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DISCOVERING THE SYNTHESIZED EXPERIENTIAL LEARNING MODEL

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ABSTRACT

A Western Pennsylvania managed service provider needed to find a better way to train new employees so that they could be productive and assist customers quicker. Research was undertaken into the method of differential diagnosis, typically found in the medical profession. It was quickly found that in order to perform differential diagnoses people must have a large repertoire of experiences from which to draw. This lead to research into the best way to learn from experiences. Literature was reviewed on learning models and gaps were identified, which lead to the creation of a new learning model, the Synthesized Experiential Learning Model. This model builds upon experiential learning, action learning, and many other crucial facets of learning found in the literature to create a new model that more accurately reflects the necessary components to generating knowledge from learning.

Keywords: Synthesized, experiential, learning, model, action, ludic, differential, diagnosis

INTRODUCTION

"We need a better way to get new-hires up to speed". That was the challenge of a Western Pennsylvania managed service provider's (MSP) president to his senior systems engineer, the researcher. Over the years, the president noticed that the process of hiring new Information Technology (IT) staff and bringing them up to speed on the way his company does work was taking too long. Whether the new employees were recent college graduates or seasoned professionals, all had a learning curve. The recent graduates needed exposed to technology and concepts that may not have been taught in their degree program and the seasoned professionals, while more familiar with technology, needed to become accustomed with the specific technology used at this particular company and indoctrinated into its business methods. Each new hire spent multiple weeks doing nothing more than reading policies and procedures, shadowing more senior employees, and experimenting in the test lab. This cost the company money that could have been better spent elsewhere.

The challenge was simple: find a better way to teach new employees what they needed to know to be successful and begin helping the MSP's clients sooner. Dialogs occurred between the president and the researcher that ultimately lead the researcher to a harsh realization: this problem would not be solved in a single phone call. The actual problem wasn't simply to find a better way of troubleshooting IT issues, since most IT professionals have been taught a decent method similar to that proposed by Andrews (2017). The actual problem lies with the way humans learn and finding a way to align that process with the MSP's on-boarding process.

As a starting point, the researcher offered an idea: IT professionals should be taught to do a differential diagnosis of each problem, similar to how medical professionals diagnose diseases.

THE BASE THEORY

While one can find multitudes of published research on differential diagnoses, there are very few studies on how to teach a student to properly perform a differential diagnosis. Since this method isn't common in the IT industry, the scope was broadened to medical research. A study by Colella & Beery (2014) offered some insight into the problem. The primary model of teaching differential diagnosis is grounded in Kolb's (1984) Experiential Learning Theory (ELT), which has its theoretical underpinnings in what is called cognitive science by 2018 standards and is succinctly explained by Zull (2002). The ELT proposes that in order for learning to occur such that a repertoire of experiences can be created the learner must have four different kinds of abilities, depicted as the ELT model in Figure 1.

First, the learner must have concrete experiences (CE). Without bias, the learner must enter into new experiences and fully involve himself. After having the CE, the learner must enter into a period of reflective observation (RO) in which he steps out of the situation in order to observe the experience from a myriad of perspectives. From there, the learner must take what he has observed and transform the knowledge into abstract conceptualizations (AC), which allow him to apply what he has learned to different experiences. In order to test these conceptualizations, the learner enters into the last phase, active experimentation (AE), in which he actively applies the abstract conceptualizations to new concrete experiences in order to solve problems and make decisions (Kolb, 1984).

The ELT it not a model that is to be followed for a single iteration. The learner is expected to treat the model as a spiral, revisiting the original problem to experience it anew (Kolb, 1981; Kolb, 1984) and gain insights originally overlooked. By following the ELT through multiple iterations, the learner is able to transform his experiences and, as such, generate knowledge (Kolb, 1984; Lisko & O'Dell, 2010).

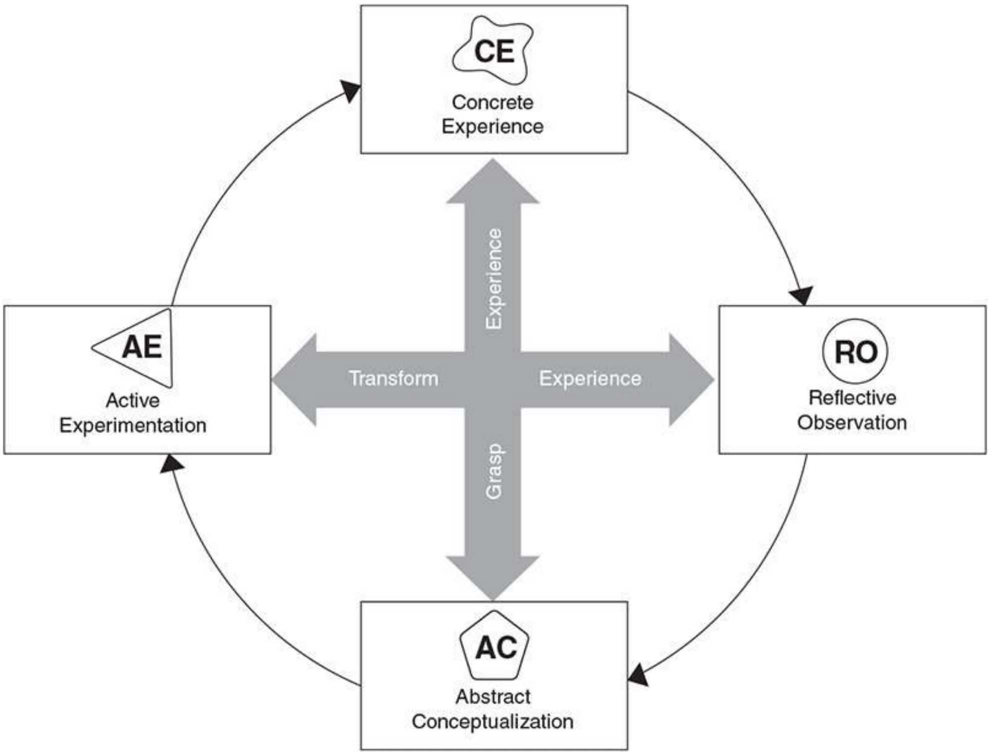

Figure 1. Experiential Learning Cycle (Kolb, 1984)

A similar model to the ELT was constructed by Bybee & Landes (1990) specifically to correct the way primary and secondary school students learn in the hard sciences. The creation of the 5e model was based on the view that challenging students' initial conceptions must happen first followed by better experiences that allow students to broaden their view and construct more complete conceptions (Champagne, 1987; Anderson, 1987). The 5e model begins with the Engagement phase and follows through the Exploration, Explanation, Elaboration, and Evaluation phases. One key is that all phases are bidirectional so that teachers can go back and forth as needed due to student understanding. Additionally, most phases include a degree of hand-holding by the teacher since this model is geared toward young children. Newer research by Eisenkraft (2003) expanded the model from 5e to 7e, splitting Engagement into Elicit and Engage and adding Extend to the end of the model. While this model has similar principles to the ELT model, the ELT model has better applications for adult learners.

EXPANDING THE BASE THEORY

The exposition of literature on the ELT lead to a similar theory: action learning. While action learning was developed from ELT, it revealed a missing component. The ELT focuses on the learner as a single object learning on his own. Studies in action learning uncovered the need for learning to move from a personal to an interpersonal space (Anderson & Coleman, 2014). Multiple studies have pointed to the need for groups of people to join together and be engaged in the learning process. This can happen by forming a learning team, such that all members work together toward the common goal of solving a problem (Brook, Pedler, & Burgoyne, 2012; Joon, Cho, & Bong, 2012), or by having a more experienced person act as a learning coach to aid the learner through the process by encouraging reflection (Marquardt, 2004). In either case, it is clear that for learning to be effective a person cannot enter into this process on his own.

Other studies have taken this interpersonal idea in a different direction. Taylor, Marienau, and Fiddler (1999) explain that the process of knowing is a dialogical process. In other words, there are many facets of dialog that have to occur in order for one to construct knowledge. One example of dialog is already present in the ELT and action learning model, though other studies have expanded on the idea. When the initial concrete experience is not an overtly interactive experience, but an experience between the learner and the written word, Säljö (1982) & Hounsell (1984) contend that it is up to the learner not only to interpret the written word on its face but also to understand the underlying meaning. This dialog between learner and written word is a critical first step in the learning process when literature is the initial experience.

A second example of dialog appears during the reflective observation phase, where the learner must look inward and "challenge and question [his] own basic values" (Keegan, 1994, p. 303). This dialog with one's self is a self-assessment component. Those who take the proper time to reflect and self-assess find that they are "less likely to ignore the familiar or avoid the unfamiliar" (Marienau, 1999, p. 143). Additionally, learners have found a strengthened commitment to performing well in the workplace and have noticed greater confidence in their abilities as both employees and leaders. At the end of a proper reflective observation phase, a learner will have a larger repertoire of experiences from which to draw during future reflection sessions (Marienau, 1999).

The third form of dialog, dialog with others, similar to the aforementioned interpersonal arena, is missing from the original ELT. The action learning model begins to expose this necessary component. Illeris (2004) takes a high-level approach to learning by defining learning to include two different processes, one of which is "an external interaction process between the learner and his or her social, cultural, and material environment" (p. 81). Even in this simplistic description of learning the concept of multiple participants is present. With all of this research, it is clear that by adding an interpersonal dimension to the learning model we can allow learners to "gain insights that simply could not be achieved individually" (Senge, 1990, The Discipline of Team Learning section, para. 10).

BOUNDING THE MODEL

In addition to dialog and teamwork, the ELT and action learning model neglect to mention the space in which learning occurs. Kolb & Kolb (2010) found that learners are more effective in transforming knowledge when they are in a safe environment that provides them with unlimited opportunities to learn through continuous practice. This idea of a learning space is named a ludic learning space after the Latin Homo Ludens, the man who plays, a nod to the idea of balancing 'contest' and 'play' to create a non-stressful environment, which is depicted in Figure 2.

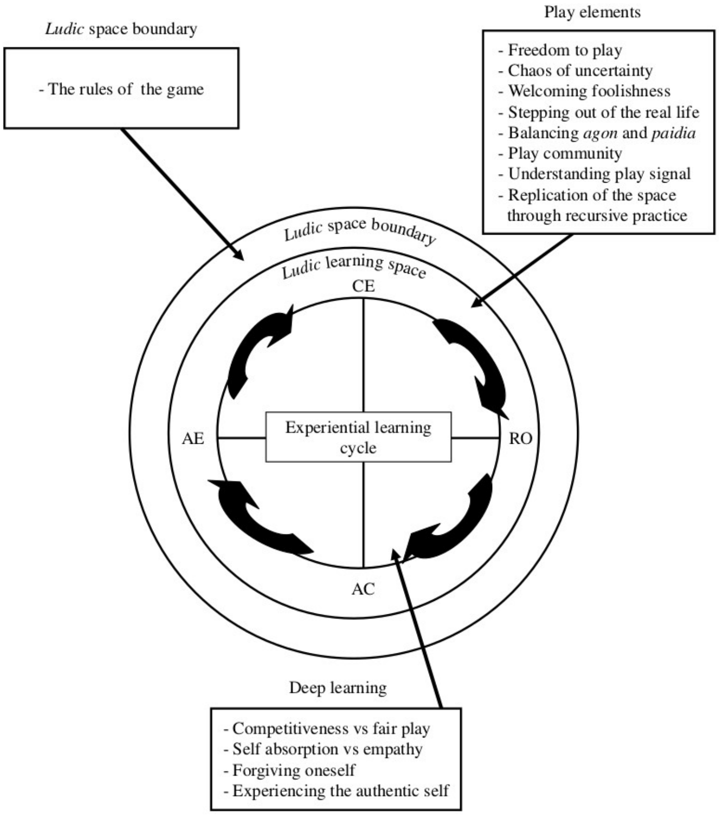

Figure 2. Ludic learning model (Kolb & Kolb, 2010)

The key feature of the ludic learning space is that the learner is free to experiment without consequences. Managers aren't breathing down anyone's neck about deadlines, teachers aren't planting the fear of a poor grade into anyone's mind, and nothing bad will happen upon failure. This allows for the optimum flow of creativity and experimentation. Kolb & Kolb (2005) uncovered nine features that a learning space must exhibit in order to be conducive to learning. Three of those features describe the so-called rules of the learning space: respect for the learners and their experiences must be shown, learning should begin with the learner's current understanding or experience of the subject, and the space should be hospitable for learning such that the learners are supported by others throughout the experience. Five of those features are geared toward the creation of spaces for certain tasks: spaces for conversational learning, development of expertise, acting and reflecting, feeling and thinking, inside-out learning, and taking charge of one's own learning.

These features of the learning space corroborate the research into the action learning model, whereby dialog plays an important role in the learning process, and validates the need for a carefully designed learning space.

DISCOVERING A NEW THEORY

The methodology of this research is based on the principles of grounded theory. The purpose of the literature review is to expose gaps in existing knowledge (Creswell, 2007). As exposed by the present field of research, major gaps exist in the current models of learning. Some models omit learning from text, some omit dialog with others, and some omit the environment in which learning is to occur. In order to offer a better learning experience and to ensure that learning exercises are created that are as efficient as possible, a learning model that accounts for all necessary aspects of the learning experience is vital.

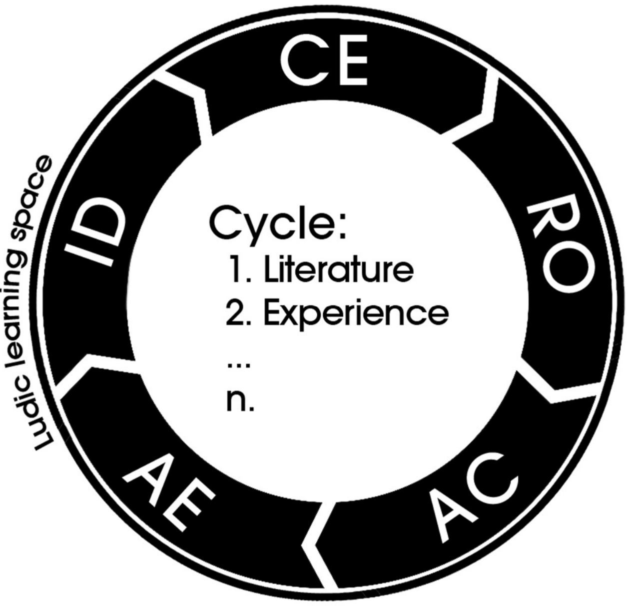

Figure 3. Synthesized Experiential Learning Model

Working from the outside in, the Synthesized Experiential Learning Model, presented as Figure 3, is bound by the ludic learning space. It is paramount that the learning environment be segregated from the business environment. In a school setting, this would mean that students have the ability to learn via trial and error without the fear of earning a poor grade. This could be accomplished via "lab time" or any other means to separate the assessment of learning from the learning itself. In industry, the use of a ludic learning space could be a physically separate lab environment, where employees can go to test hypotheses before implementing them into a production environment. Such a space means that no harm is done and no loss of business occurs if a catastrophic failure transpires because the failure occurred in a non-production environment.

To accommodate the need for dialog with others, a new phase was added to the learning cycle: Interpersonal Dialog (ID). While dialog with text and dialog with oneself could fit within the confines of the previous model, none of the phases could encompass the need for the learner to interface with another human, one who is more experienced in the selected field and can act as a coach or mentor. After the AE phase, the previous model sent the learner back to the original problem to revisit it with the newly acquired knowledge. The problem with that approach is that the learner does not know whether or not his new knowledge is correct. It may take many iterations of the learning cycle to work out all of the knowledge inconsistencies and arrive at accurate knowledge. Especially with complex problems having multiple acceptable solutions, this method does not make the best use of the learner's time nor the organization's money.

Instead of endless iterations of the ELT, the Synthesized Experiential Learning Model has the learner enter into the ID phase immediately after each AE phase. This will allow the learner to discuss his findings with a more experienced person, consider the pros and cons, and ultimately arrive at accurate knowledge much faster. The learner can either revisit the original problem to fully understand the situation or move on to another iteration seeking to apply his new knowledge to a different problem.

The last major change to previous learning models is the addition of a prescribed minimum number of iterations of the cycle. Where previous learning models simply stated that the learner can continue to iterate on the same problem or apply the newly created knowledge to a different problem, the literature suggested a more concrete path. Adding Säljö (1982) & Hounsell's (1984) findings to the model, the first iteration of the cycle should be a dialog with text. An illustration of this from the IT sector is when a new employee is struggling with something and a seasoned employee bluntly tells him to RTFM (Read The *expletive* Manual). The sentiment is that one should read the literature on a subject and attempt to fully comprehend it before physically engaging with the subject.

Thus, the first iteration of the cycle loosely follows the term "concrete experience" in that the experience is with the written word. The learner should read the manual or any other literature on the subject, reflect, conceptualize, experiment, dialog, and then proceed to the second iteration of the cycle. In the second iteration the learner will have a literal concrete experience, applying what was garnered from literature to the actual tangible problem. In the case of configuring a new database server for a company, the IT professional should read the documentation (iteration one of the cycle) before typing any commands on the server to perform the actual configuration (iteration two of the cycle). It goes without saying that this entire process should be done in a non-production, ludic environment.

After iteration two, the learner can continue iterating ad libitum (as with previous learning models) on the same problem or on a new problem until he is confident that the material has been mastered and he can perform the particular task flawlessly in a production environment, where negative consequences may result from poor performance. While some may argue that larger organizations have exhaustive training methods to ensure that new employees are exposed to all required knowledge, this is not the case in the IT industry, where, due to the constant change of technological innovation, knowledge becomes stale extremely fast and new knowledge must be created as part of one's daily routine.

LIMITATIONS AND FUTURE RESEARCH

The main limitation of this research is that the new theory is solely grounded in literature. The efficacy of this theory hinges upon all previous research being accurate and complete. For that reason, this theory will need refined through future application. In order to ensure that all of the new components work together with the base theory many MSPs will have to implement this model and perform separate studies, corroborating or invalidating the new model. Furthermore, the Synthesized Experiential Learning Model is not specific to any single field. Organizations outside of the IT sector should conduct their own studies applying the model to ensure that its generalizability is confirmed. Each study applying the new model can be used to produce new, better training scenarios.

CONCLUSION

What started as an investigation of differential diagnoses ended as a lesson in the best way to learn. The core component of a differential diagnosis is the person's repertoire of experiences; thus, the proper building of said repertoire became the core of this research. With the ultimate goal being the proper training of new IT employees to quickly and accurately diagnose hardware and software issues, ensuring that said employees have a wide array of experiences from which to draw is key. Not only do the employees need a vast repertoire of experiences but those experiences need to have culminated in accurate knowledge. The Synthesized Experiential Learning Model will assist learners in generating accurate knowledge from their experiences. Additionally, this new model will aid learners in dealing with ambiguity and uncertainty (Cavagnaro & Fasihuddin, 2016) and strengthen their epistemic authority, or their "perceived competence in a domain" (Ellis & Kruglanski, 1992, p. 372), important traits in seasoned professionals.

The discovery of the Synthesized Experiential Learning Model will help the MSP to design training exercises for the on-boarding process that will broaden an employee's experiential repertoire and expedite his journey to be a productive member of the company.

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