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Androgogy and K-12 technology staff development : towards effective practice

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Abstract

Many K-12 technology staff development programs are based upon pedagogical models. Adult learners require a different set of design and facilitation skills referred to as andragogy. The primary goal of adult education in any arena is to produce independent life long learners. This is particularly valuable in the ever changing realm of technology. To engage this task Knowles and Brookfield each identify six guiding principles that construct a framework for designers and facilitators of adult education programs to follow. The process of meaningfully integrating technology into the schools requires substantial change to current instructional methods. K-12 technology staff development designers are the change agents who can use learning contracts, inquiry teams, and mentoring to produce independent lifelong learners.

Androgogy and K-12 Technology Staff Development: Towards Effective Practice

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Table of Contents

Abstract

Many K-12 technology staff development programs are based upon pedagogical models. Adult learners require a different set of design and facilitation skills referred to as androgogy. The primary goal of adult education in any arena is to produce independent life long learners. This is particularly valuable in the ever changing realm of technology. To engage this task Knowles and Brookfield each identify six guiding principles that construct a framework for designers and facilitators of adult education programs to follow. The process of meaningfully integrating technology into the schools requires substantial change to current instructional methods. K-12 technology staff development designers are the change agents who can use learning contracts, inquiry teams, and mentoring to produce independent lifelong learners.

Chapter One

Introduction

School districts nation wide are spending enormous amounts of money on technology. There are national initiatives, such as the Universal Service Fund, and state level programs as well. The efficiency, access to information, and novelty of technology seem to be incredibly powerful benefits for instruction. The introduction and infusion of technology into schools intuitively appears to be the right thing to do. However, there is no definitive proof that technology improves instruction or student achievement.

This paper will examine effective practices for constructing adult learning experiences for K-12 technology staff development. Questions that will be examined here are as follows: What are effective practices for establishing an adult centered learning program? What are effective implementation strategies for an adult learner centered technology staff development program? What are the characteristics of successful utilization of technology in a K-12 instructional environment? How does the successful utilization of technology transform the traditional instructional environment?

Throughout the examination of these issues, recommendations will be given based upon the findings of effective practice for educating adults. Many of the conclusions are intuitive and based upon common sense. However, there are

several techniques used with adults which are strikingly different from the pedagogical models that are currently being used in most K-12 school districts for staff development. It is these highlighted variances which may determine if schools use technology effectively or not.

Methodology

A content expert in the area of effective practice for adult learners was used as the genesis and filter for much of the material in this paper. He was formally interviewed twice and visited many other times in order to gather material on this topic. Knowles, Mezirow, and Galbraith were three of the initial leads that were dispensed. From Knowles source material, Brookfield was noted and explored.

The adult learning theory was evaluated by two standards. Information that focused exclusively on voluntary continuing education programs such as GED or adult literacy, were not used. These topics were too dissimilar from the current context. Source material about corporate human resource development was also not used for the same reasons.

The instructional technology source information came primarily from Jamison McKinzie. Everything on his on-line journal, *From Now On,* was reviewed for this paper. *From Now On* also lead to the Johnson material that has proved invaluable. Material from the local Area Education Agency, as well as *THE*

Journal, Leaning and Technology, as well as *Educational Leadership* were used in preliminary searching for source research. However, most of the articles, activities, and models for technology staff development either seemingly ignored effective practice for teaching adults or were contradictory in nature. There were no comprehensive programs based on adult learning theory research, with the notable exception of McKinzie's material.

Credibility of source material was evaluated at several levels. Adult learning theory material was discussed with the content expert, Dr. Burrichter. The technology materials were evaluated by date of publication and relevance in relation to previously researched findings on effective practices of adult learning.

Chapter Two

Analysis

Staff development is the critical issue facing K-12 schools that are serious about impacting the student environment with technology. All too often the critical item that is often underemphasized in the process of technology planning is the liveware. Without properly considering the users, the people who will be implementing the technology, schools are creating a recipe for disaster. However, creating a technology staff development program based upon a pedagogical approach may be as damaging to the success of a technology plan as developing no staff training program at all. Planning, teaching, and evaluating adult learners is a very different process than educating children. The research on adult education has profound implications for the creation of staff development on technology for K-12 schools.

The analysis portion of this paper will focus on how Knowles' (1991) six assumptions of how adult learners differ from child learners impact the design of instruction for adults. The transactional process of adult learning as laid out by Mezirow (1990) will also be examined. Finally, the role of the facilitator in the adult learning process as described by Brookfield (1986) will be discussed.

The central theme in educating adult learners is the movement of these learners from a self-concept that is dependent upon a teacher, to an independent self-concept which engenders lifelong learning. An independent learning self-concept has many evident benefits. Independent learners experience intrinsic motivation. This inner will to strive forward is not only the most powerful motivator, but also the most pleasing reward when a goal is obtained. Also, due to this internal motivation, learning is more meaningful. An independent learner is also the best judge of the level of competence attained from an educational encounter. The learner knows if she or he needs more time to work, needs remediation, or has attained the goal. Therefore, much of the focus will be on how to move learners to become independent learners.

Knowles (1991) defines andragogy as, "The art and science of helping adults learn" (, p. 57). Many individuals charged with creating instruction for staff development are teachers or former teachers. Therefore, the primary models used to construct technology staff development programs are often based upon standard pedagogical approaches. Andragogy as defined by Knowles (1991) is based upon six assumptions that are differentiate it from pedagogy. These assumptions are based upon the learner's (1) need to know, (2) self concept, (3) life experiences, (4) readiness to learn, (5) orientation to learning, (6) motivation. When creating

effective instructional design for staff development regimens, it is critical to keep these six guiding factors in mind.

It is arguable that many of precepts of andragogy are transferable and useful for pedagogy. The first assumption of the differences between pedagogy and andragogy exemplifies this to some extent. It is fundamentally critical for the adult learner to understand the purpose and need for the instruction. Adults are much more likely to participate, invest substantial effort, and retain learning when they understand clearly what the possible positive results of instruction are as well as what the possible negative implications of not working through instruction will be (Knowles, 1991). It is hard to effectively argue that this assumption is not also true of children as well as adults. However, while children can often suspend this need for purpose, adults have greater difficulty in doing so. Therefore, as instruction is being created, the designer must be sure to clearly identify the purpose and benefit of the intended learning to the participants.

The adult learner's self concept greatly differs greatly from that of a child's (Knowles, 1991). The second assumption of difference points to this fact. In the pedagogical model, the teacher expects the learner to have a dependent personality. Therefore, as time goes by, the learner develops a dependent personality (Knowles, 1991). The teacher is the focal point of learning. All information comes from the teacher, and students depend on the teacher for this

information. However, by Caffarella and Merriam's (1991) standard of adulthood, one of the benchmarks in the achievement of maturity is the development of independence in terms of self concept. The conflict between the independent adult self-concept and the pedagogical expectation of dependency makes it is easy to see why many adult education programs have high drop-out rates (Knowles, 1991). According to Knowles (1991), the key to correcting this problem is to facilitate a transition from dependent learning styles to self directed learning. The instructional designer must create a needs assessment to determine the level of dependence of the learners. If the learners are dependent in nature, the educational experience must be designed to incrementally lead the learners to independent learning styles.

Knowles' (1991) third assumption about andragogy that differentiates it from pedagogy is the contrast in the role of the learner's experience. The pedagogical model does not value the experience of students. "The experiences which count are that of the teacher, the textbook writer, and the audio-visual aids producer" (Knowles, 1991, p. 58). Simply by having lived longer, adults have a great deal more experience to bring to the learning situation. This depth of experience has a profound effect on the learner's, "background, learning style, motivation, needs, interests, and goals" (Knowles, 1991, p.59). The vast amount of experience spread over such a diverse range makes a group of adult learners

more heterogeneous than a group of child learners (Knowles, 1991). This storehouse of information presents a challenge for adult educators, in that, personal experiences tend to define adult identities. The significant implication for education is clear. By attempting to change or to tamper with these life experiences through the introduction of new material that may challenge the validity of an individual's personal experience, the adult educator runs the risk of invalidating the learner's personal sense of identity. Therefore, if an adult learner feels that personal experiences are ignored or devalued, this is not just as a rejection of that experience, but as a rejection of the adult as a person (Knowles, 1991). Effectively dealing with an individual's professional experience may be the most difficult aspect of implementing and andragogical approach to K-12 technology staff development. However, the designer of instruction can use this wealth of experience as a catalyst for change by building in opportunities for learners to share and validate their experiences.

The fourth assumption that contrasts andragogy from pedagogy is the adult learner's readiness to learn (Knowles, 1991). In the pedagogical model, the learner must learn what the teacher says is to be learned if promotion is to take place (Knowles, 1991). While this assumption of the pedagogical model is highly arguable, the implications for readiness to learn seem more grounded and valid. Adult learners will not process information well that they will not use in the near

future (Galbraith, 1991). For example, it is unwise to teach an adult about desktop publishing if the learner has no immediate need to publish a document.

The fifth difference that separates andragogy from pedagogy may be the most critical difference. Adults' orientation to learning is vastly different from the orientation that is used in pedagogy. Typically, K-12 teaching environments, learners study content or subject areas that are sequential and follow a logical order. In programs that use the andragogical approach the focus is life centered, problem centered, or task centered. Adults are motivated to expend energy when they see the learning as "real life" oriented. Adults will learn new skills more effectively when they are presented in the context of authentic situations (Knowles, 1991).

The final difference between andragogy and pedagogy is the learner's motivation. In pedagogy, the learner is motivated by extrinsic factors such as grades, teacher's approval or disapproval, and parental pressure. While it is true that adults can be motivated by external factors, the more powerful motivators, the ones that keep adults active in learning situations, are internal (Cross, 1981). The motivation for higher self-esteem, increased job satisfaction, and better quality of life all out weigh the external motivators such as job promotion, increased status, and higher salary (Knowles, 1991).

Knowles' six assumptions provide an adequate framework to begin the process of creating instruction. However, the process of facilitation of adult learners is also substantially different than that of teaching children. Without out effective facilitation, even the best designed programs are destined to fail. Just as Knowles (1991) laid out guidelines for creating instruction, Brookfield (1986) and Mezirow (1991) detail recommendations for facilitating the process of adult instruction.

As stated earlier, the primary outcome of any effective transactive experience is the transformation of the learner from a dependent state to a self-directed and independent state. In order for this process to take place, there are three assumptions that must understood by all members of the learning community (Brookfield, 1986). Adults will only truly participate in learning of their own volition. All members of a the community must respect each others' self worth. Finally, all members must participate; the environment must be one of collaboration. It is up to the facilitator to engage these assumptions in the most positive manner possible.

Brookfield (1986) also spells out six guiding principles which engender the learning encounters of the transactional process:

1. An appropriate philosophical orientation must guide the educational meeting.

2. The diversity of adult learners must be recognized and understood.
3. A conductive psychosocial climate for learning must be created.
4. Challenging teaching and learning interactions must occur.
5. Critical reflection and praxis must be fostered.
6. *Independence must be encouraged (p. 231).*

The first principle refers to the underlying belief system which underpins the instructional process. Of course this philosophy will be different from situation to situation. However, if the other five principles are examined, it becomes clear what sort of bent the belief system must have in order to be effective. Individuals need to be appropriately valued. Learning is viewed as a process and not a singular act. Perhaps most critically, the instructor facilitates learning and is not the center point of the encounter.

The second guiding principle ties in closely with Knowles' third assumption of difference between pedagogy and androgogy. It is essential to acknowledge the life experiences of the learners. Every adult has a wealth of information that is unique to themselves. This diversity must be recognized and valued by facilitators. The variety can even be used as a substantial benefit by giving the facilitator a wide range of expertise to tap at different times along the course of instruction.

The climate for the learning environment is also fundamental to the success of the adult educational experience. When presented with situation which does not fit their current system of learning, adults may suffer a disorienting dilemma (Mezirow, 1990). The dissonance created by the dilemma may make it difficult for learners to process information. However, it may move adults to voluntarily participate in new learning, or conversely, mandatory educational programs may bring about such a dilemmas. In any case, it is absolutely critical for the facilitator to create the safe environment which will make it possible for learners to move forward toward independent learning behavior and not regress into a mode of dependent learning behavior. When considering environmental tone, it is also important to address the dichotomy between thinking and feeling in learners. Learners often rationally know that learning is positive; however, learners also may simultaneously feel threatened by the task of learning. This conflict can also create disharmony which can interfere with the process of education, and, therefore, must be addressed when the facilitator is molding the instructional environmental tone.

Brookfield's (1986) fourth principle is true no matter what the nature of the learning is. All learners need the appropriate amount of challenge. This is so for adults and children alike. If there is not enough challenge, the tasks are dismissed as unmeaningful and little learning occurs. If the tasks are too difficult, the learners become frustrated and quit. Little learning occurs in this scenario as

well. Of course, the art of instruction is managing the level of difficulty. Particularly with the diverse nature of adult learners, this is a much more difficult activity than it is with children who can display general developmental cues which provide a framework for the level of challenge presented.

The fifth principle for effective practice is the application of the process of praxis. Brookfield (1986) defines praxis as a process in which:

"Learners and facilitators are involved in a continual process of activity, reflection upon activity, collaborative analysis of activity, new activity, further reflection and collaborative analysis, and so on" (p.10).

This process of critical reflection enables the learner understand his or her own learning style. When the learner not only understands the process of what is being learned, but the process by which the learner was able to learn it, it is possible to make the leap to independent learning. This double loop learning (Galbraith, 1991) is a crucial element in establishing a theoretically sound process for effectively facilitating the instruction of adults.

The final guiding principle may be the most important in that it reflects a larger goal (Brookfield, 1986). Independent learning is the most meaningful, motivating, and effective learning. Adults, by the vary definition of the word, display competence at independent behavior. However, when faced with an instructional situation, most adults revert to a dependent set of behaviors. This is

natural considering that the K-12 environment promotes dependent behaviors. Unfortunately, the conflict in adults between the independent and dependent behaviors in instructional environments represents a significant impediment to learning. In his third assumption, Knowles (1991), recommends that effective androgogical instruction build in components to resolve this conflict in self-concept. It falls to the facilitator to make this happen. Brookfield's (1986) fifth guiding principle, process praxis, is a key tool to help solve this discord.

Just as there is a discord in most adults between the dependent and independent learner, there is also a dichotomous split in the role of the facilitator of adult learning. It falls into the realm of the facilitator to establish and maintain the educational environment. One of the key roles of the facilitator is to validate the learners and reinforce positive behaviors. At the same time, the facilitator must also provide a significant and appropriate level of challenge for the learners. These two tasks can seem contradictory. However, there are three techniques that can be applied give positive focus to this issue. They are the instructor's ability to appropriately frame problems, challenge the norms of the learning group, and give appropriate feedback to the learning community (Galbraith, 1991). The ability to frame problems allows learners to get a handle on the issues involved without having the problem solved for them. This keeps the burden of thought on the learners and fosters independent behavior. By challenging the norms of the

learning community, the instructor does not confront individuals, but the group as a whole. This is less threatening. However, this is not to say that it is inappropriate to challenge individuals. This leads to giving feedback. Appropriate feedback, positive, constructive, or neutral, allows the learner to feel a sense of progress and context. However, feedback should be carefully monitored as to avoid reinforcing dependent learning styles.

Galbraith (1991) assigns five roles to facilitators of adult learners. They are developer of human capital, problem solver, change agent, designer, and empowerer. These roles fit well within the frame work of guiding principles and assumptions laid down by Brookfield (1986) and Knowles (1991) and need not be discussed further. However, what makes them worth mentioning is that they point to what is most essential in the educational process of adult learning: collaboration and negotiation.

The transactional process, as the name denotes, requires an exchange between facilitator and learner (Mezirow, 1991). The process of learning becomes a two-way street with both the facilitator and learner gaining new insights, and not simply a one-way street with the instructor disseminating knowledge and learners absorbing it. This process of exchange comes by means of negotiation and collaboration.

The ultimate implication of the negotiation and collaboration of learning process is a type of individualized instruction that is unheard of in the pedagogical paradigm. Once again, this type of individualized instruction is in accordance with Knowles' (1991) assumption on the differing levels of value place upon life experience between the androgogical and the pedagogical models. It falls to the facilitator to move the process which creates individualized instruction.

Each of the roles Brookfield (1986) details for the facilitator connotes the interactive aspect of the facilitation of adult learning. Once again, as the name suggests, the transactional process involves an exchange between the learner and the facilitator. The learner has qualities and experiences that must be drawn upon in order to configure and maintain a healthy community of learning. This collaborative component necessarily requires an appropriate psychosocial environment and the understood value that the facilitator and learning community as a whole place upon the diversity within a group.

Knowles (1991), Brookfield (1986), and Mezirow (1990) all agree that in the ideal educational community, the learners and the facilitator will negotiate the process of instruction. If learners are engaged in double loop learning coupled with process praxis, they should develop enough metaconative insight into their own learning style that they will know best what they need to learn and how best to learn it. According to Brookfield (1986), content should not be the only issue

open to negotiation. The entire scope of the learning process should be negotiated. This includes every thing from objectives, delivery style, formative assessments, and summative assessment. Of course, for this to happen, learners must have an independent self-concept in terms of learning. In this scenario, the role of the facilitator is overtly less active. However, even in this statement of the ideal, the role of the facilitator is not a simple or easy one.

In order to be effective, facilitators must have credibility within their learning community (Galbraith, 1991). It would be simple to misinterpret the emphasis on creating independent learners as passive behavior by the facilitator. However, even in the ideal case of working with truly independent learner, the facilitator's role is highly active and complex, and requires a highly trained and skilled professional. The facilitator must be highly versed in the theories of learning as so to add insights to the process of metacogintion for learners. Galbraith (1991) referred to this as being a developer of human capital. The facilitator must also be a superb listener and be able to anticipate, from listening, where the learner is going with his or her studies in order to lend appropriate assistance. This falls under the problem solver role (Galbraith, 1991). Creativity is also a critical trait in that much of the learning adults engage in is life centered. These life centered problems often have many different answers which depend greatly on perspective. The facilitator can help a learner see beyond his or her own

personal perspective to find a solution. In this sort of activity, the facilitator is functioning as the change agent. Finally, the facilitator must also be an expert at instructional design in order to create the widely divergent types of experiences that learners will require in order to attain their goals (Galbraith, 1991).

However, in most adult learning communities, much of the facilitator's energy will be spent attempting to move learners from a dependent personality in terms of education to an independent personality in regards to learning. This adds another level of complexity on to the task of facilitation. One of the potential pitfalls of moving learners from dependence to independence is the perception that the facilitator is not performing his or her job correctly. Often, dependent learners view the difference between the androgogical transactional process and the pedagogical model they had in K-12 school as the adult facilitator being lazy or unprepared. This perception comes straight from the heart of the dependent/independant learner conflict. As children, students were given information to learn. The learning was structured around curriculum content. Their role was for the most part passive. In the androgogical approach, the responsibility for learning is placed squarely on the learner. The learner's role is active. This shift in overt activity from instructor to learner can be viewed by arrested dependent adult learner as unprofessional behavior on the part of a facilitator. It is absolutely critical that the facilitator not under cut his or her own

credibility by not refuting this misconception. Therefore, this shift in activity must be openly discussed at the inception of the learning community in order to minimize the effect of such an impression.

During the course of instruction, there are many possible obstacles which may disrupt the learning. Two of the most common that afflict adult learners are transitional fluctuation and the impostor syndrome (Brookfield, 1986). It is critical that the facilitator understands the nature of these two problems, and how to resolve them.

Impostor syndrome is a term coined by Brookfield (1986), which refers to an initial internal condition with in the learner during the early part of the educational experience. Often times when learners are just beginning the process of expanding their boundaries, they feel as if they do not belong in the learning community. They may feel that the other members of the community are far more sophisticated in their development towards the learning goal. They may view fellow learners as much more capable and confident. These insecure feelings may stem from a dependent learning mind set. "Many of them seem to perceive themselves as inadequate impostors who wish to hide their inadequacies as best they can by seizing on cues tossed off by teachers about what behaviors are expected of students"(Brookfield, p. 41, 1986). Impostor syndrome can be dispelled by utilizing concepts from Knowles (1991) and Brookfield (1986).

Establishing a proper tone for the learning community will make it possible for learners to openly share and thus dissipate their feelings of inadequacy. Also, if the facilitator is able to recognize and value the different life experiences of each member of the community, this may break up the feelings of inferiority by bolstering each learners' self-concept. Clearly, if learners are to begin the journey toward independent learning, the impostor syndrome must be over come.

The second common affliction which adult learners may experience is transitional fluctuation (Brookfield, 1986). As learning occurs, the learner is assimilating new ways to view the world. Learners will not simply adopt these new points of view; it will happen incrementally. Brookfield (1986) uses the analogy of travel. Learners leave "home," their old belief system, for a short period of time then return "home." As the learning becomes more substantial, the learners stay away from "home" longer and longer. It is critical to remember that these belief systems are essential to how adults perceive themselves. As Knowles (1991) points out, adults tend to create their personal identity based upon their experience set. Therefore, this restructuring of belief is a disconcerting risk for learners. Until the new ideas are satisfactorily integrated with previous life experiences, learners will continue to return "home." This condition is a healthy part of the learning process and should not be rushed. Facilitators and learners who are unaware of how this process operates may view the phenomena as

regression or slippage which it is not. Transitional fluctuation has enormous implications for how facilitators go about the instructional design process. Learning of this sort is non-linear; therefore, curriculum and materials must be created in such a way to support this type of growth.

The assessment of the progress of adult learners and assessment of programs for adult learners are tasks closely linked to one another. As stated earlier, adult learners should pay the key role in assessing the success of their learning endeavor. Independent learning is a critical component of creating instruction for adults. Therefore, if learners are truly independent, it follows that the learner should be in the best position to determine how effective their experience was. Of course, this is a statement of the ideal. Not all learners will attain independence. Therefore, it falls to the facilitator to negotiate with the learner to develop the most appropriate assessment possible. Once again, it is critical that the process is individualized to promote the independent learning.

Learners should also play a key part in program assessment. The success of an adult learning program depends on what the focus of the program is. Criteria could be based upon the exit competence of the learners, the drop out rate of participants, or the exit comments of the learners. In the ideal situation, program assessment would be based upon the growth of the learners who participated.

Chapter Three

Conclusions and Recommendations

The first and most critical step when creating instruction for adult educational experiences is to choose a philosophy of learning that is most suited to the values of that organization. For the purpose of this paper, the assumption was made that the organization, a K-12 school district, believes all individuals can and must learn. This learning must be competency based.

Appropriate resources must be allocated to the task of technology staff development. A general rule states that approximately 30% of the total technology budget should be devoted exclusively to staff development. Not only should there be the appropriate amount of time for designers to create programs, but time should be allotted for staff to attend programs as well. The commitment of resources must be substantial, sincere, and serious.

The following recommendations are aimed at addressing Knowles' (1991) six assumptions of difference between androgogy and pedagogy. Make the learning purposeful and application oriented. The trick here is to merge technology into the day to day life of the school and make staff members dependent upon it. Technology should be incorporated in to the very essence of school culture. Staff should be unable to fulfill their job descriptions without the

use of technology. An example of this approach is to make attendance, announcements, grades and other administrative functions only accessible through the use of technology. Of course proper training and support must be given or this plan will backfire. However, the staff's dependence on technology will make the need for training very clear. Staff will plainly see the positive effects that training will provide as well as the negative consequences of not participating in the training.

It would appear on the surface that the first recommendation for professional development, the idea of making staff dependent on technology in a safe environment, is in direct conflict with the information presented in the examination of the differences in self-concept. This is not so. One strategy that can be used to overcome this friction is to give the learners a choice of whom they will work with to attain competence and a choice of how they will learn what is to be learned. This gives the learner a feeling of empowerment and self direction (McKinzie, 1994).

Knowles' (1991) third assumption dealing with the life experiences of adult learners has two approaches that can be used in a positive and non-threatening way. Due to the diverse nature of adult groups, it is important to let the learner have input in the process of instruction (Galbraith, 1991). As stated earlier, letting staff members choose their own path way to competence is important yet again.

This ability to choose allows a more individualized approach to instruction. This freedom to choose is absolutely essential for adult learners (Knowles, 1991).

A strategy that can be used to incorporate Knowles' (1991) fourth assumption regarding an adult's readiness to learn is the idea of tiered levels of competence in technology staff development. A training regimen could have multiple levels of competency built in that go from simple and more basic operations to more complex and interrelated performances. When goal setting is used in conjunction with this structure, a powerful motivator is put into play to advance readiness.

The adult learner's orientation to learning is the fifth factor outlined by Knowles (1991) that must be considered by program designers. Once again, a conflict can arise between the independent and dependent educational self-concept. One way to resolve this disturbance is to give learners a wide variety of choices to demonstrate competence. If the appropriate number of choices are available, learners will select the choice that is most comfortable to their learning style. Therefore, this will increase the chance that the learner will have the appropriate orientation to learning.

Effective staff development programs can also build in the appropriate motivation to learn, albeit in a somewhat artificial way. As stated in the first assumption, infusing technology so thoroughly into the school culture that staff

members will not be able to do their job's without using the technology. While this technique may seem contrived, it does place the learning in an authentic set of circumstances and it makes the learning task or problem centered.

These recommendations based upon Knowles (1991) observation about adult learning will only go so far to promote the use of technology within a school. These changes will set in place cosmetic changes in the daily business of the school. Unfortunately, most of the strategies listed will not make a significant impact on instruction or student achievement. In order for technology to make a real difference in the bottom line, educational organizations must undergo a philosophical change. Therefore, for the sake of this paper, here are more assumptions that a district needs to endorse in order to see growth based on technology.

The emphasis in the classrooms must change from teacher centered modes to student centered paradigms. Thinking and processing skills must be valued more than traditional curriculum content. Much like the major recommendation for adult learners, independent learning styles must be fostered over dependent learning styles.

To further set the stage, the optimal use of technology must be examined in order to ascertain the best method for creating instruction. Johnson (1996) gives three hierarchical uses of technology in education. The lowest level is

productivity. Word processing to create better handouts, using e-mail to communicate professionally, using databases and spreadsheets to track grades are all productivity uses for staff. These uses may make more efficient use of time and eventually lead to more sophisticated application of technology. However, productivity has little or no impact on student achievement or instructional prowess. The second layer of utilization is automated tasking (Johnson, 1996). Simulation software, drill and practice applications, and simple instructional programs comprise the middle level to the model. Once again, while these programs may make better use of teacher time or add enrichment to a curriculum, they do not make a substantial impact on instruction. At the top of the hierarchy is information processing uses of technology (Johnson, 1996). As the name of the utilization infers, technology is used in conjunction with higher order thinking or processing skills to create, analyze, synthesize, and evaluate information. Technologies that can be used for this end are word processors, databases, spreadsheets, presentation software, and many others. The key difference between information processing and productivity is the purpose of the utilization. Information processing requires a framework in place which necessarily engenders the use of technology as a higher order thinking tool. Once again, as the name of the use suggests, process skills are the meat of the instruction. A move must be made away from the teacher or text book as the sole disseminator of information. The process of learning must be valued over the content that is learned.

This is the real conflict for designers and facilitators of technology staff development. If such a shift is endorsed by the district, the primary change agent is technology staff development designer and facilitator. Teachers are not simply having something new added to their responsibilities, i.e., a computer on their desk to use for e-mail and grades, but rather a fundamental change is being promoted. Such a change threatens to invalidate a large amount of the personal experiences of teachers. This issue is at the heart of why schools do not change easily.

Even with this sizable dilemma placed upon a technology program designer and facilitator, there is a substantial advantage inherent in the domain of technology which makes change possible. It is a two fold technique. If the instruction is designed in accordance with the principles laid out by Knowles (1991) and Brookfield (1986), the program should give abundant choice in the style and structure for instruction making the greatest possible allowance for individual differences. It falls to the role of the facilitator to go "into the trenches" and make it work. However, the facilitator does have a distinct advantage, and it lies in the core of the transactional process.

Negotiation and collaboration are two of the essential elements in the transactional process. In other realms of instruction, one of the major problems with the process is creating authentic collaboration. There are times when a facilitator and learner may have little to exchange in terms of negotiation. This

makes a transaction very difficult to enact authentically. However, in technology, by its ever expanding nature, there is always new territory that can be collaboratively explored. This novelty can create interest and excitement in both learner and facilitator. It can add the necessary genuine synergy to the transactional process which makes it so effective and rewarding for all involved. This aspect must be exploited by the facilitator to engage effective staff development.

The recommendations up to this point have been broad and easy to generalize. However, there are several specific techniques that can be applied within an androgological transactional learning regime. These techniques, while still very general, will allow both technology instructional designers and facilitators to work with the "nuts and bolts" of the process. The techniques can be use separately, infused with one another, or run concurrently together. This eclectic mix can be tailored to many differing sets of learning styles.

Invitational Immersion is the process of infusing technology into existing curricular structures by use of a peer coaching model (McKinzie, 1994). A technologically competent trainer works to facilitate the use of technology into an existing unit of study with a less competent staff member. The teaching process is cooperative. The less technologically experienced staff member acting as the master of subject content, a role that should validate his or her personal

experiences, and the trainer acting as the technical help behind the scenes. This experience lasts six to eight sessions with the trainer slowly weaning the staff member from technical dependency. If done correctly, the utility of the technology should out-weigh the anxiety that it provokes (McKinzie, 1994). Obviously, this system relies heavily on the content experiences of the less technically skilled staff member, and it gives value to such experiences. This should validate the staff member's experience rather than ignoring it or devaluing it.

Contract learning as it applies to androgogy was developed by Knowles (1991). The contract is negotiated between the facilitator of the program and the learner. The learner is allowed, with the guidance of the facilitator, to set the content, the delivery style, the benchmarks for formative assessment, and the evidence of goal attainment performance. The form is written up in chart format listing the name of the learner, the subject or learning goals, resources and sources to be used, strategies and time frame for completion, and evidence of attainment (Knowles, 1991). The contract should not be totally binding, in that it should make allowances for collateral learning, and it should be renegotiated in order to refine goal statements. This technique supports the learner's independant self-concept, validates previous life experiences by allowing the learner to choose to build off his or her own interests, and promotes reflective thought or praxis thought discussion at the renegotiation meeting.

Inquiry teams or study groups are sets of individuals with common interests and learning styles that collaboratively gain expertise (Galbraith, 1991). As with all programs, participation in such a group should be voluntary. The structure for the team could be combined with the contract learning components to give the group more structure. Once again, as with learning contracts, the focus of the group is negotiated with the facilitator. There are on-going meetings for formative assessment purposes. The summative assessment is based upon a collaborative effort by the team and the facilitator. One of the benefits of this technique is that it builds a system of peer support for learners. Teams also appeal to a distinct set of learning styles. Inquiry teams can also concentrate expertise and make it easier for other members of the organization to get assistance.

Mentoring is one of the oldest instructional strategies in existence. Yet, it is still highly effective. The mentoring technique consists of a mentor, a more experienced individual, and a protégé, with less experience. While this is a time proven method of effective instruction, it still needs substantial structure to be successful. Again, the contract format could be infused here as well. However, it is important to realize from both the design and facilitation perspective that both the mentor and protégé are taking risk to enter the relationship. This risk needs to thoroughly discussed by all parties involved (Galbraith, 1991).

The final technique applies more to group activities, but is also appropriate in small group or individualized settings. When new learning is enacted, it is critical to put up front information from the learners and the facilitator on rational thought about the learning experience and affective feelings about the learning experience. Many times a learner will rationally acknowledge the value of learning. At the same time, they may have very negative feelings about going through the process of learning. Understandably, these feelings can get in the way of learning. By being open, and discussing these issues the facilitator may be able to move aside resistance to learning by going straight to the core of the issue: the learner's fear. The tone of the educational community is essential for success. Learners must feel comfortable and safe enough to genuinely share these feelings. The bulk of the responsibility for this task is with the facilitator. However, as in any instructional situation, if the activity is designed into the instruction, it probably will not happen. So, the designer must be aware of this as well.

The design and facilitation of K-12 technology staff development based upon effective practice research for adult learners is a highly complex task. The designer and facilitator must be somewhat knowledgeable in the field of instructional use of technology. However, the more important skill set involves instructional design and background on adult learning theory. These two components will likely stay constant while the technology information will change

very quickly. Ultimately, if technology is to live up to its promised instructional potential, it will be the designers and facilitators of technology staff development that make it happen.

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