



# CHALMERS

## Chalmers Publication Library

### **The Learning Alliance: Relational Aspects to the Development of Competence**

This document has been downloaded from Chalmers Publication Library (CPL). It is the author's version of a work that was accepted for publication in:

**Work Values and Organizational Behavior Toward the New Millennium: Proceedings, from the 7th Bi-Annual ISSWOV conference in Jerusalem, June 25-28, 2000**

Citation for the published paper:

Frischer, J. ; Alänge, S. ; Scheinberg, S. (2000) "The Learning Alliance: Relational Aspects to the Development of Competence". Work Values and Organizational Behavior Toward the New Millennium: Proceedings, from the 7th Bi-Annual ISSWOV conference in Jerusalem, June 25-28, 2000 pp. 165-172.

Downloaded from: <http://publications.lib.chalmers.se/publication/178979>

Notice: Changes introduced as a result of publishing processes such as copy-editing and formatting may not be reflected in this document. For a definitive version of this work, please refer to the published source. Please note that access to the published version might require a subscription.

Chalmers Publication Library (CPL) offers the possibility of retrieving research publications produced at Chalmers University of Technology. It covers all types of publications: articles, dissertations, licentiate theses, masters theses, conference papers, reports etc. Since 2006 it is the official tool for Chalmers official publication statistics. To ensure that Chalmers research results are disseminated as widely as possible, an Open Access Policy has been adopted. The CPL service is administrated and maintained by Chalmers Library.

(article starts on next page)

# *The Learning Alliance*<sup>1</sup>

## *Relational Aspects to the Development of Competence*

Josef Frischer<sup>2</sup>, Sverker Alänge<sup>3</sup>, Sari Scheinberg<sup>4</sup>

### **Background**

In an audit covering almost three decades, the Swedish National Audit Office (RRV, 1996) concluded that in the social sciences only one out of five of the doctoral students had obtained a Ph.D., and for these it took more than a decade to finish. Within the stipulated 4 years, only 1 (one) percent of the doctoral students had completed their studies. The Swedish National Audit Office drew the conclusion that the underlying problem was financial, suggesting increasing financial resources.

Almost identical results were seen at the department of psychology, Göteborg University<sup>5</sup>. As a result a study was endorsed which aimed at finding out *why* a doctoral student, after committing himself to an exclusive, expensive, long-term, and demanding doctoral program, and after years of efforts, terminated the endeavor, without success. It was found that main reasons behind these poor results were not financial at all. Instead, results showed that the main cause was due to random and infrequent meetings between students and supervisors and the non-existence of thesis goals after several years as doctoral students. It was concluded that the relationships between supervisors and doctoral students could be described as one based upon a *laissez-faire* relationship. This is illustrated by the supervisor who is physically present in the environment but has abdicated his roles and responsibilities as a supervisor, and where the student waits and hopes to get direction, which however, rarely comes. This relationship unfortunately contributes to block the doctoral student's learning process. It was concluded in the Frischer and Larsson (1997) study that the doctoral process should be more structured and that the goals and conditions for working relationships, be more clearly expressed.

A similar conclusion was reached by the Department of Industrial Dynamics at Chalmers University of Technology when analyzing the weaknesses of its own doctoral process in 1995. As a result of this analysis, measures were taken by the department in 1996-97 to make goals and strategies in the doctoral students' program more explicit. And an assessment and follow-up system was created for the doctoral learning process and for supervisor performance as well<sup>6</sup>.

The two studies above have raised up the serious flaw in present-day doctoral processes, and have each suggested improvements, including the use of routines and work process standards within the doctoral process. As a result of these findings, we thought it would be interesting to further examine when and to what extent standards and explicit work routines could contribute to an improved doctoral process.

### **Purpose**

The purpose of this paper is to present a *model*<sup>7</sup>, which can serve as a framework for developing and analyzing relationships conducive to learning between supervisors and doctoral students. It specifically sets out to explore the extent to which standardization of the relationship can support the competence development process.

---

<sup>1</sup> In the Proceedings of the 7<sup>th</sup> Bi-Annual Conference of the International Society for the Study of Work and Organizational Values 'Work Values and Organizational Behavior Toward the New Millennium, June 25-28, 2000, Jerusalem, Israel.

<sup>2</sup> Dept. of Psychology, Göteborg University, e-mail: frischer@swipnet.se

<sup>3</sup> Dept. of Industrial Dynamics, Chalmers University of Technology, Göteborg, e-mail: sval@mot.chalmers.se

<sup>4</sup> Gestalt Academy of Scandinavia, e-mail: sari@recomat.se

<sup>5</sup> During a twenty year period 1974-95 only 20% of the doctoral students obtained a Ph.D., in on the average 11,5 years, and only one percent managed to finish within the stipulated four years (Frischer & Larsson, 1997).

<sup>6</sup> Alänge & Frischer, 1998

<sup>7</sup> RELEMO (relational learning model), Frischer 2000

This model, presented in figure 1, presents some of the components needed in establishing the relationship between 2 persons, joined together due to their mutual need to transfer and develop competence. The components of this model are thereafter described and evaluated for practical application.

### ***Learning Alliance***

At the center of this relation, is the concept of the Learning Alliance. This concept has been derived from the concept of the working alliance, which has been proved to be critical for a successful outcome in psychotherapy.<sup>8</sup> Bordin (1979) proposed that the alliance between a person who wants to learn and another person who offers knowledge, is one of the keys, if not *the* key to learning. According to Bordin this concept has a wider application: “The concept of the working alliance would seem to be applicable as well in the relation between student and teacher, between the community action-group and leader, and with only slight extension, between child and parent”(p.252). Because of its clear relevance for learning, the alternative use of the concept *learning alliance* has been proposed<sup>9</sup> – and in this paper this concept will be used.

At the core of the learning alliance, is the notion of mutuality; in terms of the development of a mutual platform for the supervisor and doctoral student to work on. The learning alliance can be manifested in a contract that includes mutual agreement on goals, on tasks, and on process to reach the goals<sup>10</sup>. In the doctoral process, the primary goal is usually expressed in terms of learning and of developing the competence needed to become a Ph.D. capable of designing and conducting independent research. Further, this competence includes the development of knowledge in the subject area, skills in developing networks and in communicating research results, as well as developing a scientific and ethical attitude<sup>11</sup>. In this alliance, competence can be acquired in different ways, including, by doing, experiencing, seeing, listening or reading<sup>12</sup>. For example, the doctoral student studies the literature (which is codified knowledge), conducts own experiments or collects other forms of primary data, and learns through dialogue and discussions both at seminars and in less formal settings with professors and fellow students. However, a large part of the required knowledge/competence is tacit and therefore “hidden” in skilled individuals<sup>13</sup> (here experienced researchers), and hence this knowledge cannot be easily codified and transferred from one individual to another.

One way to ensure that this tacit knowledge is transferred, is to develop/enhance the relationship between the supervisor and the doctoral student. This relationship has a potential of conveying both explicit and tacit knowledge. Here, learning takes place in the interaction between the parties and through different mechanisms, including words in the form of instructions and feedback, or through opportunities for the doctoral student (“apprentice”) in observing the supervisor (“master”)<sup>14</sup>. By definition, the supervisor, in a master-apprentice relationship, is supposed to master the subject area. However, the master is most often only able to articulate a part of his/her knowledge, while other parts (of the master’s competence) remain tacit.

There are however, a number of ways of making tacit knowledge more explicit and visible between the master and apprentice. One way is to ask the master to reflect upon his/her way of performing a task, including both motor and thought steps, i.e. to make the master articulate on knowledge that otherwise would remain hidden. Another way is to let the apprentice, e.g. the doctoral student, study the master’s work process and ask questions, which may also reveal deeper knowledge (this approach

---

<sup>8</sup> Bordin (1979)

<sup>9</sup> Fleming (1989) in Field et al. (Eds).

<sup>10</sup> Clarkson (1996)

<sup>11</sup> Alänge & Frischer, (1989)

<sup>12</sup> An important component for learning is the opportunity for the student of getting feedback, based on a measurement of competence or learning, either in a quantitative or qualitative way.

<sup>13</sup> Polanyi (1966)

<sup>14</sup> The “master-apprentice” relationship is one of the most traditional ways of learning, however, still an important means of learning all those aspects of skilled behavior, which is not codified.

**Standardization**

**Processes**

- contracting
- scrutinizing
- learning cycle

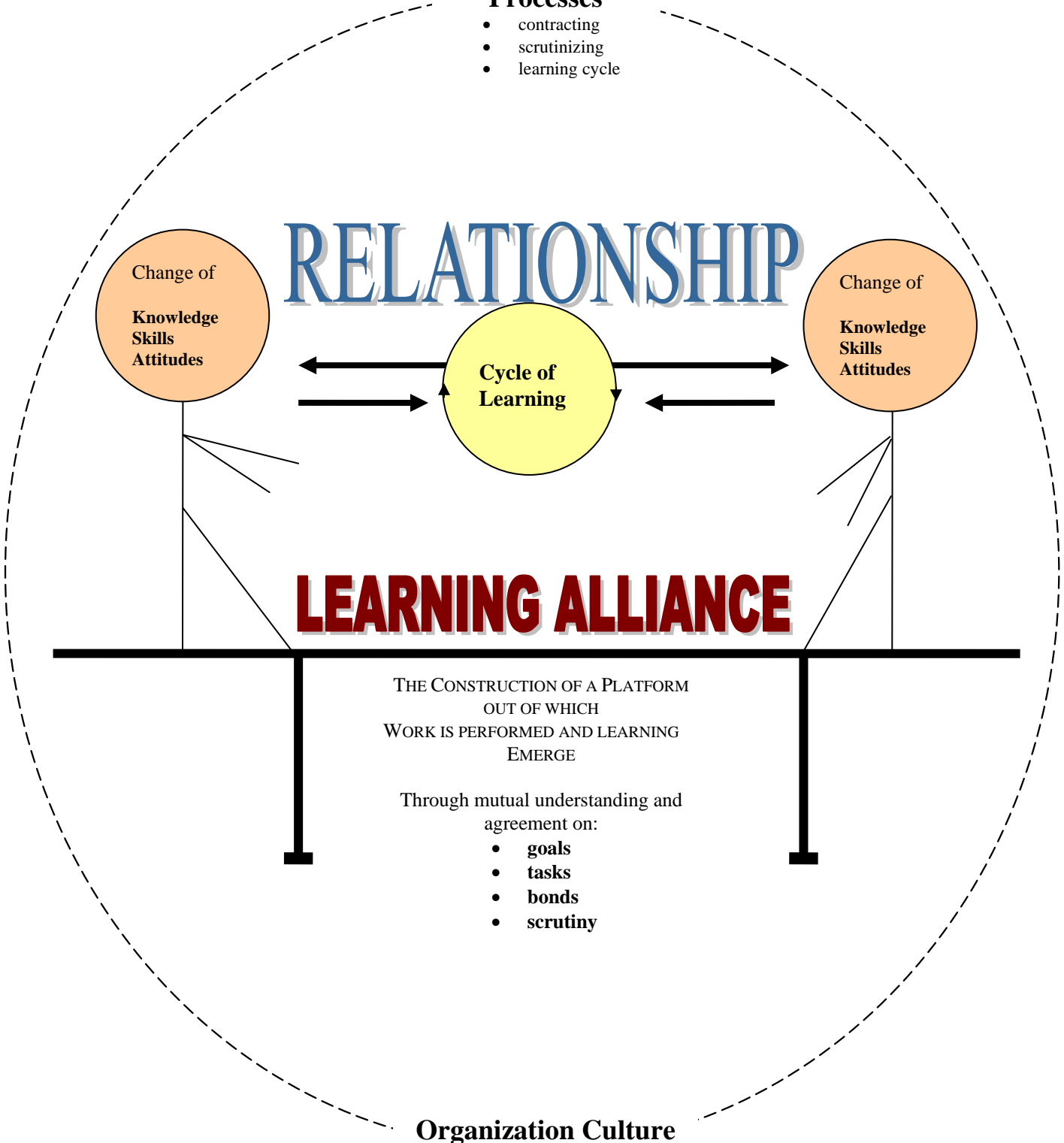


Figure 1: RELEMO – The Relational Learning Model  
Frischer (2000)

can also include variants such as using a video camera to document skilled behavior). There is also the possibility that the apprentice by participating in the work process, doing the same things as the master, gradually will develop own competence through a process, which to a large extent is tacit in nature.<sup>15</sup>

In addition to the apprentice learning from the master, the master has the possibility to learn from or with the apprentice or from the process as well.<sup>16</sup> Hence, by being part of this relation the apprentice can also learn to learn from the master. However, ultimately these learning processes aim at making the apprentice/Ph.D. student develop an in-depth competence within his/her specific area, which over time may become deeper than that of the master's competence.

However, in order to realize the full potential of a *learning alliance*, especially when it comes to developing more tacit elements of competence, it has shown to be essential to develop a relationship built on mutual trust.<sup>17</sup> Both the supervisor and the doctoral student need to express their needs and demands on the cooperation. By making each party's expectations clear, as well as making the process leading to the Ph.D. visible for both parties, a mutual agreement (the contract) can be established between the supervisor and the doctoral student, which allows for trust to develop. However, the quality and content of relationships can vary considerably, which has implications on trust, and hence, on the learning process.

Relationships can be qualitatively characterized as instrumental, affective or ethical.<sup>18</sup> Instrumental relationships focus on the task, and nothing else. Affective relationships includes the parties expressing what they like and dislike, i.e. the parties bring more dimensions of themselves into the relationship. Ethical based relations, include expressions of values and views on what is good or bad, righteous or wrong, i.e. it includes one further dimension of self. A master-apprentice relationship of a pure instrumental nature is lacking the potential for transferring more subtle and tacit components of competence. The more affective and ethical dimensions that are included into the relationship, the more of tacit knowledge has a potential of being communicated.<sup>19</sup> However, a deeper trustful relationship, between the doctoral student and the supervisor, does not normally start from scratch. Typically a relationship including affective and ethical dimensions need considerable time to develop, as the parties need to develop a deeper understanding of each other.

The relative balance between the parties in a learning alliance can vary considerably, depending on the natural inclinations of the supervisor and the doctoral student, as well as on the specific process for establishing a platform. Typically, the balance also varies over time, where the doctoral student gradually assumes a more prominent role, taking over more of a responsibility for task and process, on his way towards becoming a self-going researcher. However, it has been found that a high degree of mutuality is beneficial for the learning alliance, including a mutual commitment and active involvement in the learning process. Furthermore, a mutual respect for each other has shown to be of considerable importance for learning.<sup>20</sup> A supervisor can only be effective if he respects his student and if he wants his students to succeed.<sup>21</sup> It is generally recognized that students progress or not in

---

<sup>15</sup> Regardless of the way of transferring knowledge/competence from one person to another, there are a number of activities that are important for the learning process. One activity is in making one's own experiments. A second activity is to measure and evaluate the result of the experiment. A third activity is to reflect upon how work has been done or upon an experiment, either alone or together with others. A fourth area includes those activities, which support the student to integrate what has been learned, in order to keep it as a basis for future action. The first three activities can be found in most learning cycles, while the fourth step, integration/standardization, is more emphasized in the Gestalt experience cycle and the PDCA-cycle. (Alänge, Fjølner and Scheinberg, (1996)

<sup>16</sup> Elson (1989)

<sup>17</sup> Greenson (1973) points to the need to constantly scrutinize and renegotiate the contract for the working alliance.

<sup>18</sup> Kanter (1967)

<sup>19</sup> Scheinberg (1998), personal communication.

<sup>20</sup> Lewin (1943)

<sup>21</sup> A Cleveland professor emeritus who had succeeded to bring 60 students to a Ph.D. degree reported that the most important factor for success is "to want your doctoral student to succeed in obtaining the degree". However, supervisors who are negative, indifferent or not explicit in their wish for success, will negatively affect outcome of getting a Ph.D. (Ansel Woldt, (1998), personal communication)

accordance with the expectations of their teachers.<sup>22</sup> The expectant mode seems actually to provide an important basis for motivation to learn.

Above, we have presented the concept of learning alliance and discussed an array of factors and activities conducive to learning. However, a strong learning alliance does not always develop automatically, which can be seen in the big variation between different supervisor/doctoral student relationships. Hence, there are reasons to try to influence the process of establishing learning alliances and one way of doing so is to standardize the process.

### ***Standardization of the process towards a Learning Alliance***

In order to make sure that strong learning relationships are being developed between doctoral students and their supervisors, academic institutions can develop routines. These routines could provide guidance into *what* to consider and *how* to proceed when aiming at establishing a learning alliance. By introducing a more standardized way of entering into a good working relationship, these routines can provide a means of limiting variations between different supervisor/doctoral student pairs. The organizational culture and the presence of role models can as well influence the establishment of a learning alliance. However, the organizational culture provides guidance in a less explicit way than do standardized routines.

There is a choice to make as regards how to develop new routines and how to introduce them. The routines can either be introduced *by command*, i.e. they are standardized from above, in the form of externally imposed rules, regulations or laws as to how a learning relationship has to be established. Or, they can be introduced through *involvement*, both in the creation of the routines and in the subsequent implementation. In the latter case, all those concerned (or representatives for all stakeholders) take active part in the analysis and decision-making on what to standardize in the process of developing a learning relationship.

When routines are introduced *by command*, the routines have typically been developed by specialists who have made insightful suggestions to management, who in turn have made the decision to introduce a policy indicating *how* to establish a learning relationship and *what* one should consider when establishing it. These policies are standards formed as instructions that are imposed and have to be followed by those affiliated to the organization. In some organizations, those who do not follow the standards can be punished, including being forced to leave the organization. But most commonly many "laws" of this type are being ignored, e.g. in academic environments. Sometimes, forced instructions have their origin outside the organization, e.g. in the case of voluntary agreements among several organizations. Or when a national/regional body has made decisions concerning general guidelines, e.g. in a university setting, where the Ministry of Education creates laws/instructions that are valid for all institutions of higher education in a country.

In the case of standardization through *involvement* of all members concerned, there is a higher possibility that the routine will be perceived as relevant, and that it will be followed. The reason is that when someone has been part of formulating and identifying the problem and then, has been part of developing the solution (here, a routine), there is strong research evidence that this also leads to a change in behavior to follow the new routine.<sup>23</sup> By being part of the change process, people will inevitably develop an ownership and responsibility to the standards and the use of them. However, this approach to standardization and behavioral change puts demands on creating a process for change, which can be perceived as more complicated and time-consuming, as it involves more people in the organization. However, because of the greater acceptance of the routine, the net input of management efforts might even be less, because of less need for enforcing the use of the standard.

---

<sup>22</sup> Elashoff, 1971. Pygmalion Reconsidered: Reconsideration of the Rosenthal-Jacobson Data on Teacher Expectancy. Worthington, OH: C. A. Jones.

<sup>23</sup> Lewin & Grabbe (1945)

The second factor, which can contribute to the forming of a Learning Alliance is the organizational climate. All organizations develop *cultures*, which provide guidelines for the acceptable behavior of the members of the organization. Most often, this culture, including norms and values, is not made explicit, but can be "felt in the walls" of the organization. Typically, it is being reinforced by stories about what leaders of the organization have done or said, or what happened to organizational members in the past. These local organizational cultures have a high degree of inertia, and are not easily modified. The organizational culture may have a very strong influence on the behavior of the members, and if this culture is conducive to learning, it could strongly contribute to the establishment learning alliances.<sup>24</sup> Recently, there has been a development of methods to assist in making the culture visible through measurement of e.g. a "innovative organizational climate"<sup>25</sup>, "creative communication climate"<sup>26</sup>, or "corporate culture"<sup>27</sup>. By making the climate or culture visible, there is a possibility to find areas of improvement. The way this improvement is done is once again dependent on the choice between "by command" or "through involvement", and once again, the same advantages/disadvantages can be found when it comes to influence the way people perceive as the correct way of acting in an organization. Typically, the improvement recommendations concerning climate and culture are formulated in more general policy statements, and they are supplemented by direct activities to remedy identified problems. The use of climate/culture measurements to influence the values of the organizational members is typically a complement to the use of standardization resulting in the creation of routines.

However, there is often resistance to standardization of work and learning processes within the academic environment. Usually, this is voiced in a concern for the negative influence standards may have on the freedom to create and learn<sup>28</sup>. We have found that the opposite has occurred in university settings, where lack of standards blocks learning creating a high rate of dropouts among doctoral students.<sup>29</sup>

#### ***Scrutiny - The dynamics of the learning alliance.***

If the Learning Alliances are built up over time, enforced by contracts, agreements and standardized routines, then it is also important to scrutinize these agreements and routines, to ensure they are continuously valid. Any alliance, pact or agreement on standardized procedures is by definition a 'frozen' structure subjected to stagnation or even worse, counterproductive as to the process of creativity and learning.<sup>30</sup> Therefore, it is important that standardization processes include processes of "unfreezing" routines and contracts, in order to facilitate the "change" needed to cope with new demands. The changed routines are then "refrozen" and a new standard is set<sup>31</sup>.

Any learning encounter in a relationship structured by a learning alliance should reflect the present situation<sup>32</sup>. Where are we now and where do we go? How do we get there? What are our means and tools? These are questions to be stated and reflected upon by both partners in the relationship. In this way, each step will be scrutinized and reflected-in-action<sup>33</sup> and the alliance redesigned according to the constantly changing situation. The constant scrutiny of how the parties in the relationship are working together, the mutual concerns with the learning alliance, are themselves factors that serve to enhance the learning alliance. In the case studied in Alänge & Frischer (1998) "Standardization of the doctoral learning process", the learning alliance between the supervisor and the doctoral student is constantly scrutinized, as a standard procedure.

---

<sup>24</sup> Sometimes leaders of good learning/research cultures claim that they largely have been unaware of the need to develop a good culture, and that the culture grew organically (personal communication with C. Freeman, 1997)

<sup>25</sup> Ekvall (1996)

<sup>26</sup> Alänge & Sjölander (1986)

<sup>27</sup> E.g. Hofstede 1980, Hamed & Miconnet 1998

<sup>28</sup> Nybom (1997)

<sup>29</sup> Frischer & Larsson (2000)

<sup>30</sup> Leonard Barton (1998)

<sup>31</sup> Lewin, (1943)

<sup>32</sup> Scheinberg and Alänge (1998), The Cycle of Experience Revised.

<sup>33</sup> Schön (1995)

In this empirical case, from the department of industrial dynamics at Chalmers University of Technology<sup>34</sup>, standards were set according to an involvement approach. In this process all members of the department were involved, including all the doctoral students, all the supervisors and the secretaries. As point of departure, the main problems in the doctoral process were identified, as being the lack of clear goals and strategies for how a doctoral student should be developed. Goals and strategies were then developed, by the participation of all members of the department. These goals, include the traditional ones of presenting a thesis and mastering the subject knowledge, as well as the abilities to formulate research questions, and to design and conduct research, but also less common goals such as the abilities to be a leader, to teach, to establish an international scientific network, and to be a good communicator. In addition, these goals include the ability to function as a "good human being" in research environments. These goals are followed up twice a year in meetings between the supervisor and his doctoral student, and this procedure provides an important input for scrutinizing some aspects of the learning process. In addition, an instrument was developed, in which the doctoral student and the supervisor independently answers questions as how the supervisor is managing his role.<sup>35</sup> This instrument is the platform for the evaluation of the Learning Alliance, as it provides a neutral discussion forum for the doctoral student and the supervisor to scrutinize their relationship. In this way what is not working well can be discussed (unfreezing) and the most essential improvements are mutually agreed upon, and signed by both doctoral student and supervisor (refreezing). This instrument is used once a year, and the agreed upon improvement areas are in specific focus next time the results are being discussed. Hence, the department has established standards both for how the learning alliance should be scrutinized and how frequently this should be done.

### ***Conclusions***

It has been found that the absence of Learning Alliances has been the main contributor to the poor outcomes in the doctoral process. However, the Learning Alliance does not happen spontaneously or naturally. In fact, the Learning Alliance requires substantial time and effort, in order to be created and maintained. And, most supervisors are not naturally skilled in creating the conditions and contracts needed.

In response to these shortcomings, it is important to first develop a common understanding, among supervisors and doctoral students, of what a "good learning relationship" could look like. A new model illustrating the essential components of a Learning Alliance has now been offered as a tool. Another response to the missing skills, is the suggestion of specific methods and processes to establish Learning Alliances. Such methods include the introduction of routines and standard procedures. One clear example of this is the routine of regularly scrutinizing the Learning Alliance itself. Another method is to influence the working climate in the organization.

---

<sup>34</sup> Alänge & Frischer, (1998). Standardization of the doctoral learning process.

<sup>35</sup> Alänge & Lundgren (1997)



## References

- Alänge, S. Fjellkner, C. & Scheinberg, S. (1996), "Continuous Learning through Learning Cycles: A Comparative Review of Schools of Thought and Application for revolutionary change, culture transformation & development", *Dept. of Industrial Management and Economics, Chalmers University of Technology (mimeo)*.
- Alänge, S. & Frischer, J. (1998). Standardization of the doctoral learning process. *Chalmers University of Technology. Göteborg-CIM Working Papers, No. WP 1998:01*.
- Alänge, S. & Lundgren, R. (1997), *Supervisor Evaluation Questionnaire within the Doctoral Process*. Department of Industrial Dynamics, Chalmers University of Technology, Göteborg, Sweden.
- Alänge, S. & Sjölander, S. (1986), Intern Teknologi-transfer inom ett högteknologiföretag, (Internal Technology Transfer within a High-Technology Group of Companies), STU/Institute of Management of Innovation and Technology, Stockholm and Göteborg (in Swedish)
- Bordin, E.S. (1979). The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy: Theory, Research and Practice*, 16, pp. 252-260.
- Clarkson, P. (1996). The Eclectic and Integrative Paradigm: Between the Scylla of Confluence and the Charybdis of Confusion. in Woolfe, R & Dryden, W. (Eds.) *Handbook of Counseling Psychology*. (Sage, London).
- Ekvall, G. (Ed). (1996). *Navigatör och Inspiratör*. Studentlitteratur.
- Elashoff, J., & Snow, R. (1971). *Pygmalion Reconsidered: Reconsideration of the Rosenthal-Jacobson Data on Teacher Expectancy*. Worthington, OH: C.A. Jones.
- Elson, M. (1989), The teacher as learner, the learner as teacher, in Field, K., Cohler, B. J., & Wool, G. (Eds.). *Learning and education*. (Madison, Connecticut, International Universities Press)
- Fleming, J. (1989), Editorial in Field, K., Cohler, B. J., & Wool, G. (Eds.). *Learning and education*. (Madison, Connecticut, International Universities Press)
- Frischer, J & Larsson, K. (1997). The Gold that Disappeared. *Journal of Studies of Higher Education and Research*.
- Frischer, J. & Larsson, K. (2000). Laissez-faire in research education - an inquiry into a Swedish doctoral program. *Higher Education Policy* 13, 131-155.
- Greenson, R.R. (1973). *The Technique and Practice of Psychoanalysis*. (London, Hogart).
- Hamed, K. & Miconnet, P. (1998). Global Diffusion of Best Practices. *Master's thesis MoP 98:6*, Dept. Industrial Dynamics, Chalmers University of Technology. Göteborg, Sweden.
- Hofstede, G. (1980). Motivation, Leadership and Organization: Do American Theories Apply Abroad? *Organizational Dynamics*, Summer 1980, p. 42-63.
- Kanter, R., M. (1967), *Utopia: a study in comparative organization*, University of Michigan, Ann Arbor (doct.diss.)
- Leonard-Barton, D. (1998). *The Wellsprings of Knowledge*. Harvard Business School Press. Boston, Mass.
- Lewin, K. (1943). Group Decisions and Social Change. In Maccoby, E. Newcomb, T.M. & Hartley, E.L. (Eds.) *Readings in Social Psychology*. 1958: Holt, New York.
- Lewin, K. & Grabbe, P. (1945). Conduct, Knowledge, and Acceptance of new Values. *Journal of Social Issues*, vol. 1, no. 3, August.
- Nybom, T. (1997). *Kunskap, politik, samhälle : essäer om kunskapssyn, universitet och forskningspolitik*. Hargshamn: Arete.
- Polanyi, M. (1966). *The Tacit Dimension*. Doubleday Anchor, Garden City, NY.
- RRV (Swedish National Audit Office). (1996). *Samhällsvetenskaplig forskarutbildning. "Four years - not for years"*. RRV,1996:52. Stockholm.
- Scheinberg, S. & Alänge, S. (1998), *The Cycle of Experience Revised*, Dept. of Industrial Dynamics, Chalmers University of Technology, Göteborg
- Schön, D. (1995) *The Reflective Practitioner*. Aldershot: Arena