

July 2013

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Recommended Citation

Brown, Stephen M.; Garnjost, Petra; and Heilmann, Stefan (2013) "Problem-based Learning: Leadership Development Program in a Multi-National Company," *Journal of Executive Education*: Vol. 10 : Iss. 1 , Article 1.

Available at: <https://digitalcommons.kennesaw.edu/jee/vol10/iss1/1>

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Problem-based Learning Leadership Development Program in a Multi- National Company

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Abstract

This paper reports on a development and implementation of a team leadership training program in a multi-national company. The European Engineering Company (EEC Group) had grown and expanded into many countries in a relatively short timeframe as a result of increased demand for the company's products and services in newly developing countries.

The EEC Group and the training program had additional issues of culture and basic institutional knowledge. The paper reports on the program, the conceptual framework of the International Leadership Development Program (ILDP), results, and lessons learned.

The authors advocate use of a Problem-based Learning (PBL) methodology to train in a multi-national environment. This approach not only resulted in meeting the program's learning goals, but worked to provide all participants with an overview of company products, services and processes.

Background

The majority of Leadership Development Programs is experiential in nature which is strongly supported by decades of literature. Starting with Dewey (1938) the connection between learning and experience has a long supported history in adult learning literature. Such authors as Kolb (1984), Jarvis (1987) and Fenwick (2003) have theorized on the

experience/learning dynamic. In fact, Jarvis (1987) states, “all learning begins with experience” (p.16).

There is support in the literature for international meetings and forums to develop global competencies in leaders (Brake 1997; Dowling et al., 1999; Roberts et al., 1998). Brake points out these meetings facilitate cross-cultural interaction, establishing international networks, sharing of experiences, and identifying talents for global assignments. Srinivas 1995; Seibert 1995; and Crotty and Soule 1997 all recommend the use of experiential management development for global leaders. This is, of course, congruent with the adult learning concept of learners being problem centered and real life directed (Knowles 1984).

It became apparent to us that an approach that simulated the work environment and presented teams with a “real work problem” would provide the training design with several advantages. It would make use of the tacit knowledge of the participants, it would exploit the real problem orientation of the adult learners, it would create an environment of sharing of experiences for the multi-cultural teams, and it would expose the participants to the many facets of their work problems. It also created a space where the trainers could give participants feedback on their observed performance.

Training in a cross-cultural environment should be experiential in order to allow the participants to experience their cross-cultural competencies. Don't lecture them on cultural differences; let them experience them in a real work situation, but in a safe and supportive environment. This is particularly true for giving feedback to the group members. Thomas (2008) summarizes the literature on culturally diverse teams, “Cultural diversity has been shown to have both positive and negative effects on work group effectiveness. Culturally diverse groups, particularly those acting face to face, are likely to suffer from increased process losses and have lower group performances than homogenous groups.” P179. These findings are supported by Carte and Chidambaram (2004); Hill (1998); and Staples and Zhao (2006). This means that culturally diverse groups take longer to complete a task and establish group norms and practices. However, the results can be more creative solutions and higher quality group decisions (Early and Maosakowski, 2000; Elron, 1997; Thomas, 1996).

We were guided by the Problem-based Learning (PBL) approach. PBL was originally applied to degree oriented study at the medical school at McMaster College over 25 years ago. It has since been widely used and researched in medical and health professional education and training. PBL

as a pedagogical method has found its way into the education of other professionals (Savin-Baden and Major 2004), primarily because it is believed this pedagogy addresses some of the dilemmas of educating professionals for the current context of practice (Coombs and Elden 2004). These include the need to have team skills and good team member attitudes (Peterson 2004), discipline knowledge that has outstripped the ability to know it all, requirements of efficiency of organizations within which graduates practice, the presentation of unique and unfamiliar problems, and pressure to solve problems with incomplete or contradictory data (Brownell and Jameson 2004). PBL is a learner-driven pedagogy in which learners are asked to solve real world problems, usually in teams or groups (Lusardi, Levangie and Fein, 2002). The first order of business of the teams, when presented with a problem, is to decide on how to define and address the problem; this includes making decisions about both content and process (Branda, 1990). Typically, teams work on problems outside class, and team members apply past knowledge (content and process) and research new areas of information and knowledge. The problems come from the practice field and/or simulate the types of problems the learners might encounter in the profession. Typical problems are messy (the most commonly used term in the literature to describe them), interdisciplinary, and do not have a single correct answer.

“In some ways, PBL shares characteristics with experiential exercises and with case methods, but in other ways, PBL is quite different. Compared to traditional experiential exercises, the problems are more complex and messy and cannot be accomplished in a single class period. The second important difference is that the questions that are asked and the tools and techniques brought to bear on the problem are more student-identified than faculty-identified. In a typical experiential exercise, the faculty member has a reasonable idea of what the learning outcomes might be and what a typical process for accomplishing the exercise might be. In PBL, the learning journey is far more student-defined, in terms of learning outcomes, tools and approaches to use, as well as decision and group processes.” (Stork, Woodilla, and Brown 2009).

In the typical case methodology, learners are presented with a great deal of information from which they are to define a problem and propose solutions. They are often dealing with incomplete information, but lots of information has been presented to them. In a PBL scenario, however, the learners define what information they might need and how to find the information. They are typically given very little up front. Thus, for learners, the ability to generate questions rather than answers is more

important than might be the case when using a traditional business case methodology.

The Company

The company (EEC Group), headquartered in the European Union, was formerly family owned and had been in business for more than a century. Over the last decades it has transformed itself into an internationally renowned engineering company with a portfolio of more than 500 patented inventions. The EEC Group is today one of the world leaders in design and supply offering cutting-edge green technologies, systems and processes, as well as specialized mechanical equipment in the engineering sector. This also includes activities supported by products and services required in the field of environmental protection.

The EEC Group has not only expanded into an international leader, but also developed from a European equipment supplier into an international plant engineering company. The growth of the Group within the past decade is due to two factors: acquisition of former competitors and hiring employees at the major entities. Today, the Group is present in an international setting and able to manage large projects in many different markets. At the end of this growth period, the number of employees in existing international entities and newly acquired companies was nearly 4 times higher than at the beginning. The number of projects increased by a factor of ten compared to the year the growth started. Today, the international presence of the Group is expressed through a vast network of subsidiaries and branches in the main markets in Europe and US as well as in emerging markets such as Brazil, India, Russia or China together with agents and representatives who assist customers on every continent. This allows green field projects as well as revamping of older equipment in the clients factories all over the world.

A crucial success factor and one of the strengths of the company has been the human capital in engineering and project management knowledge. It is important to keep these strengths. However, because of acquisitions and mergers, team members on a project do not only have different nationalities, they also come from different entities with different corporate cultures, different work routines and procedures. Therefore, teamwork training, and being excellent in international project management, as well as engineering, became a critical issue for the company.

The Training Initiative

As a result of the history of the company, until recently training was mainly technical in nature and provided by the entities in a decentralized structure. Each entity fulfilled its own training needs. Leadership development was informal and based on experiences gained from work assignments. The training being discussed in this paper is a result of the corporate human resources department responding to the new structure and its training needs. This was a strategic decision by the company to strengthen capacity to compete in the international marketplace long term, and develop leadership for international projects that resulted from the corporate growth. With the growth the need to formalize processes and culture also became apparent.

Therefore, the main tasks of the training initiative of the EEC Group are to foster personnel and personal development in teamwork in international project teams, developing project management skills and leadership competencies. With the strong growth of the Group, the need for a corporate wide training was identified. The main goal was to develop the project management competencies of young members of the international project team. These activities started in 2007 and still continue as shown below.

The company had to face a new reality in 2009. The global economic downturn had slowed business and brought the steep and steady growth to an end. In some entities, up to 10 % of the employees were made redundant, budgets were cut and some investments postponed. However, the crisis has shown that improving the level of teamwork and leadership in teams in each individual project is even more important than ever, as customers' requirements on project quality have increased, as well as the competition to win contracts. It is even more important than before that project members from different entities agree on and work along the same standards and procedures. To improve collaboration of project members coming from different entities, the company wants to improve trust and communication as the technical expertise itself was not a problem. They needed a better understanding of the role of headquarters and the expertise of recently acquired companies. Headquarters also wanted to support its young, high potential employees to build up their individual network throughout the company into the large entities.

Program Goals

Corporate human resources identified the following overall goals for the International Leadership Development Program (ILDLP) to support future collaboration and success in teamwork throughout the entities:

- a. Fostering integration of new entities and team development
- b. Promoting career development on all levels for young professionals
- c. Developing leadership and project management skills in addition to engineering competencies.

The main program goal of ILDP is to develop participants into well-functioning team members. In addition, by using a real business setting and problem other skills needed to achieve the goals of the organization were addressed. The learning goals of the program were the following:

- Develop an understanding of team roles, team management, and how to influence team effectiveness,
- Foster team building and networking across different functions and profiles and among different group members,
- Develop an understanding of the technical and financial aspects of the products and services of the company,
- Develop skills in making presentations to and communicating with internal and external customers.

Design of the ILDP

The design of the ILDP was guided by the principles of Problem-based Learning, allowing the participants a real teamwork experience in a real business setting and helping them to understand the team process and key success factors of teamwork.

Instead of presenting key results of current research on teamwork and leadership in teams, a problem was created based on a real project of EEC Group. The problem was comprehensive and detailed. The training consists of 12 hours including two sessions to work on the problem in

teams, seminars and feedback. The major part of the workshop was the teamwork experience itself, in addition to reflection on individual behavior and team performance.

Material used for the problem was project documentation, but parts have been taken out and/or made unclear in order to encourage the group discussion and to provoke different assumptions and solutions that are typical in PBL design. In addition, there was a large volume of information presented in the problem and some of the information was very detailed and technical. Also, some of the information was totally irrelevant for answering the problem questions. Technical questions and management questions to be solved by teams of 6 members were also presented. The participants received the problem materials plus additional material two weeks ahead of the start of the training session, but without any additional task. The workshop teams were set up by the HR department assuring a high level of diversity, and the participants did not know their team member prior to the start, nor did they know what the problem will be used for throughout the training. The workshop started with a little introduction of the problem, the distribution of the timeframe and the question. No further support was given nor any suggestions on how to start. This process is congruent with the PBL approach.

Some entity and department heads of the Corporate HR members involved in the design of the training were initially uncomfortable with the use of experiential methods and would have preferred a more traditional style of presentations and some team tasks. However, they agreed that the learning environment created by using a PBL approach was exactly what project teams experience in everyday business.

One of the learning goals of the training was to understand team roles, management of a team and influencing team effectiveness. The presentations between the two team work sessions gave the participants theoretical constructs that could be used to reflect on their experience in the team. In order to allow the team member to reflect on the above mentioned aspects, the groups were observed in each session and given feedback half way through on how well they performed as a team. The consultants reflected with the group how they have started working together and shared with them their observations. Team roles and group effectiveness were discussed, why engineers feel more comfortable with focusing on content, and the nature of different types of tasks. It was further addressed why and how communication patterns in teams establish norms and leadership at a very early stage of the group process. The content of the second presentation reflected on team effectiveness and

leading teams to address observed issues. The final feedback to the whole group also addressed team effectiveness and roles.

Participants were asked to produce an overall organization sheet, which reflected the organization of the project, and entities place in the overall structure of the project. They had to identify potential problems regarding communication, competencies, and responsibilities in working together with different entities and an approach to solve these problems. They also had to develop a project management plan addressing how the project is executed, monitored, and controlled. The teams had to design a kick off meeting with the various entities. Each team had to present its results in front of a jury that was composed of technical experts and executives of the EEC Group in order to give them feedback on the content presented. The fact that high-level executives served as jury members put extra pressure to perform their best in front of the jury.

Participants

The target group for ILDP identified by the Corporate HR is young professionals with a university degree and 1–3 years of work experiences at the EEC Group who are also potential participants for professional development on a management level. Their current job functions could be a team member working as a project engineer, or a functional member in technical and non-technical departments.

List of levels of job categories at EEC Group:

- 1) Staff: Junior individual contributor (vocational training only),
- 2) TM, Team member (University degree but not that much experience and recently started at EEC),
- 3) JPM, Junior project manager,
- 4) SPM, Senior project manager,
- 5) Executive.

In addition to this group, junior project managers with some first experiences in assisting and leading smaller projects were also identified as potential participants for this training. Participants were selected by the entities based on these corporate recommendations.

In total, the training was delivered three times over a period of 1.5 years. The total number of participants was 102; each training session had about 35 participants. Even though the three trainings focused on identical

target groups, different results regarding learning objectives reached were observed. The chart below summarizes the participants from the three offerings of the training program.

Chart 1:
ILDP training participants:

	ILDP 1	ILDP 2	ILDP 3
Participants #	34	36	32
Average age	30	31	28
Female	less 10%	25%	25%
Average months at EEC	32	25	23
From Headquarters	35%	44%	46%
Junior project manager	41%	28%	28%
Team member	56%	72%	72%

In the first program offering, the experience and level of the participants was very high compared to the later workshops. The next two groups were less experienced based on months of experience and job category level. However, the last group had the lowest level of commitment and engagement and on average lowest performance level. This was due to the fact that the number of people working in supportive functions and the number of people working at Headquarter was significantly higher compared to the second training.

Chart 2:
ILDP 1 participants' experience and job category

	TM	JPM	SPM
< 1 year	17.6%	11.8%	0.0%
1 -3 years	23.5%	14.7%	0.0%
> 3 years	14.7%	14.7%	2.9%
	55.9%	41.2%	2.9%

Chart 3:
ILDP 2 participants' experience and job category

	TM	JPM	SPM
< 1 year	19%	0%	0%
1 -3 years	42%	22%	0%
> 3 years	11%	6%	0%
	72%	28%	0%

Chart 4:
ILDP 3 participants' experience and job category

	TM	JPM	SPM
< 1 year	19%	13%	0%
1 -3years	31%	13%	0%
> 3 years	22%	3%	0%
	72%	28%	0%

Observed Results

The chart below summarizes the group characteristics and performance on the various tasks of all participant groups.

Chart 5:
Group characteristics and performance

Group	ILDP 1	ILDP 2	ILDP 3
A	T -, M -, G +++	T +, M +, G +	T +, M +, G -
	all the same age, all below average, JPM and TM inexperienced at EEC, two in support functions	highly diversified in age, and nationality, technical expertise, 5 inexperienced, 3 TM, 3 JPM, 3 in supportive functions	highly diversified by nationality, 3 without knowledge from core business, 6 TM
B	T ++(+), M ++, G +	T ++, M +, G +	T +, M -, G +
	highly diversified (nationality), all inexperienced in working for EEC, 5 at TM level	highly diversified by age, and nationality, 3 member in supportive functions, 4 TM	highly diversified by nationality, very inexperienced, three supportive functions, 4 TM
C	T ++, M +, G ++	T +++, M +, G +	T +, M -, G +
	highly diversified by age, and nationality, working for EEC, 3 in supportive functions	age above average, European group, strong technical expertise	average age, highly diversified by nationality, low level of experience at EEC,
D	T +, M ++, G +++	T +++, M ++, G +++	T -, M +, G -
	inexperienced at EEC, low level of diversity by nationality, inexperienced JPM and 5 TM	highly diversified by nationality, 3 from HQ, 3 excellent technical experts, one trained HR TM	low diversity by age, and nationality, three inexperienced, 5 TM
E	T +, M ++, G -	T +, M +, G +++	T +++, M +++, G +++
	highly diversified by age, nationality, education, inexperienced, 3 in supportive functions,	no group member had experience in the core business of the EEC group, all relatively new.	average age, strong European focus, only one inexperienced JPM, 3 JPM, 4 TM
F	T +++, M +++, G ++	T +++, M +++, G -	Only Group A-E in ILDP 3
	2 senior members with excellent technical expertise	average age, European group, 3 from Headquarter 3 excellent experts,	

Legend:

- T: Quality of the technical responses to the problem,
- M: Quality of the management responses to the problem,
- G: Observed quality of group process
- Team and management task: +++ excellent, ++ good, + ok, - below expectation
- Group process: +++ well managed, ++ good managed, + ok managed, - poor
- JPM: Junior project manager
- TM: Team member

Analysis

We observed the following:

- 1) High performance was facilitated by high technical expertise in the group, less diversity, and some members having significant experience in the company (E3). If high technical expertise and high diversity come together and the diversity was managed well, and the group process taken care of, we observed a better outcome (D2).
- 2) A well-managed group process cannot overcome a lack of technical expertise (A1, D1, E2).
- 3) High level of diversity takes more time and energy to be managed which will in the short run affect the level of outcome by the group (B1, B2, B3). Combined with inexperience and a lack of technical expertise, it will lead to an overall low performance (A3).
- 4) A team with good technical expertise requires less group management to produce good results (F1, F2).
- 5) However the quality of the outcome will be affected negatively, if all members produce for their individual goals instead of for the group (A2).

The findings are consistent with what one would predict using traditional training methods to develop highly diversified, multi-cultural teams. It was observed that PBL methodology also facilitates group

learning of team functioning and roles. In addition, the PBL methodology worked for achieving the other learning goals reflecting organizational goals, technology of the products and services, and project management issues. Experienced participants immediately became more engaged with the problem, because it was similar to problems they had confronted in practice. Less experienced members of their groups also benefitted from their experience and level of expertise. As was reported in the findings, a little expertise went a long way in the groups, and no amount of group process could make up for lack of expertise.

What is surprising was the level of learning for the groups that had little or no experience. The executives at EEG Group were disappointed with the technical level of the results. However, the amount of learning about the company, its products and services, and its entities was substantial. The PBL methodology had lived up to its promise of allowing participants to learn what they needed from the presented problem. What was a surprise to the EEG Group was the level of need for this content. Therefore, we can conclude that the method worked to teach participants at different levels.

We observe that the overall engagement and commitment of the participants throughout the whole teamwork sessions was exceptionally high. This observation was proofed by the results of the evaluation. Looking at the overall feedback, more than 60% said that they liked the pedagogical method used for the workshop very much. The more experienced the participants were, the higher they rated the PBL method.

In the beginning, the assumption was made that all participants already had a basic understanding of the roles of the entities, basic functions in the EEC Group, knowledge of the core products and services offered, and key procedures in managing projects. In the first delivery of the ILDP, we thought that those who did not have this basic knowledge had an individual deficit. Because the participants in later programs were less experienced, had less time working for the EEC Group, and were lower level in the company structure, our assumptions changed. It turned out that there is no institutionalized training for new employees where they acquire this basic company knowledge. By working in a simulation in a cross functional team, the participants reported significant learning and appreciation of basic products, procedures and features. As the participants gained knowledge related to other functions through the sharing of expertise, they also gained appreciations of the importance of other functions in the company. This was particularly true for the administrative personnel as the simulation turned out to be an accelerated

vehicle for learning basic technical aspects of the product. The fact that the simulation covered the entire product delivery process worked to broaden the knowledge of all participants. A particular surprise was the fact that some technically trained participants' product knowledge was limited by their specialized role in the company.

In the different ILDPs there were technical areas in which the group demonstrated a need for further corporate training. In one ILDP, it was health and safety, in one it was environmental issues and in another it was continuous improvement processes. So it turned out that one of the by-products of the training was pointing out additional training needs on a corporate level.

Conclusion

PBL proved to be an effective way to get multi-cultural groups to learn to work together. While diversity in the group meant it would take longer to learn to work together, the groups did eventually find ways of using the expertise in the group to produce acceptable products. PBL is a much different way of working with multi-cultural groups than traditional training techniques. However, it seems to bring out the issues involved much more naturally. This increases the likelihood of the learning being applied in other settings.

It was also found that the PBL approach was an effective method for providing employees with an overview of all processes related to basic products and services. Participants saw it as providing a complete view of the company regardless of years of service. The results indicate that PBL is an approach for orienting employees to the basic services and products of a company. These seem to be new uses of a PBL approach. Thus, they warrant further study.

We also learned that a well-designed set of training using PBL as a training methodology is multi leveled and dimensional. This became very important in the continuation of this program. While it trained participants in team membership skills (original objective), using the PBL method gave participants the freedom to learn what they needed. In some cases, this was about the basic products, services, and processes of the company. This outcome made the training more valuable to the participants and the company. Interestingly with the expansion and globalization, the learning of basic functions and creating a cross-national peer group were more of a corporate need than the original and somewhat limited objectives.

There is a need for further research on long-term effects of cross-cultural teams on individual retention and promotion in the company. Further exploration of the appropriate timing of employee product and services orientations and the format of that training are natural questions that arise from this paper. The results of this paper suggest that traditional timing (immediately in the very beginning of employment) and traditional lecture methods may not have the best results for these tasks. Additional uses for PBL approach with multi-cultural groups seems worthy of further exploration and experimentation.

Summarizing the results, the major finding may be that PBL is a useful training method for multi-cultural training and is a way of accommodating participants from a variety of backgrounds in one training session.

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