

**EFFECTIVENESS OF ONLINE LEARNING AND VIRTUAL TOOLS  
IN ASSISTING ENTREPRENEURS WITH BUSINESS PLANNING**  
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**Abstract**

The purpose of the study is to determine if the integration of online courses and tools have an effect on entrepreneurs in business planning and business start-up behavior. An extensive literature review on online learning specifically related to entrepreneurs provides a foundation for the first step in assessing the effectiveness of a blended learning program for entrepreneurs. A synthesis of the literature indicates that online learning is as effective in promoting learning as face-to-face (FTF) instruction when measuring traditional learning outcomes. Following this finding, a qualitative study was done comparing the achievement of milestones between entrepreneur who used online learning with entrepreneurs who did not use online learning. Though causality was not determined, the study confirms ( $p < .0001$ ) that entrepreneurs who participate in online learning courses and who utilize virtual tools are more likely to complete business decision and planning milestones than those who do not. Practical applications of both the qualitative and quantitative aspects of this study are discussed as well as further possible investigations into identifying causal factors and other effects of online learning and virtual tools.

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**Executive Summary**

A Small Business Administration (SBA) Portability Grant funded a study to determine the effectiveness of using online learning modules and tools with entrepreneurs. Our first task was to conduct a search of the literature regarding online learning and entrepreneurs. The literature review concluded that a constructivist theoretical framework (Huang, 2002) of learning is important to entrepreneurial learning and online learners. Because of the dearth of research specifically addressing the effectiveness of online learning with entrepreneurs, a synopsis of entrepreneurial learning styles in general is also reviewed. Both qualitative and quantitative studies were included in the literature review. A summary of online learning effectiveness studies that consider student learning attributes is found in Table 1 in the appendix.

Based upon the search of the literature, we can qualitatively conclude that online learning is as effective in promoting learning as face-to-face (FTF) instruction when measuring traditional learning outcomes. However, many of the research designs

used in the online quantitative research are considered weak designs.

Entrepreneurial learning style research supports the importance of collaboration and mentoring for entrepreneurs. In addition, learning disabilities and spirituality are confirmed as important aspects of learning for various groups of emerging disadvantaged entrepreneurs.

We further investigated the topic by conducting a quantitative study to determine if blended learning (a combination of online and FTF instruction) was effective in helping entrepreneurs achieve their goals. The participants in the study were clients of Small Business Development Centers. Those who completed online learning and used virtual tools as a part of their consulting engagement were compared to clients who did not complete any online learning courses or use any virtual planning tools as a part of their consulting engagement. The dependent variables were milestone behavior such as making the decision whether or not to go into business and/or completing a business plan. The dependent variable was tested using a chi-square analysis. Though

causality was not determined, the study confirms ( $n = 2004$ ,  $\chi^2 = 21.3$ ,  $p < .0001$ ) that entrepreneurs who participate in online learning courses and who utilize virtual tools are more likely to complete business decision and planning milestones than those who do not.

Both the qualitative and the quantitative findings are important to future research because the learning needs of entrepreneurs are very different than the traditional college age students that were used in the reviewed research concerning the effectiveness of online learning. This will inform future research for entrepreneurial outreach programs that are interested in using online learning and online tools to help entrepreneurs launch new businesses. As entrepreneurial outreach programs struggle with scarce resources, funding agencies will promote technology as a way to stretch declining program funding. However, as entrepreneurial educational outreach programs are encouraged to offer more online learning options, small business educators and mentors will need to understand the implications of offering online learning to entrepreneurs. This paper offers some insight toward that end.

### Introduction

Information, knowledge and course content are becoming increasingly more available on the World Wide Web (WWW) at little or no cost. Horrigan and Smith (2007) reported that almost 50% of U.S. adults had broadband connections in their homes in their recent Digital Future Report of U.S. Households. They also report that the Internet is perceived by users as a more important source of information – over all other principal media, including television, radio, newspapers, and books. In fact, 80% of Internet users, age 17 and older, consider the Internet an important source of information.

Small business owners are increasingly turning to the WWW for information and learning needs. While there are numerous studies about the implications and effectiveness of online learning, there are questions about how and why entrepreneurs might benefit from online learning differently than other adult learners. Studies concerning the way that entrepreneurs learn

indicate that they use different strategies for learning than most adults, and therefore there may be important implications for why online learning might be more or less effective with this group of learners.

Serial entrepreneurs are often described as careful planners who are innovative and self-directed. Increasingly, programs serving the educational needs of entrepreneurs are turning to online learning to provide education and knowledge to aspiring entrepreneurs. Despite this move on the part of entrepreneurial education programs toward online learning there is very little research about the effectiveness of online learning with entrepreneurs. Some educators are beginning to use a blended learning approach that is defined by Bonk and Graham (2006) as combining face-to-face (FTF) instruction with computer-mediated instruction. This may be in response to problems reported by Martinez (2003) concerning attrition, persistence and completion rates associated with online learners. At this time, it is important to question the implications for entrepreneurial learners as policy makers and funding agencies push to transition these entrepreneurs to an online learning environment. This literature review will offer some information toward that end.

The purpose of this literature review is to discuss the research that addresses online learning effectiveness, completion rates, and factors that help predict success in an online learning program designed for the small business community. This literature review will first discuss the method used and participants involved in the online learning studies. Because of the dearth of literature addressing the effectiveness of online learning in the context of small businesses, a section addressing entrepreneurial learning styles precedes the online learning effectiveness findings. Research on how entrepreneurs learn will provide insights to help evaluate studies about online learning effectiveness. The **method for review** section discusses the search strategy used to select the articles for this literature review. The **qualitative findings** section will then highlight four themes found in the literature, concluding with implications for practice, and future research. Following that will

be a description of the quantitative aspect of the study.

### **Method for the Review**

The electronic databases searched for this literature review include ProQuest, EBSCO and dissertation abstracts through World CAT. No articles were selected that were published prior to December 1999 because currency is an important issue with respect to online learning. The platforms and technology change so rapidly. Previous database searches in this area demonstrated a prolific amount of literature on the effectiveness of distance education versus FTF courses. However, distance education is a broader term used to define many other forms of learning beyond online learning course delivery. Therefore, online learning was the term selected consistently for this literature review search strategy. Effectiveness of online learning was paired with entrepreneur, small business, business, persistence, completion rates, and learning style as second level search terms. The 40 qualitative studies and 10 quantitative studies produced with this search criteria were reviewed and paired down to 11 quantitative studies, 10 qualitative studies, one mixed method study, and one government sponsored report. The online learning effectiveness quantitative studies are summarized in Table 1 in the Appendix. The entrepreneurial learning style discussion includes seven qualitative studies and one quantitative study.

### **Participants in Research Literature**

The majority of the participants across the online effectiveness studies were traditional, enrolled, college age (18-24) undergraduate or MBA graduate students, with the exception being a dissertation study that surveyed business engineering staff, high school technical students, and customers as participants. With the exception of two studies, the online effectiveness research was conducted with business or computer science students attending American institutions of higher education. The studies were all conducted with institutions that are offering FTF, online, and blended courses on business or closely related topics as part of a regular degree program.

As noted in Table 1 in the appendix, the general topics highlighted in the studies included learning style, self-directed learning (SDL), readiness, intrinsic/extrinsic motivation, demographic characteristics, different types of learning task, quality of the communication with faculty and peers, support factors and previous experience with online learning. In a majority of the studies effectiveness was determined by comparing numerous student output measures through pre-test and post-test achievement scores. In addition, surveys were used in a majority of studies to solicit student perceptions about their achievement of the course objectives, their perceived learning outcomes, and their perceived satisfaction with the faculty who taught the course as well as the course itself. Most of the studies contrast similar courses that were offered as either a FTF or online course option for students to self-select their preferred course delivery mode. The exceptions were two studies by Benbunan-Fich and Hiltz (2003) and Terry (2007) that offered a blended mode of delivery as a course delivery option. The next section will explore selected pieces concerning entrepreneurial learning styles.

### **Entrepreneurial Learning Styles**

This section explores issues surfacing in selected literature regarding entrepreneurs learning style that are included here to provide insight for using online learning with small business owners. These issues include experiential learning, learning through critical incidents, self-directed learning, learning through spirituality, and cognitive issues.

#### **Experiential Learning, Critical Incidents and Self-Directed Learning**

Van den Broeck and Willem (2007) explored the learning style of Belgian small business owners. This study reinforces the importance of small business owners using both reflective learning and continuous pro-active learning. This study found that entrepreneurs do not learn enough at the early stage of business formation and that their learning tends to be too reactive. Furthermore, the study notes that entrepreneurs often employ a disjointed learning style that makes it difficult for the learner to use critical

reflection as a means to reach higher levels of learning. The study determined that entrepreneurs do not place enough emphasis on “learning to learn.” Moreover, the learner’s gap between actual learning and required learning is thought to be due to the independent nature of small business owners, and the fact that their independent nature makes it difficult for them to adequately self-assess their learning needs. Furthermore, inadequate self-assessment is further compounded by the learner’s reluctance to seek help from the educational small business channels due to their self-reliant nature. The study concluded that mentors, support networks, and traditional courses are helpful to entrepreneurs who seek to turn experiences into learning moments, and this is reinforced by the fact that those who seek fewer educational learning channels tend to report fewer learning events. This study found that Belgian entrepreneurs think that personal experience is the best way to learn. However, this study also revealed that entrepreneurs have difficulty learning from critical incidents, and thus, tend to fail to use reflective learning effectively, without the help of mentors.

Cope and Watts (2000) used a phenomenological case study with six entrepreneurs to explore the complexity of entrepreneurs’ use of critical incidents as a higher order learning tool. They concluded that mentoring is essential for helping an entrepreneur interpret their critical incidents as a powerful learning outcome. In a later study, Cope (2003), using two business owners in a case study design, explored the importance of discontinuous events as they relate to the learning experiences of entrepreneurs. This study illustrates that discontinuous incidents can stimulate distinct forms of higher-order learning that are fundamental dimensions of both personal and business success. This study discusses the complexity of the relationship between entrepreneurs and their enterprise, due to the extreme levels of personal investment, and risk that owners take when starting their business. Cope also recommends further research into the affective dimension of critical incidents and its corresponding relationship between the emotional intensity of the event with the corresponding depth of personal reflection and

learning. These studies demonstrate the importance of critical events, and they suggest that entrepreneurs require a communicative interface between the learner and mentor for higher level learning to be fully realized from the learners critical incidents. This reinforces the need for online learning programs to address this communicative element within the course design. These studies also suggest that there is an aspect to learning and reflective experience that may be best accomplished through FTF interaction between learner and mentor to fully capture the affective intensity of the learner’s critical incident.

Learner attributes associated with self-directed learners are frequently mentioned as critical enhancers to the effectiveness of online learning; O’Hara’s (2005) qualitative study states that entrepreneurs have many attributes associated with self-directed learners. This study also suggests that online learning helps develop entrepreneurial attitudes by the fact that students need to manage their own time and independent work in an online program.

### **Cognitive Learning Issues**

Logan’s (2008) quantitative study found that 35% of U.S. entrepreneurs experience dyslexia, compared to only 1% of this incidence with U.S. corporate managers. The dyslexic entrepreneurs in the study indicated that they were either good or excellent at visualization learning task, oral communication, problem solving, and delegation, while the non-dyslexic entrepreneurs rated themselves as average or good on these same learning dimensions. Logan explained that dyslexic entrepreneurs might enhance their ability to apply creative solutions through their earlier years of learning to overcome obstacles resulting from their learning disability. Moreover, Logan believes that dyslexics learn to be exceptional oral communicators, and this enhances their ability to motivate their employees. Their disability also taught them to rely on, and trust other people at an early age making them exceptional delegators; which is often a missing attribute that can restrain entrepreneurs from pursuing business growth strategies because of their desire to micro-manage all aspects of the business.

Logan recommends that entrepreneurial learning programs offer a dyslexic friendly curriculum, one that promotes soft skill development, and Logan claims that lectures and case study that are typical pedagogical practices in FTF business programs are not ideal teaching methods for dyslexics.

### **Spirituality and Cross Cultural Aspects of Entrepreneurial Learning**

An important issue for the entrepreneurial educational community concerns marginalized entrepreneurial learners and this section reviews several pieces toward that end. Smith's (2001) qualitative study investigated business success from the perspective of Black women entrepreneurs, who comprise one of the fastest growing segments of entrepreneurs. This study used an exploratory method to determine learning strategies employed by Black women entrepreneurs who were participating in an entrepreneurship educational program in New York State. Black feminist theory informed this study, as well as Smith's experience as a Black woman entrepreneur and teacher. The study determined that the dominant learning strategies used by the participants included observation, listening, modeling, apprenticeship, collaborative learning, mentoring, and transfer of learning. Also, these strategies were used in both formal and informal learning settings, often simultaneously. More importantly, spirituality (faith in themselves as well as a higher being) was found to be a major factor in helping these learners overcome obstacles associated with starting a business. Smith found that spirituality provided the women an advantage, a base of support, a source of guidance, strength, and inspiration sustaining them through difficult times. Moreover, these Black women entrepreneurs also connected their spirituality with their need for balance between their mind, body and spirit, as well as to life and work, which comprise a measure of success for these learners.

Online learning could help foster spiritual learning by narrowing the distance of time and place between learners and through building online learning communities. Using asynchronous design strategies,

online learning can offer a means for entrepreneurs to meet, discuss and share experiences, as well as a way to offer peer-to-peer mentoring, and sharing of ideas between peers. The literature regarding entrepreneurial learning styles helps inform the next section that discusses the literature about online learning effectiveness.

### **Qualitative Findings**

This section will discuss four themes emerging in the findings of the online effectiveness studies including: a) dropout rates, persistence and motivation; b) student attributes and learning outcomes; c) cognitive engagement; and d) social factors influencing online learning.

#### **Dropout Rates, Persistence and Student Motivation**

The problem of online attrition rates and persistence is a common issue for online educational programs. According to Martinez (2003) attrition refers to the decrease in the number of learners engaged in a course of study. Martinez defines persistence as relating to the act of continuing toward an education goal. In a conceptual piece, Diaz (2002) noted online learners tend to be older, have completed more college credit hours, more degree programs and generally maintain a higher GPA than students enrolled in FTF courses. These learner characteristics are noted by Diaz as being well suited for self-directed study, such as online learning.

Online learning effectiveness research frequently overlooks those students who might have dropped a course before completion. These students are never counted in the final analysis of studies comparing effectiveness between various modes of learning that use end of course achievement scores as a measure of effectiveness. Consequently, when evaluating online learning effectiveness it is imperative to consider completion rates in relation to the overall evaluation of online learning versus FTF instruction.

Parker (2003) tested the hypothesis that a learner's locus of control as measured by Rotter's Locus of Control scale is a significant predictor of academic

persistence. Using groups of traditional and online community college students Parker was able to confirm that a student's internal locus of control, and their academic persistence were shown to have a correlation of .83 ( $p=.05$ ). Indicating that those students with higher internal locus of control and self-motivation are more likely to complete their online course study than students who scored as having an external locus of control and who are externally motivated.

Parker concludes by suggesting that a screening procedure should be used to determine a student's locus of control prior to assigning them to online learning. As Parker hypothesized, an internal locus of control orientation, as the independent variable by the learner, predicted dropout rate with an accuracy of 80%. This study used two self-selected groups for the same classes and offered both classes in traditional FTF format and distance education format with the same syllabus, examination schedule and faculty. The results of the study concluded the locus of control was the greatest predictor of completion with the distance education program. Age, gender and number of previous distance education courses completed did not meet the completion group predictive criteria of this study.

Chyung (2001) carried out a seven year evaluation study determining the effectiveness of interventions implemented to improve student persistence rates with online learning. This study sought to improve the motivational appeal of the online course by using John Keller's attractive, relevant, confidence, satisfaction (ARCS) model. The ARCS model focuses on making the online learning attractive and, relevant to learners. The model also seeks to improve student's confidence and satisfaction levels toward their online learning. Using this model as a guide to improve the instructional design of online learning proved significant when Kirkpatrick's evaluation model was used to measure results. Between the fall semester of 1989 and the fall semester of 1996, the average retention rate for online courses by the end of the third course was only 56%. When the interventions based on the ARCS model were implemented, the retention rate improved to 78% by

the end of 1997, just three semesters after the interventions were implemented.

### **Student Attributes, Learning Styles, and Learning Outcomes**

The studies discussed in this section considered students' success in online learning by using more traditional pre-test and post-test measurements to evaluate knowledge or skill acquisition in the online learning course. Locus of control and student motivation are not only important learner attributes that affect students attrition rates in the online learning environment, but they are also important attributes when measuring student outcomes using traditional learning achievement measures such as pre-test and post-test scores. Issues such as learning style, degree of experience with online learning, cognitive engagement (e.g. deep or surface) learning, and intrinsic or extrinsic dimension of the student are all considered potential variables impacting effectiveness with online learning. Neuhauser (2002) used the Learning Modality Preference Inventory to test students' learning styles. Of the most successful online students receiving at least an A or A-, 40% listed a visual learning style as either their preferred or one of their preferred learning styles, as compared to 66% listing a kinesthetic learning style as either their preferred or one of their preferred learning styles. In comparison, 43% of the FTF most successful students had a visual preference learning style, and 43% had a kinesthetic preferred learning style. The study found that there was no significant relation found between final grades and preferred styles of learning in either mode of learning.

Hsu and Shiue (2005) used the Self Directed Readiness Scale (SDLR) with 126 students taking FTF and two-way distance education courses to compare Taiwanese undergraduate students' achievement on grades between similar courses with the same instructor. They found students' educational score (prior GPA and SDLR) is a strong predictor for determining students' success in distance education courses. This confirms that locus of control not only plays a pivotal role with enhancing completion rates

with online learning but also enhances online learner outcomes.

Ashill, et al. (2006) hypothesized course structure, self-motivation, learning styles, instructor knowledge and facilitation, and interaction and instructor feedback would affect perceived learning outcomes. Although each of these factors were significant when measuring student satisfaction for the online course, only learning styles and instructor feedback were significant when measuring for student perceived learning outcomes. However, student user satisfaction with online learning was a significant predictor of learning outcomes. Although, perceived student satisfaction is impacted by significantly different learner attributes than perceived learner assessment of knowledge acquisition. This reinforces how important it is for educators to clearly define what they are measuring to determine effectiveness when discussing the issue of online learning effectiveness.

Finally, in a dissertation study by Fitzgerald (2003), there was support found for matching the type of activity (collaborative or self-directed) to the learner's preferred learning style as a way to improve performance. This tends to contrast with the Ashill, et al. (2006) study which indicated the students learning style only impacted one aspect of the effectiveness (student perceived satisfaction). This may be a result of the Fitzgerald study using validated instruments to determine learners' preferred learning style, as compared to Ashill's et al. study that relied on the student's reporting their perceived learning style. Fitzgerald also used a more diverse sample of older adults as participants in the study while Ashill, et al. used traditional college age (18-24) students.

### **Cognitive Load Theory, Cognitive Engagement and Knowledge Task**

Cognitive load theory was raised in a qualitative piece by Tyler-Smith (2007) as an issue of concern in the context for online learning course designers. Cognitive load theorists believe that learning is first processed in short term working memory. Short term memory is very limited in the amount of new information that can be processed in a given time.

Learning new complex material that has an under developed cognitive schema in long term memory, can cause our short term memory to overload, which causes the learner to become incapable of continuing with the learning task. Salmon (as cited in Tyler-Smith, 2007), stressed the importance of limiting the amount of content specific information in the early stages of an online course, to help reduce cognitive overload in the context of online learning. Tyler-Smith recommends that online learning instructors focus on doing E-activities that help foster group cohesion and self-identity as an online learner. Tyler-Smith also discusses the importance of starting the online course with a face-to-face meeting with the learners. This is important to help learners foster a group identity and to ease their angst over migrating to online learning. Tyler-Smith proposed a conceptual model that specifies five multiple learning tasks that the novice online learner is confronting. These include negotiating the technology, negotiating the course website, negotiating the course content, becoming an online learner, and negotiating the online course mediated- communication processes. An example of mediated communication is the online discussion forum where learners often experience cognitive load just trying to read through the extensive postings that are generated in an online class discussion. Similar experiences can cause the learner to become cognitively overloaded, leaving them to think that dropping the class is their only option.

In a qualitative piece Kirshner (2002) calls for enhancing competency-based education in online learning. Competency-based education is defined as the ability to enable learners to recognize and define new problems in their domain of study, while also solving these problems. Kirshner (2002) also states that competency-based education is a combination of complex cognitive and higher-order skills, highly integrated knowledge structures, interpersonal and social skills, and attitudes and values. Educators engaged with online learning need to consider these higher-order thinking skills required in new learning domains, and this requires educators to better understand and make use of the possibilities and to take into account the limitations of the human mind.

Richardson and Newby (2006) used the Study Process Questionnaire (SPQ) to examine the affect of learner motivation and learning strategy on learner outcomes. The SPQ scale defines students' learning strategy and motivation as either surface or deep. Deep learners are highly engaged with the learning material. Surface learning involves learning what is necessary to get a passing grade. Students using surface strategy and surface motivation are less cognitively engaged with the course material. This study found as students gain more experience with online learning, the students' achieving motive (e.g. working to get the highest grade) was replaced with an achieving strategy (i.e. better organization of their time and learning resources). Therefore, as students gain online experience, they are also learning to employ different learning strategies and they take more responsibility for their own learning. This study demonstrates online learning may be an important tool for educators who desire to increase their students' self-directed learning skills. Integrating online modules with their FTF instruction may improve students' self-regulatory learning skills. Furthermore, as students take more responsibility for self-regulating their learning, they also are likely to perceive online learning as a more effective learning mode of delivery. Consequently, this reinforces self-regulatory skills in the online learning experience. This study also found that student-perceived effectiveness with online learning can be improved by increasing student confidence and satisfaction with the course design.

Moneta and Moneta (2002) examined the effectiveness of multimedia-rich e-learning materials, in comparison to FTF instruction. Their study compare results of factual based learning and higher-order applied conceptual learning using four learning outcome measures. These outcome measures include the percentage of correct answers to the factual and applied-conceptual questions in the midterm and final exam. Both FTF and online learners improve equally well between midterm and final grading when answering factual questions. However, interesting results were observed between the two groups when comparing the effectiveness in applied-conceptual learning task. First, they found that FTF students

ability to answer applied conceptual questions decreased from midterm to final, while online students increased their scores. They speculate that students experience a learning curve in adapting to new challenges with online learning and that this learning curve adjustment may be the reason why they witnessed suppressed performance with the online learners midterm grading with applied-conceptual question responses, but yielded superior performance in the final. This is the only study which considered the impact on effectiveness from different learning tasks required as a controlled variable in the studies between FTF and online learning.

For the majority of the studies, instrumental knowledge was being taught and evaluated, but little attention was given to how online learning effectiveness might be different with other forms of knowledge that Habermas (Kincheloe, 1991 ) would label as communicative and emancipatory knowledge. Liebowitz's (2003) study is the exception. Using MBA students, the Liebowitz (2003) study sought to determine if communication skills could be taught by group exercises and role plays synchronously in the online chat room. The study determined the students' assessment of their ability to perform a multitude of communication skills, which were taught in an organizational behavior course, were able to be performed equally well using both FTF and online modes of delivery. The instructor used the assessment instrument in six semesters taught in a FTF format, and one online format. Although only one online course was used in the comparison, the results hold promise that communication knowledge and skills can be taught in the online learning environment. There was no significant difference in the student self-rating effectiveness scores between the seven comparison classes.

### **Social Factors Influencing Online Learning**

Huang's (2002) qualitative piece addresses several issues related to practice for online instructors. First, teachers need to address the loss of humanity that online learning presents for the student due to the lack of face-to-face social interaction with peers and



the teacher. Moreover, a key issue for instructors of online learning is to be aware that adding new learner communication media such as list serves, forums and teleconferencing will not necessarily alleviate the isolation that online learners frequently feel. In addition, the adult learner's self-directed learning style makes them more favorably disposed toward an active learning style, and online learning, in its strictest form, only provides information. Another important aspect for online educators relates to what role the teacher should play in the online course. According to Huang, the teacher is best suited to be a facilitator in the online learning environment, and the teacher should move freely between the role of consultant, guide and resource provider. The issue of learning assessment is also viewed as a time consuming endeavor. However, Huang states that "learning to learn" defined as the learning process, is just as important as the result of learning. The constructivist learning theorists believe that teaching and learning need to be learner-centered and under this framework, each learner is recognized as bringing their own unique experience and knowledge to the learning environment (Huang, 2002). Online learning can be viewed as static and not easily customized to the individual learner. Therefore, if online learning is not designed well, there is a trade off on this issue when using online learning from a constructivist teaching orientation.

The quality of the communication and frequency of communication between and among student and faculty are also discussed. Frederickson's et al., (2001) longitudinal study on online learning effectiveness determined that the transparent interface, frequent instructor interactions and dynamic discussions are the most significant factors of student success with online learning. Reisetter et al. (2007) found that the timing of teacher input was a critical pedagogical difference between FTF and online learners. For example, in the online course, the instructor's anticipatory skills were essential for preventing student mistakes and misconceptions. By contrast, the FTF comparison group of students reported the immediacy of the teachers scaffolding skills, oral communication skills and approachable personality were essential to the student's success in

the classroom. Most importantly this study found that online learners do not expect a virtual FTF learning experience and the students had less value for a FTF virtual experience in their online learning experience. This study takes a slightly different approach to some previous research that suggested that online learning should seek to recreate the FTF interaction as closely as possible. This most likely is explained because this study specifically asked students about their expectations of the experience for taking the online course, and they found that students did not expect the same experience in the online course as they did in their FTF class. Previous qualitative studies may have assumed that the student would desire to experience the replication of the FTF classroom in the virtual world without necessarily asking the student what they expected to experience in the online learning program.

Benbunan-Fich and Hiltz (2003); Kuhl (2002) and Rovai (2003) each consider the importance of providing for student-to-student interactions when designing online courses. Benbunan-Fich and Hiltz (2003) found that the greater the extent of student-perceived collaboration, the greater the perceived learning reported. Another finding for online courses was the greater the student access to the professor, the better the student perceived the learning experience. Therefore, the improved and enhanced communication with the professor resulted in the student being more likely to perceive the learning as valuable. Moreover, Kuhl's (2002) piece suggested that student to student communication is an important aspect of fostering motivation; online learning encourages students who are quiet in the FTF classroom to be more engaged in the online chat room or email streams. Consequently, student online discussions are viewed by Kuhl as an important aspect of the online learning environment that provides benefits to certain groups of students who are not as skilled in expressing themselves verbally. Rovai (2002) states that hybrid or blended learning programs may hold the most promise by incorporating the best of both worlds of FTF and online learning. Blended learning assumes that learning can be enhanced during one or more FTF meetings to promote collaboration and socialization

among learner cohorts. The next section addresses implications of the findings for practice in an entrepreneurial adult education program.

### **Implications for Practice and Future Research**

This section will provide recommendations for practice in light of the research on entrepreneurial learning style and online learning effectiveness. These recommendations are intended for an entrepreneurial education program context.

### **Meeting the Needs of Multiple Learning Styles**

Entrepreneurs use a multitude of learning styles including self-directed learning, experiential learning, and reflective learning in both formal and informal settings. Critical incidents and cognitive disabilities are also surfacing as important issues that impact the entrepreneur's learning. Furthermore, marginalized entrepreneurial learners may benefit from other ways of learning, including spiritual learning and collaborative learning.

A number of mediators and factors impact the overall effectiveness of online learning as depicted in Figure 1 in the Appendix. A significant mediator surfacing across several studies reinforces the importance of communication between students and the teacher. This mediator has implications for both pedagogy and learning platform technology. Kuhl (2002) recommends that teachers incorporate live chat room conversation as a way to promote conversation from students lacking confidence to speak orally in FTF classes. Online learning platforms should provide live streaming video, live chat rooms and enhanced online facilitation tools. An added benefit for using these advanced online learning platforms with entrepreneurs is that they will be learning to use technology, which will also prove helpful for them in connecting with customers, suppliers and employees.

Kirshner (2001) believes that critical load theory holds promise for informing course designers how instructional materials for acquiring complex cognitive skills and competencies can and should be designed. Mentors and instructors can limit cognitive overload by carefully selecting the online modules that address the learner's specific learning needs.

Furthermore, online course developers should integrate streaming video clips that incorporate marginalized entrepreneurial success stories to help inspire others to pursue their dreams in the wake of obstacles. Starting a business is frequently initiated in response to a critical life event (job loss, life style changes), and critical reflection on the part of the learner is important to helping them determine the financial viability of their business concept. Critical reflective learning can be enhanced through a mentor (Van den Broeck & Willem, 2007) and entrepreneurial educators should link learners with FTF mentoring to help facilitate the critical reflection process. Journaling, storytelling, and role-playing could be incorporated into online learning. These tools can help raise an entrepreneur's consciousness concerning their affective connection between themselves and their business. Emotional attachment can hinder an entrepreneur from taking immediate action that could stem a spiraling series of critical events from turning into a business financial crisis.

Future studies on effectiveness of online learning with entrepreneurs should ask the learner how effective they perceived the learning to be in helping them reach these critical milestones. More detailed effectiveness measures should include the level of satisfaction with various online program components. Finally, critical reflection skills and self-directed learning skills are key components of long term entrepreneurial success. Therefore, effectiveness measurements should attempt to evaluate these higher level thinking skills that are essential long term success as a self-employed business owner.

### **Next Step: Quantitative Confirmation**

The qualitative aspect of this study clearly pointed to a level of effectiveness for online learning that is on par with FTF learning. The interesting question then becomes; Can we experimentally test for this effectiveness? Can we find out whether or not entrepreneurs exposed to online learning in a blended format with personal consulting support do better than entrepreneurs who obtain the same personal consulting support, but who do not choose to register for online learning?

### Hypothesis for Quantitative Study

There were two hypothesis for the quantitative study. In order to provide for a two-tailed test, the hypothesis is stated as a null hypothesis.

H<sub>0</sub>: There will be no difference between the online training group and the no-online training group in completing a written business plan.

H<sub>1</sub>: There will be no difference between the online training group and the no-online training group in the decision whether or not to open a business.

### Method for Quantitative Study

Data was obtained from the Small Business Development Centers in Pennsylvania that included information about whether or not the clients registered for online training as well as identifying whether or not the client had achieved a number of milestones. After reviewing the available data, we decided to limit the data to the clients of just one center because it was the only one which had a large enough population of clients who had registered for online training to provide sample to compare. Additionally, we limited the data to just those years when online learning was available; from January 2006 to August 2008. There were 2004 subjects who met the criteria. The subjects were separated into two groups; those who had registered for online learning, (n = 310) and those who had not registered for online learning (n = 1694).

Next, the milestones for each subject were codified. There were 32 different types of milestones, many of which had nothing to do with the topic of the study. Similar milestones such as "Completed a Business Plan" and "Completed a Marketing Plan" were grouped together for each hypothesis. Two binary variables were created from the groupings: Planning Completed, and Decision Made. Subjects were determined to have completed planning if they had any of the similar milestones for planning. Subjects were determined to have made the decision if they had a milestone for either "Started a business" or "Decided not to go into business."

Due to the binary nominal nature of the data, a chi-square test (using SPSS 16 for Windows) was used to determine whether or not there was a significant difference in the achievement of milestones between the two groups. The 2 X 3 contingency table is reported in the next section.

### Quantitative Results

Our initial review included the descriptive statistics of the data. We then conducted the chi-square analysis and follow up tests of significance.

### Descriptive Statistics

A little more than half of the subjects had not yet officially started their businesses (52.3%). Less than 4% were considered "homebased" businesses. Forty seven percent of the businesses were owned by a male, thirty two by female, and twenty one percent by both male and female. A comparison of their ethnicity and gender did not differ significantly from the general population. Business size ranged from very small to large and followed a normal bell-shaped curve distribution.

### Inferential Statistics

Both hypotheses were rejected. There was a difference between the online training group and the group that did not do online training. The contingency table is shown in Table 2. The actual count of subjects was greater than the expected count for the group which registered for online learning for both Decision Made and for Planning Completed, with a much larger discrepancy for the Planning Completed variable.

**TABLE 2: Contingency Table for Crosstabulation of Milestones By Online Learning**

			OnLineReg		Total
			No Online Learning	Registered for Online Learning	
Milestones	Neither Decision nor Planning Completed	Count	1454	295	1699
		Expected Count	1427.7	261.3	1689.0
	Decision Made	Count	102	27	129
		Expected Count	109.0	20.0	129.0
	Planning Completed	Count	138	48	186
		Expected Count	157.2	28.8	186.0
Total		Count	1694	310	2004
		Expected Count	1694.0	310.0	2004.0

To test for significance, we employed the Pearson Chi Square, which resulted in a value of 21.268,

which is significant ( $p < .001$ ). None of the cells had an expected count of less than 5, so we did not apply the Yates correction.

While the Chi Square test enables us to tell if the results are significant, they do not tell us the strength of the results. To analyze the strength of the nominal by nominal relationship, we utilized the Phi statistic (a correlation technique for dichotomous variables). The value was .103, which indicates that though there was a significant difference, the relationship between the variables is not extremely or highly correlated. Cramer's V, another test of strength of relationship, showed the same thing.

### **Limitations of Study**

There were several limitations which impacted the generalizability of the findings. The data was from a single center only; perhaps there was some unknown geographically based variable that impacted the results. Additionally, we did not differentiate by consultant; perhaps the difference was due to quality of consultants, or a tracking bias. Subjects registered for online learning may have been more closely watched for milestones than non-online learning subjects.

Furthermore, registration for on-line training was measured, not actual participation in on-line training. There was no way to tell if the clients actually followed through with the online training, or felt that the training was helpful to them. Subjects who were not registered for online learning may have, elsewhere, taken part in online learning.

We were unable to measure *how* the subjects integrated the learning with their practice. The consultants took a blended learning approach; utilizing both online learning and FTF interaction in order to get the help they needed in developing a business plan or making a decision as to whether or not they should start a business. There was no way to delineate the impact of the online learning from the consulting help in general. Additionally, the quality of the business plan was not evaluated. It may be that the group that did not do online training had superior plans to the online training group.

Both online and no online training groups of entrepreneurs had members with both just starting and existing businesses.

### **Discussion & Conclusions**

Despite the noted limitations, the findings of the quantitative aspect of this study clearly indicate that providing online learning opportunities has a positive impact on whether or not entrepreneurs complete their milestones on the way to starting and growing their businesses. Considering the cost and resource differential between providing FTF and online learning, this blended approach may serve entrepreneurs the best.

As new technologies continue to enhance communication capabilities that improve online learning platforms future researchers might want to consider how effective online modules could be with teaching higher levels of learning (e.g. communicative and emancipatory learning). Online learning effectiveness with established business owners should also be addressed. Entrepreneurs use more formalized learning networks, and their needs are very different from most people. Logan's research about the high incidence of learning disabilities in the entrepreneurial learning community may help online course designers take additional steps to improve the interface to assist entrepreneurs with various cognitive learning issues. As new technology improves, and as knowledge about learners advances, researchers will need to consider new questions about the relationship between these exciting new developments. Especially considered in the light of the qualitative findings regarding the differences in the way entrepreneurs learn, the quantitative results indicate that it would be beneficial to any program designed to support entrepreneurs to consider adding an online training component.

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**TABLE 1**  
**Empirical Studies for Online Learning Effectiveness**

<b>Author</b>	<b>Methods/Participants</b>	<b>Topic</b>	<b>Mode of Learning</b>
Ashill, et al., 2006	Survey n=397 U.S. college students	Antecedents driving online learning effectiveness	Online
Chyung, 2001	Survey, 8 semesters n=296 U.S. college students	Learner perceptions, learner outcomes impact on drop rates/retention rates with online learning	Online
Fich & Hiltz, 2002	Field study 17 courses n=(pretest)=1,048 (post-test)=842	Mediators of effectiveness of online courses	FTF/online/hybrid
Fitzgerald, 2003	Survey U.S. corporate employees, students & customers, n=106, 46 courses, 326 pre/post-test	Self directed learning, collaborative, learning style & performance (dissertation)	FTF/self-directed online/collaborative online
Hsu & Shiue, 2005	Survey n=126 Taiwanese college students, one course	SDL readiness on achievement	FTF/2- way distance education
Liebowitz, 2002	Survey (7 semesters) n=126 U.S. college students	Effectiveness of teaching people skills online	Online/FTF/ Satellite location
Moneta & Moneta, 2002	Field study/post-test scores 7 FTF and 2 online courses n=105, 180 and 129 Hong Kong college students	Learning outcomes with factual versus applied concept learning	FTF/online
Neuhaser, 2005	Survey n=62 U.S. college students, one course	Learning Style & Effectiveness	Online/FTF
Parker, 2003	Survey n=151 students	Rotter's locus of control as variable for successful completion of online learning	FTF/online using Blackboard
Richardson & Newby, 2006	Survey n=121 U.S. engineering and education students	Program focus, gender, age, prior online experience Impact with online learning effectiveness	Online
Reisetter, et al. 2007	Mixed method FTF n=59, 46 online	Attitudes about online experiences	Online/FTF
Terry, 2007	Multiple surveys, n=366 (FTF), 312 (online), 198 (hybrid)	Faculty & course evaluation & Learning objectives measured	FTF/Online/ Hybrid

**Figure 1. Mediators impacting online learning effectiveness.**

