
CAN LEARNING ORGANISATION MATURITY BE INTERPRETED AS A PREDICTOR OF ICT INTEGRATION LEVELS. A RECENT EMPIRICAL STUDY IN A HIGHER EDUCATION SETTING IN IRELAND.

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Introduction

This study is set in an era when higher education institutions, similar to private business organisations are required to adapt and change at an increasingly frenetic rate to ever more intrusive environmental stimuli which require rapid cultural shifts. These adaptations are being driven by factors such as globalization, increasing competition, ubiquitous technology and communications and the emergence of the post industrial society where the required graduate will be a knowledge worker employed in a knowledge economy. This is particularly true of Ireland a small open economy on the periphery of Europe which is currently haemorrhaging its traditional manufacturing base to less costly eastern European and Asian states. The current mantra of the Irish Government and all its agencies is to transform Ireland to a leading knowledge economy as soon as possible. Therefore, the question is what type of higher education institution is required to produce new knowledge workers and / or transform traditional workers to knowledge workers? The answer suggests a higher education institution which, somehow itself operates similarly to what is expected of any new knowledge economy entity. Marquardt(2000), Senge(1990) and others advise that knowledge economy entities are ones that embrace the learning organisation phenomenon. While the learning organisation phenomenon is supported by many in the literature the writer acknowledges that it has its detractors also such as Brown and Keep(2003). There is a lack of empirical evidence of successful deployments of the learning organisation concept in many studies. This fact must also contribute to the view that the phenomenon, like many other yet to be proven management theories, must be employed with a certain amount of scepticism. Sennet(1998), adds to this theme from the perspective of the learning organisation approach being adopted in higher education, in that it should be rejected because it is too close to student management theories pertaining to private sector for profit organisations. The writer would disagree with these views however from both a theory and a praxis dimension. From the theory perspective the writer is convinced that the learning organisation approach is suitable as a model for the higher education setting. From the praxis side, the actual parallels seen in the recent partnership projects in the institute of technology sector in Ireland and those of a learning organisation approach are compatible. Higher education institutions are required to respond in ever shorter life cycles in adapting to new pedagogical cultures, driven by environmental change. In this climate there is a need to at least investigate frameworks such as those espoused in learning organisation theory. It is salutary in exploratory research in this area to look at a model like the learning organisation in that a limited amount of research exists in a higher education setting using such a model and thus more investigation is necessary here.

In essence this brief exploratory study fits into this drive towards the knowledge economy currently the strategic focus of Ireland Inc., in that it examines in a small way two important building blocks of the knowledge economy i.e. learning organisation maturity and efficacy in ICT deployment in a higher education setting. In a wider context, this study also can be seen as contributing to the European Union objectives in relation to the development of knowledge economies and in its setting of agendas in areas such as life-long learning and e-learning. These aims originated from Lisbon in 2000 when the EU declared that it wished to become "*the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion*". While a lot has been written about learning organisations and organisational learning in the literature, there appears to be a dearth of work which links the theory to the application or practice.

Methodology & Literature Review

The study set out initially to identify strategies and / or strategic frameworks around the integration of ICT into TL&A in higher education. During this journey through the literature the lack of such frameworks became evident. This lack of frameworks did not come as a surprise to the writer given the newness and exploratory nature of the subjects being examined. This 'lack of frameworks' was also evident from the praxis side, in that the institutes, which were the subjects of the study, were themselves, only in the initial stages of engaging with strategic planning at any level in their organisations. So if strategic planning at organisational level was absent then it was to be expected that planning at ICT integration level would also be negligible. This, again, was the case as the writer was aware of such a void given his professional background and personal interaction with ICT professionals throughout the sector. However, despite the lack of frameworks, the writer was still determined to somehow examine institutes organisational strategic awareness. Should it prove possible to establish that awareness, then, the writer wished to see if this awareness or maturity, if you like, had any influence on or correlation with ICT integration levels in the subject institutes.

Learning organisation maturity for an entity may be viewed, analogously, as continuous professional development or life long learning for an individual. The learning organisation approach seemed to fit with what the writer sought as a framework for strategic thinking, given its currency, into the study. The next hurdle to be crossed was to ascertain, whether it was possible to establish a measure of this 'learning organisation maturity' in relation to higher education institutes under examination. This led the writer to the work of Professor M. Marquardt who along with others such as David Schwandt had explored and applied in practice learning organisation maturity theories in many case studies. The tool developed by Marquardt for this purpose was called the learning organisation profile (LOP). The LOP tool made up of five subsystems namely, learning dynamics, organisational transformation, people empowerment, knowledge management and technology application. These subsystems seemed to have the elements required for the idea of a measure of learning organisation maturity, which was necessary to address the strategic focus aspect of the study. The tool in praxis had been applied in over 500 case studies consisting mostly of business type organisations. The writer, by employing this tool, was if you like continuing the practice, mentioned many times in the literature, of applying strategic methodologies first used in business organisations subsequently a higher education setting. A number of small adjustments were made to the LOP tool in order to adapt it for this study. Firstly some of the statements were slightly amended to allow a better fit to a higher education environment. Next some of the all positive statements in the questionnaire were changed to negative statements in order to mitigate bias in the data.

Having found and adapted the tool to address the strategic focus aspect of the study, the writer next sought a tool that might assist in establishing the level of integration of ICT into TL&A in the subject higher education institutions. Again during the literature exploration many tools were looked at around themes such as Rodgers (1962) 'diffusion of innovations' and Davies (1986) 'technology acceptance model' (TAM). The writer felt these tools failed to satisfy entirely the requirements for this study. While acknowledging that the ideal way to make a measure of ICT integration is to monitor behaviours of use over time, this is not always feasible. So, given the exploratory nature of the study and having anchored the strategic focus aspect in a well tried tool, the writer decided to develop a new tool to measure ICT integration levels. In order to mitigate in some way the risks presented by a new tool, TLA was developed in a similar fashion to the already well accepted LOP tool, in that it used a likert type questionnaire, a well established methodology in exploratory social research. This tool was referred to as the TLA tool in the study. The TLA tool consisted of three subsystems with likert type questions around the elements of lecture preparation, delivery and assessment. The tool was devised to provide a snapshot of ICT integration into TL&A in the subject institutes. The TLA tool, having been modelled on the LOP tool, could also follow the argument around aggregation of data from individual to organisational level, which was necessary for this study. The TLA tool was tested statistically for validity and reliability, similarly to the LOP tool, and proved well within the required norms for exploratory social research.

The main question posed by this study was :

Is it possible to correlate, the identification of 'learning organisation' maturity, with the level of integration of ICT into TL&A in the IOT sector in Ireland?

Preliminary Findings

First off it was imperative for the writer to identify a suitable means for gathering data given the limited resources available. Having looked at various options such as mailing surveys and online surveys, the online route was chosen because of administrative efficiency. Within the online area the next decision to take was whether the writer would outsource or manage himself the technical aspects of the survey. The latter was chosen, as the writer felt confident enough technically to do so. The main benefit, here, was the cost-neutral aspect of this approach. Having examined many open source survey tools PHPSurveyor was chosen as it showed best fit for what was required by the study. The adapted LOP and TLA tools were loaded onto an the online PHPSurveyor tool. This tool is open source and uses the PHP scripting language and has the MYSQL database system as a back end. It catered for all the types of survey questions required by the writer. It had its own mass emailing system built in, for inviting participation, which the writer in the end did not use because of technical difficulties around email security. Another useful feature of PHPSurveyor was that survey data could be easily extracted from it into an excel or CSV spreadsheet format. This would greatly help in preparing data for analysis. The writer downloaded this open source product from www.phpsurveyor.org and installed it on a LINUX web server based within Athlone Institute of Technology. The reasons an online publishing method was chosen were the following:

- Fast delivery of survey to targeted cohorts
- Easier administration of gathered data
- The predication of limited time and resource of the writer
- It was felt that participants would be more predisposed to completing a survey about ICT in Teaching Learning and Assessment in this fashion.

The survey was launched and data was gathered between June and July 2007. There were thirteen subject institutes targeted and data from both tools was successfully gathered from ten of them. When the survey was closed the data was exported from PHPSurveyor and imported into SPSS for codification and analysis. Tables 1 to 5 give a summation of preliminary findings.

		<i>Correlations</i>		
<i>All Institutes</i>		<i>Preparation</i>	<i>Delivery</i>	<i>Assessment</i>
Learning	Pearson Correlation	0.186	0.240	0.211
	Sig. (2-tailed)	0.000	0.000	0.000
Organisation	Pearson Correlation	0.227	0.267	0.268
	Sig. (2-tailed)	0.000	0.000	0.000
People	Pearson Correlation	0.275	0.289	0.221
	Sig. (2-tailed)	0.000	0.000	0.000
Knowledge	Pearson Correlation	0.222	0.231	0.235
	Sig. (2-tailed)	0.000	0.000	0.000
Technology	Pearson Correlation	0.253	0.256	0.258
	Sig. (2-tailed)	0.000	0.000	0.000
N		366.000	366.000	366.000

Table 1

The two tests chosen for this analysis were correlation of LOP subsystems with TLA subsystem results and multivariate analysis between LOP subsystems as dependent variables and TLA subsystems results as dependent variable. Table 1 applies a correlation analysis of LOP subsystems against TLA subsystems to ascertain trends here around the research question. Table 1. shows significance in all cross-tabulations with, in general, a positive weak to moderate relative effect between subsystems. In table 1 the most significant correlations returned from cross tabulation are in the people empowerment subsystem, first and technology application subsystem, second.

The analysis in table 2 tells us that the independent variables of people and technology can reliably predict the dependent variable preparation. This again underpins findings in table 1. Table 2 indicates that for every unit increase in the independent variable, the dependent variable preparation is increased

/ decreased. For example with the people on its own in the model every unit increase in the independent variable people there is a predicted .21 increase in dependent variable preparation.

<i>Model</i>		<i>Coefficients(a)</i>					
		<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>		<i>t</i>	<i>Sig.</i>
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>	<i>B</i>		
1.00	(Constant)	19.94	0.96		20.66	0.00	
	People	0.21	0.04	0.27	5.45	0.00	
2.00	(Constant)	18.87	1.10		17.22	0.00	
	People	0.15	0.05	0.19	2.93	0.00	
	Technology	0.10	0.05	0.13	2.04	0.04	
a	Dependent Variable: Preparation						

Table 2.

The analysis in table 3 tells us that the independent variable of people can reliably predict the dependent variable delivery. This again underpins findings in table 1. Table 3 indicates that for every unit increase in the independent variable, the dependent variable delivery is increased / decreased. For example with the people on its own in the model every unit increase in the independent variable people there is a predicted .20 increase in dependent variable delivery.

<i>Model</i>		<i>Coefficients(a)</i>					
		<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>		<i>t</i>	<i>Sig.</i>
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>	<i>B</i>		
1.00	(Constant)	17.37	0.84		20.57	0.00	
	People	0.20	0.03	0.29	5.77	0.00	
a	Dependent Variable: Delivery						

Table 3.

The analysis in table 4 tells us that the independent variables of organisation and technology can reliably predict the dependent variable assessment. This again underpins findings in table 1. Table 4 indicates that for every unit increase in the independent variable, the dependent variable assessment is increased / decreased. For example with the organisation on its own in the model every unit increase in the independent variable organisation there is a predicted .22 increase in dependent variable assessment.

<i>Model</i>		<i>Coefficients(a)</i>					
		<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>		<i>t</i>	<i>Sig.</i>
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>	<i>B</i>		
1.00	(Constant)	15.42	1.03		15.03	0.00	
	Organisation	0.22	0.04	0.27	5.31	0.00	
2.00	(Constant)	13.72	1.25		10.97	0.00	
	Organisation	0.15	0.05	0.18	2.76	0.01	
	Technology	0.14	0.06	0.15	2.35	0.02	
a	Dependent Variable: Assessment						

Table 4.

The analysis in table 5 tells us that the independent variables of people and technology can reliably predict the dependent variable TLA. This again underpins findings in table 1. Table 5 indicates that for every unit increase in the independent variable, the dependent variable TLA is increased / decreased.

For example with the people on its own in the model every unit increase in the independent variable people there is a predicted .61 increase in dependent variable TLA.

Model	Coefficients(a)					
	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta	B		
1.00	(Constant)	53.17	2.38		22.38	0.00
	People	0.61	0.10	0.32	6.36	0.00
2.00	(Constant)	49.35	2.68		18.41	0.00
	People	0.38	0.12	0.20	3.08	0.00
	Technology	0.36	0.12	0.19	2.97	0.00
a	Dependent Variable: TLA					

Table 5.

While this short exploratory study employed a learning organisation maturity model, adapted from Marquardt's work, as a strategic framework measure for comparison with ICT integration in higher education institutes, the study acknowledges that the learning organisation discourse is large and complex and requires much more analysis to decide whether it may be a suitable strategic framework for higher education institutions. However, given the need for speed required by higher education institutions in adoption new strategies for transformation where the idea that competition in the space is emerging in Ireland in the early part of the 21st century, against a backdrop of scarcer resources, an approach such as that of the learning organisation, which embraces a holistic view of organisational health in that it attempts to marry the desires of the individual and the organisation while acknowledging the tensions between culture and structure, may prove worthwhile.

Preliminary findings here would indicate that learning organisation maturity be interpreted as a predictor of ICT integration levels.

References

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