

Connecting Leadership and Learning: Do Versatile Learners Make Connective Leaders?

*“Leadership and learning are indispensable to each other”
— President John F. Kennedy*

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Submitted: December 28, 2015 | **Peer-reviewed:** March 16, 2016 | **Editor-reviewed:** March 19, 2016
Accepted: March 24, 2016 | **Published:** March 30, 2016

Abstract: Recent failures in leadership, suggest that creating better-quality leadership development programs is critical. In moving from theory to practice, this paper examined the relationship between learning style and leadership style which may enable us to move away from one-size-fits-all leadership development programs. Utilizing Kolb’s Experiential Learning Model and Connective Leadership theory, approximately 3600 college students were analyzed to discover whether versatility in learning styles translates into versatility in leadership styles. One group of versatile learners reported using a wider range of leadership styles suggesting that learning flexibility may transfer to leadership flexibility. Surprisingly, learners of all types reported utilizing Power and Intrinsic styles of leadership above all others. Implications for leadership development include considering individual differences when crafting leadership programs, matching learning styles to leader training, and the need to move beyond one set of leadership behaviors to increase flexibility in dealing with complex situations. Using a large sample rarely seen in management studies, this paper makes key contributions to the literature.

Keywords: Learning style, leadership development, connective leaders

Introduction

The development of future leaders may be one of the most pressing issues of our time. While leadership skills are honed throughout our lives, the development of these skills is particularly salient in the college years (Dugan & Komives, 2007, 2010; Logue, Hutchens, & Hector, 2005). Despite the litany of leadership literature, we know surprisingly little about how leaders learn their craft and even less about how to improve the process. More than ever, leaders must develop a complex set of skills to deal with an increasingly complex set of problems; yet, the overlap between how we learn and how we lead is rarely examined. Specifically, what can leadership scholars uncover that may pave the way for the critical task of developing future leaders capable of tackling complex issues not only on the global front, but in the micro-cultures within organizations?

A review of leadership development research highlights three points. First, effective leadership behaviors can be learned (Day, 2001; Harless, 1995; Dugan & Komives, 2007, 2010;

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Suggested citation: Robinson, J. (2016). Connecting leadership and learning: Do versatile learners make connective leaders? *Higher Learning Research Communications*, 6(1).

Hayes & Allinson, 1998; Sims, 1990; Towler, 2003). In their recommendations for campus leadership programs, Dugan and Komives (2007) stressed that students must realize that leadership behaviors can be learned and developed. Second, individual differences should not be ignored in developing leaders (Noe, 1986; Ree & Teachout, 1995; Ruble & Cosier, 1990; Sims, 1983; Whetton & Cameron, 2002). Third, individual learning styles should be considered when creating leadership development programs (Armstrong & Mahmud, 2008; Bitterman, 1989; Brown & Posner, 2001; Harless, 1995; Hayes & Allison, 1993; Li, Mobley, & Kelly, 2013; Mainemelis, Boyatzis & Kolb, 2002; Van de Sluis & Poell, 2002; Wyrick, 2003). By integrating the leadership and the learning research, we begin to articulate the variety of leadership behaviors desired and whether learning styles influence those behaviors. Such exploration conceptually pushes us into insufficiently explored territory.

Learning Styles

Hayes & Allinson (1998) defined learning styles as an individual's preferred way of processing and organizing information that leads to changes in knowledge and skill. "Learning style is based on two key dimensions: (1) the manner in which you gather information and (2) the way in which you evaluate and act on information" (Whetten & Cameron, 2002, p. 70). Specific learning styles have been shown to have a direct impact on acquisition of job knowledge (Armstrong & Mahmud, 2008; Ree, Carretta, & Teachout, 1995; Sadler-Smith, Allinson & Hayes, 2000). Within the learning literature, the most commonly used theory and measure of learning is David Kolb's Experiential Model, which assesses learning through experience (Cornwell & Manfredo, 1994; Hayes & Allison, 1993; Heffler, 2001; Whetton & Cameron, 2002). This is particularly relevant in the college years of emerging leaders.

Kolb's Experiential Learning Model

Kolb developed his experiential learning theory, including his measure of four distinct learning styles, by examining how individuals cognitively process experiences and their own reflections of these experiences (see Figure 1). This model shows a circular depiction of learning, where an individual moves from Concrete Experience to Reflective Observation then to Abstract Conceptualization and Active Experimentation. This model is designed around two continua seen as the horizontal and vertical axes. Where an individual's learning preference falls along these two axes reflects his or her learning style, as depicted in the four quadrants. For example, if an individual prefers learning through Concrete Experience (over Abstract Conceptualization) and through Active Experimentation (over Reflective Observation), this individual would be categorized as an Accommodator.

Kolb's Experiential Learning Model describes the first stage of learning as Concrete Experience (CE) in which individuals learn as they encounter new experiences. The second stage, Reflective Observation, occurs when new experiences lead to observation and reflection as people try to make sense of their experiences. The third stage consists of forming Abstract Conceptualizations (AC) and generalizations by comparing current experiences with those that the learner has experienced in the past. This may require the modification of past experiences based on new information gained in more recent experiences. The final stage, Active Experimentation (AE), results when the individual tests hypotheses in future situations (Sims, 1990). According to this cyclical learning process, this final stage will lead to new experiences as the cycle continues (Kolb, 1984).

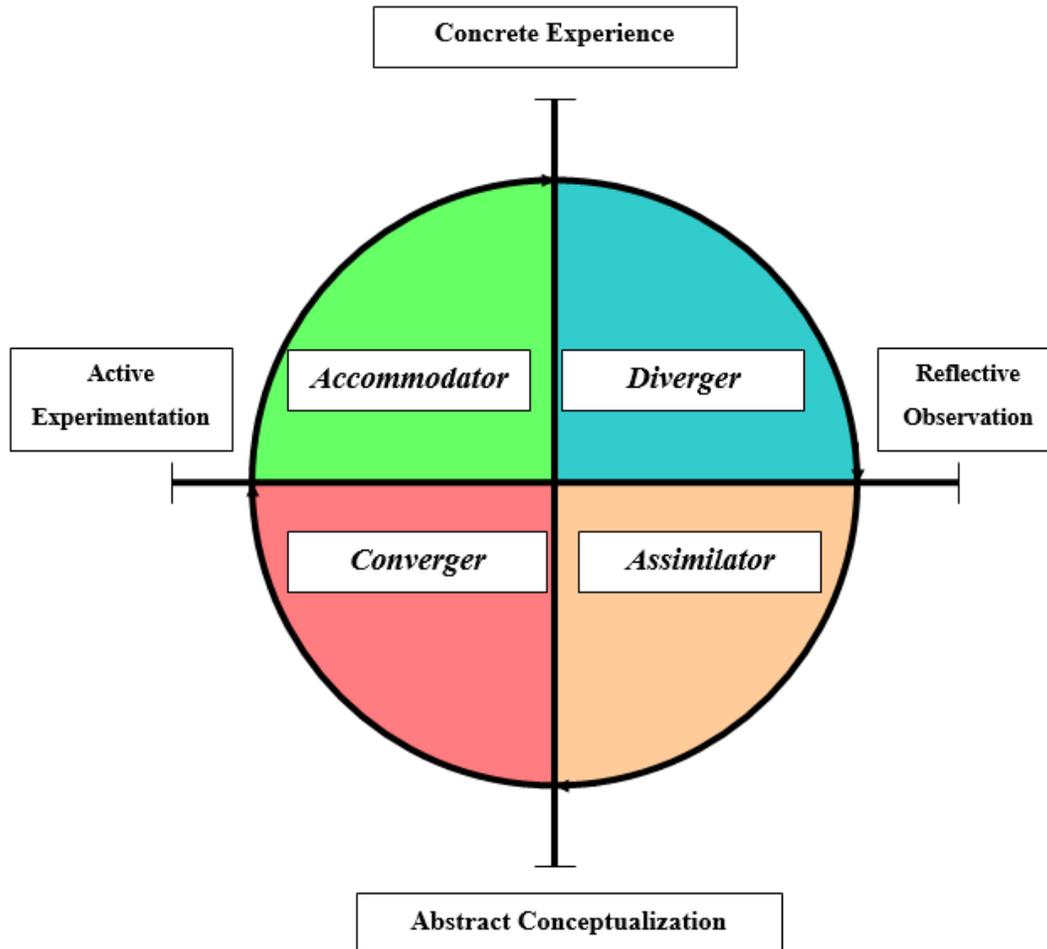


Figure 1. Kolb's Learning Model (adapted from Li et al., 2013).

According to Kolb's model, individuals move through the learning cycle by fluctuating between two bipolar continua. The first is between active and reflective learning and is evident in an individual's preference (as defined by a higher score on Kolb's Learning Inventory) between learning through experience and learning through autonomous research. The second dimension is between concrete and abstract. This is defined as an individual's preference to act immediately upon information versus avoiding quick judgments. Based on this model, Kolb has defined four distinct learning styles: Divergence, Assimilation, Convergence, and Accommodation (DeSimone & Harris, 1998; Sims, 1990). Versatile learners (a.k.a. Hub learners) are categorized as those with identical scores on the bipolar continua. Depending on the continua, these individuals are classified as either Hub CE/AC or Hub RO/AE learners.

While Kolb's Learning Style Inventory (LSI) remains one of the most widely used learning styles inventories, some have questioned its validity (Cornwell & Manfredi, 1994; De Ciantis & Kirton, 1996; Loo, 2002). Other researchers have found support for the validity and reliability of the LSI (Heffler, 2001; Towler, 2003). For example, Heffler (2001) found test-retest reliability ranging from a high of $r = .81$ (RO factor) to a low of $r = .63$ (AC factor).

Kolb's Learning Styles

Several studies suggest that matching an individual's learning style with the information processing requirements of particular tasks increases performance (Hayes & Allinson, 1993, 1998; Sims, 1983). For example, Kolb's theory was the underpinning of a computer-based tutoring system in which the trainee's learning style was assessed and the computer modified its presentation accordingly (Eurich, 1990). Conversely, it has been found that a mismatch between learning style and information processing requirements of a particular situation can lead to less effective performance (Hayes & Allinson, 1998).

Mainemelis, Boyatzis, & Kolb (2002) examined whether 198 MBA students who were "balanced," as defined by their LSI scores, also showed greater adaptive flexibility. Individuals with balanced profiles on the AC/CE continuum scored higher on adaptive flexibility. Balance on the AE/RO continuum, however, was not related to adaptive flexibility scores (Mainemelis et al., 2002). This study does provide some support for the idea that learning styles may relate to behavioral flexibility.

Moreover, Hayes and Allinson (1993) examined 17 studies related to matching an individual's learning style to the instructional strategy in various training programs. Overall, ten studies supported the proposition that training is more effective when matched to an individual's learning style. It should be noted that all five studies that used Kolb's LSI to measure learning style supported the increased effectiveness of training when instructional strategy was matched to learning style (Kolb & Goldman, 1973; Sein, 1988; Sein & Bostrom, 1989; Sein, Bostrom & Olfman, 1987; Vondrell & Sweeney, 1989).

Leadership Development

Similarly, the results of numerous empirical studies suggest that leadership behaviors can be learned (e.g., Barling, Weber & Kelloway, 1996; Bitterman, 1989; Dvir, Eden, Avolio & Shamir, 2002; Harless, 1995; Karnes, Meriweather & D'Illio, 1987; Sirianni & Frey, 2001; Towler, 2003). For example, Karnes, Meriweather, and D'Illio (1987) reported increased leadership effectiveness for students who participated in a Leadership Studies Program. While this empirical literature supports the conclusion that leadership behaviors can be developed, little is known about *how* these behaviors are learned. According to Lipman-Blumen (1996), the skills learned in childhood are the very behaviors individuals take with them into their leadership roles.

Connective Leadership Model

By combining both behavioral and contingency perspectives, the Connective Leadership Theory provides a comprehensive framework to examine the complex phenomenon of leadership development (Lipman-Blumen, 1996). Connective Leadership explicitly reflects the need for leaders to be flexible in their leadership styles to account for constant environmental changes. In addition, the theory is based on leadership behaviors, rather than traits, and suggests that individuals can learn to be better leaders by developing a wider variety of behavioral patterns.

Few studies, however, have looked at this theory from a prescriptive rather than descriptive perspective and examined the influence of learning styles in how individuals learn leadership behaviors. The Connective Leadership Model suggests that the most effective leaders possess a wider range of leadership behaviors than leaders who are less effective (See Figure 2).

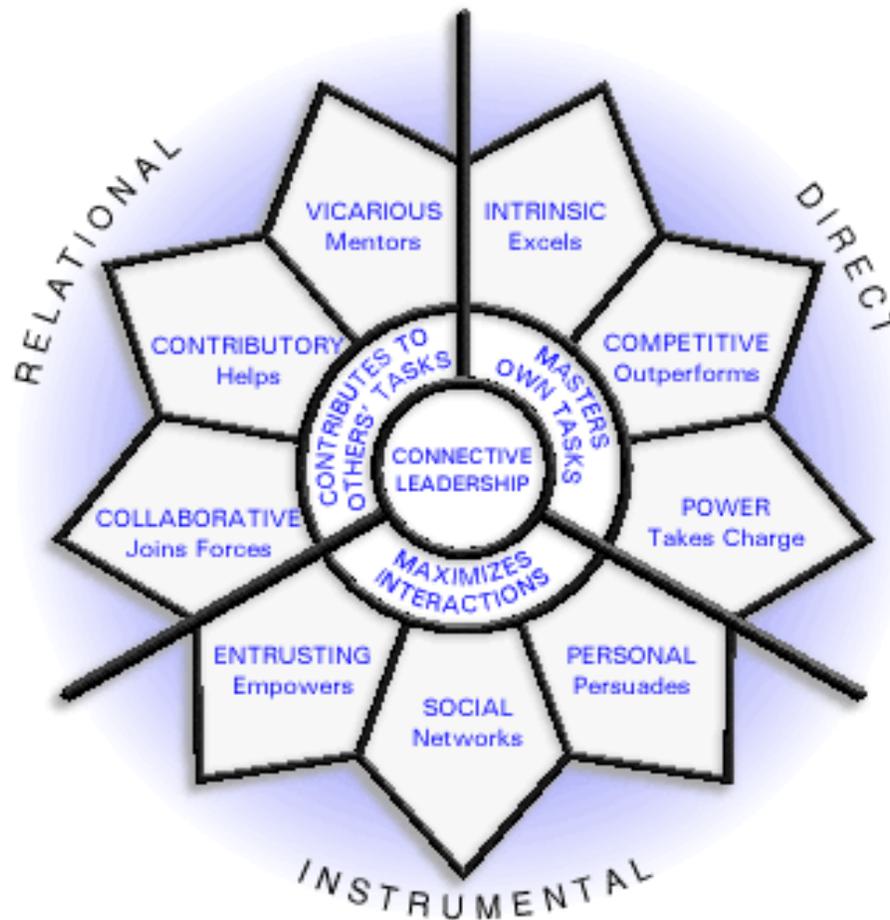


Figure 2. Connective leadership model (reproduced with permission from Lipman-Blumen, 1996).

As seen in the figure, the nine achieving styles are arranged in a circular pattern. These styles fall into three domains depicted by the inner circle in Figure 2. These domains include: (1) mastering own tasks, (2) maximizing interactions, and (3) contributing to others' tasks. By expanding their leadership repertoire, leaders can choose from a range of behaviors, depending on the task at hand. It is individuals with an expansive array of behavioral choices at their fingertips that Lipman-Blumen (1996) refers to as "connective leaders." To depict connective leaders, the center circle in Figure 2 represents the intersection of the three domains, as well as the nine achieving styles. Individuals classified as connective leaders are able to utilize all nine styles in all three domains. In contrast, most individuals rely heavily on only two or three of the nine leadership styles (Bitterman, 1989; Harless, 1995; Lipman-Blumen, 1996), even in situations where these behaviors may not be effective.

The nine Achieving Styles are grouped for explication into three sets: Direct, Instrumental, and Relational. Each set, in turn, consists of three distinct styles. More specifically, the Direct set focuses on executing and mastering one's own tasks. The Instrumental set uses the self, the system, and others as instruments for goal attainment; while the Relational set emphasizes contributing -- actively or passively -- to the tasks of others (Lipman-Blumen, 1996).

The Direct Set

The first of three domains within the Connective Leadership model is the Direct domain. The three achieving styles within the Direct domain are Intrinsic, Competitive, and Power. The Intrinsic style focuses on an internalized standard of excellence, which emphasizes accomplishing and mastering one's own tasks and striving to outdo one's own prior performance. In contrast, the Competitive style focuses externally and is driven by the motivation to outperform relevant others. The Power style is dominated by taking control and organizing tasks, often delegating them to other individuals, while retaining control over the process and outcome (Lipman-Blumen, 1996).

The Instrumental Set

The Instrumental styles include Personal, Social, and Entrusting. The Personal style uses intellectual, physical, familial, and other characteristics of the leader to attract followers to accomplish the goal. The Social style accomplishes tasks by persuading individuals with specific, relevant abilities, experience, or connections to pursue the goal and relies upon social networks. The Entrusting style utilizes optimistic expectations of others, with or without pertinent experience, often successfully pushing followers beyond their comfort zones (Lipman-Blumen, 1996).

The Relational Set

Finally, the three Relational styles are labeled Collaborative, Contributory, and Vicarious. The Collaborative style unites individuals to accomplish group goals, equally sharing the successes or failures of such endeavors. The Contributory style actively and directly contributes to the goals of another individual with whom the contributory achiever identifies subsequently deriving accomplishment from that other's success. In contrast, the Vicarious style contributes passively or indirectly by supporting, encouraging, or taking pride and obtaining satisfaction in the tasks of another with whom the vicarious achiever identifies (Lipman-Blumen, 1996).

Learning Styles and Connective Leadership

According to Harless (1995), achieving styles may be conceptually related to learning styles, "just as learning styles investigate students' preferred styles for learning, achieving styles focus on how individuals go about the process of achieving" (p. 7). For example, Bitterman (1989) examined the relationship among the learner's cognitive style, preferred achieving style(s), and her/his preference for self-directed learning (SDL). Results showed achieving styles to be highly statistically significant in determining SDL preference of the participants. Perhaps the strongest evidence for a relationship between Connective Leadership and learning styles comes from a study by Harless (1995) in which the relationship among achieving styles, learning styles, and study strategies for college students was examined. The results showed that specific achieving styles served as predictors for particular learning strategies.

Merging Learning and Leadership Research

The existing research supports the relationship between student leadership development and the learning experiences that take place in the college environment (Dugan & Komives, 2007, 2010; Logue et al., 2005). In a national study, Dugan & Komives (2007) reported that 7-

14% of the variance seen in leadership outcomes were explained by experiences in the college years. The learning and leadership research reviewed above suggests some intriguing questions. Do those college students who demonstrate diversity in learning styles also display a facility for using all nine leadership styles? Perhaps Connective leaders develop due to their ability to gather and use information from a wide array of experiential activities. Does the ability to select and use the most relevant information available predispose students to develop a sense of which leadership behaviors are most relevant given the situation?

There is evidence to support a connection between Versatile learners and Connective leaders (see Table 1). Both groups are rare among the general population (Lipman-Blumen, 1996; Wyrick, 2003). Learning style balance has been associated with adaptive flexibility and more complex levels of development (Mainemelis et al., 2002), along with a high tolerance for different situations (Wyrick, 2003). These attributes logically link to the skills Connective leaders use to attack complex situations.

Table 1. *Versatile Learners and Connective Leaders*

Versatile Learners	Connective Leaders
Small percentage of learners	Small percentage of leaders
Learning style flexibility	Leadership style flexibility
Complex development	Tackles complex problems
Makes connections	Makes connections
Adaptive flexibility	Selects behavior to fit situation

Versatile learners have also been found to have high levels of ego development (Kolb, 1984), suggesting they may be well versed at “harnessing their egos” for a greater cause, also a Connective leadership trait (Lipman-Blumen, 1996). According to Kolb (1984), Versatile learners have fuller lives characterized by the connections between multiple life domains. Similarly, Lipman-Blumen (1996) speaks of Connective leaders as those who search for meaning by making connections. Further evidence of such a link between versatile learners and leaders is provided by Posner (2009), who found that those students who reported greater versatility in learning also engaged in a larger range of leadership practices (Posner, 2009).

The literature supports the similarities between Versatile learners (a.k.a. Hub learners) and Connective leaders. For the current study, Hub learners were placed in two categories based on whether they scored the same on the Abstract Conceptualization/Concrete Experience continuum (Hub AC/CE) or the Reflective Observation/ Active Experimentation (Hub RO/AE) continuum. This led to the following hypotheses:

Hypothesis 1: Connective Leaders will also be categorized as Hub AC/CE learners.

Hypothesis 2: Connective Leaders will also be categorized as Hub RO/AE learners.

Methods and Measures

Participants

The sample examined in this study included undergraduate journalism students at a large northeastern university from 1988 through 2001. The data collected included the Achieving Styles Inventory and Kolb's Learning Styles Inventory, which are the two instruments used in the current study to test the proposed hypotheses. This archival database of students included 3,932 participants with an average age of 19.7 years. The data represent approximately 100 students per semester from 1988 through 2001. The participants are predominately from the US (97.1%); the majority (68.1%) are female.

Additional data for 2002 was collected from students enrolled in a west coast university business department. There were 84 students in this part of the study, with 39 males and 45 females. The students were slightly older with an average age of 24.2 years. Similar to the students in the archival data, most of these participants were from the U.S. (95.2%). Statistical analysis showed no significant differences between the two student populations. For purposes of the study, therefore, west coast students' data were combined with the students represented in the northeastern archival data.

The overall sample examined in this study included undergraduate students from 1988 through 2002. Prior to initial data screening, there were 4022 participants. Of those, 422 were eliminated because they did not complete the inventories. There were thus 3600 usable cases. The initial analysis examined issues with respect to missing data or other problematic distributions. Data were screened for outliers, skewness, kurtosis, and any input errors prior to hypothesis testing. Means and ranges were compared for the variables along with histograms to examine normality.

In the final analysis, the sample contained 1127 males and 2471 females; two respondents were missing gender information. Of these 3600 participants, 3390 were U.S. citizens, with the others spread among 51 other countries. Of the participants who reported their ethnic background, most were White ($n = 2682$) followed by 387 African-Americans, 230 Asian, 128 Hispanic and 17 American Indian. Most respondents were never married (97%) and full-time students (98%).

Learning Style Measure

Learning styles were measured using Kolb's Learning Styles Inventory (LSI), which is a self-report measure. This measure contained 12 worded stems that are each a variation of "I learn best when." Participants are required to rank order (one through four) the four phrases that follow the word stem, such as "I rely on logical thinking," or "I listen and watch carefully." A score of four is placed next to the word stem that the participant feels most represents his or her learning preference. For example, in the phrase "I learn best from" the four possible choices are (a) observation, (b) personal relationships, (c) rational theories, and (d) a chance to try out and practice. Respondents place a four next to the choice that best describes their learning preference, a three next to the second choice and so on. Each of the four-word phrase choices corresponds with the four learning styles measured by this inventory.

Leadership Style Measure

The dependent measure of leadership styles used in this study was the L-BL Achieving Styles Inventory (ASI). The L-BL Achieving Styles Inventory is a 45-item self-report instrument. The nine leadership styles are measured using a 7-point Likert scale that represents the behaviors individuals utilize to accomplish their goals. Each behavioral scale ranges from 1 ("Never") to 7 ("Always"). Respondents are asked to rate behavioral statements, such as "Faced with a task, I prefer a team approach to an individual one" or "I achieve by guiding others towards their goals." Lipman-Blumen (1987) conducted reliability and validity studies on the ASI. Test-retest reliability correlation coefficients for the nine scales range from .75 to .90 and from .81 to .89 on the three domains of Direct, Relational, and Instrumental (Lipman-Blumen, 1987).

Results

Frequencies and Means of Measures

Means and standard deviations were computed for the nine leadership styles and the six learning styles. The means for the nine leadership styles ranged from 4.1 to 5.0 on a one-to-seven scale. Regardless of learning style, participants reported a preference for the two Direct styles of leadership, Power and Intrinsic. The leadership style with the highest mean was the Power style and the least used style was the Social style. The participants were further categorized into Connective Leaders or Non-Connective Leaders. Connective leaders are defined in the ASI technical manual as individuals scoring a 5 or higher on all nine leadership styles (Lipman-Blumen, 1988). As predicted by the literature, there were a low number of Connective Leaders ($n = 104$, 2.9%) and 3496 Non-Connective Leaders.

Means were also calculated for the LSI. The means on the four continuum points in Kolb's learning model ranged from 12 to 36. The most preferred learning factor was Active Experimentation (AE), with a mean of 32.5, and the least preferred was Concrete Experience (CE), with a mean of 27.7. The scores on these four learning factors were then used to categorize the participants into six learning styles. The two groups of Versatile learners were made up of individuals with identical scores on one of the learning factor continua. No individuals had identical scores on all four learning factors. Participants scoring the same on the CE and AC learning factors were categorized as Hub CE/AC learners, while individuals scoring the same on the RO and AE learning factors were placed in the Hub RO/AE group. Of the six learning styles, more respondents fell into the Converger category than any other learning style ($n = 1072$), and the lowest number of participants were, as expected, in the two versatile learner styles with 112 Hub CE/AC learners and 79 Hub RO/AE learners. Our analysis also found no differences based on the participant's sex.

The inter-correlations were compared among the nine leadership styles and the learning factors (CE, RO, AC, & AE). Statistically significant correlations were found. This suggests a relationship between how individuals learn and how they lead (see Table 2). For the Hub CE/AC scores, as the participant's score decreased indicating more versatile learning, the scores on the leadership styles of Social, Entrusting, Collaborative, Contributory, and Vicarious increased suggesting the use of a wider range of leadership styles. This pattern was not seen for the Hub RO/AE scores; when these scores decreased, the only significant increase in leadership styles was seen with the Power style. It should be noted, however, that with the large sample size used in this study, even relatively small correlations are often significant.

Hypothesis Testing

The hypothesis proposes that Connective leaders will also be more versatile learners. To test this hypothesis, mean scores on the nine connective leadership styles were calculated for the two types of hub learners. Hub CE/AC learners reported the highest means on the two Direct styles of Power ($M=5.09$, $SD = 1.23$) and Intrinsic ($M=5.07$, $SD = .85$) and scored lowest on Social-Instrumental ($M = 4.21$, $SD = 1.18$).

Similarly, the Hub RO/AE learners reported the highest means on the Power ($M=5.01$, $SD = 1.30$) and Intrinsic ($M = 4.92$, $SD = 1.01$) styles. The lowest reported means for Hub RO/AE learners was the Contributory ($M = 4.19$, $SD = 1.09$) style. These results are similar to those seen in the Hub CE/AC group. These two Hub groups share the aspect of flexibility and may not feel comfortable having the goals set by another group or individual.

Further analysis was conducted by comparing correlations of the two versatile learning scores and the nine connective leadership styles. Versatile learning scores were calculated by taking the absolute value of the difference between the AC and CE scores. The lower the score, the more balanced the individual was on the AC/CE continuum. The scores for AC/CE learning significantly negatively correlated with five of the nine connective leadership styles. All three Relational styles, Collaborative ($r = -.083$, $p < .001$), Contributory ($r = -.046$, $p = .006$) and Vicarious ($r = -.036$, $p = .033$) were significantly negatively correlated with the AC/CE scores. This suggests that the more balanced individuals are between Abstract Conceptualization and Concrete Experience, the more they engage in the Relational leadership behaviors. Moreover, two of the three Instrumental styles, Social ($r = -.037$, $p = .027$) and Entrusting ($r = -.050$, $p = .003$), were negatively correlated with the AC/CE scores. These results suggest that as individuals report more balanced (lower) AC/CE scores, their leadership behaviors in the five correlated styles increase, thereby revealing a greater tendency toward Connective leadership. The effect size of the correlations, however, is small indicating only a weak relationship. Nevertheless, they do provide insight into how the balance between learning factors increases leadership behaviors. The significance of these correlations may be a result of the large sample size. This partially supports the Hypothesis 1.

Table 2. Correlations Between Hub Learners and ASI Scores

Variable	1	2	3	4	5	6	7	8	9	10	11
	Scores (n = 3600)										
1. Hub CE/AC	---	-.01	-.02	-.01	-.03	-.02	-.04*	-.05**	-.08**	-.05**	-.04*
2. Hub RO/AE	---	-.02	.01	-.05**	-.01	-.01	-.02	-.02	.01	.00	
3. Intrinsic Direct		---	.38**	.40**	.23**	.19**	.10**	.17**	.37**	.32**	
4. Competitive Direct			---	.51**	.42**	.40**	.09**	.18**	.22**	.20**	
5. Power Direct				---	.37**	.39**	.11**	.16**	.29**	.20**	
6. Personal Instrumental					---	.48**	.34**	.16**	.26**	.28**	
7. Social Instrumental						---	.35**	.27**	.34**	.23**	
8. Entrusting Instrumental							---	.45**	.35**	.36**	
9. Collaborative Relational								---	.49**	.35**	
10. Contributory Relational									---	.62**	
11. Vicarious Relational										---	

Note. * $p < .05$ ** $p < .01$

The same process was used to measure balance on the RO/AE continuum (see Table 2). The scores for the RO/AE balance significantly negatively correlated with only one connective leadership style, Power ($r = -.045, p = .007$). This correlation indicates that as individuals become more balanced, or report lower scores, the leadership behaviors associated with the Power style increase. These Hub RO/AE learners do not however, score higher on the wide range of leadership styles that would signify they were Connective leaders. Caution should be exercised in using such small correlations as support for the proposed hypothesis. Since only one style was significantly correlated, this only weakly supports Hypothesis 2.

To examine further the proposed hypothesis, t-tests were used to compare respondents categorized as Connective Leaders with Non-Connective leaders. Note that lower scores on these continua represent more versatility in learning styles, in other words, not a strong preference for one learning style over another. Non-Connective leaders ($n = 3496$) and Connective leaders ($n = 104$) were compared on their scores reported for the AC/CE balance and the RO/AE balance. For analysis, t-tests were used to examine the differences between variable means. Since multiple t-tests were used which could result in an inflated Type I error, a Bonferroni type adjustment was made (Tabachnick & Fidell, 2001). In examining the scores on the AC/CE continuum, participants categorized as Connective leaders reported significantly lower scores on the AC/CE continuum ($t = -2.27, p = .025$) when compared to Non-Connective leaders. In other words, Connective leaders who exhibit a wider range of achieving styles also report more versatility in their learning preferences on the AC/CE scale. This partially supports the Hypothesis 1.

Table 3. *Versatile Scores for Connective Leaders Compared to Non-Connective Leaders*

	Mean	Std. Dev.	t value	p value
AC/CE Scores				
Connective Leaders (n = 104)	8.21	6.55	-2.27*	.025
Non-Connective Leaders (n = 3496)	9.70	7.21		
RO/AE Scores				
Connective Leaders (n = 104)	12.16	7.75	1.48	.143
Non-Connective Leaders (n = 3496)	11.03	7.60		

For the reported scores on the RO/AE continuum, there was no significant difference found between Connective leaders and Non-Connective leaders ($t = 1.48, p = .143$). This suggests that Connective leaders did not significantly differ from Non-Connective leaders in their scores on the RO/AE scale. These results fail to support Hypothesis 2.

Discussion

Versatile or Hub learners, by definition, did not show a preference on at least one of the two learning continua. Versatile learners were divided into two groups, based on whether they reported no difference on the CE/AC continuum or on the RO/AE continuum. Both of these learning groups were hypothesized to be similar to individuals classified as Connective Leaders who report they frequently use all nine leadership styles, indicating versatility in leading.

Both Versatile learners and Connective leaders are a small percentage of the population as supported in this study. Theoretical similarities between these two groups are also proposed in their flexibility, complex reasoning, and their ability to recognize connections between differing aspects of their lives. Hub learners reported using the Intrinsic and Power leadership behaviors most often, thus lending little credence to the theoretical relationship.

Connective leaders were compared with Non-Connective leaders to detect differences between the two groups. Connective leaders were more versatile on the AC/CE continuum than were Non-Connective leaders. This versatility in learning was not supported for Connective leaders on the RO/AE continuum. This suggests that college students who learned equally well using Concrete Experience or Abstract Conceptualization may be able to translate that flexibility into versatile leadership behaviors. This is not true of students who reported versatility in learning by Reflective Observation and Active Experimentation. This supports previous research by Mainemelis et al. (2002) that demonstrated greater behavioral flexibility for Hub AC/CE learners but not Hub RO/AE learners. Perhaps the skills required to become a versatile leader are less related to the ability to balance between when to act quickly on information and when to avoid rash decisions. Moreover, balancing learning between the more concrete approaches of active experimentation and reflecting on observations may tie less into leadership behaviors. This suggests versatile leaders may demonstrate a preference between individual research and hands-on experimentation, but neither strongly impacts the flexibility of their leadership behaviors.

The one of the most important findings in terms of leadership development was the unexpected result that most college students self-report that they rely on Direct leadership styles, specifically Power and Intrinsic to accomplish their tasks. This presents an area of challenge for higher education hoping to train future leaders in a variety of leadership behaviors.

Limitations of this study

This study offered some insight into the complexity of the relationship between learning and leadership styles for college students. Overall, the mixed results obtained suggest that further research is needed. The large sample size constitutes a strength of this study. This study, however, had some limitations. The research design, which measured both learning styles and leadership styles at the same point in time, does not provide any insights into causality. A further limitation was that this study uses self-report measures. The use of Kolb's learning model and the LSI also represents a limitation. There has been controversy in the literature concerning the validity of Kolb's learning model with some studies validating the model, while other studies do not (Cornwell & Manfreda, 1994; De Ciantis & Kirton, 1996; Henson & Hwang, 2002).

Implications

One of the most interesting implications of this study lies in the unintended finding that college students tend to display the same leadership behaviors regardless of their learning style. If higher education is to promote the diversity of leadership behaviors required, then college courses must provide opportunities for students to practice leadership styles other than the Direct styles. Research suggests that future leaders must increasingly possess a variety of skills to be effective (McCauley & Van Velsor, 2004). "Executives who remain successful and effective over time are those who can learn from their experiences and use that learning to develop a wider range of skills and perspectives so that they can adapt as change occurs and be effective in a wider range of situations." (McCauley & Van Velsor, 2004, p. 208). Further, traditional university education stresses individual attainment. It should, therefore, not be surprising that students prefer Direct leadership styles. How, then, do institutions of higher education develop leadership programs that allow students to learn other forms of leadership behaviors?

One way to accomplish this may be through problem-based learning (PBL). PBL takes authentic business problems and uses small student teams to solve them under the supervision of the professor. Students become responsible for their own learning by selecting and organizing information, constructing hypotheses, making decisions, and reflecting upon the process and how the skills learned could be transferred to other settings (Sorenson, J. F., & Wittmer, D. P., 1996). This may foster greater diversity in the choice of leadership styles. "The real danger lies in getting stuck in the comfortable patterns that grow out of prior success experiences and personal learning preferences" (McCauley & Van Velsor, 2004, p. 209).

Conclusion

Using a large sample rarely seen in leadership studies, this paper makes key contributions to the literature. First, learning styles should be taken into consideration when creating leadership programs, thereby crafting a better approach to developing in our future leaders. Moreover, the results suggest that most students rely on only a few leadership behaviors and therefore, more should be done to expand their repertoire.

The question remains "Which individual differences are important to student leadership development?" The current study suggests that learning styles may influence what information is deemed important and how it is processed. Leadership development must, therefore, keep pace by promoting leadership not as a "one-size-fits-all" model, but rather as a tool chest of leadership behaviors from which students can select as required. Research supports that matching learning styles to training can improve information processing (Hayes & Allinson, 1998), create more behavioral flexibility (Mainemelis et al., 2002), influence decision-making and problem definition (Chenhall & Morris, 1991), and increase performance (Sein & Robey, 1991).

Some options offered as learning choices include case studies, student leadership reading groups, programs specifically focused on special issues, handbooks, half-day workshops, supervisory network programs, and on-line training (Caudron, 2000). Learning style research suggests that these training options will be most effective when synchronized with a student's learning preferences (Hayes & Allinson, 1998). Future research into matching learning styles to student leadership development options may thus provide a critical key in training our future leaders in business, government, and academic arenas.

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