

Adult Learning for Earned Value Management Analysts

© 2012 by Cole J. Kupec II

On August 4, 2005 the federal chief information officer of the Office of Management and Budget (OMB) released a memo to encourage better management on technology acquisition and weapons systems by applying Earned Value Management Systems (EVMS). By doing this the OMB signaled the need for increased accountability in the acquisition process to better understand cost, schedule and performance. The need for members of the acquisition community to better understand Earned Value Management (EVM) principles has never been higher and more necessary. (Evans, 2005)

“Earned Value Management is a methodology for determining the cost, technical, and schedule performances of a complex program or project by comparing work that is planned with work that is accomplished in terms of the dollar value assigned to the work (Damaré & Peterson, 2005).” EVM is a project management tool that can effectively manage the cost, schedule and scope of a project through careful data collection and data analysis. To effectively gather and analyze data generated from the EVM process requires training in the fundamentals of the acquisition process and the fundamentals of EVM metrics. (Damaré & Peterson, 2005) The training is based around adult learners and the adult learning process that is grounded in adult learning theory.

Professionals across the acquisition community in the United States and abroad have recognized and embraced the principles of EVM to improve their project management and oversight (Evans, 2005). Courses that teach the fundamentals of EVM are offered at a variety of levels from a number of different types of organizations. The vast majority of students learning EVM are adult learners as EVM is a process improvement tool that is aimed for implementation by post graduate-aged working professionals. Adult learning theory plays a role in the training of adult learners. EVM analysis is based on experience and interpretation in addition to quantitative data so theories based on the learners’ experiences are especially applicable to EVM training.

Andragogy

One of the most well-known theories of adult learning is andragogy which covers the art and science of helping adults learn. The theory was originally named by a German high school teacher named Alexander Kapp in 1833. The term was not understood as we know it today until an academic named Malcolm Knowles defined the term in 1966 to differentiate it from the science of teaching children which is pedagogy. (Henschke, 2011) Knowles believed that adults learn differently than children, and they in turn need their own field of learning. One of the most defining factors of Knowles’s theory, which he approached as a science, was that adult learners are self-directed and autonomous. Unlike like children, adults apply discipline as well as their own experience toward the learning process in order to gain understanding for its own sake. (Knowles, 1970)

Some critics of andragogy say that some adults are not disciplined and some children learn for learning’s sake. Some even go as far as to question whether andragogy is even an established discipline or even a theory. Critiques of adult learning says that that adult learning theories are principles of good practice, but not theories, and they can be applied to adults regardless of age or their stage in life. (Merriam, 2001) Despite criticism, andragogy continues to be researched and continues to evolve with new findings and theories. Some researchers like Henschke (2011) believe that andragogy is a thoroughly established doctrine. Researchers like Henschke have dedicated their life’s work to understanding and furthering the study of andragogy, many of whom are confident in the future direction of research in the field.

EVM and Adult Learning Theories

The principles of EVM were established about a decade before Knowles coined andragogy; however, the principles were not established as a Department of Defense wide project management tool until 1967 in the 7000.2 instruction, the "Performance Measurement for Selected Acquisitions." The principles of EVM are rooted in quantitative data but it is important to remember that EVM does not offer solutions to problems; it merely helps to point out where problems might be in managing a project's cost schedule and technical performance. (Abba, 2000) According to functional theory in adult learning participants building on their own experiences is one of the most important factors, (Trotter, 2006) EVM cannot be implemented without the benefit of the individual adult learner's project management experience.

As such, it is important to note that EVM is inherently an ideal subject for adult learning because EVM implementation requires a very in depth knowledge of a specific project. This knowledge only comes to project managers who already have a college degree and many years post-graduate work experience. Further, in DoD, a significant number of project managers have a post graduate degree in addition to their experience. A project manager must use EVM as a tool to assist in their own understanding of the projects integration of cost, schedule, and scope, but that person's experience working the project is critical for understanding what data is available, where can it be found and how best it might be utilized. An inexperienced person would not have that insight into the program.

The researchers Knowles and Tough stated that some self-directed learners have the desire to increase their abilities. Not everyone falls into the category of wanting to learn something. Some people need encouragement to get them on board. It is important for EVM analyst to realize that if they want to change the habits of an organization it requires understanding of transformational learning. The better a stakeholder can promote the EVM system in a company the more effective the system can be. The research Cho wrote that the main purpose of self-directed learning, an important concept in adult learning, is to recognize and promote personal interaction, collaboration, and growth. These are all things that EVM tries to promote in an organization as well. Training in EVM is enhanced through organization interaction with the hope of promoting collaboration to improve efficiencies. The ultimate goal of EVM is to inspire growth in management practices and organization effectiveness.

Self-directed learning principles are useful for analysts to be familiar with in order to implement changing and create an environment that will facilitate EVM practices. (Merriam, 2007) Self-directed learning does not mean that individuals try to learn without others involved. It means that they take responsibility on themselves for their learning decisions. This can often be done with others and with teachers. According to Hiemstra (1994), self-directed learning doesn't necessarily mean that teachers are excluded from the learning process, but rather they play the role of facilitator. They can encourage critical thinking and understanding. Groups and associations like PMI[®] put together conferences for acquisition professionals; they assemble regularly and share experiences and lessons learned. This is a great example of adult learners taking autonomous paths and coming together to learn and communicate ideas with others in similar careers. Case studies are most often the core of the presentations at these conferences and give presenters the opportunity to reflect on experiences that have led to their understanding of the field.

Reflection can also play an important part in the adult learning process as evidenced by the sharing of experiences at these conferences. The individual's reflection provides other attendees, who are also adult learners, with the ability to develop critical thinking skills on a topic and show understanding of the body of knowledge being shared. Creating and presenting these case studies provides the opportunity to show understanding of the knowledge as well as sharing pitfalls and shortcomings. Case studies can build on previous knowledge and other participants can walk away having learned from other successes or failures of others. (Goldberg, 2010)

Networking with others in the field to work on future progress and come to consensus on new theories and concept in EVM is another benefit of the conferences and fosters an environment of a synergistic benefit for the adult learner attendees.

The definition of an adult learner is broad, and encompasses people from a wide variety of backgrounds who are socially accepted as an adult who are in a learning process, whether it is [formal education](#), [informal learning](#), or corporate-sponsored learning for continuous education and training as part of a process improvement initiative. EVM training like many adult learning situations and scenarios have an audience with different levels in educational development. It is important to acknowledge the difference between educators and students, and that each are aware of the differences and take strides to develop relationships between themselves; especially in an adult learning environment where maturity and experience play a critical role in learning. Students in EVM courses may come from a variety of industries with different roles and responsibilities, and can easily range in age from 20's-70's. Additionally, years of experience with EVM, and experience in the work place also play a factor in the learning environment. (Kenner & Weinerman, 2011)

Clearly, the educational requirements of someone in their 60's is different that for someone in their 20s. Even professionals from a similar background and level of experience with EVM might face generational differences. There has been much research on differences in generational gaps between the three major groups that make up the bulk of the work force today. The three generations are the millennials, generation-x, and the baby boomers. Much of the generational gap differences lie in expectations about work environment, and expectations on how other generations should interact are different. (Holyoke & Larson, 2009)

Generational differences are just one aspect to look for in an EVM training and implementation process. Differences in generations go back to age which can be tied to both age theory and stage theory. Age theory is based in the belief that adult learners face different challenges at different times in life. One age bracket that researchers have explored is the mid-forties to early fifties age bracket which people tend to focus on commitments to relationships and planning out the rest of their lives. Understanding age theory is useful for communicating and lends itself to providing better training because of the gained insight into the communication differences. (Trotter, 2006)

Similar to age theory is stage theory, in that adult's take on a different perspective depending on their stage in life at the time of their learning. The theory was originally developed by Piaget who focused on the stages of learning of a child, and Daloz among other stage theory researchers, have found that adult learners have stages as well. The first stage from the adult learning perspective is focused on survival and what it takes to just get by. The second stage of an adult learner is focused on fitting into their environment and surroundings. The final stage of stage theory, when applied to adult learners, is focused on the ability to do critical thinking which allows the learners to move past surviving or fitting. Whatever stage the learner is in is an important part of how they will learn from their experience and grow and develop from that experience. Taking this into consideration and understanding EVM development practices from this perspective can help an EVM implementation analyst assist the project manager in their understanding of EVM utilization and practices. (Trotter, 2006)

Houle has been a contributor to adult learning theory over the last several decades. Houle's research has led him to classify adult learners into three categories. The first type of learner is the goal oriented learner that strives to achieve goals in the learning environment. The second type of learner is the activity oriented learner. Activity oriented learners approach learning from a more social perspective and enjoy interaction with others while they learn. The third type of learner that Houle categorizes is the learning oriented learner that approaches learning for the sake of learning. (Hiemstra, 1994)

Task oriented people who Houle defines as goal oriented, may approach EVM with specific ideas in mind that need to be accomplished while an activity oriented learner might just enjoy the social necessities that EVM may require in the training process. EVM can require a lot of coordination and personal interaction which could be a social benefit to the activity oriented learner. An example of a learning oriented adult student may be someone that is just professionally satisfied by the opportunity to learn something new and useful. In an EVM training environment or EVM implementation and review environment, it could be useful to recognize learners' categorizes in order to work out achievement strategies, problem solving and understanding; especially, in a team oriented environment.

One theory in adult learning is McClusky's theory of margin. McClusky believed that life could be seen in terms of "load" and "power." Load is the amount of responsibility that someone can inherit while power is the amount of influence someone has. McClusky thought that the very young and very old are less capable than the rest of society, so they naturally have less load and less power. As the young get older they are faced with more load and power until they near the end of life where a considerable amount of the load and power are lifted. At different points in a person's life they have a varying level of load and power.

The load and power of an individual at an organization can also vary with experience and education. Some people have the inherently more ability to affect organization change within a management structure they use EVM. Age or experience is not always the key variables that determine how much load or power an individual has in an organization. It must be assessed on a case to case basis. EVM is a management tool that must rely on proper organization implementation and use in order to be valuable. It is necessary that leaders with power and those who carry the load are considered when EVM is implemented. (Merriam, 2007)

Another adult learning researcher, Jarvis, explored the sociological side of adult learning. His findings suggest that learning does not occur in a vacuum. Everything must be taken in the context in which it is presented. Jarvis found that certain systems of training and education only serve to reinforce current social structures. If that social structure is a poor management process then efficiencies in the management system cannot be gained. (Merriam, 2007) It is important that EVM analyst that participates in training and daily management of an EVM structure understand that poor practices cannot be reinforced and that training should not facilitate those poor practices.

On the Job Training

On the job training is an invaluable necessity in the understanding of EVM. Working with EVM hands on gives users certain critical processes in learning that they would otherwise not have achieved. It is a critical that those involved in the EVM implementation, analysis and tracking have a significant in-depth knowledge of the project for which the EVM system is being implemented; as such, the persons involved must build consensus on the way EVMS are implemented and practiced.

With respect to on the job training, especially in vocational education, learning experience comes from vertical development and horizontal development. Vertical development is learning that an individual does in isolation. Horizontal development is learning that is done in the context of the institution. In the EVM context an acquisition professional that is sitting at their desk reading EVMS guidelines for understanding is an example of vertical development. An acquisition professional on a review with others going over EVM practices in a company for understanding and correction would be an example of on the job training in horizontal development. Some researchers say that about seventy percent of learning in the work place is learned in informal settings. (Guile & Griffiths, 2001)

This accents the importance of on the job training, especially in a field like EVM that is defined in terms of a workable everyday system that promote coordination and daily efficiencies for management purposes. The fundamentals of EVM still require a formal teaching process so that an EVM system can organically grow in an organizations corporate structure.

Formal Training

Courses in EVM are offered for acquisition professional from a number of different sources. Universities such as George Mason University and Georgetown University offer courses geared toward working professionals in addition to courses in the traditional undergraduate setting. Government sponsored institutions such as the Defense Acquisition University (DAU) cater solely to acquisition professionals in the Department of Defense and falls under the purview of the Under Secretary of Defense for Acquisition, Technology & Logistics. (*About DAU*, 2011) There are also associations and professional groups that offer courses and certificates in the field of EVM.

Examples of these groups would be the Program Management Institute (PMI) and the Association for the Advancement of Cost Estimating (AACE) which offers EVM in addition to other industry related continuous professional education and training for the benefit of improving and honing skills of their members. Consultants and private companies have seen the opportunity to offer training courses in classroom setting and online for profit. Online courses offer students the chance to take a more self-directed approach to learning. Research has shown that some instructors prefer online courses in general and one study has found that teachers spend more time preparing and planning for online courses than traditional courses. Even with more time needed for preparation and planning almost 47% of instructor's preferred online teaching over the traditional learning environment. (Magnussen, 2008)

Although EVM is largely a creation of the United States Department of Defense it has spread beyond the United States to Australia, Japan, Sweden, and the United Kingdom. Many of these countries have conferences to support the development of EVM and promote training of professionals there as well. Private training companies are filling the training needs of acquisition professional in those countries. The training options may differ in other countries than they do here in the United States. For example, in Australia the government does not have a government sponsored institution like the DAU that provides training for its personnel. In Australia their Ministry of Defense contracts out the training of their personnel to a private company called Deakin Prime. (Defense, 2006)

Conclusion

In conclusion, EVMS is a useful tool for program management to effectively oversee their project's cost schedule and technical performance. Proper training, implementation, and oversight are key to the success of any EVMS. Understanding adult learning theories and principles can help facilitate EVM analyst in their efforts to provide an effective EVMS to an organization. Stressing the importance of preventing bad habits and implementing goals and learning processes can be valuable to the priorities of an EVM stakeholder.

Courses and training are offered from a variety of different outlets including government sponsored institutions, universities, and private companies. Organizations exist to promote EVM training and understanding to provide success in its implementation and use. EVMS is not a substitute for management practices but can be more easily integrated with management priorities through an understanding of adult learning.

About the Author



Cole J. Kupec, II

Senior Business Analyst, Welkin Associates, a wholly owned subsidiary of the Computer Sciences Corporation. Ph.D. Candidate at Old Dominion University studying Occupational and Technical Analysis. Holds a Masters in Business Administration (MBA) from Auburn University and a Bachelor of Science in Finance from the University of Wyoming.

Note: All trademarks are the property of their registered owners.

References

- Abba, W. (2000). How Earned Value Got to Primetime. Retrieved from Dekker, Ltd. website: <http://www.pmforum.org/library/papers/2003/evprimetime.pdf>
- About DAU. (n.d.). Retrieved June 8, 2011, from Defense Acquisition University website: <http://www.dau.mil/aboutDAU/default.aspx>
- Damaré, B., & Peterson, J. (2005, October 18). An Education in Earned Value: Procurement Officers' Expanding Role. GOVPRO, Retrieved from http://govpro.com/resource_center/gov_imp_27887/
- Defense Supplement to AS4817-2006 - Project performance measurement using Earned Value. (2006, May 25). Retrieved from Australian Government, Department of Defense, Defense Material Organization website: http://www.defence.gov.au/dmo/esd/evm/DEFENCE_SUP_TO_AS_4817_2006.pdf
- Evans, K. (2005, August 4). *MEMORANDUM FOR CHIEF INFORMATION OFFICERS*. Retrieved from Executive Office Of The President - Office Of Management And Budget website: <http://www.whitehouse.gov/sites/default/files/omb/memoranda/fy2005/m05-23.pdf>
- Goldberg, K. (2010). Reflective Journaling: Creating Learning Pathways for Experiential Learning and the Adult Learner Kenneth
- Guile, D., & Griffiths, T. (2001). Learning Through Work Experience. *Journal Of Education & Work*, 14(1), 113-131.
- Henschke, J. A. (2011). Considerations Regarding the Future of Andragogy. *Adult Learning*, 22(1), 34-37.
- Hiemstra, R. (1994). Self-directed learning. In T. Husen & T. N. Postlethwaite (Eds.), *The International Encyclopedia of Education* (second edition), Oxford: Pergamon Press.

- Holyoke, L., & Larson, E. (2009). Engaging the Adult Learner Generational Mix. *Journal Of Adult Education*, 38(1), 12-21.
- Kenner, C., & Weinerman, J. (2011). Adult Learning Theory: Applications to Non-Traditional College Students. *Journal Of College Reading And Learning*, 41(2), 87-96.
- Knowles, M. S. (1970). *The modern practice of adult education: Andragogy vs. pedagogy*. Cbicago: Association Press/Follett.
- Magnussen, L. (2008). Applying the Principles of Significant Learning in the e-Learning Environment. *Journal Of Nursing Education*, 47(2), 82-86.
- Merriam, S. B. (2001). Andragogy and Self-Directed Learning and Something Old, Something New: Pillars of Adult Learning Theory. *New Directions for Adult & Continuing Education*, (89), 3.
- Merriam, S. B., & R. Caffarella, & L. Baumgartner. (2007). *Learning in Adulthood: A Comprehensive Guide*. (3 ed.). San Francisco, CA: Jossey-Bass.
- Trotter, Y. D. (2006). Adult Learning Theories: Impacting Professional Development Programs. *Delta Kappa Gamma Bulletin*, 72(2), 8-13.