Efficacy of Training in Software Development Organizations

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Introduction

Organizations spend significant amounts of money on training. Training is conducted in organizations mainly for two purposes. The first objective is to ensure that people perform their current jobs effectively and efficiently. The second objective is to prepare people to be able to shoulder future responsibilities. There is a third objective which is exclusive only to software development organizations and that is to enable the team to learn the technologies necessary to execute the current project. The organizations have to continuously upgrade the skills of their staff just to be in the business. Therefore, training becomes a strategic activity in software development organizations. On-the-job-training which is used very effectively in other sectors of the industry has little applicability in software industry as the development platforms are characterized by continuous change.

The software architecture itself has undergone a metamorphosis. It started out a single-tier – that is the software and data resided on only one computer machine. Then came client-server technology in which software resided on multiple machines, called the client machines, and data resided on one computer system called the database server. Then came the multi-tiered architectures to accommodate Internet based applications in which the components of software are distributed across multiple computer systems.

In addition to the changing development platforms, the development paradigms themselves are changing! The development paradigms changed from programming to SSADM (Structured Systems Analysis and Design Methods) then to OOM (Object Oriented Methodologies), to Iterative Development Methodologies, then to process-driven methodologies of ISO and CMMI and finally now to Agile Methodologies. Each of these changes caused a paradigm shift in the way software is developed.

All in all, the software development field is characterized by continuous change the kind of which has not been witnessed in any other sectors of industry.

In such a volatile environment, how do we ensure that the money spent on training returns value for money?

Costs of Training

When I use the term training, I refer to classroom based training in this article. I know that training can be imparted in many a way including but not limited to classroom training, on-the-job-training, vestibule training, guided learning, mentoring, coaching, counseling, self-learning, CBT (Computer Based Training), VBT (Video Based Training), ABT (Audio Based Training) etc. I use training to mean classroom training here because this is the predominant form of training as well as being the costliest of all training vehicles.

The cost of training can be divided into two categories, that is, direct costs and indirect costs. Direct costs include the fee paid to the faculty, the cost of course & training material, cost of the venue, cost of the coffee, snacks and lunch etc, served during the training program, cost of arranging the program, cost of travel, lodging, boarding and local transport (for the faculty,

participants etc.) and so on. Indirect costs include mainly the cost of personnel spending time for the duration of the training program, which includes their salaries, perks and overheads besides the opportunity cost of their absence from their place of work.

When compared to the opportunity cost of personnel attending the training program all other costs pale into insignificance, as this is the highest, although, intangible, non-cash cost.

There is a vital indirect cost that is of imparting wrong concept or wrong methods to the participants. Certain training programs are conducted to impart / upgrade skill and if a wrong methods are imparted during the training program, they would be detected early on the post-training be seniors and supervisors. Thus the damage could be contained. However, training programs conducted to impart concepts, such as executive development or management development, the wrong concepts imparted there could not be detected that easily and may cause severe damage to the organization.

What can training achieve?

Obviously a training program is expected to achieve the objectives set for it. The objectives usually are multiple with one major objective (that is of imparting the desired skill or concept) and several other minor objectives.

A skill-imparting training can be expected to enhance the desired skill in the participants and if proper care is taken, the objective can be achieved. Again, can any training program enhance the skill of a person from that of a novice to that of an expert? Perhaps, it is possible in multiple steps, the first step being to impart adequate skill in the person to be able to work without assistance. Then a series of enhancement programs to elevate the person's skills to the level of an expert progressively. Organizations usually provide the first step of providing adequate skills so the person is capable of working without assistance and delivering acceptable quality.

But in case of training programs that attempt to impart concepts, the training is limited to imparting the basic concepts and leaves the participants to develop further and become successful. Experience sharing seminars and interaction with experts from the field, reading of journals and case studies, coaching and mentoring would provide necessary inputs to the people to enhance their performance in applying the concepts in the daily life to deliver success to the organization. In this case, training can at most, introduce the concepts to the participants.

Training programs in organizations are akin to driver's training in which the learner is trained to the extent that he is able to drive in the normal traffic at a moderate speed. Then the learner is left to his own ingenuity to develop the driving skills to able to drive in difficult traffic and drive at greater speeds. This is what is achievable by training in organizations, practically. Perhaps, more is achievable in theory and rarely in practice.

Impact of training in organizations

Impact of training can be divided into two classes, namely, positive impact and negative impact.

Positive Impact

It is relatively easy to feel the impact of skill training within the organization. It is visible in the form of being able to carry out activities, which were hitherto being not possible or were carried out with

less than desirable efficiency or quality. Positive impact reflects improved productivity, improved quality, reduced turnaround times, and performance of new activities.

It is relatively difficult to feel the positive impact of concept imparting training programs, especially, in the short term. If we maintain meticulous records (snapshots) or pre-training results and post-training results and a methodical variance analysis is performed, then and only then, can we assess the impact of concept imparting training programs. Needless to say, most organizations do not maintain such records or perform a diligent variance analysis.

Negative impact

Negative impact of skill imparting training programs is immediately discovered by the seniors or expert colleagues the first time the imparted skill is used in practical scenario by the participant. Or it is discovered by the quality assurance team as soon as the work performed using the newly learnt skill is submitted for inspection or testing.

Negative impact of concept imparting training programs is sometimes immediately discovered and most times is never discovered until too late. When concepts are wrongly applied they may result in immediate reactions in the form of increased conflict, impact on other departments, complaints from peers or customers, or reduction in quality, though this immediate discovery is rare a occurrence.

More often than not, when the concept is wrongly applied, the quality of results may not immediately decrease noticeably. For example if the manager applies wrong concept of motivation, it would take significant amount of time to discover the reduced levels of motivation in personnel.

Supposing the project manager applies erroneous concepts in project management, the result would not be noticed until the project is deeply on the path to disaster and failure.

How to ensure that wrong concepts are not imparted during the training program?

Let us list the factors that affect the impact of the training program –

1. Selection of appropriate participants – this is a vital activity as selection of wrong participants could hamper the smooth conduct of the program. The wrong participants pull the trainer in wrong / unrelated directions with irrelevant discussions and waste of time. As these wrong participants do not have the right pre-requisites for attending the program may not grasp the concept being imparted and in their frustration pull the whole batch into gloom and misunderstanding. One recommendation, when in doubt about the suitability of a participant, elimination is better than inclusion of that person in the training program.
2. Provision of training facilities – right facilities aids learning. Continuous learning can cause fatigue in the participants, which can be alleviated with proper facilities that include right temperature, lighting, ventilation and right breaks etc. Improper facilities could divert the attention of the participants from the trainer, which would result in lack of understanding of what is being imparted.
3. Training materials – including computer slides or transparencies, exercise material, and handouts etc will assist the participants in grasping the subject at hand more fully.

4. Faculty / trainer – while I kept this aspect to the last bullet, it is the most important aspect that either makes or mars a training program. The faculty must be very carefully chosen. The criteria for listing a faculty are enumerated separately

As the faculty is the most crucial aspect of a training program, the faculty / trainer must be chosen very carefully.

Criteria for selecting a faculty

While it plays an important role in selecting a faculty, money should never be the criteria in selecting the faculty to conduct the training program as it is far less than the opportunity cost of having participants spend time in the training program as well as the intangible cost of imparting wrong methods or concepts. Selecting the cheapest faculty is like selecting the cheapest school for your children! You may save money on fee but future is impaired. The following are the criteria for choosing a faculty –

1. The faculty ought to be an expert on the subject at hand. The expertise can be judged from the work carried out by the faculty, the results obtained from such work, the papers published and the general reputation. These things can be gleaned from the resume of the faculty but a discussion either face to face or over phone would yield better insight into the faculty. So the first criterion is that the faculty ought to be an expert on the subject.
2. The faculty ought to have excellent communication skills. Some people, though are experts in the subject, they are not good trainers as they lack one-to-many communication skills. Some people are great in one-to-one communication but are poor in one-to-many communication skills. In a training program, one-to-many communication skills are vital. A trial class of one hour, for which payment may be made, would go a long way in assessing the communication skills of the faculty. The second criterion is that the faculty ought to have excellent one-to-many communication skills.
3. The faculty ought to be proficient at handling difficult participants. Participants become difficult when they are not in the right program or when the subject being dealt does not agree with their beliefs. Faculty ought to have techniques for avoiding arguments and retrieving and recovering from a difficult situation. This can be assessed thru an evaluation lecture by putting some cross-questions. The third criterion for selecting the faculty is the ability of the faculty in handling difficult participants.
4. In many cultures especially Asian and Indian, participants expect the teacher to be older. So if your participants are from such cultures, an older faculty will go a long way in getting the participants to accept the faculty. In other cultures where age does not matter, the faculty is expected to have hands-on expertise in the subject. So the fourth criterion for selecting a faculty is that the faculty ought to be acceptable to the participants.
5. The faculty ought to have a presence - a presence that commands respect from the participants and at the same time friendly with the participants so that they are free to ask relevant questions and get the faculty to clarify the advanced issues.

Sometimes the organizations do not deal with the faculty directly but deal with a training organization. While so, the training provider can be requested to identify the faculty and subject that faculty to the above-cited criteria.

After selecting the faculty for the training program, the organization ought to motivate the faculty. Some de-motivating factors for the faculty, we find in practice are –

1. Endless negotiations about fee, and duration of the program
2. Not paying the mobilization advance fee requested by the faculty

3. Not arranging comfortable quarters for living
4. Not providing proper local transport.

These would cause the faculty to focus more on these trivial aspects and deviate his attention from giving the best to the participants.

How to measure the efficacy of the training program

The present method is to obtain feedback from the participants. This feedback normally asks about –

1. Relevance of the program to their assignments
2. Depth of coverage by the faculty
3. Assimilation of the training by the participants
4. Presentation skills of the faculty
5. Whether it is worth repeating the program again
6. Any other information specific to the organization

I do not think that this would really prove the efficacy of the program. I advocate creating a pre and post training maps of the participants and conducting a variance analysis.

The pre-training map could be ascertained for the following aspects –

1. Participants present grasp of the subject at hand
2. Participants need for the subject at hand
3. Participants concerns about the subject at hand
4. Management's perception of the need for the program
5. Concerns of the supervisors of the participants about the participants present grasp of the subject

This can be created either by running a questionnaire for the participants and their supervisors or thru personal interviews of the participants and their supervisors. This map should be created even before planning of the program and this should be created for every participant.

The post-training map should be created twice –

1. Once soon after the program is concluded
2. Second time after a time lapse – say on to three months.

The aspects to be covered are identical to those depicted for pre-training map. In fact, it is desirable to run the same questionnaire once again. Objective analysis would be possible with a proper questionnaire.

Now variance analysis ought to be conducted for the pre and post maps. This analysis ought to show improvement. The inferences can be drawn in the manner shown below –

1. An improvement of less than 60% would indicate that the training program achieved bare minimum results.
2. An improvement of 60% to 75% would indicate that the program just met the objective.
3. An improvement of 75% to 90% would indicate that the training program is successful
4. An improvement of above 90% would indicate that program was excellent and can be repeated if there are more people in the organization that can benefit from this program.

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About the Author – Murali Chemuturi is a Fellow of Industrial Engineering and an MBA and has over 30 years of corporate experience and about 8 years of consulting experience. He is a trainer of repute with more than twenty years of standing, in the areas of information technology and HR. He can be reached on murali@chemuturi.com or thru his web site http://www.chemuturi.com . Your feedback is welcome and appreciated

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