How can organisations learn: an information systems development perspective

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Abstract   This article sets out to argue that organisations can learn but that they cannot do so in their own right without infrastructural support. This article further examines the notion that individuals in organisations also require the cognitive participation of the organisation itself as a learning entity to learn. The close reliance and affiliation required between individuals and organisations to enable their learning from one another are discussed. In continuation of this, specific examples are provided through the industry sector of information systems development (ISD) projects to illustrate of how organisations can learn. Finally, the question of how one identifies organisational learning is analysed. Following on from the ISD and its use in the analogy of organisational learning, the article discusses an organisational empirical research project currently being undertaken by the authors, which utilises blogs. Though there are many potential organisational learning connotations associated with blogs, they could be perceived as a type of information system. The ongoing research being undertaken with the company using the blogs will attempt to identify indicators of learning at the individual, group and organisational levels. The significance of the issues explored in this article lies in the fact that it addresses an ISD approach to study how an organisation learns, and why this perspective is useful towards understanding the process of organisational learning. This article contributes to the organisational learning debate through an illustrative industry example of ISD projects. In doing so, we wish to argue that though individual learning can occur in ISD projects, the collective nature of projects primarily engenders the interpretive aspect of organisational learning. We further believe that it is the interactive nature of an ISD project that allows an organisation to learn in tandem with project members as exemplified through the stages of a project life cycle. We feel that this article contributes to the ISD and organisational learning literature in terms of linking both concepts together.

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Introduction

The ideology of organisational learning has been debated extensively throughout the
academic literature (Levitt and March 1988; Huber 1991; Easterby-Smith 1997). The
concept is devoid of a unified consensus by academics researching this diverse theoretical
field. Fiol and Lyles (1985) stated that "no theory or model of organizational learning is
widely accepted." The topic of organisational learning is an area that is open to multiple
interpretations and perspectives and this appears to be the current state of art of the subject
in terms of conceptual advancement. Despite the lack of agreement on the concept of
organisational learning, one fundamental issue relates it to the learning processes that
occur within an organisation (Firestone and McElroy 2004; Örtenblad 2001). However,
closely associated to this characteristic of organisational learning is the other challenging
debate that focusses upon which particular entities are capable of learning in organisations
and who or what can be perceived to be the catalyst or driving force behind such a notion
of organisational learning within organisations. There are three distinct views that are
prevalent in the academic literature in response to these questions. One specific view
considers learning as an individual activity (Popper and Lipshitz 2000; Mumford 2001) and
argues that it is the individual within the organisation who is the primary facilitator of
learning within organisational contexts. It is surmised that organisational learning cannot
occur without the existence of individual learners. The second view focusses upon the
social and cultural aspect of learning within organisations (Lucas and Kline 2008; Anto-
nacopoulou 2006; Wenger 1991), which asserts that collective and social learning at all the
levels of an organisation is the predominant factor that results in organisational learning.
Strongly associated with this view of organisational learning is the concept of communities
of practice (COPs) (Brown and Duguid 1991; Wenger and Snyder 2000) where individuals
come together forming specialised groups of learning to facilitate and share knowledge.
The third view that is debated in the organisational learning literature is that organisations
themselves are capable of learning (Kim 2004) as organisations are themselves "living
entities" (Örtenblad 2005) and therefore possess cognitive and interpretative capabilities,
adapting and modifying themselves in the face of internal and external change.

The objective of this article is to support the view that organisations can learn and to
outline how organisations can and do learn. We agree with the interpretive perspective of
organisational learning based upon our theory of reality which adheres to the view that
reality is socially constructed, that organisations and the individuals within them are
socially dynamic and interactive in nature, people can generally think for themselves, have
their own world view and that organisations are usually different from one another. We do
not however concur with the position of the functionalistic standpoint of organisational
learning primarily due to our perception that learning in organisations, whether initiated
from an individualistic perspective is predominately influenced and developed as a result
of the social environment in which that individual resides. We further believe that if the
concept of organisational learning is to flourish and learning organisation status to be
subsequently achieved, it is important that organisations do learn and that they continu-
ously modify their infrastructural support or behaviour in accordance with the learning and
engendered knowledge socially produced by their organisational members. A principle

argument of this article is that individuals and organisations require the mutual reciprocal didactic support of one another as learning entities to learn. The remainder of this article is organised as follows. Firstly, the close relationship and necessary association among individuals and organisations, which allow them to learn from one another is discussed. Secondly, the industry sector of information systems development (ISD) is briefly analysed in an attempt to highlight how organisations, though in this case project-based organisations can learn. The term ISD is referred to in this article in an organisational context in respect of organisations that are in the habit of developing information systems in project-based scenarios. The discipline of ISD is significant from an organisational learning context because the nature of ISD projects can involve learning at all the levels of an organisation—the individual, collective and organisational level. The dynamic nature of ISD projects means that there is often a mutual dependency of functionalistic and subjective learning for projects of this nature to succeed. Finally, and of potentially greater significance, some direction and thought are applied towards thinking about how can we evaluate an organisation's learning and which criteria could we use to measure such learning. This path for future research is intended to open up further avenues of empirical study to lend further evidence and academic credibility towards the perspective that organisations can learn.

What is an organisation?

The debate as to who or what learns within an organisation and through or via which particular means is the one that has remained predominantly persistent throughout the organisational learning literature. However, to provide a sense of perspective in this area of organisational learning, we examine the questions of what is an organisation in its own right whilst focussing upon the aspect of what is learning. This leads on to a discussion of the concepts of organisational learning and the learning organisation. This provides a context to objectively critique the theoretical argument of who learns in an organisation as well as what is meant by the concept of organisational learning.

The notion of what comprises an organisation as well as what it means to work within one will raise dissimilar viewpoints by different people. Several theoretical discussions and definitions surrounding this debate have been provided within the organisational learning literature. According to Sun (2003), "an organization is a structured, co-ordinated and goal-orientated social entity which is brought into existence and sustained in an ongoing way by humans." Further perspectives, as to what is an organisation, have a topographic stance and view an organisation as primarily a place (Tsoukas 1992). The opinion of what an organisation is has also been formulated from a social perspective where organisations are viewed as "systems of interrelated roles" (Simon 1991) and cultures (Cook and Yanow 1993). This avenue of thought, upon reflection, would appear to be a credible one as it can be generally accepted that organisations are composed of social beings. This perspective coincides with the societal outlook of organisational learning that has been acknowledged as gaining theoretical momentum in the academic community (Nicolini and Meznar 1995; Miner and Mezias 1996). This alternative conceptualisation of organisational learning that relates its influence towards the notions of learning within a social environment has been developed based on influential works that include those of Vygotskij (1962) and Bruner (1986, 1991). This view has been further expanded via the notion that the way in which people work, communicate and formulate the social hierarchal cultural values of how they structure their interactive and fluid nature of social groups involved in organisational working contexts (Ehn 1988) is undertaken through the concept of 'activity systems'

(Gherardi et al. 1998). Through the social aspect of learning, the notion of language is a key means of engendering interaction among individuals in an organisation and may be associated as part of an organisation's culture (Czarniawska-Joerges 1997) in terms of defining social relationships and facilitating the way in which a social group such as a 'community of practice' (Lave and Wenger 1991; Eckert 1993) sets out to embark upon its activities.

It could also be further surmised that all organisations, regardless of industry type, size or purpose, do maintain a culture of some kind or at least operate under certain organisational principles having unique competitive cultures appropriate to their industry disciplines. The crux of the debate about what characteristics constitute an organisation essentially depend upon how the concept is observed from both within and without with the organisation's structural boundaries. Individuals who work within a particular organisation may tend to define it in terms of their everyday working activities, the inner culture of the organisation, industry type and scale of operations. However, asking someone who does not work in the same organisation to conceptualise may result in a statement that their only perception of that organisation is through both their external knowledge and social experience of it.

The apparent emphasis of the social traits in the academic literature about what is an organisation raises the issue of whether organisations are dynamic or static entities. There are those who argue that organisations can act (Cook and Yanow 1993) and that they can be thought of as living entities (Örtenblad 2005). How then do organisations act in such a way that they interact with the individuals and social groups contained within them? It could be argued that the social aspect most prominent within most organisations is embedded within them, when they are initially created. The fact that most organisations are established by individuals for a particular purpose means that organisations have social values instilled within them based on their foundation. It is through the spreading of these cultural and social values to the organisational members that the organisation itself interacts with them. These cultural and social values could consist of the rules and regulations surrounding the organisation, particular procedures and ways of doing things.

If the initial conception of an organisation equates it to being a living entity then it could be argued that it is its pre-imposed and defined infrastructure that provides the organisation with its sustenance or life line. Organisations require infrastructural support to survive and to be able to act. Thus, it could be argued that organisations can act and learn but that they cannot do so alone. Organisations are reliant upon a sense of evolving infrastructural support by the individual and social groups contained within them. As the organisation modifies and adapts its behaviour towards these structural changes, the social groups within the organisation also cognitively and socially develop. A mutual relationship of learning is important between organisational and human entities if the notion of organisational learning is to thrive. This argument is explored in greater depth in a later section of this article when attempting to illustrate the characteristics of an ISD approach.

Providing an overall definition of what is an organisation is difficult since most organisations are structurally, strategically and culturally different. The notion of what an organisation is will logically mean different things to the individuals who work within them from the perspective of their role within their organisation. Though we are aware that alternative definitions may equally be as valid when considering other perspectives, we provide a working definition of organisations as "real world objects inhabited by social entities that learn, work and interact with one another and with the organisation itself through the organisation's infrastructure."

What is learning?

In attempting to explore what an organisation is, the previous section of this article indicated that some of the salient attributes of an organisation consist of the elements of interaction and mutual collaboration between the organisation and the social entities within it. This is achieved through the organisation learning to adapt and modify itself through the evolving infrastructure created by the individuals or social groups as well as social beings in the organisation learning as a result of interacting with its infrastructure. The concept of learning in an organisation or learning at work is difficult to define in organisational contexts due to its often abstract nature. The dilemma of characterising learning is further exacerbated by the problem of trying to identify learning in organisations. Learning in organisations means different things to the individuals working within them due to the varying degrees, styles and experiences of learning that will often occur because of their different job roles.

When considering the question of what is learning, it is important to establish that the learning discussed in this article refers to and relates to learning occurring in organisations. The term learning, in the organisational learning literature, predominately refers to both process and outcome (Dodgson 1993; Fenwick 2008). However, the concept of learning in organisational contexts has become more perplexing to conceptualise due to it being used to describe a diverse range of phenomena that encompass aspects of: cultural change, personal self-development of individuals, daily work practice and the notion of participation, the acquirement of new knowledge and information and the development of further skills (Fenwick 2008). An additional reason why learning, particularly in large organisations, is a concept that is elusive to define could be ascribed to the observation made by Dodgson (1993) who states that "In complex organizations many different learning processes can proceed at the same time in different directions and at different speeds." Though the notion of having learnt something in an organisation may have different meanings to different individuals, it could be argued that an individual's learning in an organisation could be perceived in terms of attitudinal or behavioural change. These aspects of learning, if put into practice, could potentially result in organisational or even cultural change. This assertion, however, presupposes that organisations can learn from the actions of humans. The role of information systems and their use within organisations and the interaction or relationship between individuals or social groups within organisations and such information systems is one possible way of identifying a mutual learning relationship between organisation and social entity.

Researchers within the fields of sociology and science and technology studies have argued that in organisations, "technology is central to work, cognition, and learning" and that the technological environment in which individuals work is inherently intertwined towards what and how they learn (Jensen and Markussen 2007). One way to substantiate this assertion is by examining from a technological perspective, what an information system, in organisational contexts is primarily designed to do. Beynon-Davies (2002) states that "Information systems are systems involved in the gathering, processing, distribution and use of information. Information systems support human activity systems." This definition implies that the notion of information systems, through the assistance of infrastructural support, is purposely constructed to manage and impart knowledge to aid or even improve working practice. The concept of learning has been equated with "improvement in performance" (Gherardi 1999) and a fundamental aim of an information system is to facilitate this process whether it is the enhancement of the organisation's infrastructure or activities of the individuals working within it. As shall be illustrated in a

later section of this article, the development of an information system and its subsequent use by both organisation and social entities supports the social and cultural aspect of learning in organisations. The social and learning activities in an organisation are often complemented through the use of information systems or learning technology whereby working experiences are sometimes contextualised and recorded. The social groups within an organisation can share this knowledge, learn from it and attempt to apply it in practice. This learning occurs both directly and indirectly whereas an organisation learns through only the indirect experience of its organisational members.

It appears safe to conclude that the notion of learning within organisations means different things to different people. However, for the purposes of this article, we define learning in organisations as a "social process where individuals interact and learn from and among one another to develop existing and gain new skills, acquire new knowledge with the intention of leading to an improvement of working practice in their jobs." The problem of attempting to analyse what is learning, is compounded by the fact that it is very difficult to identify in organisational settings. In another section of this article, the comparison of how both organisations and social entities learn and collaborate through the development process of ISD projects is assessed to provide an overview of the different ways in which these entities learn. This shall primarily be argued from the social and cultural perspective of organisational learning though we do acknowledge that on occasion learning or the acquirement of knowledge may initially commence from a functionalistic perspective in an ISD project that subsequently leads to the interpretive viewpoint.

Organisational learning and the learning organisation

The previous section of this article indicated that there is no overall consensus as to what is an organisation in its own right as well as what constitutes learning within one. The fact that many of today's organisations can be viewed as being "vast, fragmented and multi-dimensional" and operating in a climate of organisational departmental "nested systems" (Daft and Weick 1984) and organisational "subunits" (Schein 1993) compounds the difficulty of epitomising what an organisation is and the learning that can occur within it. It can, however, be argued that there is a social element contained within an organisation which in turn presupposes that learning in organisations is strongly associated with the social and cultural aspect of organisational learning. The often referred to context-dependent nature of learning (Brown and Duguid 1991; Sun 2003) means that organisations have active roles in shaping the learning processes that occur within their organisational boundaries. The infrastructure of an organisation, depending upon its systematic distributed design, can afford it with the cognitive and interpretative capabilities it needs, such as through information systems to assist and support the learning prevalent within organisations. It is through this notion of interactivity that organisations thereby facilitate the mutual social process of organisational learning. Through a technological perspective of organisational learning, knowledge acquired by organisational members, through working practice, can be channelled back into the systematic infrastructure of the organisation, allowing the organisation itself to reflect, modify its behaviour thus impacting upon the behaviour of the individuals supporting it. These subsequent changes made to the organisation's infrastructure support its well being as the knowledge of its organisational member's increases.

The aforementioned theoretical analysis about how an organisation and the individuals working within it could learn from one another has predominately emphasised a systems view of organisational learning that relies upon the social aspect of organisational learning

to function. However, this perspective does not clarify what organisational learning is. The concept of organisational learning used in this article agrees with the notion that organisations can be perceived as 'social worlds' (Elkjaer 2004) where the cultural environment and infrastructure of an organisation supports the diverse learning styles of its organisational members. The different types of organisational learning predominately focussed upon in the literature encompasses the cognitive 'problem-based' view of organisational learning (Argyris and Schon 1978), the contextual aspect of organisational learning (Richter 1998; Lave 2003; Elkjaer 2004) and the social perspective of organisational learning that accentuates elements such as learning through practice, learning through narration and dialogue (Schein 1993), which may involve the formation of learning structures such as communities-of-practice (Wenger 2000) and communities of interpretation (Orr 1996). Organisational learning refers to the divergent social learning practices that can occur in the various levels of an organisation through the organisation's infrastructural support. The way in which the expression organisational learning is used in this article predominately focusses upon the "relationship-based view" (Hawkins 1994) of the term agreeing with Cook and Yanow's (1993) argument that the contextual aspect of learning in organisations impacts upon the nature of the learning that occurs in an organisation and that this learning may in turn determine the "operational consequences for the activities of the organization."

The aforementioned perspective of organisational learning coincides with the functionalistic and social (interpretive) perspective of organisational learning that has been identified in the literature (Örtenblad 2002). It is this perspective that may well lead towards an organisation transforming itself into a learning organisation. There has been significant debate about the definition of these two terms, whether they can be used interchangeably or as synonyms or whether both terminologies are distinct but interrelated (Örtenblad 2001; Sun 2003). Garvin's (1993) definition of a learning organisation states that it is "an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insights." The term learning organisation, when used or referred to in this article, pays particular attention to the element of infrastructural adaptability in the aforementioned definition of a learning organisation. This article agrees with the view that the concept of a learning organisation is a "form of organisation in itself" (Örtenblad 2001) and that it has the ability to sustain multiple organisational learning processes and activities for its organisational members to learn. However, in providing human entities with an infrastructure to learn, a learning organisation continues to learn in itself by modifying its behaviour through the tacit knowledge embedded and subsequently interpreted in its information systems and diverse knowledge channels. We believe that the concepts of organisational learning and the learning organisation are not synonyms though they are interrelated.

Concurrent learning of individuals and organisations

As already stated, this article argues that organisations can and do learn but that they require infrastructural assistance as well as the learning of individuals to do so. Learning in organisations can admittedly be individual in character though when conducted in the social environment of an organisation regularly results in the process of interpretive learning. Likewise, individuals and social groups cannot learn without the infrastructural support of an organisation. This section explores learning from the individual, collective and organisational levels. It attempts to illustrate that the notion of organisational learning

is significantly dependent upon a reciprocal learning relationship by both individuals and organisations themselves to learn from one another.

Organisational learning as an individual process

One of the predominant perspectives concerning who learns in organisations is viewed from the perspective that learning occurs primarily from the individuals who inhabit organisations. This particular viewpoint of organisational learning relates to what is known as the functionalistic perspective. A salient reason as to why this viewpoint is so strong within the organisational learning debate may be due to the fact that the concept of learning itself is still primarily "conceived in cognitive and individual terms" (Gherardi et al. 1998). It has also been suggested that learning in organisations first and foremost transpires from the bottom up (Mulholland et al. 2005). This assumption has been strengthened as a result of the theories surrounding knowledge creation in organisations (Nonaka et al. 2006; D'Eredita and Barreto 2006). According to Nonaka (1994), knowledge in organisations is principally generated by individuals. It could therefore be argued that an organisation's learning and survival is reliant upon the individuals contained within the organisation.

However, when viewed from a different standpoint, it could be argued that individuals cannot learn without the infrastructural assistance of an organisation. This line of reasoning can be developed further when considering what some of the principal objectives of organisational learning are designed to achieve. From some definitions of organisational learning, it is evident that there are those who see organisational learning as being spearheaded by individuals or groups within an organisation (Argyris and Schon 1978; Edmondson and Moingeon 1998) whereas the discipline is also seen as being predominately driven by or focussed upon the organisation itself (McGill et al. 1993; Crossan et al. 1999). Despite the difference in perspectives regarding who or what organisational learning is intended to benefit there appears to be a common consensus throughout the literature that this learning process is designed to facilitate change or improvement from an individual, group or organisational level (Finger and Brand 1999; Reynolds and Albert 1998).

The fact that the objective of organisational learning appears to be geared towards change, regardless of perspective, could well mean that organisations and individuals require each other's learning capabilities in order to cognitively progress, adapt and evolve as learning entities. If organisations are deemed to be living entities due to the individuals who inhabit them (Örtenblad 2005) then they must frequently collaborate, interact and share the knowledge they have acquired with their organisational members. Similarly, individuals are reliant upon organisations to learn since organisations can influence how individuals learn. This assertion complements Vera and Crossan's (2003) definition of organisational learning, who adopt the viewpoint that "Organizational learning is the process of change in individual and shared thought and action, which is affected by and embedded in the institutions of the organization." We therefore argue that organisations and individuals learn in tandem with one another and that each entity simultaneously develops through the establishment of a reciprocal knowledge sharing relationship.

The social and cultural perspective of organisational learning

Though learning in organisations can be driven by individuals, the notion of collective learning or learning in groups is another predominant form of organisational learning. As stated earlier in this article, this interpretive perspective of organisational learning within

organisations has already been identified within the academic literature. It has been advocated that to view learning as a solely individual process, especially in relation to working within organisations can be misguided (Gherardi et al. 1998). According to Wenger (1991), learning in organisations must be viewed as a social phenomenon due to the nature of individuals being essentially social beings. The principal metaphor utilised to discuss learning in social terms within organisations is the concept of communities or communities of practice (Wenger and Snyder 2000). It is argued that the notion of practice is increasingly relevant when attempting to understand work as are the contexts and authentic settings as to where it occurs (Brown and Duguid 1991; Orr 1996). This type of learning is often referred to as learning in situ (Lave and Wenger 1991). Strongly associated with this ideology is the activity theory of knowledge that perceives learning as an interactive process that is undertaken through the collaboration of others in organisations (Bogenrieder and Nooteboom 2004). When taken from the standpoint of a person who works in an organisation, learning can occur both individually and collectively. If we accept the perception that organisations can be conceptualised as "social action systems" (Casey 2005), "social learning systems" (Wenger 2000) or even simply practitioner communities (Orr 1996), then this implies that the very fabric and composition of an organisation has a direct influence upon how individuals can learn collectively within an organisation. These particular types of learning structures rely upon the infrastructural support of an organisation in order to thrive. This viewpoint has already been reiterated by Kim (2004) who states that the learning of groups in organisations can be affected by an organisation's infrastructure. However, the learning that occurs in an organisation, through the formation of these internal social institutions, complements the learning of the organisation, through the knowledge that comes to be embedded in the organisation's interpretative systems as a result of these social practices.

As stated earlier, this perspective also appears to stand true for individual learning in organisations. Yanow (2000) provides the argument that cultures within organisations can also learn. She asserts that "if a culture can be said to produce institutions, beliefs, and other human artefacts, then it can also be said to learn." This view relates to one of the key attributes of a learning organisation in so far as the learning climate and structure (Örtenblad 2004) can ultimately dictate how people learn, both individually or collectively. When considered from another perspective, the notion of the ideal of a learning organisation relates to how the organisational culture adapts and modifies itself as a result of the knowledge the organisation consumes from the learning of its members. Similarly, organisational members, when forming communities, must be conscious of flexibility and modify their working routines as a result of the cultural changes through the form of organisational learning mechanisms (OLMs) the organisation imposes.

We argue that the collective learning, similar to the individual learning within organisations cannot occur without the infrastructural support of an organisation. Similarly, organisations cannot endure without infrastructural support and rely upon the individual and collective learning of their members in order to sustain their learning whilst directing it to those in the organisation who need it. When based upon a subjectivist viewpoint, organisations can be seen as part of the social learning process that occurs within, for example, communities of practice due to their direct association in the learning process. Organisations could also be viewed as participators in the learning process within communities as they are the primary focal point of these communities, which are often formed to solve or work upon organisational issues. If an organisation's culture is defined as "a normative system of shared values and beliefs that shape how organization members feel, think, and behave" (Popper and Lipshitz 1998), then it can also be surmised that

organisational members can shape how an organisation evolves its learning infrastructure in relation to the knowledge the organisation absorbs from the social interactions that occur within it. Organisational culture can also be modified through the work practices of communities in organisations, through the everyday habits of narration, storytelling and reflection (Orr 1996). Organisations, the communities and individuals within them require one another to enable them learn and facilitate the process of organisational learning.

Can organisations learn?

There has been extensive debate in the organisational learning literature about whether organisations can learn. The lack of consensus regarding this issue has been exacerbated due to various philosophies of organisational learning that focus upon diverse elements and hierarchies of learning within organisations (Antonacopoulou 2006). There are those in the literature who boldly assert that organisations are incapable of learning and to suggest that they can do so only leads incorrectly to anthropomorphise organisations (Stacey 2003). Anthropomorphism relates to the recognition of human appearance or characteristics to nonhuman beings (Popper and Lipshitz 1998). However, it has also been argued that "all organizations learn, whether they consciously choose to or not" (Kim 2004) due to evolving social and fluctuating environmental conditions in which they reside and must subsequently react to in order to endure. This assertion coincides with the outlook that organisations are viewed as interpretative and information-processing entities (Daft and Weick 1984) but Casey (2005) further observes that both organisations and individuals repetitively react to numerous external environments as they adjust and evolve. It could therefore be presumed that organisations must learn to react to the everyday social interactions that occur within their infrastructures. In reference towards the various perspectives of organisational learning, Table 1 segregates and outlines some of the ways in which learning is reciprocally supported among individual, group and organisational entities.

   Organisations require a need to learn to ensure their survival whereas the individuals working within an organisation can only learn through the culture that an organisation allows them to create and from the knowledge recorded within the organisation's information systems that could be interpreted as being the organisation's memory. This assumption corresponds with Hedberg's (1981) standpoint that organisations possess

Table 1 Illustrating how individuals, groups and organisations can mutually learn

Inter-dependency of learning at all organisational levels

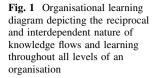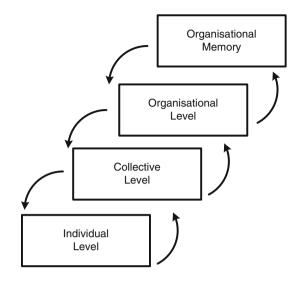| Individual	Group	Organisation
Infrastructural support of organisation	Formation of communities or COPs	Individual members
Organisational culture and external environment	Infrastructural support of organisation	Collective interaction among organisational members
Knowledge from organisation via organisational memory	Organisational culture and external environment	Modifications in organisational culture and external environment
Relevant Organisational learning mechanisms (OLMs)	Relevant Organisational learning mechanisms (OLMs)	Process of organisational learning
Communication with other organisational members	Knowledge from organisation via organisational memory	Organisational memory and learning from experience

"cognitive systems and memories." Hedberg elaborates further by saying "As individuals develop their personalities, personal habits and beliefs over time, organisations develop their views and ideologies." Individuals within organisations often require to access information from their organisation's information systems that can sometimes be conceived as being the knowledge that has been digested, synthesised and evaluated by the organisation's processing capabilities. This is the information that individuals formulate through the development of their mental models that allows organisations to develop theirs (Hayes and Allison 1998).

What appears to be apparent is that the well being and survival of an organisation cannot be sustained without the cognitive and social participation of its organisational members. If an organisation is to protract its learning and continuous improvement, then there must be constant interaction between the organisation and its organisational entities. As Pedler and Aspinwall (1995) state learning is "a property of relationship." Organisations can learn from their organisational members when individuals or groups undertake the process of double-loop learning (Argyris 1977; Argyris and Schon 1978) which involves organisational members questioning "underlying organization policies and objectives" as a catalyst for facilitating and sustaining continuous improvement within themselves as individuals and the actual organisation itself. The theory of Popper and Lipshitz (1998) who argue that there are two types of organisational learning, namely, learning in organisations and learning by organisations is applicable when considering the aforementioned assumption. When or if double-loop learning becomes successful in an organisation, then the organisation has to modify its infrastructure and working systems to coincide with the innovation and knowledge that will allow organisational members to improve their working practices.

There appears to be a lack of overall consensus as to who or what learns in an organisation or at which particular organisational level. This article reiterates that since all organisations and their infrastructures are different, organisations have the potential to simultaneously facilitate several divergent forms of organisational learning. We however argue that through the interpretive ideology of organisational learning, organisations can learn through the activities and social practices of their organisational members. We do also concede that whilst the functionalistic perspective of organisational learning cannot be ignored, the social character of organisations dictates that the interpretive perspective of organisational learning appears to be more prevalent. The organisation provides the infrastructure for the social entities contained within it to work and learn whilst their knowledge is redirected and encoded into the interpretative and sense-making capacities of the organisation, whether this be in the form of information or distributed IT systems, thus allowing it to modify its infrastructure by reacting to these new informative insights via the assistance of its organisational members.

The next section of this article is designed to provide an illustrative example of how organisations can learn through the specific example of the ISD sector. The primary purpose of the subsequent part of the article is incorporated to show how this particular industry area of ISD, has strong affiliations with the interpretive perspective of organisational learning. It is hoped that the theory discussed in the first half of this article can be further scrutinised with reference to a particular industry context. The interpretive perspective of organisational learning will be predominately used to iterate the dynamic characteristic of organisations in terms of undertaking ISD projects. The importance of an organisation's infrastructure and cultural environment, in the context of the process of ISD projects, will be mentioned to state its relevance in supporting the social communities, often seen as a prevalent component of ISD projects via infrastructural support. It will be

Fig. 1 Organisational learning
diagram depicting the reciprocal
and interdependent nature of
knowledge flows and learning
throughout all levels of an
organisation

argued that organisations can learn during an ISD project by subsequently adapting their behaviour through the knowledge acquired as the project progresses and through the subsequent use of the newly developed information system. Though there has been a significant amount of literature published in relation to the field of ISD projects and their success and failure, the applicability of organisational learning and the relevancy of learning at all the levels of an organisation throughout the development process requires further research. The purpose of this illustrative example of an ISD project scenario is designed to show a practical example of how the theory discussed in the earlier sections of this article relates to how individuals and a particular type of organisation can learn. This case attempts to demonstrate our perspective on organisational learning in relation to an ISD project environment. We argue that individuals in projects bring a certain element of personalised knowledge that, through the social interaction of an ISD project, can be transformed into collective knowledge. As the organisation provides the infrastructural support for project members to learn, they in turn facilitate the learning of the organisation by embedding new knowledge into its memory or infrastructural systems (see Fig. 1).

How organisations can learn through ISD projects

Information system development (ISD) projects naturally inherit the interpretive element of organisational learning as they often involve a significant amount of interaction among project stakeholders. The complex and often fluctuating iterative nature of a project's lifecycle often means that ISD projects are for most of the time reliant upon the social perspective of organisational learning. The project team of an ISD project can be likened towards a community of practice (Wenger 2000) or community of practitioners (Orr 1996) that are formed with the intention to improve, solve or develop an organisation's computerised approach towards information and knowledge sharing. However, it could also be argued that embedded within the development process of an ISD project is the notion of activity theory (Engestrom and Kerosuo 2007) as individuals may interact within a social collective but they can also individually learn from it. It has been stated that learning at all

the levels of an organisation is important for an organisation's prolonged survival (Casey 2005). The focus on the discipline of ISD organisations and projects is a good illustration of learning occurring at all levels of an organisation as different individual, social and interactive learning approaches can be adopted and frequently modified as the project progresses. It is a very relevant industry sector to focus upon when considering the issue of how organisations can and do learn because organisations provide the infrastructural environment for the project members to learn and work.

Prior to contemplating how organisations learn within the context of ISD project environments, it may be worthwhile to consider how project members learn from the organisation itself prior to considering how the organisation learns from the project process. Project stakeholders predominately comprise a diverse group of individuals from a variety of socially diverse backgrounds that must collaborate and share knowledge with one another to assist the progression of a project (Mann 2002). The ISD methodology of XP (Extreme Programming) is one possible approach towards allowing individuals and groups to share their differing mental models throughout the requirements, analysis, design and development phase of an IS project. XP is an agile development methodology used to speedily create software or information systems, catering for evolving customer requirements throughout the project life cycle but without incurring high financial costs (Loftus and Ratcliffe 2005). One of the fundamental characteristics of XP is the requirement of constant dialogue between developer and customer (Schneider and Johnston 2003). This integral part of the XP methodology remains constant throughout the entire development stage of a project and illustrates the notion that "learning is embedded in social interaction mediated by language" (Richter 1998). The emphasis on the use of dialogue throughout the XP methodology implies strong associations towards the notion of learning through the maintaining of social relations. It has also been argued that this aspect of social interaction throughout this development methodology has the ability to facilitate reflective ways of thinking and learning (Hazzan and Tomayko 2003). The organisation itself has an important role to play in supporting the development of an ISD project, especially one using the XP methodology. The success of such a development methodology is dependent upon the support of the organisation's environment in order to succeed. It is the organisation's infrastructure itself that determines the underlying success of an ISD project. The lack of a conducive organisational environment, being the one that inhibits the establishment and development of social working communities through the concepts of open communication and the free flowing of information, could adversely affect not only the project's outcome but the learning of the organisation itself. Overall, the majority of project development methodologies and the interactive nature of ISD projects insist on and engender learning at individual and group levels within an organisation in order to progress. However, project teams both collectively and individually also require embarking on learning at an organisational level when undertaking an ISD project. In particular reference to the requirements and analysis stage of an ISD project, project members such as business or system analysts are reliant upon learning from the organisation that they are assisting in the designing the new system. Reference has to be made towards the organisation's legacy systems, the organisation's environment and processes as well as how the people in the organisation interconnect with it. It could therefore be argued that learning from an organisational member's perspective can also occur from an organisational level.

We have briefly indicated that within the realm of ISD projects learning and social interaction is necessary to occur at both individual and group level if such projects are to be successful. However, in the context of an ISD project it is not just the project team members who must learn throughout the duration of a development project but also the

organisation itself. As previously suggested, the discipline of ISD is an industry sector that has a relevant applicability towards the concept of organisational learning. There are two particular reasons why this is the case. It is generally acknowledged within the literature that ISD projects can become 'troubled' (Keil et al. 2007; Pan et al. 2006) and may spiral into "runaway projects" (Mahaney and Lederer 1999). Coinciding with this observation is the already discussed view that IS organisations frequently involved in projects should continuously try to learn from their past mistakes (Lyytinen and Robey 1999; Al-Shehab et al. 2005). This perspective has strong connotations with the predominant functionalistic principle of organisational learning that often refers to individuals learning from past mistakes (Woerkom 2003). However, we argue that though the functionalistic outlook of organisational learning may be evident in an ISD project, it is predominately through the interpretive aspect of organisational learning that organisations can learn during and after the initiation of the project. For this learning to transpire, the organisation must constantly assist in the social learning and working practices that occur throughout an ISD project. The dynamic and socially fluid nature of these project environments has a strong reliance upon the contextual notion of learning as well as learning through dialogue. The successful outcome of an ISD project ultimately rests upon the amount of infrastructural support provided by the organisation itself. The continual flow of open information and key skill of communication, often deemed to be a key factor in an IS project's success, must be understood by the organisation in such a way that the technology systems used to aid this process can complement it. In addition to the technological feature of infrastructural support that is necessary for an ISD project to progress, the organisation must provide an open-learning culture to support the frequent project meetings and debriefings that occur, to learn tacitly from them.

The infrastructural assistance provided by an organisation must however go beyond the development phase of an ISD project. The concept of organisational memory is one such theoretical stance that has been referenced in the organisational learning literature that provides some weightage to this assertion (Fiol and Lyles 1985; Pedler and Aspinwall 1998). Closely related to this theory is the argument that organisations can learn from past experiences (Levitt and March 1988; McGill et al. 1993; Stata 1989). In relation to these assumptions, we assert that organisations learn during the life-cycle process of an ISD project whether it be through the electronic recording of project documentation, debriefings and above all the tacit experiences of the project members and also through its subsequent use. The organisation must provide a conducive learning environment that supports an open culture of sharing information and one that does not attribute blame for the recording of such tacit knowledge to occur. However, the fact that project members can further add differing experiences about varying projects means that other project teams can access this information at the organisational level. Prior to commencing a project, a project team can check for similarities from previous projects performed by the organisation, look for ways in which other project teams overcame problems and apply this knowledge from the organisation's memory towards the progression of their own specific project. This view-point of organisational learning highlights the assumption that though organisations can theoretically learn during the progression of an IS project the learning is, however, reciprocal with the project team. The learning that occurs within new project teams through the existing infrastructure can be used by the organisation to learn as it modifies the structure of its internal information systems as a result of new learning embedded in its memory. Furthermore, the notion of retrieving information from the organisation's memory whilst subsequently contributing new knowledge into it means that learning can occur at the individual, group and organisational levels of a project. Furthermore, the concept of

organisational memory and the learning that transpires from the experiences contained within it can influence the decision making processes within a project as well as affecting the direction of an organisation's strategy and behaviour.

The primary purpose of the aforementioned illustrative example outlining, how ISD projects often progress, was intended to provide a practical element to the way we perceive the concept of organisational learning to operate in such a dynamic organisational environment. We feel that by doing so, this example allows a theoretical connection to be made to the organisational learning ideology discussed in the earlier section of this article. Projects in organisations often undertake an interpretive aspect through the nature of project teams. However, we are also of the opinion that during such projects there is room for the functionalistic perspective of organisational learning whereby project members may learn on an individual basis though ultimately share this learning collectively. It is also our view that learning can occur at an organisational level during the various stages of an ISD project as the project members and organisation itself rely upon one another's knowledge for the successful completion of the project.

Conclusions

This article has attempted to analyse the complex question of 'are organisations able to learn'? One of the principal arguments of the article was that, organisations can learn but that they cannot do so in their own right without infrastructural support. Similarly, the members of an organisation both individually and collectively are dependent upon the organisation's infrastructure to learn. The cyclical process of organisational learning is reliant upon such a cycle of learning as it is central towards making the transition into becoming a learning organisation.

Though we are aware of several other studies in the academic literature that have tackled the subject area of 'are organisations able to learn' this article primarily adopted an ISD approach towards contributing to the aforementioned debate by arguing that organisations cannot learn and endure without infrastructural support. In addition to this standpoint, this article advocates via the interpretive perception of organisational learning that individuals engaged in social processes in an organisation learn through and contribute towards the subsequent development of an organisation's infrastructure. The objective of this article was to indicate through a specific industry example of ISD projects that though knowledge may initially reside within a specific project member; an ISD project cannot often proceed and progress without the process of interaction, dialogue and sharing of project information and ideas. This article thereby wished to show that in project-based environments learning and unique skill sets may be brought into a project team by individual team members who may impart their knowledge within the project group thus allowing collective learning to occur. We further advocate that in such a dynamic and fluid social environment, the infrastructural support of an organisation is fundamental for learning to transpire among both organisational members and the organisation itself.

In making our theoretical contribution to the debate of who learns in organisations, we state that our theoretical ISD approach that conforms to the importance of organisational infrastructural support in facilitating the social processes that occur in organisations differs from most of the previous studies in this area primarily due to that specific focus. We do not claim that our perspective of organisational learning is better than all the other viewpoints found in the academic literature. We do, however, consider our ISD project perception of organisational learning to be an appropriate illustration of how learning can

be elevated from an individual level to that of both group and organisational level. We do also agree with the conclusions based on previous studies of organisational learning such as those made by Cook and Yanow (1993) who argue that when organisations are looked upon as being cultures, it is the social interactivity that thrives within an organisation's culture that allows the organisation to modify and adapt its ability to function in its supportive role towards the learning of its organisational members. This perception of organisational learning has to a certain extent been advocated in this article albeit from an ISD standpoint.

The industry discipline of information systems development (ISD) was chosen as a practical illustrative example in an effort to show how organisations can learn within project-based environments. Central to this argument was the relevancy of the concepts of organisational memory and learning from past mistakes. Though these theories have been discussed previously in the organisational learning and ISD literature, respectively, there appears to be further study required on how to link the two concepts together as a way of addressing ISD projects that can sometimes experience difficulties. This industry sector example was a good way of illustrating how learning can occur at individual and social levels of an organisation as well as by the organisation itself.

We firmly believe that in order for the field of organisational learning to develop, there requires to be a greater concentration of empirical thought among the organisational learning community towards advancing the central issues of how to identify how individuals learn within organisational contexts but also how organisations themselves learn. This specific type of research, which is fundamental towards the progression of the discipline, would also assist in substantiating or potentially disproving the theoretical conjectures surrounding the field of organisational learning. Applying this focus of organisational learning research towards a wide ranging section of fields of industry would also have the benefit of informing the academic and relevant industry sectors concerned regarding what particular organisational learning methods enable learning to occur from individual and organisational perspectives.

Future research

Another taxing question, within the discipline of organisational learning, is how to know when the process of organisational learning has occurred. Unfortunately this is an area of research that deserves considerably more attention within the organisational learning literature. There have, however, been various calls in the academic literature for the establishment of approaches on how to identify organisational learning (Garvin 1993; Templeton et al. 2002; Goh 2003). Though there appears to be a number of theoretical propositions as to what encompasses organisational learning as well as frameworks or guidelines on how to instigate it as a learning process in organisations, these academic studies have yet to be sufficiently tested empirically within organisational contexts. This is an obvious requirement to advance the discipline of organisational learning but we feel that the focus should be upon a wide range of industry sectors so as to try and ascertain whether certain organisational learning approaches are suited towards only specific kinds of industries.

The question of how to recognise an organisation's learning and under what criteria are the issues the authors of this article intend to address through a current empirical research project in its initial stages that involves a large public sector ISD project organisation. The primary research focusses upon a company involved in the frequent undertaking of ISD

projects and the principle objective of the research is to improve individual, project and company effectiveness through the better understanding of knowledge. The intended potential organisational learning technique that will be utilised for the research is that of a blog. Blogs are "frequently modified web pages in which dated entries are listed in reverse chronological sequence" (Herring et al. 2005). We feel that the general theory of blogs predominately complements the interpretive perspective of organisational learning discussed in the latter half of this article. Furthermore, we believe that blogs can be conceptualised as a form of information system in themselves and that the tacit information encoded in the blogs may allow an organisation to endure as it constantly interprets this information modifying its behaviour in tandem with those of its social members. Additional reasons for choosing the use of blogs as an organisational learning tool are because "genuine empirical research" about blogs is limited (Hall and Davison 2007) and there appear to be no such studies using this organisational learning approach currently related to the ISD sector. It has also been observed in the academic literature that blogs have the ability to stimulate the creation of the concept of reflection due to the notion of "thinking by writing" (Hall and Davison 2007). In the context of project-based organisations, it would appear that though blogs can be used on an individual basis to improve or increase a project member's level of knowledge in understanding issues that may impact upon the successful running of projects. It is further surmised that blogs also have the potential to stimulate group and organisational reflection thus completing the cycle of organisational learning. The connection between reflection and organisational learning has already been identified in the academic literature (Hoyrup 2004). However, we believe that blogs have an even greater association with the interpretive concept of organisational learning in terms of their potential to engender dialogue and information sharing. Though a salient aim of blogs is to promote communication, we believe that they can still be used from a functionalistic standpoints but blogs conform to our predominately subjectivist viewpoint of an organisation.

Though there are additional questions that the authors have to address as part of this research, it is envisaged that there will be the creation of blogs that can be used by project members at a group and organisational level. The focus of the blogs will look towards assessing whether they have had the designed affect to facilitate an increase in learning, knowledge or attitudinal change or behaviour among the participants. Dialogue analysis will be used to achieve this. Regular interviews with the participants of the blogs will be used to ascertain their perceptions of the effectiveness of the blog as an organisational learning approach. The aspect of determining whether the organisation itself has learnt may be more difficult to ascertain. This has been acknowledged by the researchers though the concept of the organisational blog shall be used to see whether an organisation can reflect and if these reflections are put into practice through the modification of organisational culture or infrastructure.

The notion of trying to determine how organisations learn or indeed whether they can is a relevant area of study. There will be different approaches to addressing this question according to, and even maybe determined by, the organisation under study. It is however important that thought and debate continue to be prolonged in this area of the study of organisational learning as the empirical progression of the discipline is dependent upon it.

The future research that the authors intend to pursue has been briefly highlighted in the above section of this article. This section of the article is designed to address the questions that we intend to explore when undertaking the empirical research with the blogs. As indicated earlier, the type of company that has agreed to participate in the research is an organisation that is in the habit of partaking in software or ISD projects. The notions of

organisational learning and the learning organisation have been explained to the company concerned as have been the potential organisational and personal benefits that these concepts bring with them in respect of organisational development and improvement. The company willing to participate in the research has since stated that organisational learning and the theories associated with this concept would be of particular relevance to them due to the project-based nature of their organisations. The company concerned wishes to improve upon its organisational learning mechanisms (OLMs) to develop an effective way of allowing individuals to learn and develop their skill sets during the duration of a development project. However, the company partaking in the research also wishes to utilise a learning approach that allows project members to be more reflective about their working experiences and environment as well as allowing them to share these experiences among project members. The social and cultural concept of organisational learning and the notion of organisational memory will have an important role to fulfil during this empirical research as the creation of an organisational blog will potentially allow the opportunity for learning to occur at the organisational level of the company.

Figure 2 provides a basic overview of the intended research approach with the organisational learning approach of a blog.

The primary objectives of the research are designed to show whether the concept of organisational learning through the use of blogs are applicable to the company. The research shall also focus upon whether blogs engender learning at an individual level that may transpire to a collective level though this is dependent upon how the project members use the blog. We shall be analysing whether how individuals' use of the blog can lead to new ways of thinking and enhancement of learning. Though this may initially occur at the individual level, we believe that through the subjective nature of organisations, collective learning is also achievable via blog use due to their salient feature of feedback. The research shall also concentrate upon trying to identify whether the generation of new thinking might lead towards novel ways of doing things regarding putting reflection into practice. We perceive the use of the blogs as a complementary method of communication towards the company's existing communication infrastructure and wish to see whether the continued use of the blogs can engender a relative degree of cultural change and adaptation in relation to the concept of the learning organisation.
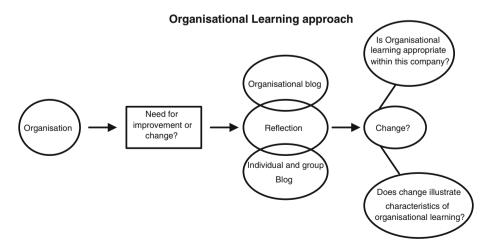

Organisational Learning approach

Fig. 2 Diagram illustrating outline of empirical research approach

The concepts that will be explored in this research are of particular relevance towards project-based organisations. The research undertaken within this company aims to address the following research questions: Can the notion of organisational learning enhance project members' understanding of the key issues impacting upon the progress of information systems development projects? Also, how effective are the use of blogs towards fostering organisational learning at both social and organisational level? Through interviews, questionnaires and dialogue analysis, the research will hopefully provide some answers to these questions. The results of the research will be used to inform the wider academic community about organisational experiences of using blogs as an organisational learning approach.

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