

TVET Teacher Education: A Vision Beyond Tradition

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Abstract

This paper identifies some basic information about brain based learning, which includes some technical information presented in terms that all may understand. Two major psychological notions, which underpin all we know about the teaching and learning process, will be identified and described. Further, this paper will focus upon best practice strategies that have been identified in the research on student achievement and will provide specific suggestions on how to implement them. It will demonstrate why the vocational education model is the premier educational delivery system for all of education and will aid in the developing of a vision beyond tradition.

Keywords: Student achievement, brain-based learning, educational delivery system, education models

Introduction

Recent research on brain development has had a profound effect upon how we approach teaching and learning in education throughout the world. Longstanding strategies for vocational and technical education and training (TVET) have now found their way into mainstream approaches to improve learning in all kinds of settings. However, as we consider the preparation of teachers for the next generation, we can no longer rely simply on technical mastery of their content areas but must help them understand the importance of engaging students in ways that respond to what we have learned about how the brain develops and functions. For example, the need to connect abstract ideas to real things during adolescence emphasizes the need for environments that have students actively engaged in their own learning. In addition, the need for students to attain academic skills must be a part of the program or TVET will be marginalized or even dismissed as an approach to education.

Brain Based Learning

The largest portion of the brain is the covering on the top: a quarter-inch thick blanket called the cerebral cortex. The cerebral cortex of each hemisphere of the brain is divided into four lobes. The occipital lobe at the back controls vision. Forward from the occipital lobe is the parietal lobe, which regulates touch, pain and other body senses, and our perception of our body's location relative to the environment. The parietal lobe is also important for directing our attention to what is most important in our surroundings. Above our ears is the temporal lobe, which lets us hear and understand speech, and helps us remember what we have heard. It also controls our ability to recognize faces and do other complex visual tasks. The frontal lobe is the part of the brain that sets goals and plans how to reach them. It is where our creativity lies, and it is critical for temporary memories (Eshel, 2007).

Deep inside the brain is the amygdala and hippocampus. The amygdala is in charge of our emotions, especially fear and anger. It helps us escape from danger or attack whatever is threatening us. Meanwhile, the hippocampus stores facts and transfers them to long-term memory (Eshel, 2007).

This information is fundamental to the position that the Vocational Education model is the premier educational delivery system. Research in a number of fields like Neuroscience has provided some insights into how people learn that heretofore were assumed by many in vocational education but not necessarily valued by others outside the profession. In effect, the research has found that the more parts of the brain we use in any given circumstance, the better we are able to learn. We have philosophically been committed to such ideas as the Problem Solving Approach to teaching and learning, which includes a heavy dose of "hands on" types of activities. The need to have students become motivated to learn something and to be physically, as well as intellectually engaged, have been at the core of our instructional efforts.

The early writers and thinkers in American Education were heavily influenced by John Dewey. The pragmatism of his approach to teaching and learning seems to have resonated with those early builders of vocational programs and so we have philosophically been driven by the need to connect with students in as many ways as possible. Thus, we

have historically been much more learner centered in our efforts than perhaps many other fields in education. We have generally seen content as the vehicle to apply our learning as opposed to being the end product itself. Now that the science of the brain is unfolding, we are learning that our philosophical roots have the support of science as well.

So, as we move from the classroom view to the program view, we find that as we connect students to their environment by utilizing tactics that engage them more broadly than just in the classroom and, that helps them find meaning in what it is they are learning, is much more likely to succeed. While we intuitively and philosophically have believed this, we now have the added presence of a body of scientific research on the brain that helps explain why this is so.

Psychological Principles

Two major psychological principles appear to underpin all we know about teaching and learning. They are the Pygmalion Effect, or the self-fulfilling prophecy, and the development of students' self-image. These two notions should be considered in all teacher education programs because of their pervasive influence.

The Pygmalion Effect is the tendency for people to live up to, or down to, what others expect of them. In a study conducted by Rosenthal and Jacobson (Eshel, 2007), the researchers convinced a number of primary school teachers that The Harvard Test of Inflected Acquisition could predict which students were about to experience a sudden burst in learning without any extra effort on the teachers' part. After this test was administered, one fifth of the students' names were selected at random and given to the teachers as representing the "educational bloomers" identified by the test.

After eight months, the students were tested again revealing that the identified students had actually "bloomed" by gaining an average of four IQ points above the control group. The researchers concluded that the difference in test scores was the result of the teachers' perceptions and expectations for the 'identified' students, thereby illustrating the Pygmalion Effect, or self-fulfilling prophecy. Although Rosenthal's study has been challenged for methodological issues, Bamburg (Rosenthal & Jacobson, 1968), Good and Brophy (Bamburg, 1994), Omatani (Good & Brophy, 2008), Patriarca (Omotani, 1996), and Purkey (Patriarca, 1986) have reported similar findings.

Self-concept is the second psychological idea that impacts adult learning. How learners perceive themselves influences their behavior as well as their achievement. If students view themselves as productive, valuable, and worthwhile, their behavior tends to reflect those beliefs. On the other hand, if students perceive themselves as lazy, incapable, and dumb, their actions will reflect this attitude as well. Purkey (2007) suggests that a student's self-concept may be as strong an indicator of academic success, if not stronger, than any other variable.

Research on self-image reflects that people who feel "different" tend to have lower self-esteem (Purkey, 2007). In a research study conducted with vocational programs in Ohio (Purkey, 2007), nontraditional students often had more negative self-concepts. The traditional students lacked confidence, but the "different" students often felt incompetent. Self-concept has a major impact on students' performance and whether or not they elect to

continue in their chosen educational programs. In addition to achievement, retention can also be better understood through knowing the impact of self-concept.

These two psychological concepts begin to highlight the cyclical nature of their relationship. In other words, how learners feel about themselves influences how teachers respond to them, and in turn, how teachers respond to students, influences how students feel about themselves. This cycle can be repeated in either a positive or a negative way. Any teacher who has worked with the younger brother or sister of a “superstar” or an “outlaw” has observed this process at work.

Strategies for Implementation

The following seven strategies have grown out of the literature related to student achievement and teaching effectiveness. For teacher education programs to truly be successful, they will need to pay attention to the research and, not only use these strategies themselves but also teach prospective teachers about them and how to implement them.

The first strategy is to provide an environment in which students feel important, invited, and have a sense of belonging. Research indicates that successful corporations consider their clientele important, treat them with respect, listen to them, and respond to their suggestions (Knight, Henderson & Ries, 1980), (Deal & Kennedy, 1982), (O’Hara, 1994), (Peters & Waterman, 1982). Our observations suggest that educational institutions often treat their clientele, the students, impersonally.

Purkey (2007) found that elementary students perceived themselves as being “invited” or “disinvited” by the way the teacher treated them as they entered the classroom. If the teacher greeted them pleasantly, they felt invited. If, however, the teacher greeted them with a frown or other negative behavior, they felt disinvited. Test scores and other variables indicated that the two groups did not differ in academic ability, but in the teachers’ perceptions of their ability. When asked a question they could not answer, the invited students were given an average of three seconds to respond before the teachers gave clues, restated the questions, redirected the questions, or answered the questions. On the other hand, the disinvited students, who were just as capable, were given an average of .9 of a second to respond to questions they could not answer before the teachers offered assistance. Over time the disinvited student performance is negatively impacted by these behaviors. The most common motive offered by teachers for this behavior is a noble one. Knight & Henderson (1980) refers to this as an “unintentional, well-intended behavior (UWIB).” Teachers want to save the students from embarrassment. However, the teacher’s preconception that a student is unable to answer a question communicates to the student, and the remainder of the class, that the student is dumb, the teacher does not like them, or that they are disinvited.

It is recommended that teachers who want to make learners feel important and invited visit lower elementary classes (K-3) to observe and experience the inviting and pleasant nature of those classrooms. The observer should note the warmth of the colors, the methods of evaluation, and the voice tones—all methods to make students feel important and invited. By giving appropriate responsibility, by listening, and by valuing each individual, teachers send positive signals to the students and ensure a feeling of belonging.

The second strategy is to deal with needed changes in students from a positive point of view. Rosenshine & Furst (1971) found that positive reinforcement and appropriate praise were both positively correlated with student achievement at all levels of education, while criticism was negatively correlated. These findings suggest that to promote student achievement and learning, teachers should use positive approaches in their interactions with students and in the process of student evaluation. In other words, teachers should be looking for what is right and not what is wrong (Purkey & Novak, 2007), Rosenshine & Furst (1971) and Peters & Austin (1985). When grading papers, for example, teachers should consider checking the correct responses and adding points rather than checking incorrect responses and subtracting points.

Further, Goodlad (1984) found that a relatively small amount of time is generally spent by teachers in K-12 classrooms in positive behaviors toward students. Dunkin and Biddle (1984) suggest that people are more influenced by negative information about others than they are by positive. Teachers will have to consciously and overtly work to change their behavior if this particular strategy is to be effective.

The third strategy is to learn the power of nonverbal cues and have a sense of humor. Galloway (1974) indicates that approximately 70 percent of what some people learn comes through their eyes, not their ears. A smile, a nod, a wink, and/or a pat on the back have tremendous power related to the learning environment. The use of space, the physical arrangement of the classrooms, the tone of voice, gestures, and even dress send powerful messages concerning how teachers feel about themselves, the students, the educational environment, and their work (Robinson, 1995). "Actions speak louder than words" is an often-heard cliché that appears to be true. Many teachers offer few positive nonverbal cues.

Often a sense of humor is closely associated with the nonverbal cues that are sent. The ability to laugh and enjoy whatever situations may arise is a trait valued by students. Being able to find humor in circumstances that might otherwise challenge a teacher, especially if the "joke" is on the teacher, is a rare and valuable commodity. Work done in the areas of education, medicine, and business universally supports the value of humor in interpersonal interaction (Millard, 1999).

Getting to know students personally and learning to empathize is the fourth strategy. As teachers deal with students, a personal knowledge and ability to empathize will go a long way in helping the students become successful (Amada, 1994). One of the most effective ways to develop positive relationships with learners is to make home visits. Vocational programs in the U.S. have used home visits for many years as a mechanism to work with students in supervision of project work. However, any teacher who has had much experience with home visits will note the advantages of knowing the students' home situations, their families, and their cultural backgrounds. To the teacher, this kind of knowledge is extremely valuable to aid in understanding student behavior and performance. For the student, the personal interest expressed by the teacher is a strong signal of the value the teacher places upon the student. Home visits are being adopted by many schools as a way of doing business for all teachers (Frymier et. al, 1994). For those who do not make home visits, other means can be found to accomplish this purpose. For example, instructors can have office visits with their students as part of the course requirement. This

will provide an opportunity for the teacher and student to learn more about each other and develop a trusting relationship.

The significant points of this strategy are that instructors have to exert extra effort and interact outside the classroom to gain personal knowledge of each learner. If teachers want more productive behavior and improved self-concepts from students, a personal interest driven by a desire to empathize should be developed.

The fifth strategy is to establish parameters (expectations of behaviors, goals for instruction, etc.). Research on learning indicates that clarity, task orientation, time on task, letting students learn the criterion material, and structuring are all positively correlated with learning (Amada, 1994) and Frymier et. al (1994). Note how each of these variables is related to the established boundaries present in a lesson, classroom, or educational institution. Most people have a need for some form of structure. This structure need not be physical, like a wall, although that often helps, but it must be psychological.

Research in schools indicates that students learn more in an environment that clearly provides physical and psychological boundaries (Alexander, 1994). This is important for all learners since they often come from different environments or backgrounds and may not know or understand the implied rules of behavior. By making the expectations and boundaries of behavior and performance clear and explicit, all students will benefit.

Using student-centered instruction is the sixth strategy to be suggested. Students learn more when they inquire into, as opposed to being instructed in. When instruction is student-centered, the focus is on the individual learner first and on the lesson to be taught, second. Methods and materials that are student-centered provide variability (change of pace) which is positively correlated with learning (Wayson, 1984).

Problem solving, by definition and design, is a student-centered approach to learning. Perhaps the most important skill a teacher can teach is the ability to solve problems. As students learn how to solve problems their confidence in their own ability rises. Thus, a student-centered approach has the additional benefit of enhancing student self-esteem. Herein lies one of the major traps of the current push to add "rigor" to curriculum. To move from being student-centered to subject matter-centered, especially impacts students who are "different" since nontraditional students' self-concepts tend to be less positive in relation to the content of a given course (Rosenshine & Furst, 1971). Since many vocational education learners are "different," they are particularly vulnerable to the increased pressures for academic achievement.

The seventh strategy is to be enthusiastic about teaching. Rosenshine and Furst (1971) indicate that instructor enthusiasm is among the most highly correlated variables of student achievement. Enthusiasm can be defined in a number of ways, but certainly the idea of passion for the subject matter and caring for the students on the part of the teacher are significant to this definition. Teachers tend to be most enthusiastic about what they know best. As one becomes more knowledgeable about a particular subject, it is more likely that the level of enthusiasm for the content will rise. If teachers possess knowledge and enthusiasm towards their students, then they are more likely to "connect" with their students.

Students rate teachers as more enthusiastic when they ask a lot of questions, show commitment to tasks, behave as though what they are teaching is important, and show

care and concern (Knight, Henderson & Reis, 1980). However, teaching in schools has sometimes been described as lifeless (Knight, Henderson & Reis, 1980) and Rosenshine & Furst, 1971). What our classrooms need for all kinds of students is a good healthy shot of enthusiasm. As teacher enthusiasm rises, student performance and self-esteem tend to go with it.

TVET Model

The model for TVET has evolved over time in the U. S. and some of that history illuminates the directions that current programs will want to consider. Figure 1 illustrates “Determinates of Excellence in Vocational Education” since the 1900s [39]. Specifically, the chart highlights overtime what attributes (i.e., basic competencies [or academics], job specific skills, or economic development) were associated with good and effective vocational education programs. At the turn of the last century, education in the public schools was boring, mostly memorization of facts and regurgitation of those facts on tests. However, most young people didn’t complete grade school education, much less high school. Regardless, education was becoming more important in the United States and there were numerous outcries for educational reform from all sectors of society.

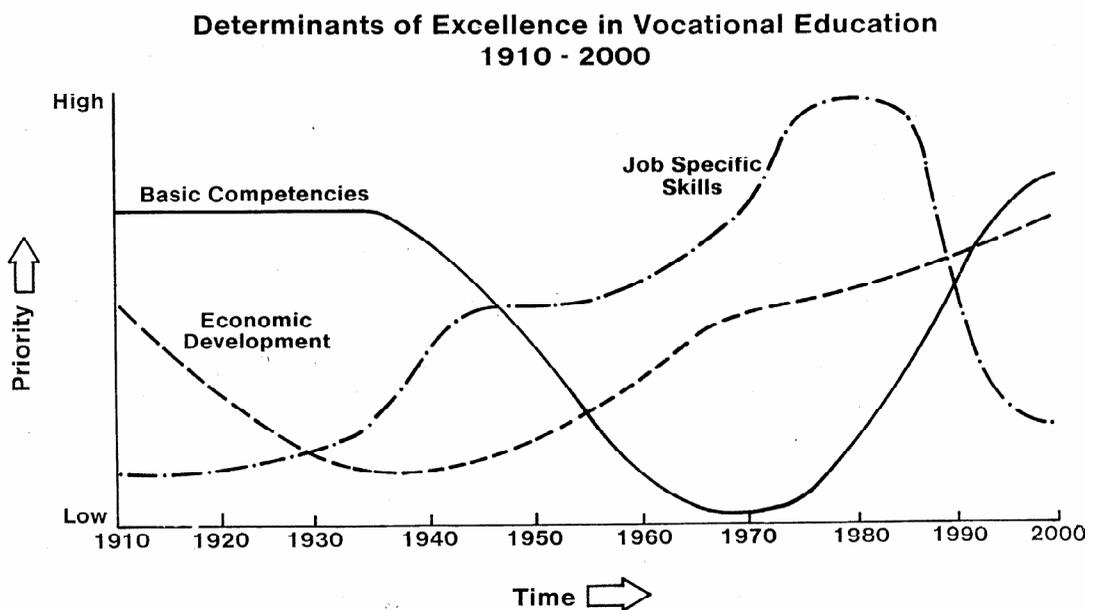


Figure 1. From the National Assessment of Vocational Education by Stuart Rosenfeld, 1988

Rufus Stimson, at that time President of the Connecticut Agricultural College (now the University of Connecticut), quit his job to become a high school teacher. He did so to test his theory of education which was to see if academics could be learned better in an applied setting. His high school students in Northampton, Massachusetts came from an agrarian countryside with hundreds of unanswered questions about their farms. Professor Stimson

used this natural curiosity in his classes and fine tuned the problem solving approach to teaching, which became the beginnings of vocational education and was the impetus for including experiential education activities within vocational legislation.

The important point of this era was that good and effective vocational education programs were reinforcing academics through applied and relevant activities.

This interesting and usually forgotten vocational education origin is the essence of being a premier educational delivery system. Table 1 identifies, from research, various educational and developmental delivery systems and their relationship with effective education. For this paper, effective education is defined as a delivery system that focuses on retention of content and skills by addressing the learning styles of all students, in every class everyday. As clearly shown in Figure 2, vocational education is poised to be the best or premier educational delivery system in the country. The chart emphasizes the relationships among vocational education and other well known educational and developmental efforts. What went wrong? Why is vocational education often left out of discussions about improving our educational situation? Looking back at Figure 1 and the era that began in the 30s gives us that answer.

Table 1: Educational and Developmental Delivery System

Delivery Efforts	Content	Application	Motivation
Vocational Education	Technical Instruction (Classroom)	Experiential Development (Laboratory & Work Based Learning including educational home visits)	Personal & Leadership Development [Intra-curricular] (CTE Student Organization)
Domains of Learning	Cognitive	Psychomotor	Affective
7-Habits of Highly Effective People, Stephen R. Covey	Knowledge	Skill	Desire
Center for Occupational Research & Development (CORD)	Academics	Skill Building Hands-on	Character Building
National Governor's Association Educational Plan	Rigor	Relevance	Relationship
Academic Class	Content Delivered	Not Applicable Usually	Not Applicable Usually

Because of the World Wars and the country coming out of the depression, funds were tight and early vocational education leaders marketed "voc ed" as the answer to improving economic development by training people for specific jobs in the workplace. As the chart

shows, “job specific skills” became the dominant attribute of the time and slowly academics became non-existent in our delivery system. In fact, the non-emphasis on academics became so pervasive that during the time when most of our current legislators, administrators, and voters came through high school in the 60s, 70s and early 80s vocational education was, in many cases, viewed as the dumping ground and oftentimes regarded as the equivalent of special education. This phenomenon is why many people today still view vocational education as a place for other people’s children. Many vocational education articles of that era centered on looking to vocational education graduates as a first choice for new employees but many of them lacked the basic competencies that were also needed in the workplace. It was also during these three decades that many university vocational teacher education departments were downsized and eliminated because the tie to academics and scholarship was forgotten. Our emphasis on our product, a trained student, and not our original comprehensive educational process evolved us into an educational delivery system that was not even mentioned in “A Nation at Risk” (Sizer, 1984).

The vocational education world was in an uproar in the 80s because of the educational reform movements that were spawned because of the emergency situation within our public schools that was emphasized in “A Nation at Risk.” The crossing of lines in Figure 1 in the 90s shows that vocational educators received the message that unless they change, they will not even be considered as a viable component in today’s educational world. A return to the past was prominent throughout the country. Research began documenting the positive academic effects of vocational education graduates. Workshops centered on integrating academics within vocational programs. A dual emphasis on graduates emerged, one that touted entering the workforce and continuing education. The more the educational community questioned the value of vocational education, the more it became apparent that the new “voc ed,” now called Career and Technical Education (CTE) was actually more relevant today than ever. In the turbulent educational reform world, other educational delivery systems have mirrored CTE, focusing on rigor, relevance and relationships. The ultimate irony is that we have had the best and most effective teaching strategies since our beginnings, but because of what we emphasized as “Determinants of Excellence” throughout our history, we have a ways to go to get others to believe that CTE has a place in today’s educational settings for all students.

Conclusion

As previously noted, Vocational Education has focused on preparing students for the world of work. Often that vision has been too narrowly defined and has created a “second class” education because it was so limited in its vision. It became viewed as education for those unable to pursue the professions and higher education. More recently, the recognition that technical content can be a tremendous vehicle for developing the academic skills, which will be needed in a more advanced technological world, has come to light.

In reviewing what we know about the physiology of the brain, educational psychology, and the research on student achievement and teaching effectiveness, we are drawn to the importance of teaching the whole person in our programs. We are left to consider the bold assertion that Career and Technical Education (Vocational Education) is the premier

educational delivery system in the world. It addresses all learning styles by employing pedagogical strategies that embrace all of the multiple intelligence areas and incorporates the latest in brain-based research. In summary, Career and Technical Education employs the best teaching strategies to reach all students, in all classes, everyday, if learning and retention is the desired outcome. To make this so, we must have a vision beyond tradition.

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