a comparison of the course versions.

<table>
<thead>
<tr>
<th>Interactions Emphasised in Course</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction: Percentage of satisfied students</td>
<td>97.5%</td>
</tr>
<tr>
<td>Learning: Average exam grades (out of 10)</td>
<td>9.5</td>
</tr>
<tr>
<td>Behaviours: Average observed change</td>
<td>1.9%</td>
</tr>
<tr>
<td>Results: Increase in sales quota coverage (percentage points)</td>
<td>9.4</td>
</tr>
<tr>
<td>Return on expectations: Percentage of students reporting fulfilment of expectations</td>
<td>100%</td>
</tr>
</tbody>
</table>

Some expectations exceeded the scope of the Feedback on Performance course and concerned the whole e-learning project implemented at the organisation. These were fulfilled and led to strategic, evidence-based changes in training practices at the organisation.

**RQ3: Which online course design results in the highest levels of effectiveness?**

Considering student satisfaction, learning outcomes and return on expectations, all courses were equally effective, regardless of the type of interactions emphasised (see
A Kruskal-Wallis test was run to compare the exam grades of the learners who took the different course versions. Results were not statistically significant.

Students reported that interactions with content, teachers and peers were helpful and worthwhile. Regardless of the design, all survey respondents (but two, n=117) reported that the materials fostered their reflection on the course topics. They considered reading resources and activities valuable for achieving learning outcomes:

- LC: *It [the course] is understandable, entertaining and with practical examples.*
- LT: *The examples are very understandable.*
- LL: *... I liked the entire course, especially because the examples are current and help us a lot to understand the lessons.*

Learners of all groups tended to rate peer and teacher participation favourably, by expressing their agreement with the following statements:

- In this course, I have shared valuable learning experiences with other students.
- The teacher helped me understand the topics of the course.

Participants enrolled in the course emphasising learner-content interactions, which had no collaborative activities with peers or teachers, also agreed with the previous statements. It was unclear whether they were referring to their communications via Moodle’s private messaging system (reported by 14 out of 18 who answered the question), or, as pointed out by the Education staff, they simply did not want to show their colleagues or their teachers, most of whom were also their bosses, in a negative light.

A final, follow-up survey asked participants to compare the different courses they had studied as part of the Leadership Programme, including the ones of the pilot stage. Most students (54%; 30/56) reported liking them all equally. The 26 who had a preference
described it mostly in terms of the topic (38%; 10/26). No preference was expressed as a result of the interactions designed into the courses. Table 35 pairs the number of students who showed a preference for a course with the reported reasons for such preference.

**Table 35 Reasons to prefer a course**

<table>
<thead>
<tr>
<th>Main interaction type</th>
<th>Pilot Courses</th>
<th>Main Course</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Situational Leadership</td>
<td>Empowering Beliefs</td>
</tr>
<tr>
<td></td>
<td>Learner-Content</td>
<td>Learner-Teacher</td>
</tr>
<tr>
<td>Topic</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Activities</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Communication with peers</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Teacher guidance</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

When asked in an interview, one of the teachers mentioned not having any preference and focused his answer more on the topics of the courses than on the learning design or the results:

*I liked the [course] of [situational] leadership [emphasising learner-content interactions] very much; in particular, I liked that one very much. I also liked the one of [effective] performance [emphasising learner-learner interactions], but now I have been looking at the one of empowering beliefs [emphasising learner-teacher interactions] and it seems to be closely related to what happens every day with [my] people.*

[TI]

Although in terms of preferences, satisfaction, learning and return on expectations all learning designs were equal, there were differences when considering the last two levels of Kirkpatrick’s (1996) model: behaviours in the workplace and business results. Students
in the course emphasising learner-teacher interactions had inadequate results (see Table 34). These outcomes were worse than those of learners enrolled in all other course versions and those of the control group.

Factors beyond instructional interactions should be considered, such as problems during delivery. Delivery posed new challenges for course effectiveness, which were not fully incorporated into the design phase. As described, these problems included learners having questions not answered by course content, teachers being disengaged and students sending shallow student contributions.

All academic assistants considered that learner-content interactions were ideal in their organisational context. They acknowledged that this type of design requires more time in developing the materials because they need to identify potential questions and provide answers for them before they happen. However, solving the main problem that may arise from this type of interactions (e.g., questions unanswered by course content) is within their control as designers.

Two academic assistants also considered that learner-learner interactions could be beneficial at the organisation, especially when participants from different sales areas were together (in this project, groups divided students according to their own region):

[I found] a full acceptance of interactions between course mates, especially when they belonged to different sales areas. They [students] saw it [learner-learner interactions] as something very enriching, sharing experiences. That is something that in face-to-face courses I have [also] noticed that they value.

[AA]

Learner-teacher interactions were not considered suitable for online courses within the organisation. One of the academic assistants explained that one may need a vocation to teach, which some of the managers and directors did not have, and the lack of it could
have negative repercussions: *If the teachers [of a course with mostly learner-teachers interactions] are not doing their job, everything gets stuck.* Suggestions to prevent teacher disengagement included having clear objectives for them (e.g., ensuring all their students complete the course).

At the time of writing, the organisation was improving and expanding their offer of online courses, using designs based on learner-content and learner-learner interactions.

**RQ3 Summary: Most effective learning design**

The findings suggest that no specific course design results in higher levels of effectiveness, when considering satisfaction, learning and return on expectations. In terms of behaviours and business results, there was a difference. Students in the course emphasising learner-teacher interactions had the worst results of all groups.

When considering factors beyond instructional interactions, for the organisation, learner-content interactions are valuable because they help to establish a baseline of information to be delivered, regardless of what other course participants do. A designer can control the content, but not human participation. Course delivery is as important as learning design.

**Chapter summary: Results**

This chapter addressed the three main research questions of this thesis by describing the findings obtained from different data sources. Table 36 provides a succinct summary. These findings are discussed in the light of previous literature in CHAPTER 7.
### Table 36 Summary of results

<table>
<thead>
<tr>
<th>RQ1: How do learners interact with the content, the teacher and other learners in online courses?</th>
<th>RQ2: How effective are online courses characterised by high levels of different types of interactions?</th>
<th>RQ3: Which online course design results in the highest levels of effectiveness?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Sources</strong></td>
<td><strong>Key Findings</strong></td>
<td><strong>Key Findings</strong></td>
</tr>
</tbody>
</table>
| Activity log  
Think aloud sessions  
Interview with teacher  
Messages in discussion forums  
Evaluation surveys  
Focus group with academic assistants | Activities encouraged learners to read in greater depth. Yet, the course material could not provide answers to every question.  
Learners made progress *despite* rather than *as a result of* teachers’ participation, which tended to be below the expected standards.  
Active communities of learners constitute potential learning opportunities, which may be scuppered by shallow contributions and superficial engagement.  
All online courses seemed to trigger informal learning activities beyond the formal requirements, on and offline. | Regardless of the types of interactions designed into the courses, 97-100% of participants reported being satisfied with their online course.  
All course participants had higher average exam grades than the control group, 9.5 versus 7.1.  
Learners on the courses designed with a focus on learner-learner and learner-content interactions deployed enhanced communication skills (average improvement of 1.8%, versus -2.0% in the control group).  
Sales supervisors who completed the Leadership Programme increased their sales quota coverage more than the control group who did not complete the programme, 7.6 versus 6.7 percentage points.  
All participants reported that their course expectations had been met. | All online courses were equally effective in terms of satisfaction, learning and return on expectations, regardless of their design.  
Delivery posed new challenges for course effectiveness, not fully incorporated into the design phase. |
| Diagnosis and evaluation surveys  
Exams  
Observations in the workplace  
Sales records  
Focus group with academic assistants | All of the previous. | All of the previous. |
CHAPTER 7
DISCUSSION

This thesis reports the findings of a comprehensive study aimed at evaluating the relationship between different types of online interactions (learner-content, learner-teacher and learner-learner) and course effectiveness (satisfaction, learning, behaviours in the workplace, business results and return on expectations) in a large Mexican organisation (see CHAPTER 6). Implementation required thorough planning, technology management, training of relevant stakeholders, design, pilot, delivery and evaluation of the online courses. The researcher collected evidence of the whole process through field notes, observations, interviews, surveys, exams, server logs and sales records (see CHAPTER 3, CHAPTER 4 and CHAPTER 5). This chapter aims to analyse the results in the light of the literature review (see CHAPTER 2) and the conceptual framework derived from it (see Figure 6). The discussion (see Figure 28) is grouped according to research questions and key findings.

Figure 28 Chapter structure: Discussion

<table>
<thead>
<tr>
<th>Chapter 7 Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• RQ1: How do learners interact with the content, the teacher and other learners in online courses?</td>
</tr>
<tr>
<td>o Activities encouraged learners to read in greater depth. Yet, the course material could not provide answers to every question.</td>
</tr>
<tr>
<td>o Learners made progress despite rather than as a result of teachers’ participation, which tended to be below the expected standards.</td>
</tr>
<tr>
<td>o Active communities of learners constitute potential learning opportunities, which may be scuppered by shallow contributions and superficial engagement.</td>
</tr>
<tr>
<td>o All online courses seemed to trigger informal learning activities beyond the official requirements, on and offline.</td>
</tr>
<tr>
<td>o Summary: How do learners interact with the content, the teacher and other learners in online courses?</td>
</tr>
<tr>
<td>• RQ2: How effective are online courses characterised by high levels of different...</td>
</tr>
</tbody>
</table>
types of interactions?
- Regardless of the types of interactions designed into the courses, 97-100% of participants reported being satisfied with their online course.
- All course participants had higher average exam grades than the control group, 9.5 versus 7.1.
- Learners on the courses designed with a focus on learner-content and learner-learner interactions deployed enhanced communication skills (average improvement of 1.8%, versus -2.0% in the control group).
- Sales supervisors, who completed the Leadership Programme, increased their sales quota coverage more than the control group, who did not complete the programme, 7.6 versus 6.7 percentage points.
- All participants reported that their course expectations had been met.
- Summary: How effective are online courses characterised by high levels of different types of interactions?
  - RQ3: Which online course design results in the highest levels of effectiveness?
    - All courses were equally effective in terms of satisfaction, learning and return on expectations, regardless of their design.
    - Delivery posed new challenges for course effectiveness, not fully incorporated into the design phase.
    - Summary: Which online course design results in the highest levels of effectiveness?
  - Beyond the research questions
    - The implementation of corporate e-learning should be acknowledged as an inter-departmental process.
    - Effective online courses can work as a lever for organisational change.
    - The successful implementation of corporate online learning requires more than effective course design and delivery.
  - Chapter summary: Discussion

**RQ1: How do learners interact with the content, the teacher and other learners in online courses?**

The different versions of the Feedback on Performance online course provided an overview on the advantages and disadvantages of learner-content, learner-teacher and learner-learner instructional interactions. Their analysis also offered an insight into the importance of communications and exchanges beyond the boundaries of online courses.
The importance of incorporating more than one type of interaction to compensate for the disadvantages of the chosen form of instructional interaction is also highlighted. This notion is in line with theory of constructivism, as this asserts that learning results from complex interactions. It also highlights the conceptualisation of learning both as an individual and a social process, requiring the acquisition of conceptual knowledge (in the form of learner-content interactions) but also the participation of others (Phillips, 1995).

A single type of instructional interactions may not be sufficient to foster learning. This idea may appear to be similar to the second thesis of Anderson’s (2003a) interaction equivalency theorem: High levels of more than one of three types of interaction (learner-content, learner-teacher and learner-learner) are likely to provide a more satisfying educational experience but at a higher monetary and time cost than less interactive courses. However, there is a difference. It is not a matter of having high levels of several types of interactions but of not relying on only one type.

Activities encouraged learners to read in greater depth. Yet, the course material could not provide answers to every question. In all groups, participants (115 out of 117) reported that the materials fostered their reflection on the course topics. This finding is in line with previous research on student agreement on the relevance of learner-content interactions (Kellogg & Smith, 2009 & Miyazoe & Anderson, 2010a; Rhode, 2009).

The course version with predominant learner-content interactions promoted flexibility and self-pacing, by enabling students to move forward without waiting for others’ input. Materials provided standard opportunities for learning. Activities requiring explicit responses and automated feedback were useful as a means of ensuring comprehension and encouraging a return to earlier parts of the content when confusions arose. Students tended to follow the recommended structure and to check the automated feedback. In
this sense, learner-content interactions performed functions usually carried out by teachers (Anderson, 2003b), such as suggesting a learning pathway and providing guidance.

Some participants attempted to contextualise the content, relating it to their own workplace experiences and making it more relevant to them. However, as in Cotton and Gresty’s study (2007), some students skimmed through the reading materials. In spite of the high time investment in their design and development, resources and activities were not completely self-explanatory. When learners had questions, there was seemingly no one to help (as was the case in Padilla Rodriguez & Fernandez Cardenas, 2012). The general support discussion forum was a dead space, rarely viewed, never used.

Yet, students were resourceful when attempting to obtain extra help. They moved beyond what the course offered. They took notes they could look back to, sought communication from peers via Moodle’s private messages, or turned to work colleagues available face to face to discuss ideas. This finding is consistent with the notion that learner-content interactions are limited in comparison to the more meaningful learning experiences that exchanges between people may create (Anderson & Garrison, 1998; Su et al., 2005). It also highlights the importance of informal interactions, which have been reported to have a high value as factors determining the quality of the learning experience (Rhode, 2009).

*Learners made progress despite rather than as a result of teachers’ participation, which tended to be below the expected standards.*

While it is usually expected that teachers will guide students and motivate them to learn (Anderson & Garrison, 1998; Moore, 1989), in the main study this was not the case. Most teachers were disengaged and did not perform adequately, despite explicitly committing to participate at the beginning of the project and undergoing training on how to teach online. Learners frequently viewed the discussion forums, as if waiting for their teachers to provide feedback or guidance. However, teachers did not respond on time.
This situation was foreseen during the pilot stage of this project (see CHAPTER 4), when less than half the teachers performed adequately and a third of them confused their role with that of learners. Actions were undertaken to foster teacher participation (e.g., Education staff made regular phone calls to those who were not logging in), prevent technology from being a limitation (e.g., the researcher reduced the number of wikis used in the main course to one, as she noticed that participants were struggling with this tool) and clarify expectations (e.g., Education staff sent teachers emails with a summary of the information available in the Teacher Manual). These strategies were clearly not enough.

Perhaps teachers thought their role was that of a content provider. This is a common assumption among first-time online teachers (Conrad, 2004). Since reading materials were already available and tasks had been outlined, they may have felt comfortable with a hands-off approach. Perhaps they thought the online course could teach itself, as it included clear resources and activities. Other Mexican online teachers have been reported to acknowledge the benefits of interactive tools without actually using them (Torres Velandia et al., 2010). Or maybe time constraints and work pressures made it difficult for teachers, who were also sales managers or directors, to fully engage in their courses. Employees at organisations usually prioritise job-related tasks over online learning activities (e.g., Gunawardena et al., 2010).

It is currently not feasible for the organisation to hire external teachers to run the online courses. Is it better to have an online teacher who performs poorly than no teacher at all? The answer to this question is beyond the scope of this thesis. The issue remains unanswered at the participating organisation. Nonetheless, the answer is likely to depend on the type of interaction emphasised in the course design. If learner-teacher communications are required for students to move forward, it is necessary to have a teacher, regardless of how poor their performance is. If other types of interaction are embedded into the course, having no teacher may be better than having an inadequate
one. Either way, it is clear that misguided beliefs about how to teach online need to be tackled comprehensively as part of the long-term process of adapting to a different mode of organisational learning.

Students managed to make progress in spite of the lack of teacher participation. Some of them replied to their peers, providing recommendations and guidance (i.e., taking the role of the teacher). Similar situations have been reported, when students facilitated online discussions, motivating their course mates, exploring different opinions and generating innovative ideas (e.g., Baran & Correia, 2009). In this study, few learners took that approach.

The motivation of many students decreased, which highlights the importance of effective online teacher moderation. Ten sales supervisors (out of 43) dropped out of the course. This was the highest dropout rate of all groups. Almost a third of learners reduced their efforts to the bare minimum. This is consistent with a previous study (Estrada et al., 2011), which found that over 40% of changes in student activity in an online course could be explained by teacher performance (i.e., the less teachers participated, the less students participated as well). Disengaged teachers led to disengaged students. Considering that teachers were usually students’ line managers, it is reasonable that learners’ motivation decreased. Why should an employee invest time and effort in an online course if their boss does not think it is worthwhile?

By contrast with the lack of teacher participation in the Moodle platform, most students agreed that the teacher contributed to their understanding of the course topics. While this is in line with reports of high perceived value of learner-teacher interactions (Anderson, 2003a; Moore, 2008; Rhode, 2009; Su et al., 2005), two questions arise. 1) Were students afraid of portraying their teachers/line managers in a negative light? 2) Or were there other meaningful interactions happening outside of the online course environment?
There is evidence supporting both possibilities. Previous research in organisational settings has reported concerns regarding the honesty of employees’ responses (e.g., Gunawardena et al., 2010). Education staff agreed that students might fear negative repercussions if they spoke badly of their teachers/line managers. On the other hand, think aloud sessions and teacher interviews showed that exchanges potentially relevant for learning outcomes happened outside the Moodle platform. Teachers could have provided guidance or support face to face or via phone calls.

**Active communities of learners constitute potential learning opportunities, which may be scuppered by shallow contributions and superficial engagement.**

In the course version with predominant learner-learner interactions, no real communications happened between participants, in spite of students’ reports of being engaged with the activities. Most learners posted the required number of messages, but their contributions were usually shallow or untimely. The e-tivity model (Salmon, 2002) was not enough to generate the expected meaningful exchanges (Armellini & Aiyegbayo, 2009).

The literature provides possible explanations why students failed to interact effectively with their peers. Some learners had inconsistent access to a computer and were new to online education. Even after having training on how to communicate via the web and several opportunities to practise beforehand, they may have felt uncomfortable using the technology to participate in the course (Gunawardena et al., 2010) or feared making a mistake when posting a message (Vrasidas & McIsaac, 1999).

Learners may have also felt time constrained (Mason, 2011) due to workloads with priority over online course activities (Gunawardena et al., 2010). Lack of time available to study was a concern raised by participants in the preparation stage of this project (see **CHAPTER 3**). While learning materials were brief, this brevity may have not been enough
to compensate for the problems of a tight work schedule. In the evaluation surveys, however, only four students (out of 46) claimed that time had been a problem.

Sometimes exchanges between learners are only appreciated for their contribution to mastering the content (Moore, 2008). Participants may have considered communications with their peers tangential, irrelevant to achieve course outcomes (Kellogg & Smith, 2009) or less important than interactions with the content (Rhode, 2009). Also, students talked regularly with their co-workers and line managers. They could have had informal social interactions related to their course, making it unnecessary to contact other learners online.

Finally, in business settings, some employees use online courses only to refresh existing skills, to reference particular topics or to find specific information (Skillsoft, 2004; Welsh et al., 2003). Perhaps some students felt that they had obtained what they needed in terms of learning from the course. Since activities were not formally assessed, they may have felt it was acceptable to ignore them, as long as they achieved the learning outcomes and obtained a passing exam grade. This could have resulted in failure to engage in learner-learner interactions.

This study contributes to the debate on the importance of learner-learner interactions. When asked about the aspect of the course they had enjoyed most, nine students (out of 46) referred to sharing experiences with peers. They also rated these exchanges favourably. While this evaluation supports previous studies emphasising the perceived high value of learner-learner interactions (Chang & Smith, 2008; Su et al., 2005), it also raises a number of questions.

Where did these communications happen? They were not visible in the activity discussion forums. Could they have happened in other contexts, such as private messages or face-to-face conversations? Participants may have found value in informal exchanges beyond
course boundaries (Caladine, 2008). Could this be a case of vicarious interaction (Sutton, 2001)? Most learners (30/56) took the role of observers, spending more time looking at resources and activities than responding to them (see Figure 23 in CHAPTER 5). Participating infrequently does not imply being disengaged (Beaudoin, 2002).

Most students successfully completed their course. Learner-learner interactions represent a potential learning opportunity. Throughout the whole research project, participants continuously expressed enthusiasm in communicating online with their peers, and academic assistants (i.e., learning designers) acknowledged the value of sharing in-the-job experiences with colleagues from different sales areas. Yet, the lack of online communications between peers did not prevent learning from happening.

**All online courses seemed to trigger informal learning activities beyond the official requirements, on and offline.**

This study focused on instructional interactions, which are developed with the purpose of helping learners reach an educational goal (Wagner, 1994), as these are within the control of course designers. However, informal learning activities, which were not planned or embedded in the online course, happened. Students took notes (learner-content interactions) and talked with colleagues face to face (social interactions). The use of Moodle’s private messaging system is particularly interesting, since participants were not taught how to use it and the average digital literacy level was low. While there is no evidence that these messages were about course topics or online learning, it is likely that they were, as students regularly used emails to discuss daily job tasks. This highlights the fact that if participants want to, they will interact with the content, teacher or peers, regardless of the activities that have been planned for them. In other words, course design does not dictate the type of interactions that students actually engage in.

A potential implication is that even if students do not visibly participate in an online course, they may engage in learning activities (Beaudoin, 2002) or interact vicariously
(Sutton, 2001). While these interactions may be ‘invisible’ to learning designers and teachers, they may have a significant influence on the learning experience. Understanding these interactions should inform design and delivery decisions. Additional research is needed to evaluate the specific relationship between engagement in informal learning via different types of interactions and the achievement of course outcomes.

**Summary: How do learners interact with the content, the teacher and other learners in online courses?**

The findings of this study provide an in-depth understanding of online interactions for course effectiveness in a large organisation in Mexico. They also offer further evidence of the importance of interactions beyond the embedded activities in online courses. Students do not depend only on the instructional interactions available for them in online courses. They may decide to not participate in them or to engage in other interactions outside the course.

Each type of interaction provides potential advantages for students. Well-designed course materials represent standard opportunities for knowledge acquisitions. A teacher can function as an expert available to provide guidance and feedback. Peer-communications can foster the sharing of ideas and experiences, helping employees from different areas create an active community of learners.

Effective learner-content interactions require a high time investment during the design and development phase, as student questions need to be foreseen and managed before they arise. Social interactions depend on human participation, which is beyond the control of the learning designer. When course delivery is not as expected, problems may arise, taking the form of questions unanswered by course materials, untimely replies or shallow contributions. Figure 29 summarises the advantages and disadvantages of different types of interactions when a course is adequately or inadequately designed and delivered. While the mentioned disadvantages are not necessarily exclusive of a particular type of
interaction, in this study they were mostly found in the course version emphasising the type of instructional interaction they are paired up with.

**Figure 29 Advantages and disadvantages of different types of interactions**

<table>
<thead>
<tr>
<th>TYPE OF INTERACTION DESIGNED INTO COURSE</th>
<th>Adequate</th>
<th>Inadequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner-Content</td>
<td>Standard, flexible opportunities for acquiring knowledge</td>
<td>Unanswered questions</td>
</tr>
<tr>
<td>Learner-Teacher</td>
<td>Guidance from perceived expert</td>
<td>Student disengagement</td>
</tr>
<tr>
<td>Learner-Learner</td>
<td>Ideas and experiences shared between employees from different areas</td>
<td>Missed learning opportunities</td>
</tr>
</tbody>
</table>

Notes: In this figure, adequate course delivery implies that the content is easy to access, and that teachers or students participate in a way that promotes meaningful learning experiences. Inadequate course delivery implies the opposite.

This diagram can help designers maximise the advantages of different types of interaction, while foreseeing potential problems. This strategy is particularly useful in contexts where practitioners are expected to make decisions on the spot and act upon them.

When course delivery is inadequate, self-motivated students will usually seek support through other interactions, even if these are not embedded in the course. It is the responsibility of learning designers to provide a choice. Some students will find effective ways of compensating for the disadvantages of instructional interactions. Others might not. Broadening the range of support options available to students may foster more meaningful, contextualized and rewarding learning experiences. In other words, focusing on only one type of interaction incurs a high risk of confusion, disengagement and/or missed learning opportunities, all of which can be managed by incorporating other forms of interactions.
**RQ2: How effective are online courses characterised by high levels of different types of interactions?**

Results provide evidence of online courses as engaging, effective alternatives in corporate settings. This conclusion has been widely acknowledged within the academic community, thanks to research initiatives such as the no significant difference phenomenon (Russell, 2010). Yet, employers and practitioners still question the value of online education (Adams, 2008), and require further evidence of the effectiveness of e-learning. At the participating organisation, the obtained data helped to justify the implementation of online learning practices.

This study documents a thorough evaluation of online course effectiveness in a large Mexican organisation. It includes indicators of student satisfaction, learning, knowledge transfer, business results and return on expectations. Most assessments focus on participants’ satisfaction and learning (Kim et al., 2009; Saks & Burke, 2012). Thus, this thesis helps tackle a common limitation of Kirkpatrick’s (1979) training evaluation framework: the exclusion of the last effectiveness levels (behaviours and business results).

*Regardless of the types of interactions designed into the courses, 97-100% of participants reported being satisfied with their online course.*

Most participants in all groups (97-100%) had positive reactions towards their online courses. This finding is in line with reports from academic institutions (Chang & Smith, 2008; Kuo et al., 2013; Moskal et al., 2006; Swan, 2002), non-profit organisations (Isoph & N-TEN, 2004) and companies (Gunawardena et al., 2010; Joo et al., 2011; Ozturan & Kutlu, 2010; Skillsoft, 2004).

These high satisfaction rates contrast with the inadequate social interactions described earlier. There are at least four possible explanations for this inconsistency.

1. The general excitement surrounding the whole e-learning initiative could have
biased responses. From the preparation stage of this research project onwards (see CHAPTER 3), participants manifested their enthusiasm with Moodle and online programmes. Perhaps their answers reflected a general view of this new way of delivering training at the organisation and not their perceptions of a specific course.

2. Maybe learners did not answer the evaluation survey honestly (Gunawardena et al., 2010). They could have felt worried about expressing negative reactions that could harm their peers, teachers (i.e., line managers) or even the Education staff. Or perhaps they simply did not want to be “the negative ones” of the group.

3. Instructional interactions may not determine perceptions of course satisfaction. Participants may have based their opinions on other aspects of the educational experience, such as informal learning activities triggered by the course, the general contribution of the training to their personal development (Vaughan & MacVicar, 2004) or the flexibility of studying online (Gunawardena et al., 2010).

4. Outside the e-learning platform, communications with co-workers not enrolled in the courses, other students and line managers may have been meaningful. These exchanges could have provided a source of satisfaction that compensated for the negative reactions derived from inadequate social interactions within the course boundaries.

All of these explanations may account for students’ satisfaction with their courses, which seems to be independent of design and delivery.

**All course participants had higher average exam grades than the control group, 9.5 versus 7.1.**

The delivery of the courses posed challenges, such as questions unanswered by the content, lack of teacher feedback and shallow communications between peers. As discussed, some students became disengaged and limited their efforts. Yet, despite these issues and the decreased motivation, most participants successfully accomplished the learning outcomes and obtained passing exam grades. They perceived an improvement in
their knowledge of the course topics and performed better than the control group. This result is similar to findings in higher education institutions (Kellogg & Smith, 2009; Moskal et al., 2006; Swan, 2002) and organisations (DeRouin et al., 2005; Padilla Rodriguez & Armellini, 2013a; Skillsoft, 2004; Welsh et al., 2003).

How deep and meaningful was this learning (or acquisition of knowledge)? While the answer to this question is beyond the scope of this thesis, there is some evidence that deep learning, as characterised by Entwistle et al. (1979) and Marton & Säljö (1976), took place. Think aloud sessions provided evidence of students attempting to contextualise the concepts of the course, relating them to their own experience. The final non-assessed project encouraged students to reach their own conclusion on what worked for them in their context.

**Learners on the courses designed with a focus on learner-content and learner-learner interactions deployed enhanced communication skills (average improvement of 1.8%, versus -2.0% in the control group).**

This study went beyond usual course effectiveness measurements of satisfaction and learning (Kim et al., 2009; Machperson et al., 2004; Vaughan & MacVicar, 2004) and included behaviours in the workplace, or knowledge transfer. Most students felt prepared to apply the knowledge they acquired in their online course, as in studies reported by Korhonen & Lammintakanen (2005), Padilla Rodriguez & Armellini (2013a), and Skillsoft (2004). However, not all participants showed an improvement in their communication skills, as evaluated by HR staff observing sales meetings.

For those who studied the courses with high levels of learner-content and learner-learner interactions, average job performance was better than that of the control group. Yet, the improvement after the course was slight (1.8% on average) and not statistically significant. This could be explained by the high initial rating of participants’ communication competence, which allowed little data variability.
Students in the learner-teacher interactions group had a decline of -4.7% in the average overall rating of their communication skills. This was a worse performance than that of the control group. The disengagement of teachers could explain this, as it may have affected learners’ behaviours in the workplace. Organisational support has been related to knowledge transfer (Gunawardena et al., 2010; Joo et al., 2011). Students with no encouragement from their line managers (also their teachers) are unlikely to apply what they learn in their job.

Sales supervisors, who completed the Leadership Programme, increased their sales quota coverage more than the control group, who did not complete the programme, 7.6 versus 6.7 percentage points.

Due to the wide range of variables involved in the macro results of the participating organisation (Kirkpatrick, 1979; Peak & Berge, 2006), business level results are outside of the area of control of the courses and only within their area of influence (Bates, 2004; Kirkpatrick & Kirkpatrick, 2010). However, online courses have been suggested to positively influence business results (DeRouin et al., 2005; Skillsoft, 2010b, 2010c).

In this thesis, the researcher checked students’ average three-month sales quota coverage three months before and three months after the Leadership Programme. She compared these data with that of the control group and with records of the same periods in the previous year. Learners from the courses emphasising learner-content and learner-learner interactions obtained better results than the control group. However, the group with predominantly learner-teacher interactions had a lesser sales quota coverage increase than the control group and the previous year.

Was the specific learning design of a single course related the changes in business results? It is unlikely that a one-week course by itself could have a determining impact on sales (Bates, 2004), especially when the economic scenario and competitors’ marketing
strategies also have a role in customers’ shopping behaviours. Nonetheless, it is also possible that teachers (i.e., line managers) showed an inadequate performance in the online courses and also in their jobs, which impacted on students’ (i.e., sales supervisors) achievement of sales targets.

When considering the Leadership Programme as a whole, findings suggest that it contributed to the overall improvement of business results. Students who completed the four online courses of the Leadership Programme had a larger average sales increase than the ones who did not complete the programme (control group), 7.6 versus 6.7 percentage points. While it is not possible to establish a cause-and-effect relationship between the Leadership Programme and the increased sales, results are encouraging, as in V. Anderson (2007). Completing the whole programme implied student commitment, responsibility for their own learning, independent study and self-motivation. These characteristics, transferred to the job, may also have contributed to the achievement of sales quota coverage.

*All participants reported that their course expectations had been met.*

All students reported that their course expectations had been met. These expectations related mostly to business results (increasing sales), behaviours (providing effective feedback to retailers in their team) and learning about the course topic. Data from the previous levels of effectiveness evaluation support this perception of fulfilment. Since expectations were consistent with planned outcomes, the online course, in all of its versions, can be considered effective (Cedefop, 2011), not only in terms of satisfaction and learning but also of knowledge transfer and organisational results.

Some expectations from the senior learning designer did not correspond to Kirkpatrick’s (1979) effectiveness levels, as in V. Anderson (2007). These expectations went beyond the Leadership Programme and related to the whole e-learning initiative. They included taking advantage of the technological resources available at the organisation and being pioneers
in the widespread implementation of a high-impact online programme. While they exceeded the scope of the specific courses, these expectations were fulfilled and led to strategic, evidence-based changes in training practices at the organisation.

**Summary: How effective are online courses characterised by high levels of different types of interactions?**

This thesis provides a comprehensive evaluation of online course effectiveness beyond the usual measurements of satisfaction and learning. All levels of Kirkpatrick’s four-level model (1979) were included: satisfaction, learning, behaviours in the workplace and business results. Return on expectations (Kirkpatrick & Kirkpatrick, 2010) was also considered. In line with previous reports of the value of online learning, courses characterised by high levels of different types of interactions were, in general, effective.

Groups that studied the online course with predominant learner-teacher interactions had worse results in terms of knowledge transfer and sales quota coverage than the control group. Since teachers were also students’ line managers, it is likely that participants perceived a lack of organisational support to apply what they had learned in their online courses and translate it into business results. Table 37 summarises the effectiveness of each version of the online course, in terms of all the levels evaluated.

<table>
<thead>
<tr>
<th>Table 37 Summary of online course effectiveness</th>
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<tbody>
<tr>
<td><strong>Effectiveness Level</strong></td>
</tr>
<tr>
<td>Level 1: Satisfaction</td>
</tr>
<tr>
<td>Level 2: Learning</td>
</tr>
<tr>
<td>Level 3: Workplace behaviours</td>
</tr>
<tr>
<td>Level 4: Business results</td>
</tr>
<tr>
<td>Level 5: Return on expectations</td>
</tr>
</tbody>
</table>

Notes: In this table, ✓ refers to the achievement of expected outcomes, and ☒, to failure.
**RQ3: Which online course design results in the highest levels of effectiveness?**

Some activities in the online courses were unsuccessful due to problems with the delivery of instructional interactions. Yet, most students achieved the planned course outcomes. It seems that committed participants will learn, regardless of learning design and delivery issues. If self-motivated, they will compensate for the deficiencies of embedded instructional interactions by engaging in learning activities in spaces not visible to the designer. Notes, online private messages, phone communications and face-to-face conversations provide evidence of students’ efforts to find alternative ways of support for their learning.

Student progress in spite of difficulties may seem to imply that designers’ efforts are irrelevant. However, this is not the case. Interaction is required for learning to happen. Sometimes the course design (and delivery) can make the difference between success and failure. As in this study, some initially motivated learners may become disengaged if problems arise (e.g., they lack feedback) and they find no sources of guidance. Designers can help by broadening the range of support options available in the course and including activities and resources that foster different types of interactions.

It is not a matter of simply adding communication tools (e.g., discussion forums) or exercises (e.g., multiple choice questions). Instructional interactions should be designed in such a way that they can be part of a meaningful learning experience for students (see CHAPTER 2). For example, in the course version emphasising learner-content interactions, there was a general discussion forum available. It had no specific instructions of how to use it. It was not mandatory to participate in it. Students found no motivation to look into it. It was a dead space, rarely viewed, never used. If designers want to encourage people to participate, they need to provide guidance.
Learning designs of future online courses at the participating organisation will focus less on learner-teacher interactions and more on other types of interactions (learner-content and learner-learner), thus enabling students to be less reliant on their teachers. Structured learner-content interactions will provide standard opportunities for the acquisition of critical knowledge and skills, without depending on the performance and commitment of online teachers, and will constitute a ‘safety net’ for participants seeking to achieve the learning outcomes. Task-based learner-learner interactions, requiring minimum facilitation by teachers, will provide opportunities for students to work together and share information and experiences.

All courses were equally effective in terms of satisfaction, learning and return on expectations, regardless of their design.

The results of this study provide evidence of all learning designs as engaging, effective alternatives for online courses in corporate settings. Regardless of which type of interaction was present in a high level, participants in all groups achieved learning outcomes and obtained higher exam grades than the control group. All types of interaction can promote academic achievement (Bernard et al., 2009; Russell et al., 2009). This implies supporting evidence for the first thesis of Anderson’s (2003a) interaction equivalency theorem: Deep learning is supported as long as one of three types of interaction (learner-content, learner-teacher or learner-learner) is present at a high level.

While the type of interaction fostered may be irrelevant for learning, student interaction with content, teacher or peers seems indeed necessary for achieving learning outcomes. This notion is consistent with constructivism, which asserts that learning is the result of complex interactions (Ally, 2008; Benbunan-Fich, Hiltz & Harasim, 2005; Kidd, 2010; Piaget 1964/1991; Vygotsky, 1978), with the conceptualisation of learning as an individual and also a social process (Paavola & Hakkarainen, 2005; Phillips, 1995), and with previous research (Beaudoin, 2002; Picciano, 2002; Swan, 2002; Zimmerman, 2012).
Nonetheless, problems during course delivery affected instructional interactions. For example, planned meaningful communications between learners and teachers and between peers did not happen. In courses with predominantly social interactions, how did students achieve learning outcomes if exchanges were inadequate (i.e., untimely or shallow)? In these groups, participants could interact with the content by reading the available materials and completing the tasks. They also sought external sources of support, such as colleagues to talk to. In other words, interactions did happen, just not as expected.

Learner-content interactions are relatively easy to control. The materials and activities based on independent study can be developed, validated and delivered in a standardised way. Social interactions, by contrast, depend on the participation of teachers and other learners to represent a meaningful addition to the educational experience. This engagement may be beyond the control of designers.

In this thesis, besides learning, other training effectiveness indicators were considered. All online courses were equally effective in terms of satisfaction and return on expectations, as participants reported positive reactions and having their expectations fulfilled. While this is consistent with previous reports of the relationship between interactions and course satisfaction (Chang & Smith, 2008; Kuo et al., 2013; McFarland & Hamilton, 2006; Swan, 2002), increasing the quality of interactions and ensuring they are meaningful may be more relevant for satisfaction and learning than merely increasing their number (Bernard et al., 2009).

Compared with a similar study with four variations of an online course and similar learning transfer results (Russell et al., 2009), this thesis found group differences in Kirkpatrick’s (1979) last two levels: behaviours in the workplace and business results. Although these differences were not statistically significant, high levels of deficient learner-teacher
interactions did not result in improvements in knowledge transfer or sales quota coverage.

According to the findings of this research, no specific learning design results in higher levels of satisfaction, learning and return on expectations. When considering factors beyond instructional interactions learner-content interactions are valuable for the organisation because they help to establish a baseline of information to be delivered, regardless of what other course participants do. A designer can control the content, but not human participation. Course delivery is, thus, as important as learning design.

*Delivery posed new challenges for course effectiveness, not fully incorporated into the design phase.*

High investment in design is not enough for achieving online course effectiveness. Delivery can pose new challenges. Students may find resources not completely self-explanatory. They may disengage after learning what they need to do their jobs (Skillsoft, 2004; Welsh et al., 2003). They may feel uncomfortable using the technology (Gunawardena et al., 2010) or posting a message with a mistake (Vrasidas & McIsaac, 1999). They may have difficulties managing their time and balancing their job and learning activities (Gunawardena et al., 2010; Mason, 2011). They may also engage in interactions that are invisible for those in charge of monitoring their progress in an online course (e.g., HR or Education staff).

In the light of the described findings, the first thesis of the interaction equivalency theorem can be expanded and reworded as follows: In corporate settings, an online course can be effective in terms of satisfaction, learning, knowledge transfer, business results and return on expectations, as long as (a) at least one of three types of interaction (learner-content, learner-teacher or learner-learner) features prominently in the design of the course, and (b) course delivery is consistent with the chosen type of interaction. Focusing on only one type of interaction carries a high risk of confusion, disengagement
and/or missed learning opportunities, which can be managed by incorporating other forms of interactions.

Statement (a) refers to what Anderson (2003a) called a “high level” of at least one of the three types of interactions. It implies the design of online activities, which require observable responses from participants and generate interactions with the content, the teacher or other learners. Statement (b) requires designers and other practitioners to consider course delivery, which should be planned and managed to maximise the benefit and impact of the predominant type of interaction designed into the course. Instructional interactions should be meaningful.

For courses focusing on only one type of interactions, different scenarios arise depending on how adequate or inadequate course design and delivery are (see Figure 30). Adequate course design includes high-quality reading texts and activities focused on promoting meaningful interactions. When a course is adequately delivered, content is easy to access, technology use is effective, teachers facilitate learning, and peers provide meaningful contributions. When both course design and delivery are adequate, it is highly likely that students will achieve course outcomes. In contrast, when this is not the case, there is a high risk of course failure.
Figure 30 Course design and delivery: possible scenarios

<table>
<thead>
<tr>
<th>Predominant Interactions</th>
<th>Course Design Adequate</th>
<th>Course Delivery Inadequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner-Content</td>
<td>Students need an extra effort to make sense of the content, resulting in some disengaged learners</td>
<td>High likelihood of achievement of course outcomes</td>
</tr>
<tr>
<td>Learner-Teacher</td>
<td>Teacher provides tangible enhancement from base materials and activities</td>
<td>High risk of course failure</td>
</tr>
<tr>
<td>Learner-Learner</td>
<td>Peer feedback and support become central to course success</td>
<td>Students require support alternatives, resulting in some disengaged learners</td>
</tr>
</tbody>
</table>

Note: Adequate course design includes high-quality reading texts and activities focused on promoting meaningful interactions. Adequate course delivery has easy-access content, effective technology use, and meaningful social interactions.

When there is adequate design but delivery is inadequate (as happened in this study in course versions with predominantly social interactions), students will require additional support alternatives. Some learners will be successful in finding them; others will become disengaged. When course design is deficient but the delivery is adequate, a tangible enhancement can be present. Students have different types of support available, depending on the type of interaction emphasised in the course. When the focus is on learner-content interactions, participants rely on their own individual efforts and need an extra effort to make sense of the badly designed materials and activities. When the focus is on learner-teacher interactions, students have the guidance of a perceived expert who adds value to low-quality resources and activities. Finally, when the focus is on learner-
learner interactions, learners have the support of a community available, which makes peer feedback central to outcome achievement. Delivery can make a substantial difference in the effectiveness of an online course.

**Summary: Which online course design results in the highest levels of effectiveness?**

This thesis provides supporting evidence for the first thesis of Anderson’s (2003a) interaction equivalency theorem. However, findings emphasise the role of delivery in course effectiveness, suggesting that for successful implementation in a corporate context, the theorem needs to be expanded and reworded: In corporate settings, an online course can be effective in terms of satisfaction, learning, knowledge transfer, business results and return on expectations, as long as (a) at least one of three types of interaction (learner-content, learner-teacher or learner-learner) features prominently in the design of the course, and (b) course delivery is consistent with the chosen type of interaction.

**Beyond the research questions**

The intervention at the participating organisation exceeded the original aims of this study. This project systematically and holistically documented an ambitious e-learning initiative in a large Mexican organisation. Steps taken included the installation and configuration of an online learning platform and the progressive involvement of participants. The researcher also designed, developed, piloted, delivered and evaluated seven online courses: 1) Moodle Features, 2) Teaching How to Teach Online, 3) Effective Online Students, 4) Situational Leadership, 5) Empowering Beliefs, 6) Effective Performance and 7) Feedback on Performance. The main study specifically focused on the effectiveness of three different types of interaction (learner-content, learner-teacher and learner-learner) explicitly and purposefully designed into three versions of one of the online courses. Data were rigorously collected from various stakeholders at different stages over 12 months. Three research questions guided the analysis:

1. How do learners interact with the content, the teacher and other learners in online
2. How effective are online courses characterised by high levels of different types of interactions?
3. Which online course design results in the highest levels of effectiveness?

Results provide answers to these questions, as discussed previously in this chapter. Yet, in the light of the comprehensiveness of this project, additional findings emerged, regarding the implementation of corporate e-learning and the role of online courses in organisational change. Although these lessons are not directly related to the research questions, they are discussed next as they may be valuable for academics interested in workplace education, managers and learning practitioners in organisations.

The implementation of corporate e-learning should be acknowledged as an inter-departmental process.

As suggested by the stakeholder analysis in CHAPTER 4 (see Figure 12), different people and groups (e.g., learners, teachers, learning designers, managers, support staff, technical staff and senior management) have different levels of influence on online course effectiveness. The experience of implementing online courses at the participating organisation from scratch yielded an interesting overview of the roles required for success. The introduction of e-learning to a large organisation should be acknowledged as an inter-departmental process, in which different stakeholders have specific functions. This idea builds on the e-learning stakeholders’ responsibility matrix developed for higher education (Wagner et al., 2008) by applying it to a corporate environment. It also challenges the traditional perspective in which training in organisations emerges solely from content-based and instructor-led interventions focused on skills (V. Anderson, 2007) and is the sole responsibility of Human Resources. Table 38 describes the different stakeholders and their role in the successful implementation of corporate e-learning.
<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Description</th>
<th>Role</th>
</tr>
</thead>
</table>
| Learners            | Users of the virtual learning environment, enrolled as students in at least one course | • Take responsibility for their learning.  
• Actively participate in the course, following instructions and completing activities.  
• Report problems (e.g., technical mishaps or unclear tasks) |
| Teachers            | Perceived experts on the subject                                             | • Prepare to be online teachers.  
• Participate proactively in the online courses, providing guidance and constructive feedback (Anderson & Garrison, 1998).  
• E-moderate and facilitate online learning (Salmon, 2011).  
• Ask for support (technical or pedagogical) when required. |
| Co-workers          | Work colleagues not enrolled in the same course as the learners             | • Be open to discussions with the learners on the topics covered in the online courses.  
• Support knowledge transfer by encouraging learners to make changes in line with the knowledge acquired in the course. |
| Line managers       | Bosses of the learners                                                      | • Facilitate study time for learners.  
• Recognise the value of e-learning.  
• Be open to discussions with the learners on the topics covered in the online courses.  
• Support knowledge transfer by encouraging learners to make changes in line to the knowledge acquired in the course. |
| Technical staff     | Usually employees from the IT department                                   | • Monitor regularly the available technology to ensure its adequate functioning.  
• Create course backups.  
• Help users solve technical problems (e.g., access failure). |
| Senior management   | Decision-makers at the organisation                                         | • Recognise the value of e-learning.  
• Provide policies that facilitate online learning (e.g., access to technology). |
<p>| Learning designers  | Employees from the Education or Training                                    | • Create high-quality courses capitalising on the benefits of different types of interactions. |</p>
<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Description</th>
<th>Role</th>
</tr>
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</table>
| department, or external course providers | • Design online activities, which require observable responses from the learners and interactions with the content, teacher or peers.  
• Plan and manage course delivery (e.g., if learner-teacher interactions are included in the course, ensure competent, prepared teachers are available).  
• Involve relevant participants (e.g., learners who can provide in-the-job examples).  
• Match course objectives to evaluation practices. |
| Support staff                   | Usually HR or Education staff                     | • Monitor the learners’ progress.  
• Support evaluation practices (e.g., observing behavioural changes).  
• Help users take advantage of their course (e.g., providing training on how to communicate effectively online and answering questions on netiquette). |

This stakeholders’ responsibility matrix is currently in a draft stage and requires further research and development. Even so, it contributes to a holistic understanding of the different roles required for the success of corporate e-learning.

**Effective online courses can work as a lever for organisational change.**

The online courses implemented as part of this research project worked as a lever for organisational change. They contributed to the shifting of a paradigm in which workplace training had been entirely a formal activity, which was the sole responsibility of the HR department and was often conducted face to face. The online courses designed and evaluated as part of this project triggered learning behaviours that exceeded the aims of the training. By taking notes, talking to colleagues face to face or by sending private messages to other participants, students were not constrained by what had been designed for them or by what was available on Moodle. Online courses and appropriate technologies can be used to empower employees, reinforce their responsibility for their
own learning and encourage them to seek other sources of support. This is in line with a previous study with large companies, in which one highlighted the impact of e-learning in the development of an organisational learning culture (Homan & Macpherson, 2005).

This project helped to challenge misconceptions about online training, such as courses being presented as content repositories and needing no teachers. Participants had the opportunity to experience learning designs emphasising different types of interactions. The experiences in the courses provided evidence of positive and negative effects of both motivated and disengaged participants. Problems that arose during the delivery of the online courses are currently lessons learned. The organisation also benefitted from the identification of effective practices to be repeated in the development and delivery of subsequent online courses (e.g., providing a choice of interaction opportunities). This marks a substantial change from the old content-based training system that was used at the organisation. Although there are still problems to be solved (e.g., helping sales supervisors find the time to study online during their regular work schedule), senior management and learning designers are enthusiastic about the future. They now have evidence-based guidelines to support new courses, which are specific to their context.

**The successful implementation of corporate online learning requires more than effective course design and delivery.**

The implementation of corporate e-learning is usually the answer to a training or development need. This thesis showcased a number of steps taken to implement an online learning initiative at a large organisation. The lessons learned at each stage provide evidence on the importance of preparation before course design, delivery and evaluation. Figure 31 summarises twelve main steps, from conducting a risk analysis to obtaining feedback for improvement. The sequence of these steps could be altered to satisfy particular needs, especially the first three (conducting a risk analysis, managing the technology and involving all relevant stakeholders). Even more, some steps can overlap.
For example, in this study, the involvement of all relevant stakeholders happened throughout the preparation and course piloting stages.

**Figure 31 Corporate e-learning implementation steps**

- Identify training or development need.

  - Conduct a risk analysis.
  - Manage technology and define user support channels.
  - Involve all relevant stakeholders.

  - Provide training on how to use the technology and how to study online.
  - Negotiate expectations.
  - Define course objectives, matching them to evaluation practices.

  - Design resources and activities, embedding different types of instructional interactions.
  - Pilot courses, validating materials, ensuring clarity and seeking improvement suggestions.
  - Establish a baseline of outcomes or select a control group.

  - Deliver course.
  - Evaluate course, comparing results to baseline or control group.
  - Obtain feedback from participants to improve courses.

Based on feedback, further enhancements can be applied at different steps (e.g., design). This diagram is currently in a draft stage and requires further research and development. However, and even if the process is context-sensitive, this diagram is valuable for workplace practitioners as it offers specific, evidence-based guidance on how to plan the successful implementation of corporate e-learning.
Chapter summary: Discussion

This chapter presented the analysis of the research findings. Advantages and disadvantages of three types of interaction (learner-content, learner-teacher and learner-learner) were discussed in the light of the literature, as well as the outcomes of five levels of course effectiveness (satisfaction, learning, behaviours in the workplace, business results and return on expectations).

The expansion and rewording of the first thesis of the interaction equivalency theorem (Anderson, 2003a) was proposed: In corporate settings, an online course can be effective in terms of satisfaction, learning, knowledge transfer, business results and return on expectations, as long as (a) at least one of three types of interaction (learner-content, learner-teacher or learner-learner) features prominently in the design of the course, and (b) course delivery is consistent with the chosen type of interaction.

Findings beyond the research questions were also presented and discussed. Table 39 shows a summary. The analysis of results presented in this chapter leads to the main contributions and conclusions of this thesis, which are described in CHAPTER 8.

Table 39 Thesis summary including additional findings

<table>
<thead>
<tr>
<th>RQ1: How do learners interact with the content, the teacher and other learners in online courses?</th>
<th>RQ2: How effective are online courses characterised by high levels of different types of interactions?</th>
<th>RQ3: Which online course design results in the highest levels of effectiveness?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity log</td>
<td>Diagnosis and evaluation surveys</td>
<td>All of the previous.</td>
</tr>
<tr>
<td>Think aloud sessions</td>
<td>Exams</td>
<td></td>
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<tr>
<td>Interview with teacher</td>
<td>Observations in the workplace</td>
<td></td>
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<tr>
<td>Messages in discussion forums</td>
<td>Sales records</td>
<td></td>
</tr>
<tr>
<td>Evaluation surveys</td>
<td>Focus group with academic assistants</td>
<td></td>
</tr>
<tr>
<td>RQ1: How do learners interact with the content, the teacher and other learners in online courses?</td>
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<tr>
<td>Activities encouraged learners to read in greater depth. Yet, the course material could not provide answers to every question. Learners made progress despite rather than as a result of teachers’ participation, which tended to be below the expected standards. Active communities of learners constitute potential learning opportunities, which may be scuppered by shallow contributions and superficial engagement. All online courses seemed to trigger informal learning activities beyond the formal requirements, on and offline.</td>
<td>Regardless of the types of interactions designed into the courses, 97-100% of participants reported being satisfied with their online course. All course participants had higher average exam grades than the control group, 9.5 versus 7.1. Learners on the courses designed with a focus on learner-learner and learner-content interactions deployed enhanced communication skills (average improvement of 1.8%, versus -2.0% in the control group). Sales supervisors who completed the Leadership Programme increased their sales quota coverage more than the control group who did not complete the programme, 7.6 versus 6.7 percentage points.</td>
<td>All online courses were equally effective in terms of satisfaction, learning and return on expectations, regardless of their design. Delivery posed new challenges for course effectiveness, not fully incorporated into the design phase.</td>
</tr>
</tbody>
</table>

**Key Findings**

**Additional Findings**

The implementation of corporate e-learning should be acknowledged as an inter-departmental process.

Effective online courses can work as a lever for organisational change.

The successful implementation of corporate online learning requires more than effective course design and delivery.
CHAPTER 8
CONCLUSIONS

This thesis aimed to evaluate the effectiveness of online courses with different learning designs. Each of these courses emphasised a different type of instructional, or designed, interactions: 1) learner-content, which implies students’ intake of the educational materials; 2) learner-teacher, which refers to communications between students and teachers; and 3) learner-learner, which points to exchanges between peers. Course effectiveness was evaluated in terms of Kirkpatrick’s (1979) and Kirkpatrick and Kirkpatrick’s (2010) steps: satisfaction, learning, behaviours in the workplace, business results and return on expectations. This chapter describes the main contributions and conclusions of this thesis. It also discusses limitations and provides recommendations for practice and for future research (see Figure 32).

Figure 32 Chapter structure: Conclusions

<table>
<thead>
<tr>
<th>Chapter 8 Conclusions</th>
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</thead>
<tbody>
<tr>
<td>• Contributions to knowledge</td>
</tr>
<tr>
<td>• Conclusions</td>
</tr>
<tr>
<td>o Instructional interactions within the design of online courses</td>
</tr>
<tr>
<td>o Online courses as an effective option for learning in organisations</td>
</tr>
<tr>
<td>o Implementation, testing and expansion of the interaction equivalency theorem</td>
</tr>
<tr>
<td>o Informal learning activities as evidence of student resourcefulness</td>
</tr>
<tr>
<td>o Effective online courses as a lever for organisational change</td>
</tr>
<tr>
<td>• Limitations</td>
</tr>
<tr>
<td>• Recommendations for practice</td>
</tr>
<tr>
<td>• Future research</td>
</tr>
<tr>
<td>• Chapter summary: Conclusions</td>
</tr>
</tbody>
</table>
Contributions to knowledge

This project had the benefit of situational specificity, as it took place at a large Mexican organisation. It thus addressed the need for e-learning research in business settings and provided relevant information about a context scarcely studied. This thesis offers an insight into corporate online learning that contemplates characteristics particular to Mexico, such as a general limited Internet access (INEGI, 2013). The findings of this research have been and will continue to be disseminated via different means (peer-reviewed articles, magazine papers, workshops and conferences) for the benefit of practitioners and academics in Mexico and in other similar contexts.

This study had a mixed methods approach, incorporating quantitative and qualitative data. It focused on the design, delivery and evaluation of online courses with different learning designs. Yet, the implementation of the project, including the multiple stages of the data collection process, required several preparation steps (see CHAPTER 3 and Figure 31 in CHAPTER 7) that provided information beyond the scope of the research questions of this study. A summary of strategic and operational lessons of the whole project of implementing corporate e-learning is available in Padilla Rodriguez, Armellini and Hawkridge (2013).

The main contributions to knowledge of this thesis are: 1) an in-depth understanding of online interactions for course effectiveness in a large organisation in Mexico; 2) a comprehensive evaluation of online course effectiveness beyond the usual measurements of satisfaction and learning; 3) the expansion and rewording of the interaction equivalency theorem (Anderson, 2003a) through its application and evaluation in a business setting; 4) further evidence of the importance of interactions beyond the embedded activities in online courses; and 5) how all of the above can promote organisational change. This study also provides research-based recommendations for online learning and teaching practices in organisations, and lines for future investigations.
Throughout her PhD studies, the researcher translated these contributions and her work in this project into several papers in academic journals in the fields of education and learning technologies (Padilla Rodriguez & Armellini, in press; Padilla Rodriguez, Armellini & Hawkridge, 2013; Padilla Rodriguez & Armellini, 2013a; Padilla Rodriguez & Armellini, 2013b; Padilla Rodriguez & Fernandez Cardenas, 2012) and a book chapter (Hawkridge, Armellini, Nie, Padilla Rodriguez & Witthaus, 2012). Other articles derived from this work are currently under construction or review.

Conclusions

The main conclusions from this research fall within five areas: 1) instructional interactions within the design of online courses; 2) online courses as an effective option for learning in organisations; 3) implementation, testing and expansion of the interaction equivalency theorem (Anderson, 2003a); 4) informal learning activities as evidence of student resourcefulness, and 5) effective online courses as a lever for organisational change. Three research questions guided data collection, analysis and discussion:

1. How do learners interact with the content, the teacher and other learners in online courses?

2. How effective are online courses characterised by high levels of different types of interactions (learner-content, learner-teacher and learner-learner)?

3. Which online course design (i.e., emphasising learner-content, learner-teacher or learner-learner interactions) results in higher levels of effectiveness?

Table 40 maps conclusions to these research questions. Specific lessons learned are described next.

Table 40 Conclusions mapped to research questions

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Conclusions</th>
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<tr>
<td>1. How do learners interact with the content, the teacher and other learners in</td>
<td>Structured learner-content interactions provide standard opportunities for</td>
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<tr>
<td>online courses?</td>
<td>acquisition of knowledge, irrespective of the input of participants and</td>
</tr>
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<td></td>
<td>teachers.</td>
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<table>
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<tr>
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<th>Conclusions</th>
</tr>
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<td>Learner-teacher interactions are heavily reliant on teacher competence, which highlights the importance of teacher selection, preparation and development.</td>
<td></td>
</tr>
<tr>
<td>Formal, task-based learner-learner interactions, requiring minimum facilitation by teachers, provide opportunities for students to work together and share information and experiences.</td>
<td></td>
</tr>
<tr>
<td>The design does not dictate the type of interactions that students actually use.</td>
<td></td>
</tr>
<tr>
<td>Students are resourceful when trying to find support and engage in informal learning activities to compensate for course design deficiencies.</td>
<td></td>
</tr>
<tr>
<td>Incorporating more than one type of instructional interaction broadens the range of support options available to students.</td>
<td></td>
</tr>
<tr>
<td><strong>2. How effective are online courses characterised by high levels of different types of interactions?</strong></td>
<td>Online courses represent an effective option for learning in organisations.</td>
</tr>
<tr>
<td><strong>3. Which online course design results in higher levels of effectiveness?</strong></td>
<td>The first thesis of the interaction equivalency theorem applied in the corporate setting of this study and can be expanded to include other indicators of course effectiveness (i.e., satisfaction, behaviours, business results and return on expectations) and to emphasise the importance of effective delivery.</td>
</tr>
<tr>
<td></td>
<td>High investment in design is not enough for achieving course effectiveness. The quality of delivery, student motivation and willingness to engage are also crucial.</td>
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</table>

The comprehensiveness of this research yielded an additional conclusion: The benefits of online courses exceed what is embedded in the design and represent an opportunity for
the organisation to encourage a culture of informal learning and continuous enhancement.

**Instructional interactions within the design of online courses**

Each type of instructional interaction has advantages and disadvantages that can inform course design decisions. Structured **learner-content interactions** provide standard opportunities for acquisition of knowledge, irrespective of the input of participants and teachers. These processes constitute a ‘safety net’ for the achievement of the outcomes. Content-based activities encourage learners to read in greater depth. Yet, course materials require more developing time and do not provide answers to every question.

**Learner-teacher interactions** are heavily reliant on teacher competence, which highlights the importance of teacher selection, preparation and development. In this study, learners made progress *despite* rather than *as a result of* teachers’ participation, which tended to be below the expected standards. In terms of knowledge transfer and business outcomes, students on the course, where learner-teacher interactions were predominant, performed worse than all other groups.

Formal, task-based **learner-learner interactions**, requiring minimum facilitation by teachers, provide opportunities for students to work together and share information and experiences. Active communities of learners constitute potential learning opportunities, which may be scuppered by shallow contributions and superficial engagement.

The design does not dictate the type of interactions that students actually use. Design is crucial for course effectiveness, but delivery poses new challenges. Student motivation and willingness to engage can affect the learning experience. Organisations interested in implementing online learning for their staff should consider these external factors. While designers and educators cannot control participants’ behaviours in an online course, they can capitalise on the strengths and manage the weaknesses of each interaction type. They
should incorporate sufficient opportunities for meaningful exchanges and ensure that learner support channels are available.

**Online courses as an effective option for learning in organisations**

In spite of the difficulties during delivery, the online course, in all of its versions, was effective in terms of satisfaction, learning and return of expectations. The participating organisation has now robust data to justify the potential and value of online learning. At the end of this study, the senior management was convinced of the value of online courses. The online learning initiative remains supported. New courses are being currently designed, capitalising on the lessons learned through this research.

**Implementation, testing and expansion of the interaction equivalency theorem**

The first thesis of the interaction equivalency theorem (Anderson, 2003a) applied in the corporate setting of this study: Deep, meaningful learning can be supported as long as one of three types of interaction (learner-content, learner-teacher or learner-learner) is present at a high level. Results from courses emphasising different types of interactions showed that participants obtained similar exam grades and reported similar perceptions of having learned. Thus, this study tested and provided empirical support for the theorem.

Furthermore, this study considered other indicators of course effectiveness, relevant in organisational contexts, including learner satisfaction, behaviours in the workplace, business results (Kirkpatrick, 1996) and return on expectations (Kirkpatrick & Kirkpatrick, 2010). All participants reported feeling satisfied with their courses and having their expectations fulfilled. Those students in courses with predominantly learner-content or learner-learner interactions also showed improvement in their communication skills and increased sales results. In courses emphasising learner-teacher interactions, most teachers were disengaged. While students achieved learning outcomes, their behaviours in the workplace and business results were not as good as those of participants in other groups. The quality of course delivery is crucial for success.
The first thesis of the interaction equivalency theorem can be expanded and reworded as follows: In corporate settings, an online course can be effective in terms of satisfaction, learning, knowledge transfer, business results and return on expectations, as long as (a) at least one of three types of interaction (learner-content, learner-teacher or learner-learner) features prominently in the design of the course, and (b) course delivery is consistent with the chosen type of interaction.

Statement (a) refers to what Anderson (2003a) called a “high level” of at least one of the three types of interactions. It implies the design of online activities, which require observable responses from participants and generate interactions with the content, the teacher or other learners. Statement (b) requires designers and other practitioners to consider course delivery, which should be planned and managed to maximise the benefit and impact of the predominant type of interaction designed into the course.

**Informal learning activities as evidence of student resourcefulness**

There was no one best learning design. When learner-content interactions were emphasised, the researcher found that some questions about the content could not be answered by referring to course materials. This lack of answers led to participants feeling lost and confused. Groups with predominant learner-teacher interactions faced disengaged teachers, who were also students’ line managers. Inadequate teacher performance resulted in decreased learner motivation. Finally in courses with high levels of learner-learner interactions, shallow replies were common, which represented missed learning opportunities.

However, participants were resourceful in their search for support. If instructional interactions embedded in course materials and activities did not provide answers to their questions, they looked for viable alternatives, such as reviewing their own notes, communicating privately with other participants via Moodle messages or talking face to
face with colleagues. When their teachers’ absence was evident, some learners stepped into the role of the teacher and gave feedback to their peers. If replies to messages in discussion forums were lacking or shallow, some students would seek colleagues face to face or by other means (e.g., private messages). These strategies, which were not embedded in the courses but were used by participants, are valuable because of their potential impact on the achievement of course outcomes and their application in the workplace.

All online courses seemed to trigger informal learning activities beyond the course requirements, on and offline. Such activities involved the three types of interactions, regardless of whether they had been designed into the course. These informal activities provided further learning opportunities for participants and added value to the courses.

**Effective online courses as a lever for organisational change**

The benefits of online courses exceeded what was embedded in the design. They represented an opportunity for the organisation to encourage informal learning activities, and to develop strategic changes in learning practices.

Firstly, this project helped to challenge misconceptions about online learning in organisations, which were identified in the preparation stage (see CHAPTER 3). These ideas included online courses being presented as content repositories and needing no forms of interactions other than learner-content. Participants had the opportunity to experience different course designs, which helped identify effective practices to be repeated in the development and delivery of future courses (e.g., learner-learner interactions to enable the sharing of ideas and the creation of learning communities).

Secondly, this study highlighted the need to capitalise on and maintain the enthusiasm of relevant stakeholders. Their experiences in the courses provided evidence of positive and negative effects of both motivated and disengaged participants. However, there was also
a transformational impact. For example, a member of the Education staff received an email from an employee who had heard about the new online courses and wanted to become involved. Although at the time he could only be given access to a preparatory course (Moodle Features), his interest created further motivation to enhance the quality of the courses on offer and increase the range of available options.

The implementation of the online courses developed for this project contributed to the shifting of a paradigm in which workplace learning had been a predominantly face-to-face, formal activity, the sole responsibility of the HR department. Students showed that they were not constrained by the boundaries of the course design. Online courses and appropriate technologies can be used to empower employees, reinforce their responsibility for their own learning and encourage them to seek other sources of support as part of a culture of informal learning and continuous enhancement.

Limitations
The conclusions of this thesis are subject to a number of limitations. Being a field study conducted in the natural social setting of an organisation, it was close to people’s regular experiences, which increased its ecological validity (Bryman, 2012). However, certain conditions, such as sources of bias, were managed but could not be controlled as well as in experiments conducted in laboratories. These conditions, listed below, cause restrictions that may impact on the validity and transferability of results.

Time constraints: The implementation of this project was bound to a tight schedule, largely dictated by the organisation. Many operational decisions had to be made on the spot. The researcher has experience as a learning practitioner and is familiar with the systems and procedures at the participating organisation, which simplified the decision-making process. Yet, it is likely that if she had had more time available for reflection she would have taken a few different courses of action. For example, she could have negotiated a better alternative to the problem of disengaged teachers rather than just
expecting them to perform adequately later because it was their job to do so. These time constraints represent a limitation of the study but also reflect a common situation for practitioners in similar contexts.

Course design: While the project at the organisation encompassed relevant areas and stakeholders, the answers to the research questions focused on the data obtained from three versions of the same competence-based online course (one week or five study hours). Would longer courses on different topics yield similar results? The course content could be considered “easy to learn”. The researcher could not increase the difficulty of the materials. She could only alter the design. There was little variability in effectiveness results, such as exam grades. Would there be greater variability if the complexity was higher? The main study focused on instructional interactions in online courses. However, other types of interactions, not embedded in the design, took place. Is it even possible to foster only one type of interaction? Some participants were not familiar with learning collaboratively online. They learned basic technical skills and netiquette, but they still required more practice to feel fully comfortable in a virtual environment. Would social interactions embedded in the courses be different if students and teachers felt more at ease? Teachers were generally disengaged. What would have happened if they had become fully engaged and their performance had been excellent? Would the interaction equivalency theorem still apply?

Sampling: Purposive sampling focuses on relevant subjects, but it is a non-probabilistic approach. The groups of students were not randomly constituted but based on sales areas. Mixed ability groups imply the possibility of bias if learners were not evenly distributed. A larger, probabilistic sample with a random group assignment could allow reliable generalisations.

Bias: Some sources of personal bias were beyond the control of the researcher. All participants have unique beliefs and ideas that influence their perceptions. Therefore
their responses to surveys and interviews are subject to their personal predispositions. In most cases, the teachers were also the line managers of the students, which could compel learners to express themselves positively about their teachers’ performance (even if they were ensured anonymity when answering). When conducting observations, HR staff may have felt they should rate students adequately, in spite of being aware that the evaluation was to test the learning design more than the people.

Context: The findings of this thesis are limited to the particular context of the participating organisation in Mexico, a large commercial company with high geographical dispersion, and should be generalised with caution. However, conclusions and lessons learned may be applicable to similar environments, including other companies starting to design and introduce online courses and academic institutions wanting to improve the use of their virtual learning environments.

Recommendations for practice
The findings and conclusions of this project are currently informing learning design and course delivery decisions at the participating organisation, and will help improve future versions of the Leadership Programme. Specifically, this thesis yields the following recommendations for practice (for further details, see Padilla Rodriguez, Armellini & Hawkridge, 2013).

1. Design for access and inclusion. When designing a course, consider the technological infrastructure, participants’ educational background and common issues (e.g., time management problems), to ensure access that caters for different threshold levels of resources, knowledge and skills.

2. Provide meaningful interaction opportunities in the course. Avoid using online learning platforms as content repositories. A real course is more than reading materials available online. Apply the expanded version of the interaction equivalency theorem. Include
activities that foster interactions (learner-content, learner-teacher or learner-learner) and make sure that course delivery is consistent to achieve desired outcomes.

3. **Involve participants in the decision-making process, before, during and after the course.** This informs the risk analysis, facilitates obtaining feedback for improvement, and helps to identify those willing to contribute by creating learning materials (e.g., sharing experiences that can be used as real-life examples, recording podcasts, etc.) or by piloting courses. Such involvement may also have strategic value, as it can enhance workplace satisfaction and increase employee retention.

4. **Communicate regularly with students to address common day-to-day issues.** Use tools learners are familiar with and cannot “miss”. For example, brief, friendly emails with e-learning tips represent a simple, cost-effective strategy to remind participants to log in and to promote good online learning practices.

5. **Ensure teachers have the required skills and are committed to teach online.** If managers will take the role of teachers, bear in mind that they may prioritise management tasks over teaching. They may assume they are content providers, not facilitators of learning. Teachers may also confuse their role with that of learners, especially if they are not the creators of course materials. Provide training and support to tackle misconceptions, to promote effective time management and to foster a culture of excellent teaching practices.

6. **Conduct meaningful and realistic evaluations of course effectiveness.** Take advantage of available resources and established practices to move beyond usual measurements of satisfaction and learning. For example, in this study, HR staff, who were going to sales meetings (established practice), observed learners to evaluate changes in workplace behaviours.
7. **Highlight the implementation of online courses as an inter-departmental process in which different stakeholders have specific roles.** Teamwork is required. While designers provide sufficient opportunities for meaningful exchanges and to facilitate learning, managers, technical staff, teachers and students should collaborate to enable the achievement of desired outcomes.

**Future research**

The findings of this thesis help fill previous gaps in the literature relating to online interactions and course effectiveness in organisations. However, more research is needed. Among other areas, future studies could consider: 1) companies with different characteristics, such as small and medium-sized enterprises; 2) knowledge-based, as opposed to skill-based, courses; 3) courses that last more than one month; 4) course topics with a high level of complexity; 5) participants with vast experience in online learning; 6) larger samples with random group assignment; and 7) fully-prepared teachers with no other work relationship with students. These conditions would help to establish the applicability and validity of conclusions of this project in other contexts.

Several questions, beyond the scope of this study, remain unanswered by the findings of this thesis: In a business context with budget constraints and an organisational culture that dictates that managers should take the role of online teachers, is it better to have a teacher who performs poorly than no teacher at all? What do students need to feel motivated to interact effectively with their peers? How can we ensure that different corporate e-learning stakeholders (see Table 38 in CHAPTER 7) fulfil their responsibilities? All versions of the online course had a high level of one type of instructional interaction. Yet, the design neither dictated nor constrained student learning behaviours. Would a course with few interactions yield the same results if students are motivated?

Additional research should also attempt to provide a better understanding of the unseen dimensions of online learning, such as informal activities that yield unplanned interactions.
beyond course boundaries. This may be particularly relevant in organisational settings, where students are in close contact with co-workers and line managers who can influence their learning experience. Are these interactions valuable for achieving desired outcomes? How important are they in comparison to instructional interactions?

An interesting future study could attempt to use online courses as a lever for organisational change or personal enhancement, assessing differences among participants’ views on workplace learning before and after course implementation. What types of transformational changes can be supported with online courses?

Researchers should consider different ways of conceptualising instructional interactions. This thesis focused on the actors involved in the interactions. An approach that classifies interactions based on their function could yield other valuable information for the understanding of corporate e-learning.

Chapter summary: Conclusions
The conclusions of this thesis covered five key areas: 1) instructional interactions within the design of online courses; 2) effectiveness of online courses; 3) interaction equivalency theorem (Anderson, 2003a); 4) student resourcefulness, or informal learning activities, and 5) effective online courses as a lever for organisational change. Table 41 provides a general summary of this study, including data sources used to answer each research question, key findings and conclusions.
Table 41 General summary

<table>
<thead>
<tr>
<th>Data Sources</th>
<th>RQ1: How do learners interact with the content, the teacher and other learners in online courses?</th>
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<td>Activities encouraged learners to read in greater depth. Yet, the course material could not provide answers to every question. Learners made progress <em>despite</em> rather than <em>as a result of</em> teachers’ participation, which tended to be below the expected standards. Active communities of learners constitute potential learning opportunities, which may be scuppered by shallow contributions and superficial engagement. All online courses seemed to trigger informal learning activities beyond the formal requirements, on and offline.</td>
<td>Regardless of the types of interactions designed into the courses, 97-100% of participants reported being satisfied with their online course. All course participants had higher average exam grades than the control group, 9.5 versus 7.1. Learners on the courses designed with a focus on learner-learner and learner-content interactions deployed enhanced communication skills (average improvement of 1.8%, versus -2.0% in the control group). Sales supervisors who completed the Leadership Programme increased their sales quota coverage more than the control group who did not complete the programme, 7.6 versus 6.7 percentage points. All participants reported that their course expectations had been met.</td>
<td>All online courses were equally effective in terms of satisfaction, learning and return on expectations, regardless of their design. Delivery posed new challenges for course effectiveness, not fully incorporated into the design phase.</td>
<td></td>
</tr>
</tbody>
</table>

**Key Findings**

Activities encouraged learners to read in greater depth. Yet, the course material could not provide answers to every question. Learners made progress *despite* rather than *as a result of* teachers’ participation, which tended to be below the expected standards. Active communities of learners constitute potential learning opportunities, which may be scuppered by shallow contributions and superficial engagement. All online courses seemed to trigger informal learning activities beyond the formal requirements, on and offline.

**Additional Findings**

The implementation of corporate e-learning should be acknowledged as an inter-departmental process. Effective online courses can work as a lever for organisational change. The successful implementation of corporate online learning requires more than effective course design and delivery.
<table>
<thead>
<tr>
<th>RQ1: How do learners interact with the content, the teacher and other learners in online courses?</th>
<th>RQ2: How effective are online courses characterised by high levels of different types of interactions?</th>
<th>RQ3: Which online course design results in the highest levels of effectiveness?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structured learner-content interactions provide standard opportunities for acquisition of knowledge, irrespective of the input of participants and teachers. Learner-teacher interactions are heavily reliant on teacher competence, which highlights the importance of teacher selection, preparation and development. Formal, task-based learner-learner interactions, requiring minimum facilitation by teachers, provide opportunities for students to work together and share information and experiences. The design does not dictate the type of interactions that students actually use. Students are resourceful when trying to find support and engage in informal learning activities to compensate for course design deficiencies. Incorporating more than one type of instructional interaction broadens the range of support options available to students.</td>
<td>Online courses represent an effective option for learning in organisations.</td>
<td>The first thesis of the interaction equivalency theorem applied in the corporate setting of this study and can be expanded to include other indicators of course effectiveness (i.e., satisfaction, behaviours, business results and return on expectations) and to emphasise the importance of effective delivery. High investment in design is not enough for achieving course effectiveness. The quality of delivery, student motivation and willingness to engage are also crucial.</td>
</tr>
</tbody>
</table>

**Conclusions**

The benefits of online courses exceed what was embedded in the design and represent an opportunity for the organisation to encourage a culture of informal learning and continuous enhancement.
Time constraints, course design, non-probabilistic sampling, response biases and context specificity pose limitations to this study. Results should be transferred to other settings with caution. Recommendations for practice and for future research were provided.
EPILOGUE

When I started conversations with the participating organisation, I was focused on answering my research questions: creating groups of students, delivering different versions of the same course, evaluating interactions and effectiveness... I soon realised that if I wanted to be successful, I needed to do much more than what I had originally planned.

Helping the organisation acquire the necessary conditions to implement interactive online learning was a hard, exhausting job. The Moodle Features course, which I moderated, had over 150 students. Since it was the first online course delivered to sales supervisors at the organisation, I tried to reply to all messages. I wanted to challenge the misconception of online courses as isolating spaces. I wanted participants to know that they were not alone, that someone was reading their contributions. I had many 14-hour days.

My original plan was to redesign, develop and evaluate four online courses. I ended up assessing employees’ perceptions on e-learning, installing and configuring Moodle in the organisation’s server, negotiating expectations, training different stakeholders, creating seven courses and moderating three of them, evaluating interactions and effectiveness, presenting results to senior managers, and establishing the foundations for the project to continue beyond the completion of my thesis.

In this sense, my PhD work was a unique opportunity to systematically document the process of implementing online learning at a large Mexican organisation. While other academics have studied different topics in the area of corporate e-learning (e.g., Vaughan & MacVicar, 2004, studied employees’ pre-implementation attitudes towards e-learning; Gunawardena et al., 2010, defined predictors of learner satisfaction and transfer of learning in a corporate online education programme), few researchers have had the opportunity to work with so many different stakeholders at different stages of the
implementation process. I did. Throughout the project, I worked with HR managers, HR staff, learning designers, IT staff, retailers, sales supervisors, and sales managers and directors.

My friendships within the organisation helped a lot in terms of access and support. I am grateful. I would not have been successful without their help. It was not easy. Yet, the experience I acquired, plus random expressions of enthusiasm, make it all worth it.

Lots of things have changed at the organisation. They now have a more interactive approach towards learning. They now have experience with different designs for online courses. They now know how to conduct thorough evaluations of course effectiveness, taking advantage of their existing resources and practices. They are now an example to follow for the parent corporation. They were pioneers in innovating, moving beyond the possibilities of face-to-face courses and online courses-in-a-box.

This project is only a beginning for the organisation. Learning designers are taking the lessons learned forward to improve their educational offer. It will take them a while to create an efficient learning culture and to truly empower employees to be in charge of their own development. It is a process, which will be full of challenges, but the first step is taken. I am happy to have been part of this.

While much remains to be researched, I have moved forward in my mission of helping employees feel better prepared to do their jobs and thus, creating a better world. I have also satisfied my personal curiosity and answered questions I have had since long ago. Are content-based online courses in organisations effective? Yes! Are online courses that foster social interactions effective? Yes! Anderson’s (2003a) interaction equivalency theorem seems to hold true if expanded to include course delivery. Both kinds of courses can be effective. The key is not in the type of interactions embedded in the course but rather on how these interactions take place.
I have learned more than what I can document in a formal, systematic way. I now feel confident enough to help organisations in the implementation of e-learning, from scratch. I can now foresee potential problems that may arise at different stages. I have enough experience to make decisions on the spot. I have a better understanding of how to design, implement and evaluate effective online courses. I know how different stakeholders can be crucial in the success or failure of corporate e-learning. I have evidence to justify the value of online courses to managers and other practitioners. I appreciate how online courses can change people’s attitudes towards learning and how technologies can empower employees.

It was a rewarding journey.
APPENDICES

Note: All appendices are an English translation of the original versions, which were in Spanish. Data that could help identify the participating organisation, such as its name and logo, have been omitted.

Appendix 1 Survey on e-learning perceptions

Survey on E-Learning Perceptions

This study aims to evaluate your perception on online education. Your participation is purely voluntary. Your answers will be anonymous and used with research purposes. If you have any question or comment, contact Brenda Padilla, [email address]. Please answer the following questions.

1. What is your gender?
   a. Male
   b. Female

2. How old are you?

3. What is your educational level?

4. How long (years and months) have you been working at [the participating organisation]?

5. What is your job position?
   a. Sales supervisor of traditional channel [convenience stores]
   b. Sales supervisor of self-service channel [supermarkets]
   c. Sales manager
   d. Sales director
   e. Other (please specify):

6. How long (years and months) have you held this job position?
7. What is your sales region?
   Please select all that apply.
   a. Centre
   b. North
   c. West
   d. Pacific
   e. Southeast
   f. Valley of Mexico

8. In general, how skilful do you consider yourself to be in terms of the use of information and communication technologies (computer, Internet, etc.)?
   a. VERY UNSKILFUL. I am learning the basics. I still need help to use the technology (example: where do I click to...?).
   b. UNSKILFUL
   c. REGULAR
   d. SKILFUL
   e. VERY SKILFUL. I can carry out almost any technological task without problems, even if it is the first time that I am doing it.

9. How many times have you answered an instrument online, such as this survey?
   a. This is my first experience.
   b. From one to three times.
   c. More than three times.

10. How much do you know about online education?
    a. NOTHING. I have no idea what is that.
    b. VERY LITTLE. I have never studied an online course, but I have an idea of how they are.
    c. LITTLE. I have studied an online course at least once.
    d. SOME. I have studied more than one online course, and I understand how it works.
    e. A LOT. I have studied several online courses, I also have taught them or designed them, and I understand how they work.

11. How many online courses have you studied?
    a. None
    b. 1
    c. 2
12. If you have studied at least one online course, how would you rate your experience?
   a. Extremely poor
   b. Poor
   c. Average
   d. Good
   e. Excellent

**Online education is the delivery of courses through the Internet.** An online course can be interactive and have activities to practice the material. It can also have opportunities to communicate with other students and with a teacher. Everything happens via the Internet.

13. Rank from 1 (more important) to 3 (least important) the following elements in an online course.
   a. Interactive content (example: individual activities and automated feedback)
   b. Communication between students (example: group assignments and discussions in forums)
   c. Teacher guidance (example: answer of questions and personalised revision of assignments)

14. How much would you like to participate in an online course [at the participating organisation]?
   a. Not much
   b. Very little
   c. Little
   d. Somewhat
   e. A lot
15. How much do you consider that online education could be beneficial in [the participating organisation]?
   a. Not much
   b. Very little
   c. Little
   d. Somewhat
   e. A lot

16. Please name two (or more) benefits that you think the implementation of online courses [at the participating organisation] could have.

17. Please name two (or more) challenges that you think the implementation of online courses [at the participating organisation] could have.

18. What would you expect from online education [at the participating organisation]?
   Please select all that apply.
   a. Nothing.
   b. Feeling more satisfied in my job.
   c. Acquiring new knowledge and skills.
   d. Improving my work performance.
   e. Achieving business results, such as increasing sales.
   f. Obtaining economic benefits from the courses that exceed the implementation costs.
   g. I don’t know.
   h. Other (please specify):

19. If you are interested in providing extra help in the implementation of e-learning in [the participating organisation], select your preference and share your email address (which will not be related to your answers). This is 100% optional.
   Note: Only some interested people will be contacted.
   a. I want to participate in an interview.
   b. I want to give my opinion on learning materials.
   c. I want to pilot an online course.
   d. I want to help in anything you need. ;-)
   e. Email:

20. If you have any other comment, please share it in this space.
Appendix 2 E-Learning tips

E-learning tips were sent via email to participants of the Leadership Programme.

<table>
<thead>
<tr>
<th>#</th>
<th>E-Learning Tip</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hello, You are receiving this email because you are a user of the e-learning platform [name of initiative at the participating organisation]. We will regularly send you a recommendation, so you can benefit the most from your online courses. All the best!</td>
</tr>
<tr>
<td>2</td>
<td>Allocate fixed hours to participate in your online course. It can be from 8 to 8:30 am or from 2 to 2:30 pm. You only need a short time (15 minutes or less) to read a text or complete an activity. Do you have your schedule already?</td>
</tr>
<tr>
<td>3</td>
<td>Give us a sign that you are there. In a classroom, it only takes people to see you for them to know that you are there. In an online course, you need to exchange messages and do the activities so others can notice your presence. Have you participated in your course today?</td>
</tr>
<tr>
<td>4</td>
<td>Divide ideas into paragraphs when you send a message. It helps people understand that you are changing the topic. Also, imagine seeing a gigantic mass of text... what a drag... Dividing ideas into paragraphs makes the text easier to reading. How do you write?</td>
</tr>
<tr>
<td>5</td>
<td>Use people’s names. It is a way of emphasising that their contribution is important and that they have been Heard. For example: “Good idea, John”. With whom have you spoken today?</td>
</tr>
<tr>
<td>6</td>
<td>Be concise. Less is more. Avoid babbling, if it does not contribute to the main idea. For example: Ok, so, see, what happens is that in that situation that you are describing, I think that for example, we could like, maybe do... The more brief and specific, the higher probability you will have of making yourself understood. How much do you babble?</td>
</tr>
<tr>
<td>#</td>
<td>E-Learning Tip</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7</td>
<td><strong>Exemplify.</strong> Use facts, data and relevant anecdotes to support your ideas. This will give you a higher credibility and improve your arguments. What example have you given today?</td>
</tr>
<tr>
<td>8</td>
<td><strong>Be constant.</strong> Several activities require you to interact with other participants. If you take too long to enter your course, you will participate little with others, you will lose a valuable learning opportunity, and here, in Human Resources, we will be sad... ☹️ Have you entered your course today?</td>
</tr>
<tr>
<td>9</td>
<td><strong>Use lower and upper case letters when writing.</strong> In online environments, WHEN YOU TALK LIKE THIS, people interpret that you are shouting (out of excitement or anger). Unless that is your intention, it is better to use lower case letters too. How do your words sound?</td>
</tr>
<tr>
<td>10</td>
<td><strong>Find your point of balance.</strong> Not so much and not too little. Neither super formal (“I send my contribution so you can kindly evaluate it”) nor super informal (“wazzup”). Neither an essay nor a one-word response (“yes”). Find the communication style that makes you feel comfortable. How do you like to express yourself?</td>
</tr>
<tr>
<td>11</td>
<td><strong>If you are going to use the idea of someone else, cite it.</strong> It is a way of giving credit to the ones who deserve credit. For example: “As Maria proposes, that strategy could increase sales”. How many people have you acknowledged today?</td>
</tr>
<tr>
<td>12</td>
<td><strong>Take advantage of your spare time.</strong> Most activities and materials in your course are designed to be checked or completed in 15 minutes or less. Do you have 15 spare minutes before a meeting? Log into your course! Have you logged in today?</td>
</tr>
<tr>
<td>13</td>
<td><strong>Mark keywords with bolds or italics.</strong> This helps to identify easily the most important information in a message. How clear is your message?</td>
</tr>
<tr>
<td>14</td>
<td><strong>Log into your course at least three times per week.</strong> It will keep you updated on the activities. Have you logged into your course today?</td>
</tr>
<tr>
<td>15</td>
<td><strong>Enjoy.</strong> Your participation is very, very, VERY important so your course is a gratifying experience. If you have any suggestion for us, email us! Have you participated in your course today?</td>
</tr>
<tr>
<td>16</td>
<td><strong>Participate.</strong> Use the tools to learn with your course peers and teachers. Analyse cases, discuss ideas, share questions and experiences in the forums, and complete</td>
</tr>
<tr>
<td>#</td>
<td>E-Learning Tip</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>group assignments.</td>
</tr>
<tr>
<td>17</td>
<td><em>Ask.</em> It is very important to share your questions in the General Help Forum or with your teacher, so you can get an answer and move forward with your studies. What questions have you answered today?</td>
</tr>
<tr>
<td>18</td>
<td><em>Allocate enough time to finish activities.</em> You may have notice that technology is imperfect. Sometimes the system crashes! We will do everything possible to prevent these situations... but just in case, manage your time adequately. If you wait until the last possible moment to do the assignments and the system crashes, you will have a problem. If you consider this possible situation in your personal organisation, you will be ok. 😊</td>
</tr>
<tr>
<td>19</td>
<td><em>Follow instructions!</em> We have noticed that some people complete the activities without reading task instructions. How do we know? Easy... Instructions ask for one thing and students do something else. Following the instructions will help you achieve the objective of the activity. ;-) How closely do you follow instructions?</td>
</tr>
<tr>
<td>20</td>
<td><em>Move forward!</em> It is important to be up-to-date with your activities, so you can have gratifying, constructive learning experience. Remember that activities are designed to be completed in 15 minutes or less. Take advantage of your time. ;-) How much did you progress today?</td>
</tr>
<tr>
<td>21</td>
<td><em>Complete the activities.</em> You may have noticed that sometimes you finish the task but the activity is not automatically ticked as completed. Activities have a follow-up part. If you do not do this part as well, you have not finished. How many ticks do you have?</td>
</tr>
<tr>
<td>22</td>
<td><em>Come back!</em> Remember that some activities are designed so you can execute an action plan and then share your results. We are waiting for you. Tell us. How was it?</td>
</tr>
<tr>
<td>23</td>
<td><em>Mark your activities.</em> Have you finished an activity and it is not marked as completed? Check if it has the option to be manually marked. If it does, click the box. 😊 Is your activity ticked now?</td>
</tr>
<tr>
<td>24</td>
<td><em>Catch up.</em> At the end of this week, we will close the activities of the course. You will not be able to complete them after this. Remember that the final activity requires you to share your results. Are you up-to-date with your course?</td>
</tr>
<tr>
<td>#</td>
<td>E-Learning Tip</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>25</td>
<td>Catch up. At the end of this week, we will close the activities of the course. You will not be able to complete them after this. Remember that the final activity requires you to share your results. Are you up-to-date with your course?</td>
</tr>
<tr>
<td>26</td>
<td>Complete the final activities! The final activity of each course gave you a month to finish it. Usually, you were asked for an action plan and the results. Have you included everything you need?</td>
</tr>
<tr>
<td>27</td>
<td>Check the feedback. Your course activities have feedback, which can be provided by the system, your teacher or your course mates. Have you checked it?</td>
</tr>
</tbody>
</table>
| 28 | Apply what you have learned! Today is the official end of the online part of the Leadership Programme. To check that you are applying what you have learned, we will conduct observations and check your indicators, including:  
  - Sales quota coverage  
  - Performance standards  
  - Turnover rate of retailers in your team  
This evaluation will be conducted in the next couple of months. If you have any questions, contact us. We are here to help. |

**Appendix 3 Translation: Activity in the Teaching How to Teach Online course**

**Activity 2.2 A difficult situation**

**Objective:** To develop strategies to support students with low motivation levels.

**Task:** Listen to the hypothetical opinion of an online student.

[podcast]

If you cannot listen to the audio, read the transcript:

_Hmmm... Well, I don’t really like this of online education. I don’t know what to click. I feel I am going to break it... Besides, I am embarrassed to publish a message that will remain there forever. I know my spelling is not the best. I am worried about leaving written evidence of my mistakes. I don’t have time to do this._

Think: How could you motivate this student? Post a message in which you describe what you would say to invite her to participate.
Follow-up: Read the messages posted by your course mates. How do you think the student would feel? What other strategies could you use to motivate her to participate? Reply to at least one message with your thoughts and comments. Make questions. Challenge. That will help your course mates build knowledge.

Appendix 4 Study information in the Teacher Manual

The Leadership Programme is part of a PhD thesis project conducted by Brenda Padilla, student of the University of Leicester (England). Here is the description.

Title of the Study: Effective design of online corporate courses based on different levels and types of interaction

Researchers: Brenda Padilla and Alejandro Armellini, from the University of Leicester, England. These researchers are external [to the participating organisation].

Objective: We want to determine the most effective way of designing online courses using different levels and types of interaction.

Participation Details: Different student groups will take four online courses of the Leadership Programme, in a different sequence. These courses will have a different learning design. To obtain information regarding the effectiveness of each version, the researchers will use data collection methods such as observation, interviews, surveys and document analysis. Participation times will be kept to a minimum.

Some data will be used for purposes of [the participating organisation] and others, for research. In terms of the research, data will be presented anonymously. Results will neither reference any identifiable individual nor the organisation. Results may be submitted for publication in scientific journals or presented at academic conferences.

If you would like more information, please contact Brenda Padilla, [email].
Appendix 5 Diagnostic survey: Feedback on Performance course

**Informed Consent Form**

The Leadership Programme was designed and delivered as part of the PhD thesis of Brenda Padilla, [email], student of the University of Leicester (England). Her supervisor is Alejandro Armellini, who has vast experience in online education.

**What is the objective?**
This course is particularly important. It will help to determine the most effective way of designing online courses. We need your help!

**How can I participate?**
You only need to do the activities and exam as usual. Your contributions will be analysed to check the effectiveness of the course. Moreover, to gather data about your experience in the course, the researchers will use methods like observation, interviews, surveys and document analysis. Your participation time will be kept to a minimum. Your participation is 100% voluntary.

**What will you do with the data?**
Some data will be used for evaluation purposes [at the participating organisation], and others, for research. Regarding the PhD study, your answers will be kept anonymous. Results will be reported in general, without reference to any identifiable person (or to the organisation). The researchers might submit the results for publication in a scientific journal or present them at academic conferences.

Your codified data (your identity will be protected) might be shared with other competent researchers and used in related studies. The information will be stored confidentially in electronic format for at least five years after the appearance of associated publications. When the study ends, you can obtain a summary of the main results.

**What shall I do if I still have questions?**
Contact Brenda Padilla, [email].

Do you accept to participate in this study?
Yes. My participation in the Leadership Programme can be used for research purposes and for evaluation purposes [at the participating organisation].
No. My participation in the Leadership Programme cannot be used for research purposes (but it can be used for evaluation purposes [at the participating organisation]).

If you accepted to participate in this study, would you like to get a summary of the results when the study ends?
   Yes.
   No.

Please answer the following questions sincerely.
1. Name

2. What do you want to improve by studying the course Feedback on Performance? 
   Please select all that apply.
   a. Nothing in particular...
   b. Satisfaction (example: experiencing an enjoyable online course)
   c. Learning (example: acquiring theoretical knowledge on effective feedback)
   d. Behaviours in the workplace (example: providing feedback more effectively to collaborators)
   e. Business results (example: increasing sales, improving the work environment, etc.).
   f. Return on investment (example: obtaining economic benefits higher than the cost of this course)
   g. Other (please specify):

3. From 1 (very little) to 10 (a lot), how much do you know about the key elements to provide an effective feedback?

4. From 1 (poor) to 10 (excellent), assess your performance during the last semester in terms of the following.
   a. Speaking clearly.
   b. Being expressive when communicating with others (moving hands, making gestures, changing the tone of voice).
   c. Using concrete facts to exemplify ("we have covered 90% of the sales quota" instead of "we are doing well in terms of sales").
   d. Showing empathy ("I understand what your point of view").
   e. Making sure your message has been understood ("any questions").
   f. Using words that express support or acknowledgement ("very good").
g. Speaking positively ("we need to do X" instead of "don’t do that").
h. Smiling and/or using humour when talking to collaborators.
i. Looking at people when they are talking.
j. Calling collaborators using their names.
k. Remaining quiet while listening and while others are talking to you.
l. Focusing on behaviours when offering personal feedback ("three times this week you have arrived 15 minutes late" instead of "you are so unpunctual").

Appendix 6 Evaluation survey: Feedback on Performance course

Please answer the following questions sincerely. Your comments will help us improve.

1. Name:

2. In total, how many study hours (approximately) did you dedicate to this course?

3. How engaged were you with the activities in this course?
   a. Not engaged at all
   b. Very little engaged
   c. Little engaged
   d. Engaged
   e. Very engaged

4. Was there anything extra you could have done (but didn’t) to take the most advantage of this course? If your answer is yes, what was it?

5. Indicate your agreement level* with the following statements.
   * Answers were from 1 (totally disagree) to 5 (totally agree) and included a “non-applicable” option.
     a. Materials fostered my reflection on the course topics.
     b. The teacher helped me understand the topics of the course.
     c. In the course, I shared valuable learning experiences with other students.

6. Please assess your experience in this course, answering the following questions.*
   * Answers were from 1 (very little) to 5 (a lot) and included an “I don’t know” option and a space for optional comments.
     a. How satisfied are you with this course?
b. How much did you learn in this course?
c. How prepared do you feel to provide effective feedback to your collaborators?
d. How much were your course expectations fulfilled?

7. What did you like best of this course?

8. What do you think could be improved in this course?

9. If you have any other comment, please share it in this space.

Appendix 7 Follow-up survey: Evaluation of the Leadership Programme

This is a survey to evaluate the Leadership Programme. We are very interested in improving. Please answer **honestly**. Your answers will be **anonymous**. It will take you 5-10 minutes to complete the survey. If you have questions, please email us, [email].

The survey has two pages. Please answer both.

1. Which course of the Leadership Programme **did you like the MOST**?
   a. Situational Leadership
   b. Empowering Beliefs
   c. Effective Performance
   d. Feedback on Performance
   e. I did not like any of the courses.
   f. I liked all of the courses equally.

2. Why? Please be as detailed as possible. Your comments will help us improve.

3. What **did you like BEST** of this course (the one you selected in question 1)?
   a. The topic
   b. Activities
   c. Communication with my course mates
   d. Teacher guidance
   e. Other (please specify):
4. What **did you like LEAST** of this course (the one you selected in question 1)?
   a. The topic
   b. Activities
   c. Communication with my course mates
   d. Teacher guidance
   e. Other (please specify):

5. Which course of the Leadership Programme **did you like the LEAST**?
   a. Situational Leadership
   b. Empowering Beliefs
   c. Effective Performance
   d. Feedback on Performance
   e. None. I liked all of the courses.
   f. I disliked all of the courses.

6. Why? Please be as detailed as possible. Your comments will help us improve.

7. What **did you like LEAST** of this course (the one you selected in question 5)?
   a. The topic
   b. Activities
   c. Communication with my course mates
   d. Teacher guidance
   e. Other (please specify):

8. Did you exchange private messages with any other participant?
   a. No.
   b. Yes, 1 or 2.
   c. Yes, like 3 or 5.
   d. Yes, more than 5.

9. In which course were you enrolled?
   Note: This question is solely to evaluate the Leadership Programme. Your identity will remain anonymous.

10. If you have any other comment, please share it in this space.
Appendix 8 Observation guide

The original observation guide listed behaviours related to skills developed in the courses of the Leadership Programme that were not included in the main study (i.e., Situational Leadership, Empowering Beliefs and Effective Performance). These behaviours were evaluated due to an interest of the participating organisation, which is beyond the scope of this thesis. They are, thus, excluded of the following translation.

Date: __________

Sales supervisor:__________

Area region:_____________

Instructions: Observe the behaviour of the sales supervisor during the sales meeting. Rate from 1 (little) to 10 (a lot) how frequently do they carry out any of the following behaviours. If for some reason it was not applicable for the behaviour to occur, write “NA”. Your evaluation will be anonymous and used to check the effectiveness of the Leadership Programme.

1. Their voice is heard clearly when they speak.
2. They are expressive (moving their hands, making gestures, changing the tone of voice).
3. They use concrete facts to exemplify (“we have covered 90% of the sales quota” instead of “we are doing well in terms of sales”).
4. They show empathy (“I understand what your point of view”).
5. They make sure their message has been understood (“any questions?”).
6. They use words that express support or acknowledgement (“very good”).
7. They speak positively (“we need to do X” instead of “don’t do that”).
8. They smile and/or use humour.
9. They look at people when they are talking.
10. They call collaborators using their names.
11. They remain quiet while listening and while others are talking to them.
12. They focus on behaviours when offering personal feedback (“three times this week you have arrived 15 minutes late” instead of “you are so unpunctual”).
Please include in the following space, your notes on the context, anecdotes, explanations, or other data that you consider important when evaluating the performance of the sales supervisor.

Comments:
REFERENCES


