ASSESSMENT OF ORGANIZATIONAL LEARNING WITHIN TEAMS

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Abstract: *Two representative approaches to measuring and assessing organizational learning are compared. Based on the benefits and drawbacks of each, an alternative framework is proposed for an assessment based on action science, from pragmatic point of view of members of a team within an organization which has declared an intention to improve learning processes.*

Key words: *organizational learning; the learning organization; assessment; measurement; action science*

1. Introduction

The organizational learning literature is quite sparse on methods for evaluating and measuring learning organizations. For the purposes of this article, we have selected two representative approaches: Moilanen (2005) who proposes a theoretically eclectic and highly quantitative evaluation method; and Smith & Tosey (1999), who propose an essentially qualitative assessment grounded in new science. We will compare them, observe the benefits and drawbacks of each from the strictly pragmatic point of view of members of an organization which has declared an intention to improve learning processes, and will provide an alternative assessment methodology.

2. Quantitative approaches and Moilanen's holistic measurement tool

Moilanen (2005) provides an inventory of the measurement instruments available for learning organizations. These are summarized in the table below:

Table 1. Questionnaire-based measurement instruments for the learning organization

Researcher	Year	Description
Pedler et. al	1989	Emphasis on the whole and on the individual's role within the whole; covers strategy, looking in, structures, looking out and learning opportunities
Mayo & Lank	1994	Emphasis on the actions needed to impact the learning process; Very broad; 9 dimensions, 187 questions
Tannenbaum	1997	Emphasis on: processes, training, and support. Carefully examines the learning environment
Pearn et al.	1995	Emphasis on ways for managers and organizational structures to encourage learning. Over-focused on leading and encouraging.
Sarala & Sarala	1996	Emphasis on validating an organization as 'learning' or not. Covers philosophy and values, structure and processes, leading and making decisions, organizing the work, training and development, and the internal and external interaction of the organization.
Otala	1996	Very general, not well rooted in a theory. Very brief - only 20 questions; self-assessment utility.
Redding and Catalanello	1997	Emphasis on the capability for learning, placing organizations within the archetypes of "traditional", "continuously improving" and "learning organizations". Simple to utilize.
Watkins and Marsick	1998	Emphasis on the aspect of learning from the individual, team, organizational and global perspective. Covers continuous learning, dialogue and inquiry, team learning, embedded system, system connection, empowerment, leadership, financial performance, and knowledge performance.

Moilanen then goes on to create and propose a comprehensive measurement instrument. His approach is not grounded in any single theoretical approach; on the contrary, there significant effort is put into listing, grouping, and an attempt to reconcile the main elements of organizational learning found in the works of Mike Pedler, Tom Boydell and John Burgoyne, Chris Argyris and Donald Schon, and Peter Senge. On this basis, a set of five areas of focus are selected: managing and leading as driving forces, finding purpose, questioning, empowering, and evaluating learning and learning organization. The author seems to consider that, by grounding his measurement instrument on an eclectic approach to organizational learning - essentially re-classifying these views to create an all-inclusive theory - a more holistic view of an organization can be achieved, and "a holistic view of learning organizations was chosen as the main criterion" (Moilanen, 2005). We shall later consider the impact of the choice of criterion and method of reaching this objective on the usefulness of the instrument for growth toward learning organizations.

On this eclectic theoretical basis, Moilanen constructs an instrument to evaluate the present state of a learning organization. The instrument is relatively straightforward to use - only 40 statements are used (though the researcher contends that "for practical purposes, the number of statements is perhaps too high", *idem*), half of them focusing on the individual level and half on the organizational level. At both levels, the statements operationalize the five areas of focus that constitute the holistic framework, and for processing are clustered by these areas of focus. Sample statements include: "Building a learning organization is a priority and has many resources in our organization" (a statement situated at the organizational level and focusing on "managing and leading as driving forces"), and "I am able to assess the outcomes and methods of the work of our team" (a statement situated at the individual level, focusing on "evaluating learning and learning organization").

The statements are then visualized by means of a diamond, which has the

advantage of showing the five elements at both the individual and organizational levels in their interdependencies. This diamond is presented in the individual and organizational version, and the size and balance of the sides of the diamond are a clear and compelling visual indicator of the readiness for learning within organizations. The instrument was applied to 27 of Finnish companies, and the results of the study are presented by Moilanen in considerable detail, with an analysis of the difference between the individual level and organizational level of learning (the diamond is consistently larger at the individual level than at the organizational level) and of the difference in organizational diamonds across industries.

3. Limitations of Moilanen's approach

The rigorousness and comprehensiveness of Moilanen's method make it a good coalescing point by which to assess the quantitative, questionnaire-based approach to learning organization evaluation and measurement. These methods utilize a questionnaire delivered at the individual level, where participants are asked to individually provide their own assessment of their personal learning and the organizational learning, with varying degrees of prior familiarity with learning organization concepts. This approach is defended by statements such as "Taking a holistic perspective of a learning organization has its advantages but considering the individual before viewing the entire organization may be more informative" (Small & Irvine, 2006). However, the cumulative result of individual assessments of a group phenomenon will be vastly different from a group assessment obtained via a dialectical, political and collaborative process; and measurement systems that focus solely on the individual representation of social realities cannot but fail miserably at creating constructs that are meaningful and useful at the social level.

The evaluation provided by these methods is discrete and regards the state of the organization at a particular moment in time. In Moilanen's case, this state is captured graphically via a diamond shape as an archetype. Taking a discrete view of the continuous process of organizational learning and of growth towards a learning organization, without careful consideration of the path between one iteration and the next, is a severely limiting form of assessment.

Moilanen goes to great pains to create a holistic measurement framework, and admits that "the framework is rather general, because organizations are different; their backgrounds, histories, cultures, processes and businesses vary enormously." (Moilanen, 2005) There a very real danger that a model that is inclusive, general and eclectic enough to fit all organizations might be all but useless for any particular organization, unless it is used only as a starting point to collaboratively create a customized tool for the particular organization that intends to use it as a benchmark for growth. An eclectic approach such as Moilanen's raises serious questions about the meaningfulness of the instrument proposed. If the nature of the phenomenon should be understood in a meaningful way before any attempt at an objective or even useful measurement instrument is made; if the instrument is not grounded in a theory that provides an understanding of reality, but rather draws on multiple theories without providing and proving a coherent integration, such a measurement tool will only confuse and misrepresent.

4. New science and Smith & Tosey's simple discriminant techniques

Smith & Tosey (1999) highlight further difficulties in the evaluation and measurement of learning organizations. They approach the issue of assessment of learning organization from a more qualitative point of view that is based on new science - a "different perspective" that aims to provide "simple discriminant techniques for learning organization assessment".

Their analysis of the limitations and difficulties in assessing learning itself is helpful and illuminating. While recognizing that a simple measurement of the extent and type of learning appears to be the best type of assessment available, Smith & Tosey highlight the following key difficulties with such an approach: what is measurable is not necessarily a good representation of the process that is being studied, so that an approach that reduces the phenomenon to what can be measured about it will necessarily distort its meaning; the meaning we attribute to learning is a construct that is dependent on the meaningfulness of our theory about learning, and is therefore elusive - it is not possible to directly observer learning, all of our statements about it are obtained by inference; and the indicators that are available to human observation to support this inference might often not be an indication of the most meaningful type of learning, as "the most measurable learning may not be critical in terms of change leverage and performance" (Smith & Tosey, 1999).

Based on the analysis of these limitations, Smith & Tosey posit that assessing learning organization is primarily political in its nature, not technical or scientific.

"The activity of assessing learning and of making progress towards the learning organization ideal is, we argue, essentially a social process" (Smith & Tosey, 1999).

Assessing is social and political because on the one hand, the very process of growing towards the state of a learning organization is a social process, and on the other hand, learning itself is a different construct for different actors and groups within the organization.

Under these limitations, three main solutions have been adopted for the evaluation and measurement of the learning organization. By circumscribing the organizational learning process tightly within the existing power structures of the enterprise, those indicators would be selected that the management team considers to be the most desired outcome; it is to be observed how this approach to evaluating organizational learning contradicts the very theory of organizational learning (for ex., a top-down results-based assessment will be very liable to the perverse effects of feedback within systems; and it is difficult to avoid the accusation of incongruence between such an approach and Senge's "shared vision"). A second approach is to avoid the results trap and focus on the learning process itself, and measure the elements of this process that are the most measurable; this approach, however, ignores qualitative growth in learning strategies, that would make it impossible to accurately infer the level of learning by focusing on only some elements of that learning process; the approach will also lead to organizations reducing their organizational learning activities to the formal training, which is measurable, but very far from the leading thinking on organizational learning. The third approach is essentially the one taken by Moilanen, where indicators are selected based on the work of researchers in the field; as indicated, this approach requires the use of experts in both administering and interpreting the results, but a more serious drawback is that, to the extent that the theory is tightly knit, indicators will confirm its positions rather than provide any helpful link to organizational effectiveness.

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These three approaches are then proposed as not mutually exclusive, but rather as providing valid methods as "heuristics" that, by organizing the culture and structure of an organization that wants to grow towards the learning organization ideal, provide a useful guide to action. This position is inspired by Weick's insistence that not accuracy is the main issue in representation, but rather the capacity to "galvanize action". However, giving up on accuracy to obtain a highly galvanizing evaluation has ungauged consequences for the capacity to maintain long-term energy and coherence around an organizational learning endeavor.

Smith & Tosey propose two approaches from their own research and consulting experience. These approaches are heavily rooted in the mindsets and metaphors of "new science". The first one is a three 'field' system consisting of focus, will and capability (with performance added to provide an objective measure of desired results). This approach is operationalized via a simple questionnaire, administered individually, where items are then grouped and processed along these axis. Thus, we find that, essentially, this approach is not different from any of the quantitative approaches that Moilanen considers or his own eclectic instrument; the only difference being that the statements are organized into a different set of areas of focus. The second approach proposes a model of organizations as energies of consciousness, and indicates seven types of energies that are present and move action at different stages in the life of an organization, ranging from very primary to more socially-organized forms of energy. This is a diagnostic tool to facilitate understanding and identify blocks to energy.

5. Limitations of Smith & Tosey's approach

While Smith and Tosey offer a very pertinent and helpful analysis of the difficulties of assessing learning organizations and the fallacies of traditional assessment methods, their proposed methods are insufficiently helpful in providing ways to move beyond these limitations. Their approach is highly speculative - a fact that they recognize themselves. This would severely undermine the capacity to transfer the methods into organizations with a culture that insists on rigor, especially once this introduction is no longer accompanied by the personal charisma of the authors. Both methods are heavily grounded in new science concepts and metaphors. This conceptual framework and the associated language is only familiar to a limited number of people, and it is likely that only a very small percentage of members of any given team or organization would have had previous exposure or interest in these matters. The time and effort necessary to introduce these concepts are considerable, with results quite mixed, as some people would readily understand and embrace the concepts based on a personal affinity with more 'loose' ways of thinking, while others would react with cognitive defense mechanisms. Among those who do embrace the concepts, these remain quite ambivalent and undefined, and when requiring members to use them as metaphors (with a high level of emotional content) for organizational processes, a radically different understanding would be adopted by each member. Thus, even training on new science concepts would not efficiently provide a common language. In fact, the researchers recognize these problems: "To date the framework appears successful as a facilitative method of assessment, but with the limitation that it is mainly those already conversant and comfortable with its language who are able to use it to advantage. For others, the 'learning curve' in beginning to think this way appears very steep" (Smith & Tosey, 1999) While the stated intention is to identify an assessment process that makes unnecessary the intrusion of

so-called experts into the organization not only in applying the evaluation instrument but also in analysing and intepreting the results, the methods proposed actually retain some need for experts but introduce the need for a truly initatic process in the mysteries of new science. Even if the model is explained, understood and adopted exemplarily, it is still so disruptive to people's understanding of physics and the world, as well as thinking processes, that the level of cognitive discomfort will prevent it from being a useful and practical approach. While new science concepts do provide very helpful frameworks for organizational learning (such as considering that the concept of a learning organization itself is very much a "strange attractor" rather than an objective state to be achieved and measured), the difficulties in making these explicitly part of the functioning language within the culture of the enterprise argue for embracing the concepts at the level of tool and mindsets proposed to members for growing towards a learning organization state. To the extent that new science as applied to orgnaizations is actually a more valid representation of the existing phenomena and forces, it should not be necessary for members to be conversant with the concepts for the benefits to be obtained.

6. Framework for an alternative assessment methodology

This analysis of two different approaches to evaluation of learning organizations provides a promising framework from which to propose an alternative assessment methodology. This will be based on the view that organizational learning cannot be meaningfully evaluated at the individual level and in a discrete manner; for an assessment to be useful, it has to take into account the flux, the process, and be produced through and refer to social interaction. The difficulties of such an endeavor have already been highlighted; an approach that might provide a working solution will be proposed. Moilanen's ideal of holism can be retained, though it is necessary to consider the cautionary tale of summative evaluations in education that operationalize learning to a set of dimensions (much like Moilanen's areas of focus); this type of evaluation has been very much discredited by formative evaluation that re-discovers the learner as a whole irreducible to a single dimension. Taking this into account, it might be worth considering that a useful holistic approach would rather look at the interactions and interplay between different dimensions / areas of focus, rather than analyze each of them independently. In any case, reducing learning to a list of factors that are measured and mapped out can only lead to a mecanicist type of learning; and most assessment methods are, in fact, rooted in such a view of learning that is in stark opposition to the archaic and metaphoric view introduced by proponents of organizational learning. Smith & Tosey introduce the idea of assessment as a political process; and indeed, research in educational evaluation shows that attempts to eliminate subjectivity lead to gross distortions in evaluation: "Formative evaluation also fell into the trap of impartiality and correctness in which summative evaluation had fallen before, thus carrying the seeds of all disappointment." (Meyer, 1995, p. 23). Furthermore, insofar as learning itself is a construct and its assessment is a social and political process, it becomes necessary to at least provide a framework for a shared understanding of the concepts to all members who will be participating in an evaluation before requiring them to answer questionnaire questions or participate in the process. This is, indeed, time-consuming, but mitigating solutions will be proposed.

An additional key issue is the influence of measurement and assessment on further

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learning and growth. If we accept that what gets measured gets learned, and also that what gets measured gets valued, then the manner in which organizational learning is evaluated heavily influences the way in which learning is approached. It then becomes vitally important to avoid distortions and incongruencies between espoused values and the values that are measured; any departure from integrity within an organization with a commitment to becoming a learning organization threatens the very core of organizational learning. Thus, a necessity emerges for members of teams and organizations to take an active role in designing, negotiating, administering, processing and adjusting assessment methods, so that they become responsible for continually creating the most congruent instrument that fits their values and commitments.

The alternative method proposed below is based on collaborative research in a consulting environment applying various methodologies, as well as observations from the experiential education methodologies of Outward Bound settings. The background is firmly set in the action research and appreciative inquiry framework.

Smith & Tosey explain that "a drawback with the performance model approach has been it inability to show the degree of assessment detail that is often of interest either from the point of view of discriminating progress or better informing remedial learning. This has entailed formation of post-instrument collaborative exploratory groups from within the communities under study to jointly explore and articulate personal details - a time and resource consuming effort, often demanding consultant intervention" (Smith & Tosey, 1999). Based on this and the necessity for social construction and processing of evaluation tools, we propose that the method below be used by teams, whether in small organizations where all members would participate, or by focusing on core teams within large organizations. This also fills an important gap, where existing instrument proposed have provided questionnaires for the individual and the organizational level, but not the team level. The heuristic, pandoxist view of Smith & Tosey has obvious advantages: "At best, treating assessment as a heuristic process allows for both pragmatism and criticality." If each member of the team becomes familiar with one general theory, the assessment process can allow the interplay of the points of view provided by different theories, thus offering a more in-depth understanding of the issues facing the team and their causality. This approach does, however, leave "the issue of choice over what type of assumptions and maps to adopt in the first place." Thus the need for a set of mutually agreed-upon criteria to guide the choice. A few criteria that could seed the discussion include: ability of the model to assess learning conditions, to enable participants, to provide a focus for inquiry, flexibility to be adapted to the specific conditions, culture and lifestage of the team and organization, and meaningfulness of the language for the team as a whole. Once a set of criteria is agreed upon, and members present the main theoretical models taken into consideration, the team will undergo a negotiation process that is fully social and political to select the model that most closely meets their criteria, and to then adapt and operationalize it into a meaningful model at the team level. There is a very real danger that team members will create their own eclectic approach, integrating all theories rather than being selective and adapting. To counter this risk, a much-simplified adaptation of the diamond model can be used as a powerful visual representation where only 3 or 4 areas of focus are available to be filled in, and only a projection at the team level is used. The level to which these factors are developed is subject to negotiation within the team, and it is this very process that forces team members to consider the interplay and interdependencies at work, bringing to bear a

group, collaborative form of metacognition. The process is repeated at regular intervals decided upon by team members, and at each iteration discussions focus on re-negotiating the model and evaluating progress and the processes by which progress has been obtained. There is a strong potential of scaling this approach to the organizational level via the World Cafe method.

7. Conclusions

Research performed in a consulting setting shows that this type of approach is sensitive to the team's capacity for self-deception and groupthink. This risk can be mitigated by applying these methods, in a manner based on Argyris's research into Action Science, to any team-building activities that place members in embarrassing or threatening circumstances. By contrasting the self-evaluation by the group with the more objective, outsider evaluation by another group, group biases can begin to be corrected. The question remains as to whether results obtained by this method are comparable across teams and organizations in any scientifically valid way. To the extent that learning processes are universal and transferable from one organization to another, this political and collaborative process provides more accurate representations of these processes, that can then be studied to determine manners to reconcile and compare team assessments across organizations. However, for the purposes of growth towards a learning organization "strange attractor", internal congruence is far more valuable than scientific comparisons and external benchmarking.

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MODELS AND SYSTEMS FOR STRUCTURIZATION OF KNOWLEDGE IN TRAINING

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Abstract: *In this work the problems of the automated structurization and activation of the knowledge, saved and used by mankind, during the organization and training, and also that knowledge which are generated by experts (including teachers) in the current activity, are analyzed. The purpose - the further perfection of methods and systems of the automated structurization of knowledge and their applications for creation: the automated workplace of the lecturer (environment for the automated structurization of a lecture material), the virtual lecturer assistant (system for the automated dialogue with students), environments for preparation by students of reports, explanatory notes to course and degree works, the virtual adviser and knowledge tester for students testing during training, for other applications. Developed by authors "the matrix of elements of knowledge" - became acting system of the automated structurization of knowledge in training, it present interest for its use in other spheres.*

Key words: *knowledge; presentation; structure; element; matrix*

1. Problem status

The analysis of a problem status was already marked by us in [1][1]. There it was marked, that the human knowledge which has been accumulated up in many millenniums, are brought up to now on such physical carriers as the papyrus, paper and others. The most widespread form of representation of this knowledge is the text. On modern representations, the access to the necessary text, labour-consuming and rather long procedure. In the