Autonomy and the State of Flow: Enhanced Learning in Technical Education

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Abstract

Educational researchers have neglected the field of technical education due to the fact that it lacked support and solidarity until the mid-1990's. This literature review demonstrates the importance of investigating the psychological constructs of flow and autonomy in the context of career technical education (CTE) by highlighting recent psychological findings on the topics in similar areas. The majority of the research that is discussed took place within the last five years. The review focuses on research that has been conducted on flow and autonomy in education and in the workplace in order to highlight the relevance of studying these concepts in the context of CTE. After providing evidence for the importance of researching these subjects in a CTE setting, the implications of the research are discussed.

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A recent article presented on the Florida Department of Education website noted that "while the total number of jobs in America had grown by 63 million [since 1973], the number of jobs held by people with no post-secondary education had actually fallen by some 2 million" (Pathways to Prosperity Project, 2011, p. 2). These statistics indicate that while it has become more difficult to find a job that requires little to no skill, there is still a large demand for employees who have skills and knowledge that relate to their particular line of work. Career technical education (CTE) provides students with the training that they need to attain the jobs that are available. These centers encourage students to get the certifications that they'll need to go into their desired field of employment, which could range from automotive mechanics to culinary art to multimedia design. Instructors in these facilities focus heavily on teaching students about the daily functions of their future jobs and on helping students develop the skills that local employers will be looking for.

So why isn't there a heavier focus on technical education in the United States? Universities and community colleges are better established in the United States, and as a result they tend to be the institutions that students are drawn to for education after high school. While the concept of technical education (formerly known as the industrial education) has been present in the United States since the early 1900s, it lost a large amount of its supporters during the Great Depression when the focus of education turned back to the concept of "classical learning". The United States Department of Education maintained classic education as its focus for several decades, and while vocational education garnered some support in the mid-1970s, the purpose of the field itself was poorly defined. It wasn't until the mid-1990s that the field of vocational and career technical education managed to regain a respected place in American academia (Foster,

1997). As a result, technical education in the United States has not accumulated the same amount of psychological research as its educational counterparts in secondary and post-secondary education. This review centers on the importance of studying two specific psychological constructs - autonomy and flow – that lack empirical research in the context of technical education. These constructs have been demonstrated to enhance psychological health and well-being in similar domains, yet they have not been studied specifically in the context of technical education.

There are two research problems that I would like to propose. First, we need demonstrate the significance of autonomy and flow in settings that are similar to technical education. Second, we need to provide evidence that the study of these psychological constructs could have a positive impact on the field of technical education. By conducting a literature review on the studies that are available on these subjects, I hope to demonstrate that further research in the areas of autonomy and the state of flow in adult education would be beneficial. Furthermore, since these constructs have been sparsely investigated in the field of technical education in the United States, I believe that an in-depth literature review that covers past research on these variables in similar contexts (i.e. the workplace and education) would provide a solid foundation for future psychological studies.

**The Relevance of Flow**

Flow theory has generated a large amount of research over the past few decades. It was first proposed by Csikszentmihalyi in the 1970s, and it is especially popular in the realm of organizational psychology. The model states that "when challenges are balanced by skills, attention is channeled from stimuli unrelated to the task at hand (e.g. self-focus; monitoring time; etc.) to the task itself" (Abuhamdeh & Csikszentmihalyi, 2011, p. 258). Individuals who are

engaged in a state of flow are able to channel a large amount of their mental energy into the particular area that they are focusing on, and many positive psychological effects have been associated with this state. For example, research has found a positive correlation between the state of flow and heightened levels of creativity and achievement (Hamilton, 2013; Baumann & Scheffer, 2011). The findings on the flow model have positive implications in many contexts – particularly in higher education and in the workplace, where achievement is highly valued.

Research on flow that is particularly relevant to CTE was conducted with a sample of higher education students. Fullagar and Mills (2008) examined the relationship between flow and motivation with a large sample of architecture students from his university. He found a significant correlation between self-determined intrinsic motivation and flow, but no correlation to extrinsic motivation. Students who were self-motivated in that they studied architecture because they found pleasure and enjoyment in the subject rather than studying it in order to enter a high-paying career were more likely to enter a flow state while studying. Similar results have also been found in the context of business classrooms, where flow has been linked to concentration and self-control (Guo, 2008).

It's important to note that much of the time that students spend in a state of flow is due to situational rather than dispositional factors, suggesting that an instructor could have a partial influence over the amount of time that their students spend in a flow state (Fullagar & Kelloway, 2009). If research on flow in technical education yielded similar results, we could provide instructors with classroom management strategies that encourage the flow state. The state of flow has a positive effect on students in higher education – an effect that could potentially carry over into technical education. However, since technical education places a heavy emphasis on

learning skills that can be directly applied to students' future work environment, research on flow in the context of the workplace also warrants examination.

Research has demonstrated that the flow state influences several important factors in the workplace, including worker well-being and performance (Smith, Bryan, & Vodanovich, 2012). As mentioned before, it also has a positive correlation with achievement – a subject that has heavy implications for employers and managers in large corporations (Baumann & Scheffer, 2011). Employees with a high need for achievement tend to seek out challenge, making them more likely to enter a state of flow in the workplace. Flow has been related to employee satisfaction, task interest, and performance among employees with a high need for achievement (Eisenberger, Jones, Stinglhamber, Shanock, & Randall, 2005). A connection between flow and well-being has also been found in research on higher education, indicating that this effect could exist in multiple contexts (Fullagar & Kelloway, 2009).

### The Relevance of Autonomy

Autonomy has been the subject of much research and, as a result, the definition of the term has become somewhat contextual, varying from article to article based on the nature of the research that it is applied to. For the purpose of this article, we will be referring to autonomy as it is defined in Ryan and Deci's self-determination model: the amount of independence that is perceived by an individual. According to this model, there are three psychological needs – autonomy, relatedness, and competence – which can yield high levels of motivation and satisfaction (Ryan & Deci, 2000). The self-determination model is supported by a large body of empirical psychological research in several contexts, including education and the workplace (Van Nuland, Taris, Boekaerts, & Martens, 2012; Reeve, Deci, & Ryan, 2004). While the self-determination model studies these three psychological needs together, it also examines the

influence of each individual need on motivation and satisfaction.  The research discussed in the following section has been drawn both from articles that focus solely on autonomy and from articles that study autonomy along with other elements from the self-determination theory.

Recently, a study that was particularly relevant to CTE found that pre-vocational secondary students experience less intrinsic motivation during tasks with a high perceived autonomy (Van Nuland, Taris, Boekaerts, & Martens, 2012).  Furthermore, this experiment indicated that test scores are not influenced by intrinsic motivation.  These findings contradict Ryan and Deci's self-determination model, which suggests that higher amounts of autonomy can strengthen intrinsic motivation (Ryan & Deci, 2000).  The authors speculate that these contradictions may stem from students having lower levels of interest in tasks that are familiar (tasks where they have more experience and, therefore, greater levels of autonomy), but they acknowledge that this is only a tentative conclusion (Van Nuland, Taris, Boekaerts, & Martens, 2012).  A comprehensive review of existing literature found that instructors' support of student autonomy facilitate students' psychological well-being and academic performance.  However, instead of focusing on one particular population it covered research on a diverse number of age groups, from elementary to college-aged students (Ryan & Niemiec, 2009).  Black and Deci (2000) also examined in the context of higher education, and found that students who reported entering a course for autonomous rather than controlled reasons experienced higher levels of enjoyment and perceived competence throughout the duration of the course.

The vast majority of the research on autonomy in the workplace indicates that higher levels of autonomy at work are beneficial.  A direct link has been found between workplace autonomy and positive variables such as employee satisfaction and psychological health (Carr &

Mellizo, 2013; Hardre & Reeve, 2009; Moreau & Mageau, 2012).   A solid amount of empirical

research has been conducted regarding managerial support of autonomy, and it's been found that

managers can facilitate higher levels of motivation and a more positive social climate in the

workplace when autonomous types of motivation are supported (Gagné, Senecal, & Koestner,

1997; Carr & Mellizo, 2013).   Managers can promote autonomous types of motivation by

nurturing their employees' inner motivational resources, such as their perceived confidence and

the value that they place in their work (Reeve, Deci, & Ryan, 2004).   I believe that instructors in

technical education could strengthen the academic values of their students by employing many of

the same techniques.

**Discussion**

The United States is lagging behind in technical education research.   Much of the

research on flow and autonomy in technical education takes place in Western European

countries.   While this research could provide valuable insights for future research, it is less likely

to be applicable to the students in our nation.   Technical education has been present in the United

States in various forms since the early 1900s, but it lost a significant amount of support in the

1950s when our nation's educational focus shifted to a more "classic" style of learning.   As a

result of its lack of popularity, it was a relatively neglected area of psychological research for

several decades.   There has been an increase in interest and research in career technical education

since its resurgence in the mid-1990s, but there is still a need for strong empirical research

involving this population of students.   Autonomy and the flow model have demonstrated value in

similar contexts, and based on the evidence provided, they are promising areas of future research

in a CTE setting.

When students and employees achieve a state of flow or a high sense of autonomy in their environment, they experience positive psychological effects that contribute to their overall well-being (Ryan & Deci, 2000; Ryan & Niemiec, 2009; Fullagar & Kelloway, 2009). However, flow and autonomy have never been examined in the field of career technical education. Evidence supports the idea that instructors in other educational contexts can have a partial influence over the amount of time that their students spend in a flow state, and that managers can have a positive influence over the autonomous motivation that is experienced by their employees (Fullagar & Kelloway, 2009; Carr & Mellizo, 2013). Potentially, research on flow and autonomy could yield instructional strategies that could improve technical students' intrinsic motivation, satisfaction, and achievement. These effects have been demonstrated in similar contexts – the workplace, secondary school, and higher educational environments.

While technical education is very different from our more traditional forms of education, it holds a great amount of value for students transitioning from education into the working world. The purpose of technical education is to educate students with skills that can be directly applied to their future workplace. As a result, instructors in this area of education should try to enhance autonomous motivation and facilitate states of flow in a classroom environment, since this could lead to long-term benefits both in their education and in the workplace.

## Methodological Issues and Directions for Further Research

A large amount of psychological research comes from higher educational institutions. Much of this research has been criticized due to the fact that the participants mainly consist of students attending the university where the research takes place. Students are often convinced to participate in these studies via extrinsic rewards (extra credit from their professors, monetary

rewards, etc.).  However, the students who pursue higher education are often similar in age to the students that pursue technical education.  They both seek a common goal – to gain the knowledge that they need to enter their desired field of employment.  While research that is only conducted on a particular group can only apply fully to that group (e.g. architect students, business students, and so forth), research findings that occurred within those groups could reveal valuable areas of future research that could be conducted on similar populations.

Another methodological issue with the literature exists in the large-spanning literature reviews that focus on one topic in several diverse populations.  While this could potentially lead to insights on how certain psychological constructs might influence a more general population, the authors of these literature reviews need to clearly differentiate the findings from the different groups.  For example, the literature review conducted by Ryan and Niemiec (2009) examined research on autonomy, competence, and relatedness in a wide variety of classrooms.  The research that they discussed spanned from elementary-level instruction to higher education classrooms, but the review itself failed to organize the research by the populations that were being studied.  Research involving autonomy in primary school was discussed in the same paragraph as research that examined autonomy in the context of post-secondary education. When a literature review involves research from a wide variety of populations, authors should carefully divide the research that they are reviewing based on population and discuss the variations that might occur in a psychological construct based on the demographics of the group that is being examined.

The field of career technical education has experienced rapid growth over the last decade, yet there are still gaps in research on psychological models and constructs that have been the subject of much study in populations that are more historically established in psychological

research.  Technical education encompasses a large and diverse number of disciplines ranging

from truck driving to multimedia technology.  As a result, future research should either focus on

one specific area of discipline (i.e., automotive programs or programs that focus primarily on

psychomotor skills) or on the field of CTE as a whole with the acknowledgement that there will

most likely be significant variations within the field.

Autonomy and flow have garnered a large amount of empirical support in similar

educational domains, and as such they would be a promising area of research in technical

education.  Research on the effects that these psychological constructs have in a CTE classroom

could potentially provide instructors with new strategies in classroom management that would

enhance their students' intrinsic motivation, satisfaction, and psychological health.  Since

autonomy and intrinsic motivation have been consistently linked together in research, there

would be value in studying these variables in a CTE setting.  Another beneficial area of future

research lies in the other variables in the self-determination model – relatedness and competence.

These variables have also been consistently linked with higher levels of intrinsic motivation,

which leads to a number of positive psychological effects including satisfaction and feelings of

empowerment (Gagné, Senecal, & Koestner, 1997).

Another promising area of future research is the triarchtic theory of intelligence – a

higher order thinking theory that could yield interesting results in the CTE context.  The

triarchtic theory of intelligence proposes that there are three important areas of intelligence -

analytical, creative, and practical.  It argues that our educational system focuses heavily on

analytical intelligence, while all three areas of intelligence are necessary to be successful in the

workplace and in other facets of everyday life.   Students in our culture are often taught to think

in a manner that is taxonomic (ex: sorting items based on category), but when it comes to

applying knowledge in novel situations on the job they tend to lack the functional knowledge that they need to succeed (Sternberg & Spear-Swerling, 1996). Technical education differs from higher education in the fact that it places more of an emphasis on practical intelligence – the functional activities that students will actually be performing on the job. A certain degree of analytical intelligence is required of technical education students in order for them to pass their industry certification exams, but due to the nature of these programs it is likely that practical intelligence is emphasized to a greater extent than it is in other educational contexts. This would be an intriguing subject for future research.

In conclusion, the field of career technical education would benefit from further psychological research. The state of flow and autonomy are two psychological constructs that could potentially have a beneficial influence on the technical education classroom environment, and as a result they are valuable areas of future research. However, while flow and autonomy are advantageous areas of future research, there are many other psychological theories that also merit further research including the triarchtic theory of intelligence and the self-determination model as a whole. There is currently a strong demand in the job market for individuals who possess the skills taught in technical education centers. There should be a stronger emphasis on providing instructors in these institutions with high quality, empirically supported teaching methods that help students effectively absorb and apply the information that their future employers will be looking for. By doing this, educational psychologists can assist technical education centers in their mission to provide students with the skills and knowledge that they need to transition successfully and smoothly into the working world.

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