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Developing global leaders in a digital world

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Table of contents

Introduction	4
Theoretical background	5
Learning through experience	5
Our digitized world	6
Virtual learning	6
Blended Learning	6
Influence of personality on outcomes from different teaching methods ..	8
Aims and objectives	9
What we did	10
What we measured	10
What we found	11
Learning	11
Learning Transfer	12
Personality Measures	12
Heart Rate Variance	13
Discussion of our findings	14
Implications for practice	15
Conclusion	15
References	16
About the authors	18

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Introduction

As our world becomes ever more global, our ways of working become ever more virtual. Operating across countries demands digitized communication and collaboration – a trend which is also being reflected in the way in which we develop our leaders. But can leaders really learn how to lead, can they develop the competences, resilience and resourcefulness to step up to the challenges of leadership through learning that is online? Or are there limitations to the benefits that can be afforded through virtual methodologies?

This research report addresses these questions, exploring whether the learning gained through a face to face, experiential behavioral simulation might be replicated in virtual or blended environments, and in addition considers whether different personality characteristics might moderate the impact on learning or application of learning from these different approaches.

Theoretical background

Learning through experience

Experiential learning is defined as the process of knowledge creation through the transformation of experience¹. The theory contends that in the management arena, real learning occurs through engagement in challenging experiences, and later reflection on those experiences². In addition, research has found experience to be related to the development of both critical leadership competences, such as cultural intelligence³, and to provide a valuable vehicle for preparing individuals for future leadership challenges and development as a leader⁴.

Research also suggests that for such experiences to have long-lasting effects, they need to be emotionally charged, with both positive and negative emotions being found to be related to learning. However, what appears to be critical to the impact of experience is the intensity of the emotion, which has been found to be more consistently related to memory than the valence of the emotion^{5,6}.

One explanation for the impact of intense emotional experiences on learning comes from our understanding of what occurs in the brain and body during times of stress. During such experiences, our body's stress hormones

produce a state of arousal which prepares us for fight or flight⁷. When moderately aroused by a situation we respond in challenge state, which optimizes cognitive performance such as decision making, learning and the formation of memories⁸. If we do not believe we have the resources available to meet the challenge, we become over aroused, and the body, perceiving threat, prepares to fight or retreat sending blood away from the brain towards the extremities impeding our cognitive performance⁹.

Given the above, it has been argued that for leadership development experiences to have a lasting impact, they need to invoke a moderate level of stress which will induce the body's sympathetic nervous response¹⁰. But can this be replicated in a virtual environment?

Our digitized world

Given the growth in reliance on virtual collaboration in our increasingly global environment, and the development of new technologies facilitating virtual collaboration, working virtually is becoming increasingly common in many organizations¹¹, and this trend is being reflected by learning and development professionals and in academia with increasing use of virtual technologies to deliver distance learning, virtual learning and eLearning¹².

Virtual learning

Learning in a virtual environment primarily involves the use of the internet to access materials, interact with content, and interact with other students and faculty through discussion boards, sharing documents and learning content in support of the learning process^{13,14}.

In recent decades the use of virtual learning has increased rapidly, with 77% of organizations in the US using online corporate training¹⁵ and 30.4% of training hours being delivered online in 2015¹⁶. Online learning enhances access to large amounts of knowledge and information, and now also often allows interaction between student and teacher through chat rooms and discussion forums^{17,18,19,20}. It also removes the geographical constraints of participant recruitment, enables scalability²¹, minimizes the cost of developing a geographically distributed workforce and reduces the number of days required away from the office²².

However, there is lot of research that suggests that face to face learning is more impactful than online learning, in terms of various learning outcomes^{23,24,25}. The reason for these findings could be down to the variety of challenges that virtual environments present to the learning experience:

- Learning in a virtual environment limits the presence of **non-verbal cues** and contextual information and may attenuate the potential for the development of various outcomes^{26,27}
- Virtual environments offer little opportunity for **feedback**, which is considered to be an integral part of the learning cycle²⁸

- Virtual learning may also isolate the learner through **limited social interaction**, which is argued to be vital to fostering learning²⁹
- The absence of interaction also results in a **lack of opportunities to establish relationships** and networks as well as share perspectives which may limit the opportunities for clarification and explanation, and require greater levels of motivation^{30,31,32}

As such, despite the promise of virtual learning, research suggests that its impact on learning, particularly in terms of the development of soft skills may be restricted by the lack of social interaction, feedback, and non-verbal cues inherent in the format.

However, other research suggests that online education may provide a superior learning experience for students than traditional, face to face methods^{33,34}. These benefits may be in part the result of the move from primarily asynchronous learning to more synchronous, interactive learning environments which offer the potential for greater levels of interaction, as well as more experiential forms of learning^{35,36}.

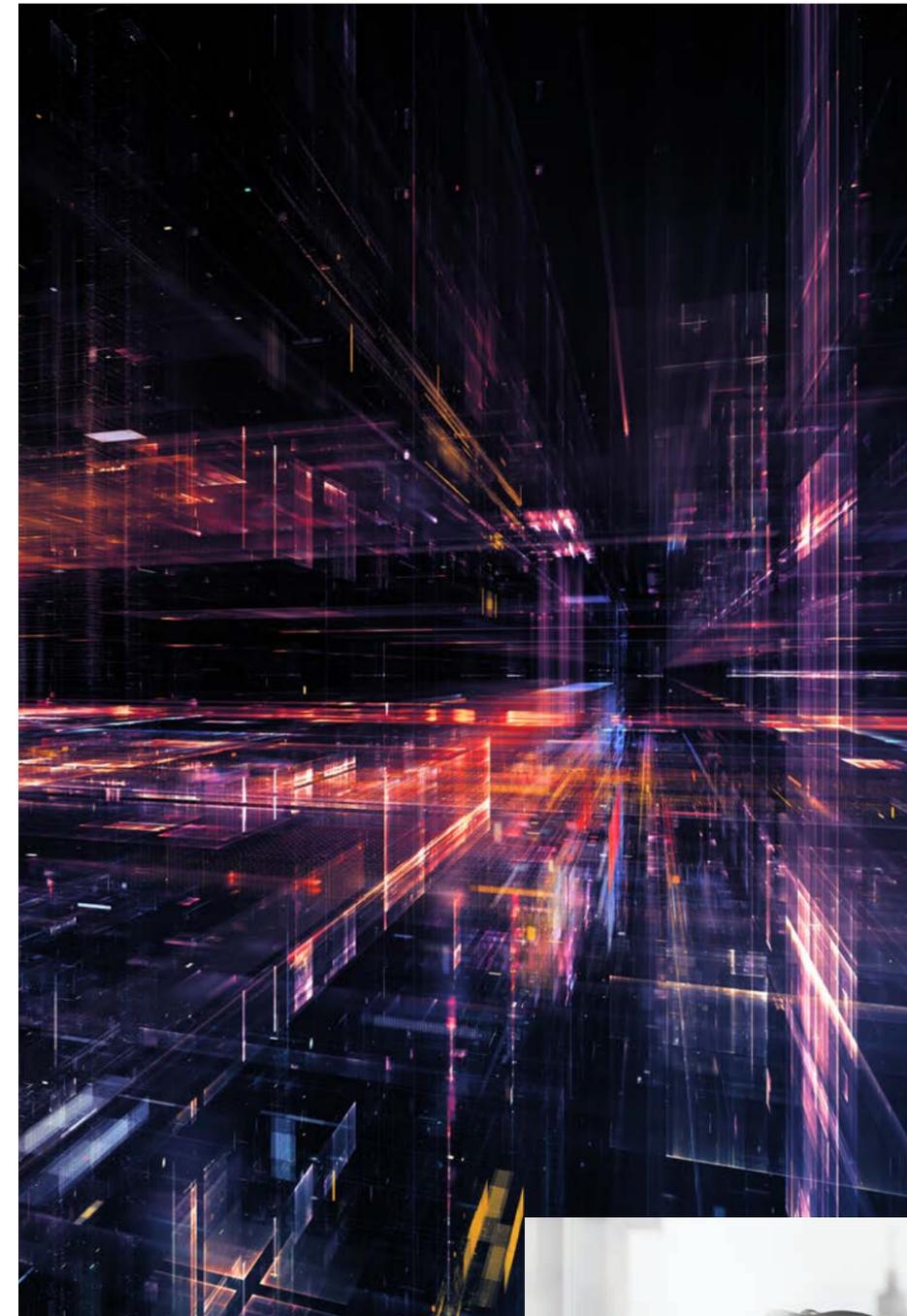
It could be that the divergence in findings therefore may be due to the learning methodology incorporated in both face to face and virtual learning rather than the learning environment itself, and that methodologies that include peer-to-peer and student to teacher interaction, as well as elements of experiential learning may be as impactful in a virtual environment as a face to face environment.

Blended learning

An alternative approach to either pure face to face or pure virtual learning is blended learning, which is broadly defined as a combination of face to face and online learning combining the benefits of synchronous learning which facilitates communication and development of a sense of community with the benefits of asynchronous learning which allows for just-in-time learning as well as interaction with and sharing of learning³⁷.

Given this balance a blended approach may be more valuable than face to face or virtual environments, and some research has found that blended learning is the same or more impactful than traditional face to face only programs in terms of both learning and learning transfer^{38,39,40}.

One objective of the current research therefore was to explore whether virtual and blended learning which incorporated opportunities for interaction, feedback, and experience, might be as impactful on both learning and learning transfer as face to face experiential learning.





Aims and objectives

The research investigated the comparative impact of these three learning environments (face to face, virtual and blended) on the development of specific leadership competences and did so from the perspectives of others as well as self. It aimed to understand whether the benefits of experiential learning might be replicated in virtual and blended environments, as well as whether different personality characteristics might moderate the impact of the learning methodology



Influence of personality on outcomes from different teaching methods

However, there is also a wealth of research that suggests that different personality characteristics may moderate the impact of learning outcomes of different learning methodologies. For example:

- The Five Factor Model of personality which includes neuroticism, extraversion, openness, agreeableness and conscientiousness, has found extraversion to be positively related to learning from experiential learning⁴¹
- Extraverted individuals tend to have an external thinking style⁴² and be more innovative and adaptive in their cognitive style⁴³, which may impact their experience of and outcomes from experiential learning
- Individual differences in negative emotional arousal (as potentially induced by experiential learning) have been found to moderate the effect of stress on cognitive performance⁴⁴
- Anxiety has been found to be positively related to sympathetic nervous system response which, as discussed above, is stimulated through stretching experiential learning⁴⁵
- Individuals high in behavioral inhibition (those who are driven to move away from something unpleasant) have been found to react with more intense negative affect in response to threats as potentially presented by experiential learning^{46,47}

- Personality traits have been found to significantly predict propensity to trust and technology communication anxiety in virtual environment, two indicators of potential success⁴⁸
- Learning agility, defined as an individual's ability and willingness to learn from experience⁴⁹, and ability to learn quickly from an experience, be flexible moving across ideas, and maximize learning from that experience⁵⁰, suggests that learning agility might be related to enhanced learning from experiential learning

All of the above indicates that different personality characteristics might well influence the impact of different methodologies on our ability to learn, and as such should be included in any exploration of the impact of those methodologies.

Taken together research suggests that, whilst virtual learning and blended learning environments might be beneficial to learning if they incorporate elements of interaction, feedback and experience, and as such be as impactful as face to face experiential learning, various personality variables may moderate that impact, and it could be that different learning environments may be more impactful for different individuals, and indeed that the experiential nature of the methodologies employed in the current research may be beneficial for some but detrimental for others.



What we did

The research involved 37 participants on three experimental versions of the Ashridge Executive Education, *The Leadership Experience (TLE)* program. Three programs were delivered by the same three members of faculty, utilizing three different learning environments:

- Face to Face Experiential (F2F)
- Blended Experiential (Blended)
- Virtual Experiential (Virtual)

The three methodologies aimed to teach the same content in terms of addressing the same specific competences which form the learning objectives of the TLE.

The F2F 2-day program was residential, the Blended 2-day program was conducted one day virtually (approximately four hours prior to the program and four hours the morning after the program) and one day residentially, and the Virtual 2-day program was fully virtual and participants were either at their own home or in their office.

The behavioral simulation which formed the basis of the three programs consisted of a simulated exercise where participants ran a company of the future, during which time they had to deal with critical incidents typical of leadership challenges, including dealing with a difficult conversation, public speaking, dealing with the media, and board presentations.

The simulation was run face to face at Ashridge for the F2F program and the blended program, whereas the Virtual program followed the same format and schedule as the F2F program but was conducted entirely in a synchronous virtual environment, utilizing the Zoom platform that allowed participants to see one another and interact live, in the moment. Pre-briefing and post-feedback were done face to face for the F2F program, and virtually for the Virtual and Blended programs.

What we measured

- **Heart Rate Variance** was measured through monitors which were fitted upon arrival for the F2F and Blended programs. Virtual program participants were sent their HRV monitors by post with instructions. All participants were instructed to wear their monitors at all times, including whilst sleeping.
- **Learning** was measured through a questionnaire which captured four scales: Self as leader; Adapting to others; Difficult situations; and Learning and development. This was completed by the participant as well as their peers, line manager and direct reports, although the 360 measure was not included in our analysis due to significantly low response rates. This was completed pre-program, one-week post-program (self-report only), and three-months post-program.
- **State-Trait Anxiety Inventory (STAI)**⁵¹ assessing, in this case, trait anxiety. This was completed pre-program.
- **Behavioral Inhibition Scale / Behavioral Approach Scale (BIS/BAS)**⁵² assesses individual differences in motivational systems, that is whether individuals are driven to move toward something desired or away from something unpleasant. This was completed pre-program.
- **Learning Tactics Inventory (LTI)**⁵³ profiles a person's preferred learning behavior, and includes four learning styles: Action; Thinking; Feeling; and Accessing Others. This was completed pre and three-months post-program.
- **Big Five Inventory (BFI)**⁵⁴ measures an individual on the Big Five Factors (dimensions) of personality⁵⁵: Extraversion vs. Introversion; Agreeableness vs. Antagonism; Conscientiousness vs. Lack of Direction; Neuroticism vs. Emotional Stability; and Openness vs. Closedness to Experience. This was completed pre-program.
- **Learning transfer** assessed participants' ability to apply their learning from the programs and consisted of 12 potential actions or behaviors, each of which was followed by a question asking, "To what extent do you feel more confident in doing so because of the program". This was completed three-months post-program.

What we found

Given the complexity of the research design, a large number of statistical analyses were conducted on the data. For brevity and clarity, only the statistically significant findings are reported in the results section.

A series of statistical tests were conducted to examine the learning gained by participation in each of the three different teaching environments (F2F, virtual, and blended).

Learning

Two of the learning scales were significantly improved following attendance on a program:

1. Self as Leader improved significantly across time ($F(1.446,36.162)=4.408$, $p=0.030$, partial $\eta^2=0.150$) for all program types, with a significant difference found between Time 1 (pre-program) and Time 3 (three-months post-program) and Time 2 and Time 3. No significant difference was found between Time 1 and Time 2 (one-week post-program). These results were found for all three programs.

2. Difficult Situations improved significantly across time ($F(1.415,35.370)=4.705$, $p=0.025$, partial $\eta^2=0.158$), for all program types, with a significant difference found between Time 1 (pre-program) and Time 3 (three-months post-program) and Time 2 and Time 3. No significant difference was found between Time 1 and Time 2 (one-week post-program). These results were found for all three programs.



Learning transfer

The table below details the percentage of participants from the three groups that reported having engaged 'sometimes', 'regularly' or 'always' in a particular behavior or action since the program as well as the percentage of participants who reported that they felt confident to do so because of their attendance on the program.

There was also a significant correlation between every 'action' or 'behavior' question and the

corresponding 'confidence' question. For all 12 sets of questions, there was a positive correlation between the application of learning in terms of reported actions and the contribution of the program in this development. That is, participants reported that confidence in applying their learning was significantly related to the program they attended. These correlations were across all of the program types.

BEHAVIOR/ACTION	FACE TO FACE		BLENDED		VIRTUAL	
	ENGAGED IN	CONFIDENCE	ENGAGED IN	CONFIDENCE	ENGAGED IN	CONFIDENCE
Reflected on leadership style	92%	85%	90%	100%	100%	100%
Reflected upon how others are likely to perceive them	100%	92%	100%	100%	100%	92%
Requested feedback from others	92%	92%	90%	100%	77%	85%
Sought out more challenging tasks/ positions	92%	85%	100%	100%	92%	92%
Recognized and responded well to ambiguous circumstances	92%	85%	100%	100%	100%	85%
Actively made changes which aim to improve personal impact with others	85%	92%	100%	100%	100%	100%
Tackled a difficult conversation	92%	85%	90%	80%	100%	100%
Actively sought to manage state and behavior during a difficult conversation	85%	85%	90%	100%	100%	85%
"Stepped into the shoes" of stakeholders to understand their needs	92%	85%	90%	90%	92%	85%
Proactively sought to manage stress levels	77%	85%	80%	100%	100%	100%
Reflected upon personal development and made plans to progress it	92%	92%	100%	100%	100%	92%
Considered and tried different strategies to deal with challenging situations	85%	77%	90%	100%	92%	92%

Personality Measures

The only personality measure to exhibit a significant relationship with the programs was the Learning Tactics Inventory which assesses learning agility.

- **LTI Thinking** improved significantly across time ($F^{(1,26)}=4.340$, $p=0.047$, partial $\eta^2=0.143$) for all three programs between Time 1 and Time 2
- **LTI Feeling** improved significantly across time ($F^{(1,26)}=17.440$, $p=0.001$, partial $\eta^2=0.401$) for all programs between Time 1 and Time 2

- In addition, there was a significant interaction between program and time ($F^{(2,26)}=3.928$, $p=0.032$), with participants who completed the Blended program demonstrating the greatest change in LTI Feeling scores between pre and post-program, with no other differences between the groups
- **LTI Accessing Others** improved significantly across time ($F^{(1,26)}=5.156$, $p=0.032$, partial $\eta^2=0.165$) for all programs between Time 1 and Time 2



Heart Rate Variance

Heart rate and learning

Heart rate variance increased significantly between resting heart rate over night and maximum heart rate during the critical incidents ($F^{(5, 125)}=78.88$, $p=0.000$, partial $\eta^2=0.76$) for all program types. No significant difference was found between the programs.

- **Self as Leader.** There was a significant positive correlation between change in HR during the Difficult Conversation CI and learning as self as leader between T1 and T2 for the F2F group ($r = 0.80$, $p = 0.031$)
- **Self as Leader.** There was a significant positive correlation between change in HR during the Communication CI and the Presentation CI and learning as self as leader between T1 and T3 for the Blended group Comms: ($r = 0.87$, $p = 0.025$); Pres: ($r = 0.85$, $p = 0.031$)
- **Difficult Situations.** There was a significant positive correlation between change in HR during the Communication CI and learning as Difficult Situations between T1 and T3 for the Blended group ($r = 0.87$, $p = 0.029$)
- **Difficult Situations.** There was a significant positive correlation between change in HR during the Communication

CI and learning as Difficult Situations at T3 for the F2F group ($r = 0.64$, $p = 0.047$)

Heart rate and personality

- There was a significant positive correlation between change in HR during the difficult conversation CI and BFI *Extraversion* for those in the F2F group ($r = 0.68$, $p = 0.035$)
- There was a significant positive correlation between change in HR during the aggressive behavior CI and BFI *Conscientiousness* for those in the F2F group ($r = 0.67$, $p = 0.0333$)
- There was a significant positive correlation between change in HR during ALL CIs and BFI *Openness* for those in the F2F group:
 - Media ($r = 0.83$, $p = 0.003$)
 - Difficult conversation ($r = 0.77$, $p = 0.009$)
 - Aggressive behavior ($r = 0.74$, $p = 0.015$)
 - Comms ($r = 0.66$, $p = 0.037$)
 - Presentation ($r = 0.68$, $p = 0.029$)
- There was a significant negative correlation between change in HR during the Media CI and BFI *Openness* for those in the Virtual group ($r = -0.75$, $p = 0.008$)

Discussion of our findings

Our results found that our virtual and blended programs were as effective in improving learning for two of the four learning scales, suggesting that despite the reticence of using virtual and blended delivery as a primary source of teaching soft skills, virtual learning might be equivalent to face to face delivery in terms of some forms of competence development.

As our virtual and blended programs were experiential in nature, our findings suggest that rather than the learning environment, it is the quality of the learning methodology which impacts learning, and that virtual learning which incorporates opportunities for interaction, feedback, experience and non-verbal cues is likely to yield similar results as face to face programs.

In terms of our learning outcomes, all three groups' self-reported learning found an increase in learning about *self as a leader* and were better able to deal with 'difficult situations'. This quantitative data was also reflected in the open text responses with participants reporting in relation to 'self as leader': "[The program provided] very profound insight regarding my blind spots and insecurities as a leader" (Blended participant); and "I think that the most I got is from the exposure in the simulation, which highlighted even more what I have to overcome to feel better and become a better manager/leader" (Virtual participant).

In relation to dealing with 'difficult situations' participants reported: "[Learning] to better deal with and manage both stressful and difficult situations" (Virtual participant); and "Step in and learn from new situations (e.g. challenging discussions, etc.)" (Virtual participant).

Interestingly the significant change in self-reported learning for all of the environments was found between pre and three-months post-program, but not between pre and immediate post-program, suggesting that real learning takes time, reflection, and opportunities for application in order to embed.

We found that all three programs were as effective in encouraging application of learning in terms of a variety of behaviors and actions, and that participants also reported that confidence in applying their learning was significantly related to the program they attended. This confidence in doing things differently was again reflected in the qualitative data: "I have more proactively addressed issues and spoken up on problems" (F2F participant); "Stepping up and being more confident as a leader and facilitating change and growth" (F2F participant); and "Volunteering to take a leadership role in a recent key presentation" (Virtual participant).

In addition, our research did not find that any of the personality variables moderated the impact of the different environments on learning.

We also found that despite the lack of physical proximity and face to face interaction, virtual and blended experiential learning were just as effective in raising heart rate and inducing a level of stress as face to face experiential simulations. Importantly,

we also found a significant correlation between this change in heart rate and learning in terms of both *self as leader* and difficult situations for the blended and face to face programs, again supporting our previous research and suggests that development programs which stimulate this response should be valuable tools for preparing leaders for the challenges of leadership.

In addition, we found some interesting relationships between heart rate and the Big Five Inventory personality measure, with those high in *extraversion* in the face to face group also having a higher change in heart rate during the difficult conversation critical incident. This incident offers the greatest opportunity for participants to engage as either part of the collective group or as an individual, and as such, extraverts who get their energy from interacting with others may have felt more energized, and as such had higher heart rates than the other participants during this critical incident. We also found that those high in *conscientiousness* in the face to face group also had higher change in heart rate during the aggressive behavior critical incident. As this incident is the only one in which nobody is assigned responsibility for dealing with the aggressive behavior, those who are highly conscientious may feel more morally responsible regardless of whether they felt able to act, and as such, have higher heart rates during the incident. We also found that those high in *openness* also had a greater change in heart rate during all critical incidents. This makes intuitive sense as those with a more open disposition are more likely to engage in and therefore physiologically respond to the critical incidents presented.

Finally, we also found that all three programs enhanced three of the learning agility scales: *Thinking*, *Feeling*, and *Accessing Others*, with the blended group reporting significantly greater improvement in *Feeling* than the other programs. *Thinking* tactics involve reflecting on and processing past experience to guide future behavior and problem solving⁵⁶, *Feeling* tactics involve acknowledgement and management of feelings that arise from experience and apply that awareness in the way they respond to challenge⁵⁷, and *Accessing Others* involves learning from others. This suggests that as well as developing specific competences, experiential learning programs can also enhance individual's learning agility, specifically increasing their capacity for reflection and relying on past experience, managing their own emotions, and learning from others which in an increasingly fast paced and task-oriented world, is very valuable to organizations.

Implications for practice

Virtual learning is as effective as face-to-face. Virtual environments and blended learning environments can be as effective as face to face environments in developing the soft skills needed to be effective and resilient leaders. However, the methodologies must present opportunities for interaction, collaboration and experience, and for participants to receive feedback on their learning. The ability to effectively develop leaders across the globe without the impracticalities of travel and long periods of time out of the office should allow organizations to scale their L&D activities, broadening the potential benefit of their initiatives as well as allow them to develop their leaders in an environment that reflects the one in which they are increasingly expected to operate.

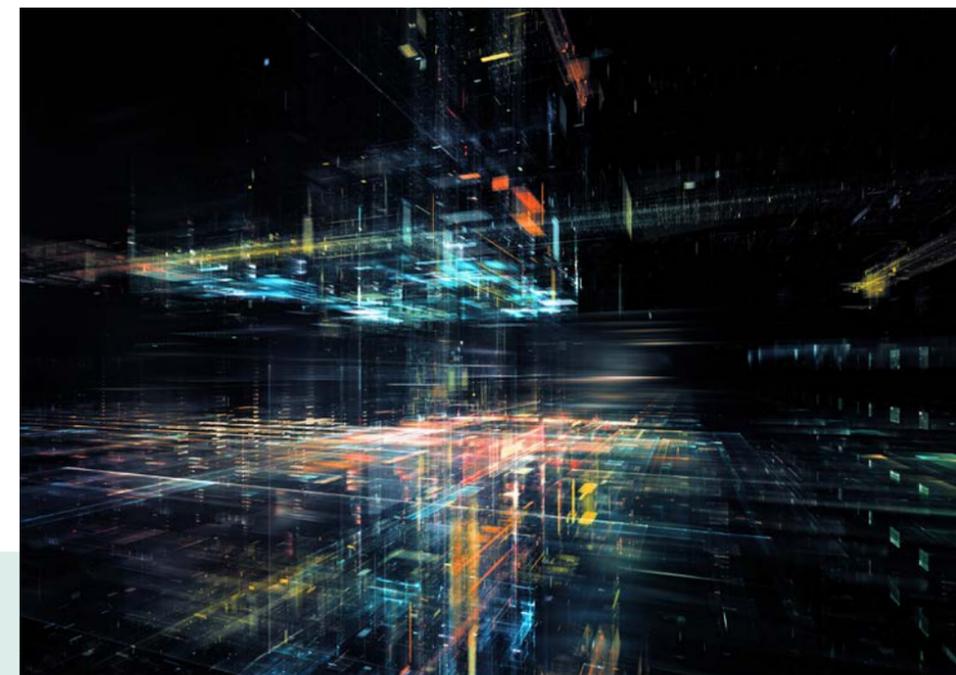
Experiential learning enhances learning agility. Experiential programs can increase participant's learning agility helping leaders to learn from all manner of experiences in the workplace, enhancing their ability to reflect on experience, manage their emotions in response to that experience, and modify their actions to incorporate new knowledge and insights. As such, experiential learning may be a valuable tool for L&D professionals not only in developing specific competences, but in developing their leaders' capacities for learning and dealing with change.

Development programs need to challenge. In order for programs to lead to lasting learning the development needs to be real, challenging, and induce a certain level of stress. By taking leaders out of their comfort zone into the 'stretch' zone and raising their heart rate, programs can improve cognitive performance during the experience and learning from it.

Learning takes time to embed. 'Happy sheets' don't always capture the full extent of participant learning, and with well delivered experiential learning programs learning continues to grow and develop over the next several

months. As such, program evaluations conducted immediately after a program should be followed up three months' post-program to get a meaningful picture of impact on both learning and learning transfer.

Experiential learning works for all. L&D practitioners need not be concerned as to whether a potential program participant is an extrovert, introvert, anxious, or behaviorally inhibited when selecting an appropriate learning intervention. All personality types are equally (and positively) impacted by interactive, experiential learning experiences.



Conclusion

Overall, our research found that virtual and blended learning environments can be as effective as face to face environments in terms of developing learning around *self as leader* and dealing with *difficult situations*, as well as increasing heart rate variance which is also related to improved learning. What is critical to this impact however, is that the learning methodologies employed in these different environments involve opportunities for experience, for interaction, and for feedback. If adhering to these principles virtual learning environments hold as much promise as face to face for developing our leaders.

What is also significant is that such experiential learning environments might not only develop the competences the programs are designed to impact, but may also develop learning agility, developing leader's capacities to learn from others, and through reflection, and manage their emotions, helping them to learn more from future learning interventions and from their everyday experience, and developing them as agile and adaptable leaders.

Taken together virtual experiential learning holds enormous promise for a scalable, practical solution to developing our leaders in our global, digital environment.

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