**Should a dynamic capabilities framework be integrated into evaluations of workplace e-learning processes?**

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ABSTRACT:

*The goal of any e-learning programme is to improve employee's capabilities in order to enhance an organisation's performance. However, notions of sustained performance in contemporary strategic management have moved from measures of productivity and profitability towards adaptability and innovation. Therefore we propose that e-learning effectiveness in workplace settings should also be related to the development of dynamic capabilities. With the aim of contributing toward emerging theory on dynamic capabilities relevant to human capital, this paper reports and discusses findings of an exploratory qualitative study that examines e-learning processes and evaluations in ten medium to large New Zealand organisations. A model and propositions are offered which provide specific mechanisms for the relationships that emerge from the data.*

Keywords:    Human capital development, innovation, learning and development, competitive advantage, dynamic capabilities, implementation.

The continued need for organisational development can be traced to numerous demands, including maintaining competitiveness, increasing productivity, and enhancing employee knowledge and skills. Investments in human capital, such as extensive training programmes, have generally been shown to yield positive individual- and organisation-level performance outcomes (e.g., Becker & Huselid, 2006;

Subramony, Krause, Norton, & Burns, 2008). This is particularly true when investments are directed towards programmes that increase and retain organisation-specific human capital (Crook, Todd, Combs, Woehr, & Ketchen, 2011). Technology assisted learning, commonly known as e-learning, offers potential advantages over traditional training methods by enabling swift and efficient integration with organisational strategies and social structures. The goal of any e-learning programme is to improve employee's capabilities in order to enhance an organisation's performance. However, notions of sustained performance in contemporary strategic management have moved from measures of productivity and profitability towards adaptability and innovation (M.-J. Chen & Miller, 2012). Therefore we propose that e-learning effectiveness in workplace settings should also be related to the development of dynamic capabilities (Teece, Pisano, & Shuen, 1997). Dynamic capabilities are defined as the organisation's "ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al., 1997, p. 516).

Training effectiveness is often embedded in static models where competitive advantage is a function of superior capabilities (Baldwin & Ford, 1988; Kline & Harris, 2008). While it is recognised that such capabilities can indeed be valuable, they are not always sources of sustainable competitive advantage, and they are certainly not the 'ultimate' source (M.-J. Chen & Miller, 2012; Collis, 1994). This is particularly true of the lower-order capabilities that reflect an organisation's ability to perform basic functions and activities to produce products and services. Such organisational capabilities are increasingly vulnerable to competitive actions (D'Aveni, Dagnino, & Smith, 2010; Li, Shang, & Slaughter, 2010). It is clear that organisations that maintain unique advantage adopt a more dynamic perspective and develop capabilities and supporting structures compatible with innovation. These higher-order capabilities and structures can be harnessed to continuously create, extend or modify an organisation's resource base (Helfat et al., 2007). A key aspect of dynamic capabilities is the application of entrepreneurial innovation to the development and adaptation of operating routines (Hine, Parker, Pregelj, & Verreynne, 2014). Taking this

into account we propose that incorporating the dynamic capabilities framework into e-learning evaluations offers a number of potential benefits. First, it focuses the learning evaluation into an emerging context, in which cause and effect are secondary to flexibility and adaptation (Giangreco, Carugati, & Sebastiano, 2010). Second, it incorporates the rapid integration of product and process innovations as a fundamental objective of e-learning programmes, and therefore evaluations (Sung & Choi, 2014). Third, it acknowledges the value of collaboration for learning acceleration, and groupwork performance (Nembhard & Tucker, 2011).

This study investigates the feasibility of aligning e-learning evaluations to the dynamic capabilities framework. Our research takes the position that practices for managing workplace e-learning offers valuable insights into the strategic orientation of the organisation. The study of dynamic capabilities through workplace e-learning offers several advantages over more functional performance indicators such as alliances, product development, and acquisitions (e.g., Kale and Singh, 2007; Macher and Mowery, 2009; Zollo and Singh, 2004). First, workplace e-learning engages many parts of an organisation. Second, e-learning processes integrate into the development of new operational processes. Third, dissecting e-learning processes offer valuable insights into the operationalization of an organisation's goals, environmental responsiveness and approaches to human capital development. We explore the following questions: How do organisations use e-learning processes to accommodate innovation and adaptation? In response to e-learning evaluations, what adaptive processes do organisations use to extend or modify their skills base? With the aim of contributing toward emerging theory on dynamic capabilities relevant to human capital (e.g., Chatterji & Patro, 2014; C. Y.-P. Wang, Jaw, & Tsai, 2012) this paper reports and discusses findings of an exploratory qualitative study that examines e-learning processes and evaluations in ten medium to large New Zealand organisations.

**TRAINING EFFECTIVENESS**

The cost of specific deliberate learning investments is often difficult to justify, particularly in the short term (Jiang, Lepak, Hu, & Baer, 2012; Valerij & Tomaž, 2013). Even over longer terms, where there is greater evidence of positive outcomes (Collier, Green, Kim, & Peirson, 2011; Kozlowski & Klein, 2000; Wright, Gardner, Moynihan, & Allen, 2005), effectiveness varies significantly across organisations (e.g., Aguinis & Kraiger, 2009; Birdi et al., 2008; Wright et al., 2005). This suggests that organisations differ widely in their ability to successfully introduce extensive training. Other researchers have provided evidence that organisations who measure training effectiveness have a greater chance of improved business performance (e.g., Aguinis & Kraiger, 2009; Kitching & Blackburn, 2002). Despite this, training programmes are seldom rigorously evaluated to determine their effect on the behaviour or job performance of participants, let alone organisational-level outcomes (Bersin, 2006; Martin, 2010; Phillips & Phillips, 2010). This problem is exasperated as relevant skills and knowledge have increasingly faster obsolescence rates (Grovo, 2015), particularly in knowledge intensive industries and activities (Allaart et al., 2002; Backes-Gellner & Janssen, 2009).

There is evidence that some training types enhance the learner's ability to generalize knowledge and skills, adapting them to new situations and problems. For example, training programmes; directed at mastering a task rather than achieving specific performance goals (Brown, 2005; Kozlowski et al., 2001; Kozlowski & Bell, 2006), that encourage learners to explore and handle errors (Dormann & Frese, 1994; Heimbeck, Frese, Sonnentag, & Keith, 2003; Keith & Frese, 2008), and guide learners to explore and build a deeper understanding of the underlying principles of the task rather than step-by-step procedural training (Bell & Kozlowski, 2002, 2008). Similarly, concept-based training is more likely to protect against human capital depreciation than skill-specific education (Weber, 2014). Thus specific types of

training orientated towards a flexible training strategy and sequenced mastery goals provide the potential means for improving adaptability and resilience in complex task situations. E-learning offers further adaptive possibilities due to the human and system ability of more rapid deployment and agile responses to environmental changes (H.-J. Chen, 2010; Luor, Hu, & Lu, 2009). Furthermore, e-learning can improve employees' ability to collaborate and access information, and offers significant opportunities for knowledge creation and sharing (Garcia, 2011; McAfee, 2009; Tafti, Mithas, & Krishnan, 2007).

Despite the advantages provided by bringing learning online the question arises; does this alter the way programme effectiveness is measured? If the ultimate goal of any human capital programme is to build and maintain a more effective workforce, the measures should also be aligned to sustainable advantage. This view is supported by numerous researchers who argue that training needs be targeted effectively to strategic objectives in order to have the maximum business benefit (e.g., Abdel-Wahab, Dainty, Ison, & Hazlehurst, 2008; Dimitriades, 2005; Garavan, Costine, & Heraty, 1995). It is sometimes argued that e-learning is a more cost-effective alternative to face-to-face training and easier to deliver. However, training costs remain relatively constant across organisations after the shift to technology-based delivery (Patel, 2010). Greater investments in technology-related costs tend to offset the savings in travel and face-to-face trainer time (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012). Therefore, there may be other benefits that make e-learning strategically significant in organisations. By introducing the dynamic capabilities framework, organisations may be able to balance the requirement for employees to have the specific skills they need to do today's work with the need to develop an adaptive, flexible workforce that can adjust to change (Salas et al., 2012).

# DYNAMIC CAPABILITIES AND E-LEARNING EVALUATIONS

The literature on dynamic capabilities addresses the question of how organisations achieve long-term competitive advantage by simultaneously developing and reconfiguring their skills and competencies (Helfat et al., 2007; Winter, 2003). Teece and his colleagues (1997) identified dynamic capabilities as those that allow organisations to add, discard or refresh operational capabilities in response to environmental change. Performance is not directly affected by dynamic capabilities but rather influences output by modifying operational routines and competencies (Helfat & Peteraf, 2003; Zott, 2003). A particular competence does not indicate a dynamic capability but rather the ability to integrate internal competencies in new directions. Teece (2007) argues that dynamic capabilities are composed of three microfoundations; sensing, seizing and reconfiguring. Sensing refers to an organization's capacity to recognize and appraise opportunities and threats in the competitive environment, as well as within its own capabilities. Seizing is the organisation's ability to amass resources and address the opportunities and threats it has identified. Reconfiguration is how firms organize new and old resources for maximum value. All three of these activities are dependent on managerial discretion that has become a primary focus of much of the recent work on dynamic capabilities (see Helfat & Martin, 2015). We narrow our focus to human capital development which has long been associated with organisational performance (e.g., Black & Lynch, 1996; Blundell, Dearden, Meghir, & Sianesi, 1999; Crook et al., 2011; Hatch & Dyer, 2004).

Using the microfoundations identified by Teece (2007) we apply a dynamic capability lens to explore one particular development tool. Once a decision is made that it would be beneficial to allocate resources to deliberate learning activities, and this is best conducted online, these activities will need to be justified via some form of evaluation. It is through this evaluation process that an organisation can validate and continue training that works, and modify or discontinue training that does not work (Salas et al., 2012). The evaluation process and the subsequent modification of the online learning strategy clearly implicates

Teece's (2007) description of reconfiguring. Thus a parallel can be drawn in two senses: the degree that e-learning evaluation enables the learning program to adapt; and how integral the system is to the organisation's innovation processes. According to Kraiger, Ford, & Salas (1993), evaluation is conducted to answer two fundamental questions, whether learning objectives were achieved, and whether this learning results in enhanced performance on the job. Applying a dynamic capabilities framework will extend these objectives and ask how the program integrates with organisational learning processes and contributes to innovation and adaptation. For example, what mechanisms are in place to alter the e-learning program as new learning needs arise? Furthermore, how integrated to an organisation's innovative processes, such as new product or process development, is the organisation's e-learning program?

## METHOD

The dynamic capabilities concept is still relatively new, complex, and context-bound and therefore best suited to qualitative research (Teece, 2012, p. 1400). We use a case-orientated research methodology as there is relatively little theoretical precedent for a deductive study (Eisenhardt, 1989; Ragin, 1999, 2001; Yin, 2009). The case-orientated approach seeks a holistic explanation of how processes and causes "fit together" in each individual case (Piekkari, Welch, & Paavilainen, 2009). Case-orientation is appropriate to document a contemporary phenomenon within its real-life context, particularly where there is no clear boundaries between the phenomenon and the context (Yin, 2003). Ten medium to large New Zealand organisations were chosen from a range of industry sectors, known by the primary researcher to use custom e-learning. Each of these organisations had a distributed workforce of more than 1000 employees and used, or intended to use, e-learning as a considerable part of their formal employee learning and development strategy. In Table 1 we provide details of the participant organisations, although the names have been changed and the employee numbers rounded down so the organisations cannot be identified.

The respondents were all responsible for decisions regarding the adoption, content and evaluation of e-learning within the organisations, with job titles varying from Digital Learning Specialist to Director of Education. In some circumstances decisions regarding e-learning were distributed over a number of roles so, where necessary, further respondents were sought from the same organisation. There were a total of sixteen semi-structured interviews conducted, each lasting 30 to 45 minutes, all were recorded and later transcribed. Before the interviews, we developed a protocol focused around our research questions, but allowed the line of questioning to evolve and probed emerging areas. Examples of questions from the protocols are 'How do you know if an e-learning content is up to date?', 'How do you assess the effectiveness of your e-learning programmes (both formally and informally)?' and 'Describe a situation where the assessment has changed the way you do things.' The full list of the interview guideline questions are provided in the Appendix.

The analysis involved iterating between theory and data and used two data approaches, drawing from previous exploratory research on dynamic capabilities (Lee & Kelley, 2008). We first conducted an examination of the data using thematic analysis (Braun & Clarke, 2006), followed by mapping and interpretation, guided by a derived theoretical coding frame (Ritchie & Spencer, 1994; Ward, Furber, Tierney, & Swallow, 2013). Each interview was categorised by organisation, allowing for a case-orientation which seeks a holistic explanation of how processes and causes 'fit together' in each individual case (Ragin, 1999). The first approach to analysis was the initial coding of the interview transcripts. NVivo (version 10), a qualitative data analysis computer software program, was used for this purpose. During this process initial data matrices were constructed to examine within and across organisations on the key variables. The second approach was to review theory on dynamic capabilities and human capital development. By iterating between theory and data, we developed a framework of

understanding the nature of dynamic capabilities and how e-learning evaluations are, or can be, structured and integrated to support strategic innovation and adaptivity.

The initial coding was line by line to discern which action it indicated and were sometimes moved, merged, renamed or redefined as the project developed. This step identified 125 open codes or free nodes which are broad categories where mean concepts, processes, thoughts and ideas are stored (Edhlund, 2011; Hoover & Koerber, 2011). The next step was focused coding where the data was scrutinised across the cases, in order to test the validity of the nodes (Charmaz & Bryant, 2010). NVivo coding strips and highlight views were used to allow easy browsing, reflecting, reviewing the results of the initial coding (Bringer, Johnston, & Brackenridge, 2006; Edhlund, 2011). Memos were attached to nodes to justify the selection of passages and to explore participant's tacit and overt meanings (Charmaz & Bryant, 2010). The memo writing became more analytic and directed as the inquiry progressed. A second level of descriptive coding was then undertaken to identify any sub-categories that may relate to elements of the dynamic capabilities framework. This stage identified theoretical themes and sub-themes across cases to emerge while oscillating between the raw data and a summary table (Corbin & Strauss, 2008). This stage moved the open coding to more abstract coding of data into theoretical sub-categories, reducing to nine theoretical categories. Once the full list of themes and sub-themes were extracted a set of three aggregate dimensions were distilled (consistent with Corley & Gioia, 2011; Gioia, Corley, & Hamilton, 2013). A visual summary of the process described above is shown in Figure 1.

In Figure 2, we display our model of how the dynamic capabilities framework can be applied to workplace e-learning evaluations. The model is made up of three basic sections. First, we discuss the triggers that influence the organisation's e-learning adoption strategy that potentially play a role in the development of dynamic capabilities. The premise for including these triggers is e-learning can be integral

to higher-order human capital development, but only if supported by the organisational context. Second, we explore the relationship between dynamic contexts and the programme evaluations. These include the achievement of learning objectives and also the indicators of dynamic capabilities such as programme integration and flexibility. Last, we analyse how the evaluations that result in reconfiguring either the programme or the learning. It is through these modifications that dynamic capabilities are indicated and supported. Next, we discuss each element of the model and offer propositions which provide specific mechanisms for these relationships emerging from the data.

## FINDINGS AND DISCUSSION

The ten organisations in this study represent vastly disparate contexts. The adoption of e-learning can represent an operational advantage where cost and centralised control are the dominant objectives. However, dynamic capabilities are indicated where the organisation's culture or the e-learning itself appears innovative, the justifications are strategic, and management supports and encourages innovation. Clearly e-learning processes reflected more about the organisation than just an operational desire to solve training issues. For example, the adoption of e-learning itself often represents a substantial allocation of resources therefore indicating a range of bureaucratic management structures and support. For example, a high degree of management discretion was displayed when our informant from Alpha Tech explained their approval process to engage a substantial e-learning programme, "Well, I sold it to our management team in New Zealand. So I wrote a paper… it wasn't a hundred pages, I think it was three". A demonstration of tactical engagement of online learning also indicates higher-order organisational capabilities (C. L. Wang, Senaratne, & Rafiq, 2015) rather than an excessive emphasis on exploitative learning (Gupta, Smith, & Shalley, 2006). For example, the Delta Gov informant explains their sophisticated learning management system in strategic terms, "We've got a lot of data, and we need to be able to use it properly, and that applies to the training … but we are pushed by strategy. The strategy is

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that we become more engaged in the world…, and technology is part of that, definitely a big part of it". In Table 2 we compare dynamic and operational e-learning adoption triggers. Based on the above, we offer the following:

Proposition 1: Organisations from a dynamic context will adopt and use e-learning more innovatively, justify it more strategically, and adapt it more quickly to support change.

According to Kraiger, Ford, & Salas (1993) evaluation is conducted to answer two fundamental questions; whether learning objectives were achieved, and whether this learning results in enhanced performance on the job. Applying a dynamic capabilities framework will extend these objectives and ask how the programme contributes to the application of entrepreneurial innovation and the development and adaptation of operating routines (Hine et al., 2014). To evaluate these second-order goals some degree of e-learning program collaboration, integration and flexibility will also need to be measured (Nembhard & Tucker, 2011; Sung & Choi, 2014). For example, some organisations reveal sophisticated online discussion groups linked to their learning management system. This is exemplified by Delta Gov's informant, "iGroups are communities of practice… they're small groups, but they're spread out, so the mechanism is to bring those people together so they can discuss what they find—you know, their issues, their problems, their solutions are through iGroups, which is predominantly around forums, so it looks a bit like Facebook". Programme integration is illustrated by one of Beta Tech's informants, "We've got a bit of a dichotomy, I suppose, where our products are changing so quickly, that we can't keep the training up to date necessarily. However, the best model we have is with our product XXX, for that, our training is launched at the same time as the product is launched… So it's a new product, it's growing, and as that product is being released in pieces, then our training is being released at the same time".

Programme evaluations in dynamic organisational contexts are often based on external achievement. For example, Alpha Tech's informant relayed this story, "So we've had e-mails coming in from the actual branch network itself telling us how successful this has been. The most successful one was a Massey University student who was working part-time in a store, undertook the training and on the first Saturday sold quite a sophisticated piece of equipment…" Beta Tech also discussed their innovative learning objectives, "The other check is revenue, I was given a goal of breaking even… so as long as my team is covered by revenue I bring in from clients …[last year we achieved a profit of] 36%." However, the true test of the success of an evaluation is how this information is used to reconfigure learning initiatives (Salas et al., 2012). For example, when asked about evaluations of discussion forums the informant from Beta Gov advised, "We have some metrics around how communities of learning work, around engagement. Are there clear leaders? Is there more than one? Is there rotation of leadership? Does it sustain over a period of time? Has the number of people engaging increased? Is there churn, but still a core base number? So those are indicators to us that the community is active and continuing to meet enough engagement to persist… Have we setup the environment where it can occur and thrive?... Our performance advisors give quite good advice on how to be a community manager and how to make it work in that context." In Table 3 and 4 we compare dynamic and operational e-learning programme evaluations and subsequent modifications. Based on the above discussions, we offer the following:

*Proposition 2:* Organisations that develop dynamic capabilities would evaluate their e-learning programmes by achievement of externally-relevant objectives, collaborative learning, and integration into innovative processes.

*Proposition 3:* Organisations that develop dynamic capabilities will use e-learning evaluations to reconfigure not just the programmes themselves but also incumbent operating routines.

## CONCLUSIONS

Our exploratory analysis revealed three main patterns which relate to the dynamic capabilities framework. First, we recognised that where e-learning objectives and use are strategic, rather than operational, their evaluations reflect this intent. For example, if the goals for the adoption and development of e-learning were competitive or strategic, their evaluations also focus on tactical achievement. Second, organisations that presented as dynamic and innovative provided evidence that their e-learning processes and evaluations also reflected these values. Numerous examples of collaborative and rapid e-learning development, responsive feedback and creative assessments were provided by respondents from these organisations. Third, the data reveal that for these dynamic and innovative organisations specific learning achievement appeared secondary to e-learning process integration and programme flexibility. Respondents in these organisations discussed the achievement of simultaneous product and learning programme developments, rapid e-learning production, and constant adjustment and updating of material. This study has limited generalizability due to a small sample size, and non-random selection of organisations. Future research may empirically test the propositions presented here using larger data sets to refine the associations between dynamic capabilities and human capital development.

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**Table 1: Participant Organisation Descriptive Data**

| Pseudonym | Sector | Employee numbers | Learner Distribution |
|---|---|---|---|
| Alpha Gov | Government | 5,000+ | National |
| Beta Gov | Government | 5,000+ | National |
| Delta Gov | Government | 5,000+ | National |
| Alpha Tech | Technology | 1,000+ | International |
| Beta Tech | Technology | 1,000+ | International |
| Gamma Tech | Technology | 1,000+ | International |
| Alpha Health | Health | 2,000+ | International |
| Beta Heath | Health | 3,000+ | National |
| Alpha Fin | Financial Services | 3,000+ | National |
| Beta Fin | Financial Services | 2,000+ | National |
| Gamma Fin | Financial Services | 3,000+ | National |

**Table 2: Dynamic and Operational E-learning Adoption Triggers**

To be completed

**Table 3: Dynamic and Operational E-learning Programme Evaluations**

To be completed

**Table 4: Dynamic and Operational Learning and E-learning Programme Reconfiguring**
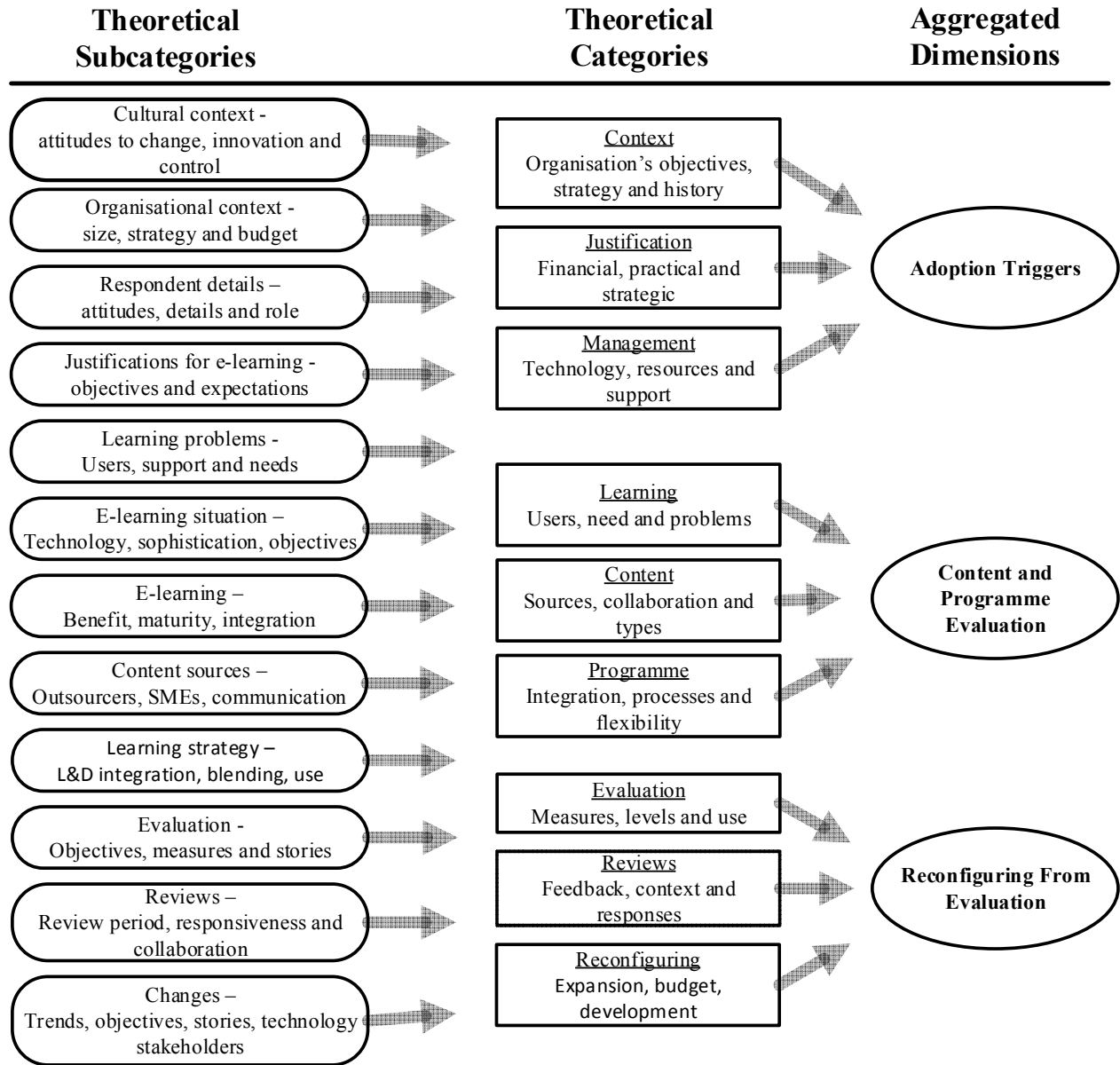
To be completed

| **Theoretical Subcategories** | **Theoretical Categories** | **Aggregated Dimensions** |
|---|---|---|

Cultural context - attitudes to change, innovation and control

Organisational context - size, strategy and budget

Respondent details – attitudes, details and role

Justifications for e-learning - objectives and expectations

Learning problems - Users, support and needs

E-learning situation – Technology, sophistication, objectives

E-learning – Benefit, maturity, integration

Content sources – Outsourcers, SMEs, communication

Learning strategy – L&D integration, blending, use

Evaluation - Objectives, measures and stories

Reviews – Review period, responsiveness and collaboration

Changes – Trends, objectives, stories, technology stakeholders

**Context**
Organisation's objectives, strategy and history

**Justification**
Financial, practical and strategic

**Management**
Technology, resources and support

**Learning**
Users, need and problems

**Content**
Sources, collaboration and types

**Programme**
Integration, processes and flexibility

**Evaluation**
Measures, levels and use

**Reviews**
Feedback, context and responses

**Reconfiguring**
Expansion, budget, development

**Adoption Triggers**

**Content and Programme Evaluation**

**Reconfiguring From Evaluation**

**Figure 1: Data Structure Overview**

**E-learning Adoption Triggers**

- Dynamic Organisational Context
- Strategic Justification
- Management Support

**Programme Evaluation**

- Achievement of Learning Objectives
- Successful Integration and Flexibility
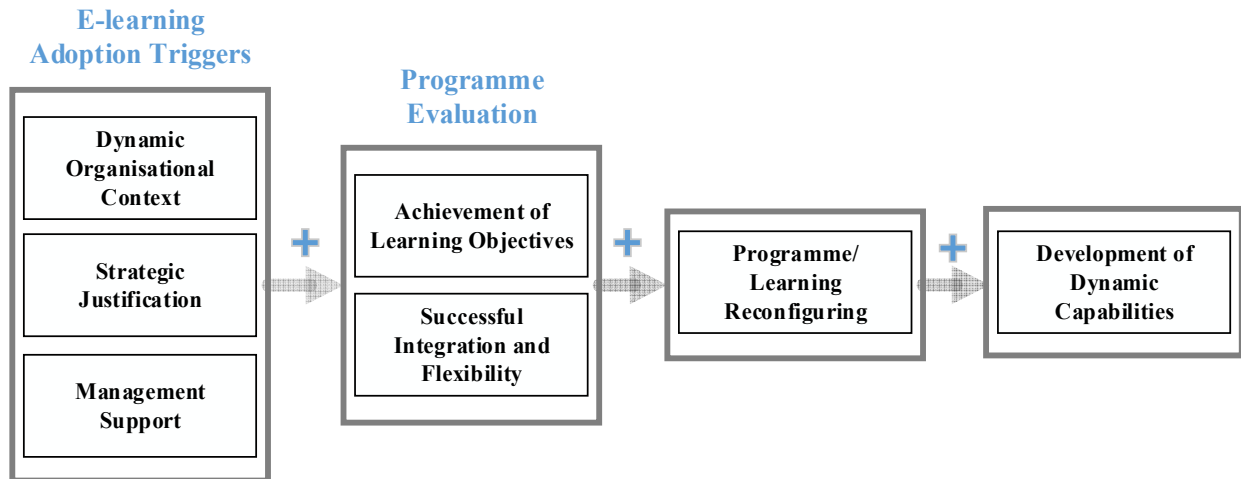
Programme/ Learning Reconfiguring

Development of Dynamic Capabilities

**Figure 2: A Model of E-learning Programme Evaluation and Dynamic Capabilities**

# Appendix: Interview Guideline Questions

**Adoption and Strategy:**

1. What are the primary goals of your e-learning programs?
2. How does this integrate with your other L&D initiatives?
3. Overall how well do you believe your L&D initiatives integrate with your organisation's goals?
4. How do you know if an e-learning content is up to date?
5. How often are changes made, or new content added?
6. Who decides, and who makes these changes?
7. How are new segments or topics generated? Briefly describe the process.
8. Can new segments or topics be easily added to your LMS or system?
9. How easy/difficult is it to alter content in a segment or topic?
10. Are new segments or topics developed using subject matter experts from more than one department?
11. Can you give example(s)?
12. How common is this?


**Learning Content**

1. How is it decided what content to include in training (on or offline)?
2. How is it decided what content goes online?
3. Where are these decisions made – who makes them?
4. What methods to you have to check that learners are using the system?
5. What methods do you have to check that employees find the training useful?
6. Are these systems regularly used, reported on?
7. Can you describe any situations where the learning is flexible, where ideas can be generated collaboratively (on or offline)?
8. Are there any collaborative technologies integrated into the e-learning system (Web 2.0, shared spaces)?
9. If there is any collaboration in the learning, how is that information used?
10. Approximately what percentage of the learning and development budget/time goes to soft skills training (on or offline).
11. Are there any e-learning segments or topics where the objectives of the training material to encourage more critical thinking and reflection (where there is no right answer)?
12. Are problem-solving scenarios or simulations available to the learners?


**Evaluation**

1. How do you assess the effectiveness of your learning and development programs (both formally and informally)?
2. How often is this done?
3. Describe a situation where the assessment has changed the way you do things.

4.      Once you decide that a piece of learning is required, how long does it usually take to develop a new segment or topic?

5.      What is the typical review period for a topic or module? Do you think this is often enough?

6.      Can you give me examples?

7.      Either formally or informally, is there any assessment of how collaborative your learning and development programs are?

8.      If there is collaboration in your e-learning how can you tell if the interactions are useful?

9.      Can you give me an example?