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CONCURRENT SESSIONS **Tuesday 13:30 – 17:30**
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SALON BANDINI/MARZIO

9.2. EDUCATION OF QUALITY – QUALITY OF EDUCATION II. 15:30 – 17:30

Co-Organizer: Óbuda University

Session Chair: ***Eric Janssens****, European Organization for Quality, Brussels, Belgium*

16.45 Effects of Advanced Terminology in Quality Management – A Survey Investigation from Swedish Organizations
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Effects of Advanced Terminology in Quality Management –A survey investigation from Swedish organizations

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Abstract

To survive in the competitive market, most organizations of today work with quality improvement of some kind in their business. Many organizations use concepts like Six Sigma and Lean, either applied as the structure for the entire improvement work, or as inspiration where elements of the concepts are used in the business development. Within Lean and Lean Product Development (LPD) literature, Japanese terms are frequently used, something that companies have applied to different extents. In Six Sigma and Design for Six Sigma (DFSS) abbreviations are equally common. Furthermore, in non-English speaking countries the frequent use of English terms sometimes obstructs the understanding of the constructs. Altogether, independent of which quality improvement concept an organization chooses to work with, the possibilities of using advanced terminology in some form are numerous.

The present study investigates possible consequences of using advanced terminology of any kind in quality management, using experience and examples from large Swedish organizations. The paper thoroughly discusses advantages and disadvantages with usage of specialist language, indicating both increased benchmarking opportunities that come with a common use of terms between companies and the risk that too advanced denominations leads to misunderstandings within an organization. Conclusively, the paper emphasizes the importance of making a distinction between terms that are constructs used in the quality management field as a profession and at the everyday work in an organization and to make intentionally conceived choices of what terms that are used within the organization.

1. Introduction

Companies have always been exposed to competition as described by for instance Juran (1989). There has also been an eternally strive for producing high qualitative products with low cost. What have change throughout the years are the strategies of how to manage for quality (Juran1989, Bergman and Klevsjö 1994, Sandholm2000). Initially the process of quality control was to secure the human survival and the edibility of results from food gathering. At this time the control composed of incoming inspection by consumers (Juran 1989) and there was no use of any specific defined terminology. Also the following development of quality assurance as inspection in companies did not require any specific construct since it was conducted by one defined and trained specialist. Since then the evolution have progressed further and several concepts and methods have passed by. By this

development the specialists are superseded and the responsibility of quality control has moved into the daily work of companies' employees. Consequently the need of a common interpretation of the used constructs and acronyms have increased to secure that the preventing quality control is realized equal regardless of who is performing it.

The rise of Shewhart's control chart, organization's development of quality control systems, economic crises, the second world war, the Japanese quality revolution (Juran 1989, Bergman and Klevsjö 1994, Juran 1995, Deming 1982, Juran and Godfrey 1999, Sandholm 2000, Sörqvist 2004) etc. have over the years bring forth new concepts as Kaizen (Imai 1986), Total Quality Control (TQC) (Feigenbaum 1991), Total Quality Management (TQM) (Oakland 1991), Toyota Production System (TPS), Lean (Womack and Jones 1990, 2003) and Six Sigma (Harry and Schroder 2000, Watson 2004, Sörqvist and Höglund 2007). The rise of these concepts in chronological order is visualized in Figure 1.

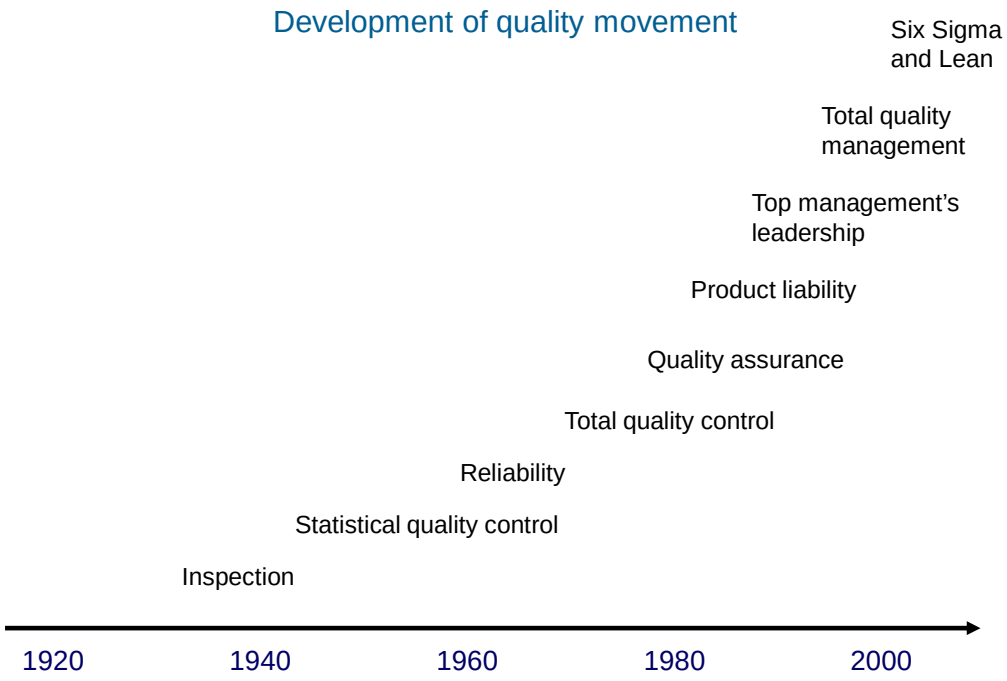

Figure 1 - Development of quality movement (Sandholm 2000)

Several of these concepts have many similarities especially when it comes to methodologies, tools and its effects (Andersson, Eriksson and Torstensson 2006). Contrary argues Pettersen (2009) for instance that lean is significantly different from its closest relative TQM and other concepts. However, all the mentioned concepts have a slightly different focus to counteract the main problems at that specific moment of time and therefore each of them provides new constructs. Most of the concepts also are specific developed by a company for its need or adjusted to a specific culture. For instance Kaizen, TQC, TPS all are developed and based for the Japanese culture, Lean is an Americanized version of TPS and thus suited for that culture whilst Six Sigma is a concept developed within and specific for Motorola. Scattering of these

concepts worldwide therefor has resulted in several organizations implementing concepts and solutions developed for someone else without reflection. Another progress is the spread of these primarily industry developed concept to new type of businesses areas such as health care, educational institutions, public bureaucracies, nonprofit organizations and service organizations (Hackman and Wageman 1995). It can be useful to benchmark other organizations and business areas within the scope of a business development and quality management investment but the fundamental condition is to plant an own tree and graft ideas from other rather than copying someone else's tree. When the terminology is duplicated as being part of a copied and introduced concept consequence as misunderstanding of constructs and acronyms easily occur.

The trends within the quality management field have continuously caused definition of new constructs to unify the discipline around the last method. It is not mainly the names of a trendy concept that cause confusion but rather all the different methods, tools and techniques included or promoted within the concepts. As mentioned above all the introduced concept to some extent differs regarding focus which means they bring up slightly different tool and technique acronyms as important. The development of the quality discipline until today have thus suggested a huge amount of methods and tools for organizations to relate to as can be seen in Figure 2.

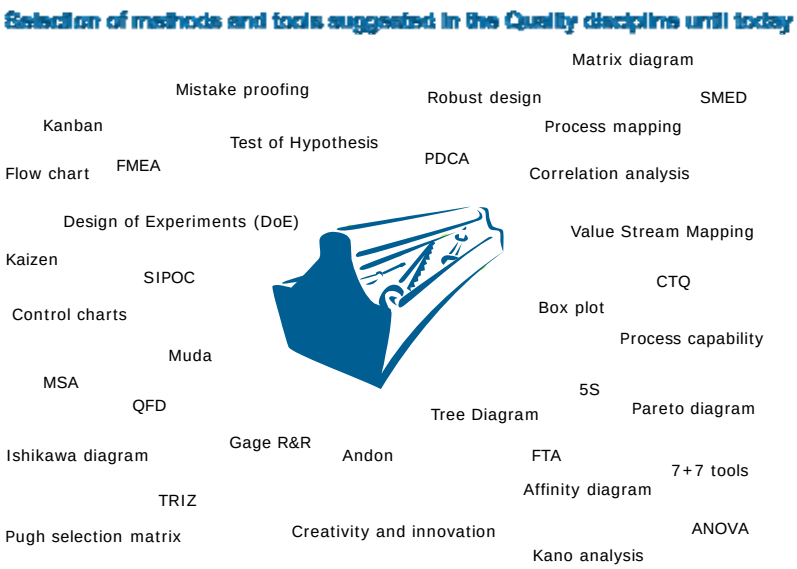

Figure 2 – Selection of methods and tools suggested in the quality discipline until today (free after Sörqvist 2000)

Most companies that join in applying any of the Quality Management concepts mentioned above get caught by the argument of its simplicity, involvement and all employees' commitment. Then they introduce someone else's solution of a concept without reflecting about the consequences. Even worse is that several companies well-reasoned implement a concept accepting the different complex constructs. For instance Lean or TPS uses only simply and elementary Japanese words to secure all employees' understanding. Unfortunately it becomes wrong when European and American people adopt these terms to secure simplicity. Similarly the usage of shortenings from Six Sigma or TQM introduced in non-

English speaking countries to simplify discussions and documentation often results in no one knowing what the abbreviation denotes and consequently it is useless.

Even though all these methods and concepts advocates for the importance of simplicity and intelligibility as well as engagement and letting everybody be committed in the improvement and quality work (Bergman and Klevsjö1994, Hackman and Wageman 1995, Dean and Bowen 1994, Sandholm 2000, Juran 1964)they all include a lot of advanced terminology, buzzwords and abbreviations that have to be related to. Just as Winter argues (Cole and Scott 2000) these methods have generate positive results in some organization but it is not established that they are generally economical effective. Still it is unclear whether organizations perform better as a result of adoption of new frameworks, slogans and buzzwords (Cole and Scott 2000).

The purpose of this article is to map whether the usage of constructs is a problem in today's organizations or not and to explain the issues with usage of advanced terminology.

1.1 Outline

The remainder of the paper is structured as follows. Section 2 describes the research method used in this paper followed by a theoretical description of educational psychology which composes the analysis framework of the paper. In section 4 the empirical results are presented and during the 5th section the analysis and discussion takes place. Finally the paper ends with conclusions in section 6.

2. Research Method

Two literature reviews have been conducted whereof the first composes the introduction of the article. This study aims to map the historical perspective on the development of the quality field from a construct and acronym perspective which creates an exposé of the growing amount of buzz-words in the field of business development. The second literature review composes the analysis framework and deals with pedagogical perspectives of how specialist language affects learning.

To find out about the usage of constructs, acronyms, abbreviations and advanced terminology in organizations and the perception about this among employees at today's companies a questionnaire has been performed. The selection of respondents was realized by cluster selection which according to Holmeand Solvang (1996) can be done as a cheaper and easier alternative to random sample or stratified selection if entities are grouped in clusters. Then groups from several sets of cluster or the entire cluster during a limited period of time can be used as selection. The actual cluster in this study composes of participants in course groups of several business development courses during the limited time period 01/02/2011 to 16/03/2011. All respondents also have a uniformed knowledge base since they participated in a business development course.

The questionnaire was realized anonymous and consisted of ten questions where the initial five composed nominal questions with background information about the respondents' organizations and their experiences within that company. The remaining questions presented below were ordinal and provides information about the considered phenomena. The ordinal questions dealt with:

• if the organization has introduced advanced terminology within their business development investment,

• if the organization has internal definitions of used advanced terminology,

• whether the organization and the respondent respectively have experience problem with the understanding of advanced terminology

The empiric generated from the survey has been analyzed from two perspectives. Firstly a statistical analysis of the survey results is performed. Tests of hypotheses are performed by a one proportion test since specific results in the survey are compared to the distribution as a whole (Walsh 1990) and the following binomial assumptions are met (Lind, Marchal and Wathen 2008)

i) there are only two possible outcomes (have internal definition/do not have internal definitions, have introduced terms/have not introduced terms, do experience problems with understanding of terms/do not experience problems),

ii) the probability of success is the same for each respondent,

iii) the trials (answers from the respondents) are independent and

iv) the sample data is the result of counts (the respondents of each outcome is counted in the sample of 73 respondents).

The hypothesis test is performed to find out whether any of the ordinal questions generates a significant result for some different nominal groups. The analysis realized in this article was performed by using the statistical analysis software tool Minitab and based on the 73 completely answered questionnaires. In total 78 participants have responded to the survey during the data collection period whereof 5 did not complete it. Subsequently the research question is analyzed against the analysis framework about how specialist language affects learning generated from pedagogical literature and presented in the analysis framework session.

3. Analysis framework (educational psychology)

Just like Quality Management, the theories about pedagogy and pedagogical psychology have been developed over many years. Gradually, the explanation models used today to understand the mechanisms of learning have evolved. A good understanding of teaching traditions still in work and of current pedagogical theories therefore requires a brief knowledge about the history of learning theories. This chapter will thus first present a brief history of educational psychology and then some classical learning theories that can elucidate the mechanisms in work when individuals and groups of individuals learn and come to understand new terminology.

3.1 Two basic viewpoints on educational psychology

During the 20th century, two fundamentally different viewpoints have evolved in parallel, namely the behavioristic and the phenomenological approach to learning. The major difference between them is that the behaviorism regards individuals as objects whereas the phenomenology includes subjective aspects in theories about individual learning (Imsen). The two concepts are compared in Table 1 below.

The behaviorism origins from the ideas of Aristotle and the believe that all scientific results, including social science studies, must spring from objective observations. Behaviorists therefore solely consider the external interactions between the learning individual and the environment. All kinds of knowledge, including feelings and emotional reactions are viewed as conditioned patterns of behavior (Imsen 2000). A famous behavioristic experiment was carried out by Pavlov, who taught dogs to react in predictable ways by exposing them to positive and negative stimuli. Watson took this experiment one step further by showing that it was possible to create new and predictable emotional reactions in a human boy by using negative stimuli (Watson 1958). A third example of behavioristic research is shown by Skinner, who proved it possible to reinforce existing behavior patterns among rats by using positive stimuli (Skinner 1953).

The behaviorism is sometimes considered as deterministic due to its somewhat machine-like descriptions of human individuals and animals. The same reasoning can however be viewed in a more positive way; as learning only depends on external stimuli, anyone can learn anything.

The phenomenology on the other hand springs from philosophers like Kant and Sartre. According to this psychological perspective, no human behavior can be understood without considering the influence that the human herself has on the process. The experiences and expectations of the individual affect the way he or she interprets a context, and thereby the reaction on the external stimuli (Imsen 2000).

Table 1– Comparisonbetween behavioristic and phenomenological viewpoints (free after Imsen 2000)

	Behaviorism	**Phenomenology**
Advocators	Pavlov, Watson, Skinner	Kelly, Heider
Fundamental views	Individuals can be viewed as objects.	Individuals can only be understood subjectively.
Fundamental views on learning	Learning is a mechanic process.	Learning is an interaction between the individual and a context.
Preconditions for learning	Conditioning	Expectations
Learning stimuli	External motivation	Inner motivation
Learning process	Simple and systematic memorization of constructs.	Expansion of known conceptual world.
Result of learning process	Behavioral change	Increased experience

Thought the behaviorism dominated the educational research of the first half of the 20th century, most pedagogic researchers of today relate to the phenomenological point of view, and the remaining behaviorists have included at least some phenomenological influences in their theories. No-one any longer believes that individual progress and learning take place

independent of feelings, expectations and previous experience (Imsen 2000). The behavioristic thoughts however live on in teaching structures in schools and other organizations. An example of this is the common believe in external motivations, like grades or increased salary, as stimuli for behavioral change.

3.2 Cognitive and constructive theories about learning

Most of the theories about learning advocated today are strongly influenced by the phenomenology. Two theories closely related to each other are cognitivism and constructivism, briefly summarized in figure 3 below. Cognitivism approaches learning as a spontaneous process sprung from a desire to interpret and organize the context. The individual does not only strive for rewards, but for finding structure and meaning. The constructivism takes this line of argument one step further by arguing that individual choices determine which parts of the context that becomes objects of interpretation.

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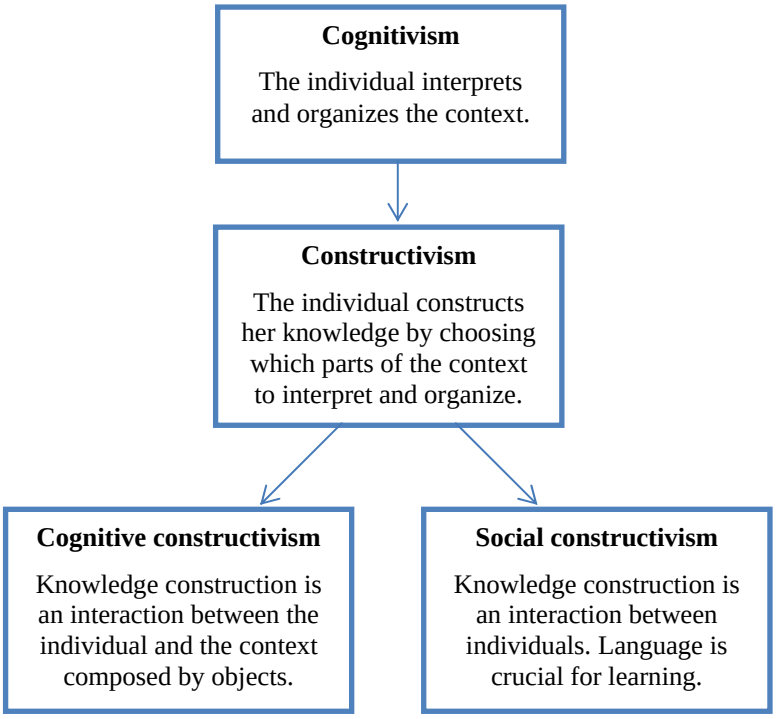

Figure 3–Cognitivismand constructivism (free after Imsen 2000)

Jean Piaget describes the inner learning mechanism as a two-step process consisting of what he calls assimilation and accommodation. At the first meeting with an unknown concept, the individual tries to explain the phenomenon through previously known knowledge. This is called assimilation. Gradually, when the implication of the new concept gets more familiar, the individual expand the previous explanation models to include the new concept as well. New knowledge has then been accommodated. Piaget's theories of the inner learning mechanisms are related to as cognitive constructivism.

Lev Vygotskij regards learning as something that takes place in a social context and his theories are therefore referred to as social constructivism. If helped by others, an individual can learn things that he or she never could have managed alone. Vygotskij call the knowledge within reach if and only if others assist in the learning process for the proximal zone of development (Imsen 2000).

Interaction with other requires communication, wherefore language and other ways of interpersonal communication play an important role in the social constructivism. The language is however not only a mean for communication, but forms the way of thinking. Neither can language be regarded as a single phenomenon. There are thousands of languages, adapted to different situations, and promoting different behaviors (Imsen 2000).

3.3 Learning as a cyclic process

Both Vygotskij and Piaget picture learning as a process rather than a single incident. Kolb describe this process as cyclic. As can be seen in Figure 4below, Kolb presupposes Piaget's terms accommodative and assimilative learning, but add two more steps to the process. He also proved that the learning can begin in any of the stages (Kolb 1984).

Hiba! A hivatkozási forrás nem található.

Figure 4 - Learning as a cyclic process (Kolb 1984)

In later research, Kolb and Kolb (2005) show that different individuals put emphasis into different phases of the experimental learning cycle. Everyone needs however to pass through all phases in order to successfully assimilate and accommodate the new knowledge. This requires both time and a possibility to investigate the unknown phenomenon in different ways. Kolb and Kolb (2005) call the prerequisites for completing an entire learning cycle for "learning spaces".

Per-Erik Ellström, who has studied several suggested learning cycles in the context of organizational learning, agrees that no matter what the different steps are called, completion of the entire cycle is necessary. This in turn requires feedback and an understanding of causes and consequences (Ellström 2001).

Feedback can be described both as a prerequisite for completing a learning cycle and as a learning loop of itself. The effects of a causal relation are reinforced by the expectations created by the feedback from the course of events, expectations of the surroundings as well as the confidence of the performers of a task. The effect concerns both positive and negative correlations (Senge 2006). Therefore, it is important to work actively with positive feedback to avoid negative spirals that can otherwise easily accede to a process. If handled in a good way, even negative feedback can however be useful for an organization, as it can contribute to a deeper understanding of the work and the avoidance of future false assumptions. A potential difficulty with the effects of feedback is that successful feedback requires a common understanding of the goals against which the process is evaluated. Feedback is always relative, and without a comparison of a vision or plan, it does not say so much about the performance (Ellström 2001).

3.4 Managing changes in an organization

Not only feedback, but any initiative concerning a group of people requires a common understanding of the vision(Senge 2006).

Hiba! A hivatkozási forrás nem található.

Figure 5 a) and b) – Effectsof increased vision alignment (Senge 2006 after Keifer& Stroh 1984).

If no common understanding of the goals is reached the intended improvement often take the form of a cosmetic change (Svedberg). This unfortunate outcome of an improvement investment is pictured in figure 5 a), where no significant result is achieved even though many individuals are working hard to do so. With an alignment of the goal or vision, the resources spent on activities connected to the goal reinforce each other. When everyone is working in the same direction as pictured in figure 5 b), more results can be gained from the same resource investment.

3.5 Learning and language

A common way of thinking is thus necessary to succeed with any kind of implementation, which in turn requires a common understanding of the terms used in connection with the activities.A mutual language can be achieved in many ways, including the use of both everyday language and specialist terms. These two approaches have both advantages and disadvantages. Specialist terms previously unknown to the individuals requires that a learning process as described above takes place, which requires time and resources. On the other hand, the introduction of a new word is free from preconceptions which mean that the meaning of the new word can be controlled much easier than with often used words.

Strömdal et al (2002) describe an experiment where a group of young students on a chemistry lecture were asked to write down the opposite of the word “acidic”. Most of them associated to the commonplace meaning of the word and answered “sweet”. (In Swedish, the scientific term “acidic” is identical with the most often used word for “sour”.) Only a couple answered “basic”. This bring about that most student came to the chemistry lecture with a, considering the situation, incorrect understanding of the word. This can often create more misunderstandings than when an entirely new word is introduced and obstruct communication and discussions about the topic at hand (Strömdal 2002).

Kolb and Kolb (2005) also discuss the influence of language and communication. They call one of the learning spaces mentioned earlier for “space for conversational learning”, in other words time to discuss a new concept, thereby providing an opportunity for reflection and meaning making (Kolb 2005). This meaning making is not only explanatory, expressing existing knowledge in words and communicating it. On the contrary, the process of formulating, discussing and explaining something is actively contributing to the accommodation of the new knowledge. Power over the language therefore brings about substantial power over thoughts and culture (Svedberg 2003).

4. Empirical results

The survey generated 73 completely answered questionnaires which are the basis for the empirical results presented here. Most of the respondents descend from the industry sector, more exactly 71% of the respondents whilst the remaining 29% come from service organizations. Only 15% of the respondents are representing organization not being part of a corporate group. There is a wide range of experiences among the organizations where 41% of

the respondents represent an organization that have been working with structured business development for less than 5 years. 12% or the organizations have structured experiences of 5-10 years and 18% between 10-15 years. Finally as many as 23% of the represented organizations have more than 15 years of experiences of structured development work. The distribution of different used business development concepts at the organizations is presented in Figure 6below.

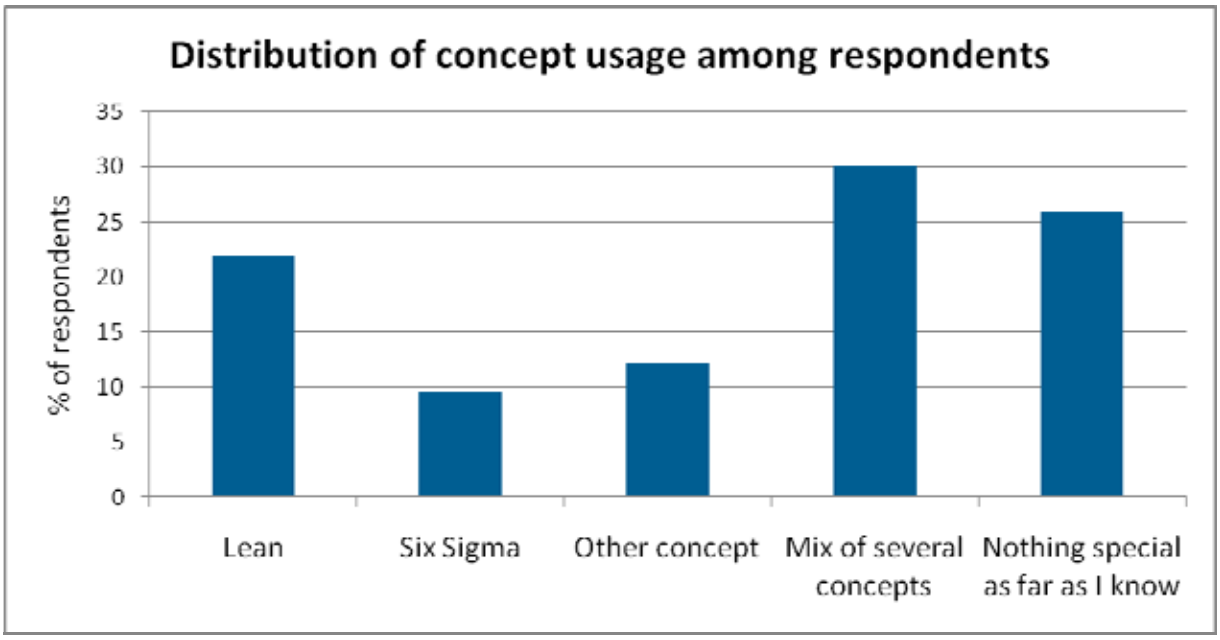

Figure 6 – Distribution of used business development concept among the respondents

The main purpose with the survey was to find out about the respondents' interpretation of advanced terminology usage in their organizations and the effect of that. The result from the questions considering this aspect is compiled inFigure 7. It can be seen that 23% of the organizations have internal definitions of their terms used in the business development work and 17% of the respondents do not know if their organization have internal definition of terms or not. Further 77% of the organizations have introduced at least some terms inspired from business development concepts and 21% of the respondents never experience problems of understanding the advanced terms used in their organization.

Figure 7a), b) and c) – Distribution of answers to the three questions: Do your organization have an internal definition of terms used in your work with business development and quality management? (a), Have your organization introduced terms inspired by different business development concepts? (b), Do you experience problems regarding the understanding of advanced terms in your organization? (c)

On the base of these three questions several hypothesis were formulated comparing the questions relative each othere.g.that organizations where the respondent neverexperiences problem regarding understanding of advanced terms have more often internal definition of used terms. Also the questions presented in Figure 7were compared relative the usage of a specific concept e.g. organizations that work with Lean or Lean Six Sigma experiences more often problem than all organizations, the different kinds of organizations i.e. the potential difference between industry and service organizations and the organizations' experience of business development work i.e. how many years of working experience with business development the organizations have.

The result from these tests was three significant hypotheses, namely that:

- **Hyp 1:**Organizations where problems regarding the understanding of advanced terms are experienced have to a larger extent internal definition of terms used in their business development work than others. With a significance of 3.8% on a one-proportion test.
- **Hyp 2:**Organizations that do not work with any specific concept for business development work more rarely uses advanced terms than others. With a significance of 0.1% on a one-proportion test.
- **Hyp 3:**Service organizations use everyday language to a larger extent than all organizations. With a significance of 0.0% on a one-proportion test.

5. Analysis and discussion

This section discusses how mechanisms of learning impact quality management and improvement work in organizations, first with focus on quality management in general and in section 5.2 with regard to the survey results.

5.1 Learning mechanisms and quality management

The study of pedagogical research presented in chapter 3 shows that understanding is a prerequisite for success in activities of different kinds. This understanding must be achieved by every individual, which requires time and a possibility to assimilate and accommodate and assimilate new concepts. This in turn requires that the individual get a chance to investigate the new concept through both reflective observations and active experimentation. The personal understandings of all individual should also be aligned with each other in order to truly support the objectives of the organization.

Business development and quality management bring about substantial changes in an organization, and for the individuals working within the organization. Senge (2006) establishes that the success of an intended change is highly dependent of an aligned vision, i.e. that all individuals have a common understanding of the goal. As language actively forms the way of thinking (Imsen 2000), an aligned vision requires a mutual language. In order to be able to prosecute an improvement program efficiently, an organization need to assure that the individuals within the organization share a mutual language.

Whether this mutual language should consist of specialist terms, everyday language or a mix of the two should not matter, as both alternatives have benefits and drawbacks of their own. Specialist terms need a greater explaining and learning effort, which both requires time and coordination. Specialist terms are on the other hand unbiased to a larger extent than everyday language that can be understood differently due to personal experiences (Strömdal 2002). Specialist terms also facilitate benchmarking with other companies and experience exchange with colleagues within the profession.

How then should different kinds of terminology be introduced in an organization to support quality management in the best possible way? Quick memorization of vocabulary lists, though commonly occurring in both schools and organizations, is not sufficient. This method derives from the behaviorism, but has no acceptance in modern research about learning. Instead, new working methods, as well as new terminology should be introduced gradually, giving every individual a chance of exploring the meaning of the construct in different ways, thereby completing the entire learning cycle. This extra time might sometimes be viewed as waste, taking time from more hands-on improvement activities, but it actively contributes to the learning (Kolb 2005). In the long run, this learning space is therefore crucial for the knowledge level of the organization and the effects of improvement investments.

5.2 Discussion of empirical results

As can be seen in Figure 7c, many companies have indeed experienced misunderstandings of the meanings of terms in the work with business development and quality management. Both organizations that use professional terminology to a large extent and organizations which mainly use everyday language have experienced these problems. This induce that organizations tend to introduce to many new concepts at the same time, without allowing in depth-learning of the constructs. In Figure 7 it can also be seen that a majority of the responding organizations have introduced terms inspired by one or several business development concept and an equally big part does not have internal definition of terms but also experiences of problems understanding advanced terms. Thus it is most probable that there exist a relation between the three parameters.

According to the research on learning mechanisms and organizational learning presented earlier, establishing organization-internal definitions of terms used in the business development work should have a positive effect. At a first look, it might therefore be surprising that the statistical analysis and hypothesis 1 showed that respondents from organizations with internal definitions of terms had significantly more problems with misunderstandings than other organizations. One might however ask if this is a matter of cause or effect. Organizations experiencing a lot of misunderstandings might have identified a need of doing something about the situation, therefore work out internal definitions of used constructs. This would explain the somewhat contradictive result, as the effects from such a definition initiative would take time to come into force.

The result from the second hypothesis, that organizations that do not work with any specific concept for business development work more rarely uses advanced terms than others, is not that surprising. Since these organizations have decided not to apply someone else's concept they also have no reason for applying someone else's advanced terminology. Regarding the third significant hypothesis it is not used for any further analysis. Since only 1/3 of the answers are represented by service organizations the data become very sensitive. Still we can presume that service organizations use everyday language to a larger extent than all organization.

No significant difference between any groups of respondents could be proved in this study. This means for instance that manufacturing companies seem to experience difficulties with quality management terminology to the same extent as service organizations in the public sector. Neither could any difference be noted between organizations that work with a specific improvement concept like Lean or Six Sigma and companies that don't. Whether this is an effect of the fairly small data set in this study (73 respondents) or an actual result should be the object of further investigation.

6. Conclusions

The empirical investigation in this study shows that more than 75 % of the respondents have experienced problems regarding the understanding of advanced terms in their organizations. These problems occur in organizations of all sizes and types, and no difference can be noticed between companies that have introduced a lot of specialist language and organizations that mostly use everyday language.

These results can be explained through pedagogical research and theories about learning mechanisms. This establishes that understanding is the foundation to success in any activity, and that all individuals need time and opportunity to reflective observations as well as active experimentation to gain understanding of a new concept. This concerns all new concepts, no matter if they are described by previously unknown specialist terms or common language.

Both everyday language and specialist terms such as foreign words or abbreviations can thus be used successfully in quality management. New terms and methods need however to be introduced gradually to allow in depth learning and true understanding of the constructs.

To assure desired effects from improvement investments, organizations should be aware of these issues and assure that all employees have a mutual language and are working towards the same goal. Otherwise, no real changes can be carried out, no matter which efforts are

invested in the work. The authors of this article strongly believe that simplicity and an intentionally conceived choice of terms facilitate the quest for an efficient improvement work.

References

Andersson R., Eriksson H. and Torstensson H. (2006), "Similarities and differences between TQM, six sigma and lean", The TQM Magazine, Vol. 18, No. 3, pp. 282-296

Bergman B. and Klefsjö B. (1994), Quality from Customer Needs to Customer Satisfaction, Studentlitteratur, Lund, Sweden

Dean J. W. and Bowen D. E. (1994), "Management Theory and total Quality: Improving Research and Practice through Theory Development", Academy of Management review Vol. 19, No. 3, pp. 392-418

Deming W. E. (1982), Out of the Crisis, MIT Center for Advanced Educational Services, Cambridge, Massachusetts, USA

Ellström P. (2001), "Integrating Learning and Work: Problems and Prospects", Human resource Development Quarterly, Vol. 12, No. 4, pp. 421-435

Feigenbaum A. V. (1991), Total Quality Control, McGraw-Hill, New York, USA

Hackman J. R. and Wageman R. (1995), "Total Quality Management: Empirical, Conceptual and Practical Issues", Administrative Science Quarterly

Harry M. and Schroeder R. (2000), Six Sigma: the Breakthrough Management Strategy Revolutionizing the World's Top Corporations, Currency, USA

Holme I. M. and Solvang B. K. (1996), Forskningsmetodik- om kvalitativa och kvantitativa metoder, Studentlitteratur, Lund, Sweden

Imai M. (1986), Kaizen, the key to Japan's competitive success, McGraw-Hill Publishing Company, US

Imsen G. (2000), Elevens värld: Introduktion till pedagogisk psykologi, Studentlitteratur, Lund, Sweden

Juran J. M. (1964), Managerial Breakthrough, McGraw-Hill Book Company, New york, US

Juran J. M. (1989), Juran on Leadership for quality: An executive handbook, The Free Press, New York, US

Juran J. M. (1995), A history of Managing for Quality: The Evolution, Trends, and future Directions of Managing for Quality, ASQC Quality Press, Milwaukee, USA

Juran J. M. and Godfrey A. B. (1999), Juran's Quality Handbook, 5th ed., McGraw-Hill, New York, USA

Keifer C. and Stroh P. (1984), A New Paradigm for Developing Organizations, Eds. Adams J. Transforming Work, Miles Riler Press

Kolb, D.A. (1984), Experiential learning: experience as the source of learning and development, Englewood Cliffs, NJ: Prentice Hall.

Kolb A. Y. and Kolb D. A. (2005), "Learning Styles and Learning Spaces: Enhancing Experiential Learning in higher Education", Accademy of Management Learning & Education, Vol. 4, No. 2, pp. 193-212

Lind D. A., Marchal W. G. and Wathen S. A. (2008), Statistical Techniques in Business & Economics with Global Data sets, McGraw-Hill, New York, USA

Oakland J. S. (1991), Total Quality Management, Butterworth-Heinemann Ltd, Oxford, UK

Pettersen J. (2009), "Defining lean production: some conceptual and practical issues", The TQM Journal, Vol. 21, No. 2, pp. 127-142

Sandholm L. (2000), Total Quality Management, Studentlitteratur, Lund, Sweden

Senge P. M. (2006), The fifth Dicipline: the Art and Practice of The Learning Organization, 2nd ed. Random House Business Books

Skinner, B. F. (1953), Science and human behavior. N. Y.

Eds. Strömdal H. (2002), Kommunicera Naturvetenskap i skolan – några forskningsresultat, Studentlitteratur, Lund, Sweden

Svedberg L. (2003), Gruppsykologi: Om grupper, organisationer och ledarskap, Studentlitteratur, Lund, Sweden

Sörqvist L. (2004), Ständiga förbättringar, Studentlitteratur, Lund, Sweden

Sörqvist L. and Höglund F. (2007), Sex Sigma: Resultatorienterat förbättringsarbete som ger ökad lönsamhet och nöjdare kunder vid produktion av varor och tjänster, Studentlitteratur, Sweden

Vygotskij L. S. (1978), Mind in Society: The Development of Higher Psychological Processes, Harvard University Press, London, England

Walsh A. (1990), Statistics for the social science: With Computer Applications, Harper & Row, Publishers, New York, USA

Watson G. H. (2004), Six Sigma for Business Leaders: A Guide to Implementation, GOAL/QPC, Salem, USA

Watson, J. B. (1958), Behaviorism. N. Y.

Winter S. G. (2000), "Organizing for continuous improvement", Eds. Cole R. E. and Scott W. R. The Quality Movement and Organizational Theory, Thousand Oaks, CA: Sage Publications, USA

Womack J. P., Jones D. T. and Roos D. (1990), The Machine that changed the world, HarperCollins Publishers, New York, US

Womack J. P., Jones D. T. (2003), Lean Thinking, Simon & Schuster, London, UK

Young G. O., "Synthetic structure of industrial plastics (Book style with paper title and editor)", in Plastics, 2nd ed. vol. 3, J. Peters, Ed. New York: McGraw-Hill, 1964, pp. 15–64.